D SILVER LINE EAST EXTENSION TO CITY POINT

Description

This project would extend Silver Line bus rapid transit service 2.9 miles beyond World Trade Center station into the South Boston neighborhood of City Point. Bus Rapid Transit vehicles would leave the transitway tunnel at World Trade Center and continue on the surface via Summer Street, L Street and East Broadway. Bus priority lanes and sheltered stops containing passenger information would be constructed along the route. ITS technology would be used to monitor and regulate service.

Capital Features

Construction and installation of dedicated bus lanes, priority signals, and passenger shelters with amenities. Purchase of additional dual-mode vehicles.

Capital Cost	**$11.4 million (CTPS estimate)**
Operating Cost	**$3,800 per weekday**
Daily Ridership Increase on Mode	**6,800**
Net Increase in Daily Transit Ridership	**1,400**
Capital Cost/New Transit Rider	**$8,400**
Operating Cost per Wkday/New Transit Rider	**$2.80**
Capital Cost/Travel Time Benefit	**$71,900**
Operating Cost/Travel Time Benefit	**$23.60**
Travel Time Savings	**159 hours per weekday**

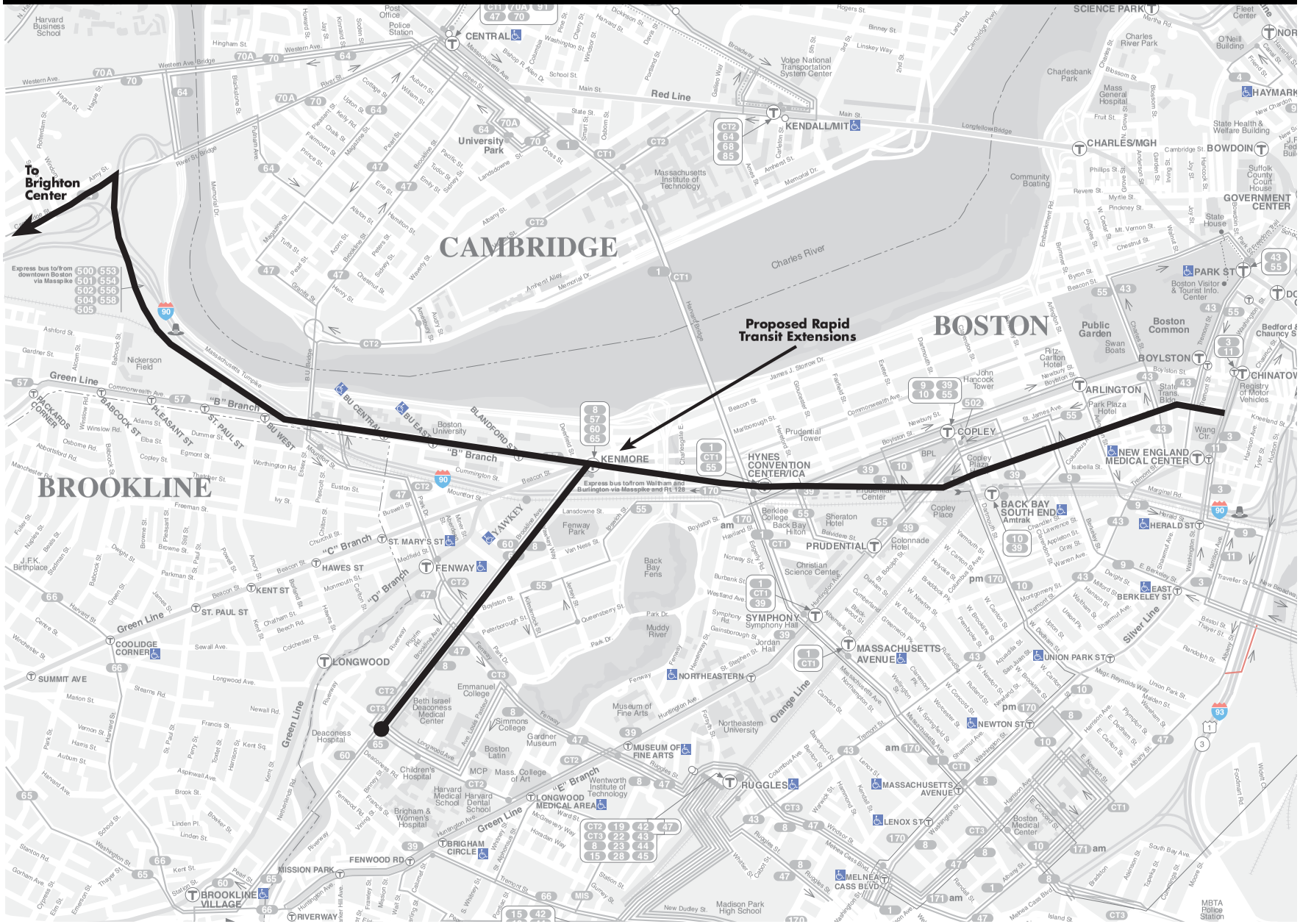
Assessment

This is a medium priority rapid transit expansion project. The capital cost for this project would be $11.4 million and the typical additional daily operating cost would be $3,800. This project would provide Silver Line service farther into South Boston beyond the Phase-2 service to Courthouse and World Trade Center stations now already under construction. Capital investment would be minimal, as buses would make use of improvements to the existing street network between World Trade Center and City Point. The service would attract 6,800 riders, of which approximately 20% (1,400) would be new transit riders. The remaining passengers would be diverted from existing bus routes, especially Route 7 City Point-Downtown, which would be replaced by this service. The capital cost per new transit rider would be low at $8,400 and the operating cost per new transit rider beyond that required by existing Route 7 service would also be low at $2.80. This would be a very cost-effective project.

Reliability would be improved through the use of dedicated rights of ways, priority lanes, signal prioritization, and Automatic Vehicle Locator systems that provide real time vehicle location information to dispatchers, planners, and customers.

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

MAP 5C-20 SILVER LINE WEST EXTENSIONS TO ALLSTON AND LONGWOOD MEDICAL AREA



D SILVER LINE WEST EXTENSIONS TO ALLSTON & LONGWOOD MEDICAL AREA

Description

This project calls for the construction of a new bus rapid transit tunnel which would split from the Phase III Silver Line tunnel near Boylston station and continue under Stuart Street and a new alignment to Kenmore Square. From Kenmore, service would continue along the surface on two branches. One would operate to the Longwood Medical Area, and the other would operate to Oak Square, Brighton via the Allston Landing development, Union Square, Allston, and Brighton Center.

It should be noted that through its *Access Boston* process, the city of Boston has identified an alternative description for a western extension of the Silver Line that could be achieved at a lower capital cost. This option would involve bus rapid transit along surface streets and the Massachusetts Turnpike through the Back Bay instead of through an underground subway line. However, only the first option is assessed in the PMT.

Capital Features

Construction of a bus rapid transit tunnel, roadway improvements west of Kenmore Square, and purchase of additional dual-mode vehicles.

Capital Cost	**$540.9 million (CTPS estimate)**
Operating Cost	**$25,600 per weekday**
Daily Ridership Increase on Mode	**27,900**
Net Increase in Daily Transit Ridership	**7,800**
Capital Cost/New Transit Rider	**$69,000**
Operating Cost per Wkday/New Transit Rider	**$3.30**
Capital Cost/Travel Time Benefit	**$619,640 per hour**
Operating Cost/Travel Time Benefit	**$29.35 per hour**
Travel Time Savings	**873 hours per weekday**

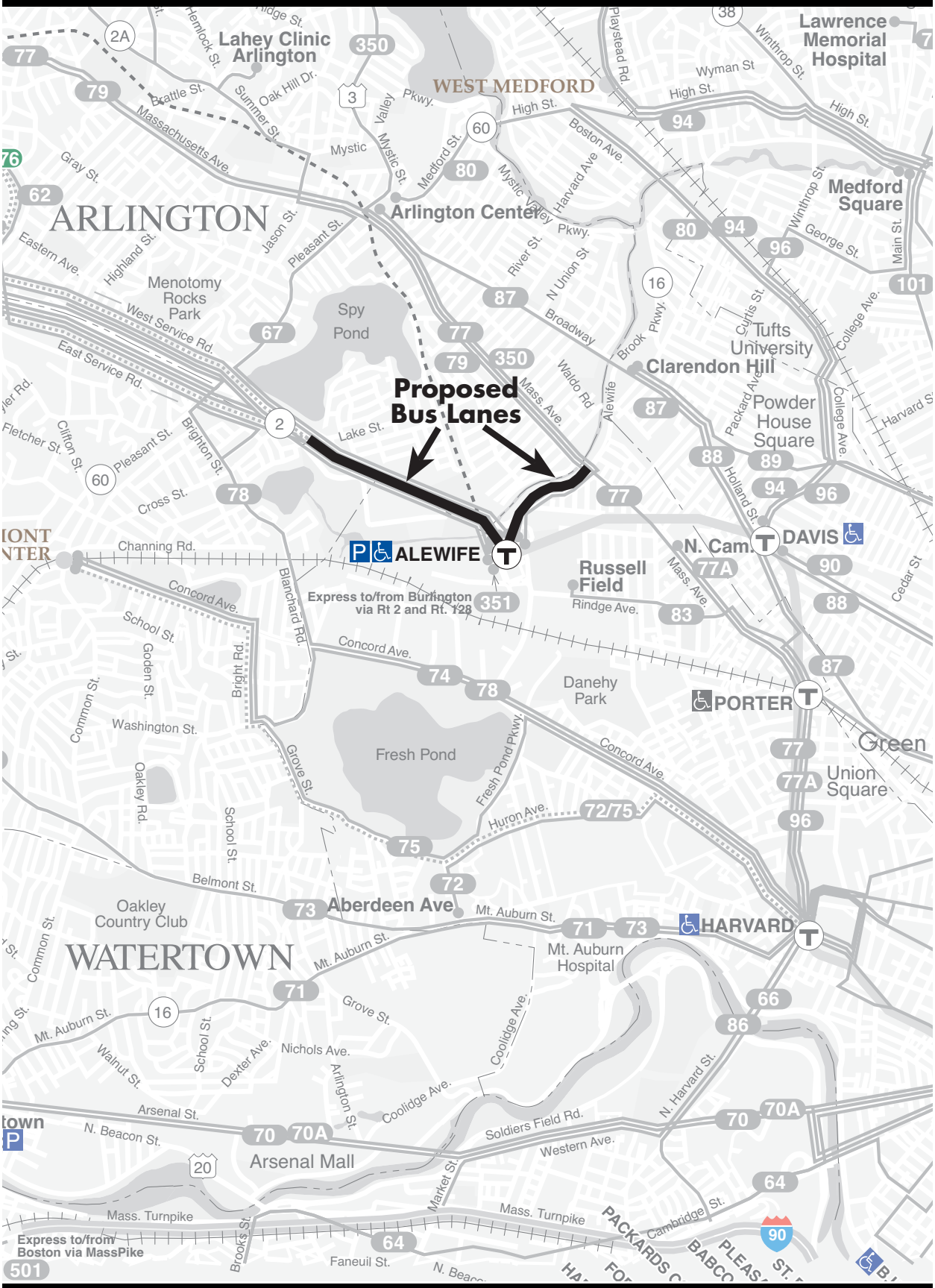
Assessment

This is a medium priority rapid transit expansion project. The capital cost for this project would be $540.9 million and the typical daily operating cost would be $25,600. This project would attract 27,900 passengers to the mode of which 7,800 would be new transit riders. The capital cost for the project would be $69,000 per new transit rider, and the operating cost per new transit rider would be $3.30. The project would have a positive impact on air quality, as many users would be diverted from automobiles. The project would also provide crowding relief to the parallel Green Line through the Back Bay. The Allston branch would provide direct service to the Allston Landing development area and densely developed mixed-use developments in Allston and Brighton. The Allston branch would fill a gap in the rapid transit system between the Red Line in Cambridge and the Green Line B-branch. The Longwood Avenue branch would increase service to the Longwood Medical Area. Direct service to Downtown Boston would be provided from Allston/Brighton and Longwood Medical Area, eliminating transfers.

Reliability would be improved through the use of dedicated rights of ways, priority lanes, signal prioritization, and Automatic Vehicle Locator systems that provide real time vehicle location information to dispatchers, planners, and customers.

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

MAP 5C-21 BUILD NEW BUSWAYS TO ALEWIFE STATION



D BUILD NEW BUSWAYS TO ALEWIFE STATION

Description

This proposal calls for the installation of exclusive bus lanes between Alewife Station and Massachusetts Avenue along Alewife Brook Parkway and between Alewife Station and Lake St. along Route 2. These lanes would improve travel times for bus Routes 62 (Bedford-Alewife), 67 (Turkey Hill-Alewife), 76 (Hanscom Air Force Base-Alewife), 79 (Arlington Heights-Alewife), 84 (Arlmont-Alewife), and 350 (Burlington-Alewife).

Capital Features

Construction of exclusive bus lanes.

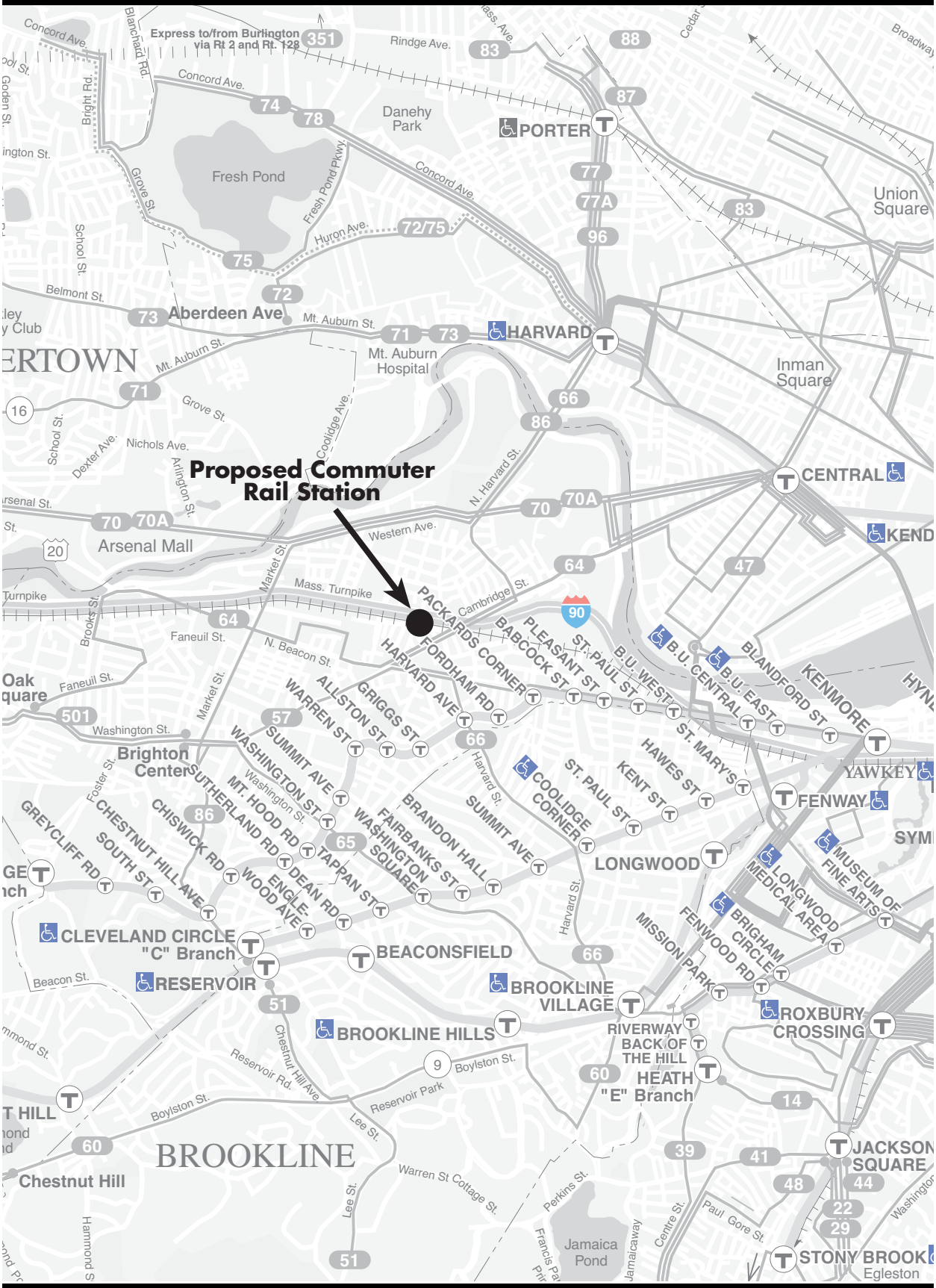
Capital Cost	**$340,000 (CTPS estimate)**
Operating Cost	**none**
Daily Ridership Increase on Mode	**600**
Net Increase in Daily Transit Ridership	**340**
Capital Cost/New Transit Rider	**$1000**
Operating Cost per Wkday/New Transit Rider	**no change**
Capital Cost/Travel Time Benefit	**$5,9100per hour**
Operating Cost/Travel Time Benefit	**NA**
Travel Time Savings	**58 hours per weekday**

Assessment

This is a medium-priority bus expansion project. The capital cost for this project would be $340,000. There is no anticipated additional operating cost. This project would attract 600 new users to the mode of which 340 would be new transit riders. The capital cost per new transit rider would be $1000. The total cost effectiveness for the project scores high compared to other bus expansion projects. Providing exclusive lanes for buses on the roadways approaching Alewife Station would improve the travel times of the existing bus service and would improve the reliability, as buses would be less vulnerable to delays caused by heavy traffic congestion in the Alewife area. There would be no improvement in mobility, as all bus routes using the busways would be existing ones.

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

MAP 5C-22 BUILD A NEW ALLSTON/BRIGHTON COMMUTER RAIL STATION



BUILD A NEW ALLSTON/BRIGHTON COMMUTER RAIL STATION

Description

This project would add a new commuter rail station on the Framingham/ Worcester commuter rail line in either Allston or Brighton. It would be between the existing Newtonville and Yawkey stations. Four previous commuter rail stations in Allston and Brighton were all discontinued in 1959 as part of a larger service reduction.

Capital Features

This project would consist of one new station with limited parking on an existing line. No upgrading of tracks would be needed. No new rolling stock would be required to accommodate the additional riders.

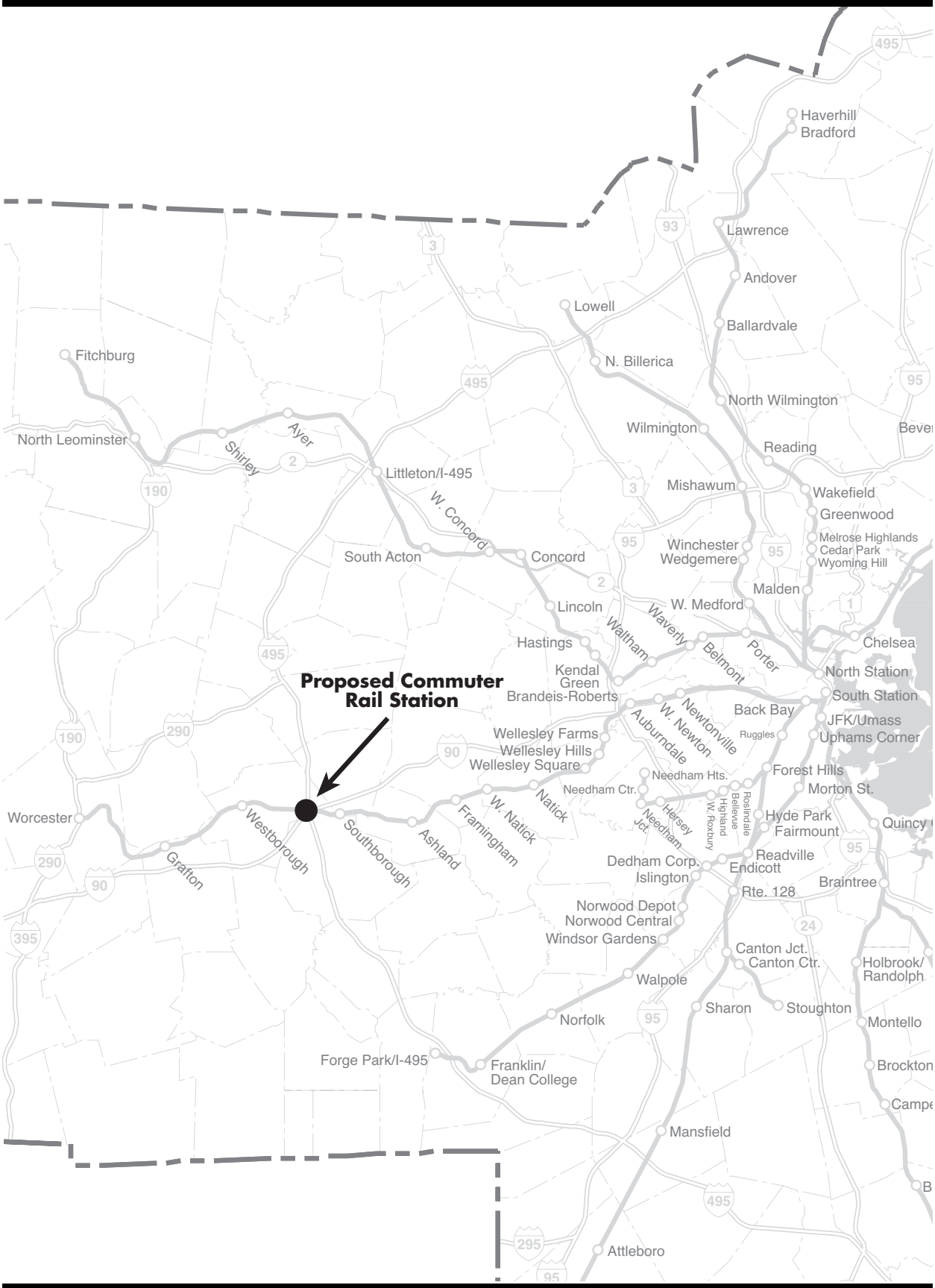
Capital Cost	**$4.1 million (CTPS estimate)**
Operating Cost	**Too small to calculate**
Daily Ridership Increase on Mode	**70**
Net Increase in Daily Transit Ridership	**50**
Capital Cost per New Transit Rider	**$81,300**
Operating Cost per Wkday/New Transit Rider	**Too small to calculate**
Capital Cost/Travel Time Benefit	**$223,800 per hour**
Operating Cost/Travel Time Benefit	**Too small to calculate**
Travel Time Savings	**18 hours per weekday**

Assessment

Overall, this project is rated medium priority. It would attract few total riders or new transit riders. The capital cost would also be relatively small in absolute terms, but the cost per new rider would be at the upper end of the mid-range among commuter rail expansion projects analyzed. Because of the relatively small saving in VMT for each new transit user, cost-effectiveness of air quality improvements would be only moderate. The Allston location does, however, receive a high rating for economic and land-use impacts, because it would be in a state-designated revitalization area, where local plans call for new industrial and high-density residential development. It would also introduce one-seat rail service to downtown Boston from an environmental justice target neighborhood that does not currently have rapid transit service.

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

MAP 5C-23 BUILD COMMUTER RAIL STATION ON I-495 IN METROWEST AREA



D BUILD COMMUTER RAIL STATION ON I-495 IN METROWEST AREA

Description

This project would add a new station on the Framingham/Worcester commuter rail line at Route I-495 in Westborough, between the existing Westborough and Southborough Stations. Both of those stations opened in 2002. Previous commuter rail stations in both towns had been discontinued in 1960.

Capital Features

This project would consist of one new station with a regional parking facility on an existing line. No upgrading of tracks would be needed. Peak capacity would need to be increased by six coaches. A new highway interchange would be needed for access to the station.

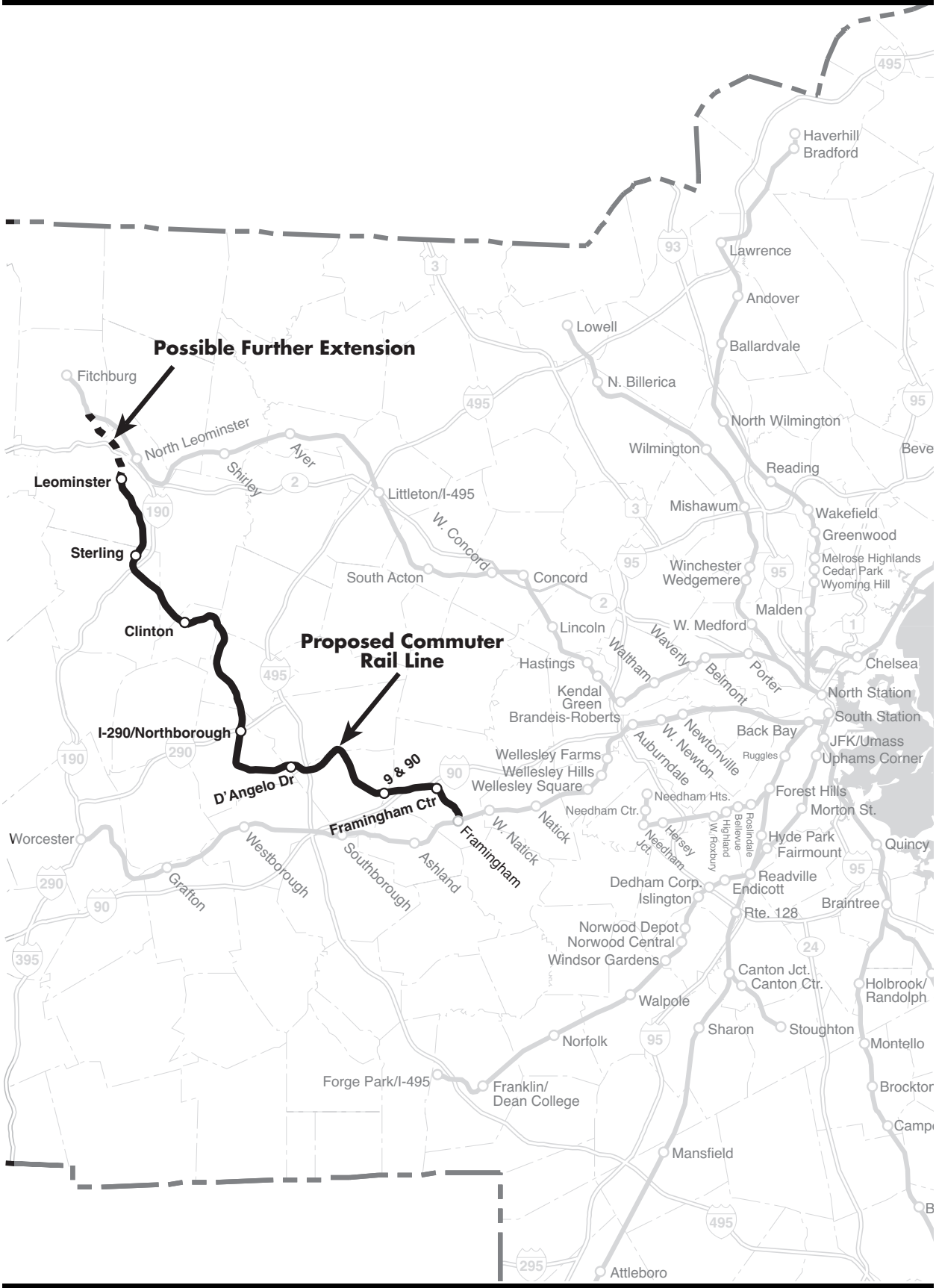
Capital Cost	**$111.1 million (CTPS estimate)**
Operating Cost	**Increased fuel from extra starts and stops, too small to calculate**
Daily Ridership Increase on Mode	**1,500**
Net Increase in Daily Transit Ridership	**900**
Capital Cost per New Transit Rider	**$122,100**
Operating Cost per Wkday/New Transit Rider	**Too small to calculate**
Capital Cost/Travel Time Benefit	**$449,000 per hour**
Operating Cost/Travel Time Benefit	**Too small to calculate**
Travel Time Savings	**247 hours per weekday**

Assessment

Overall, this project is rated medium priority. New transit ridership would fall near the lower end of the mid-range among commuter rail projects analyzed for the PMT. It would not require any track upgrading, but because it would require construction of a new highway interchange, it would also fall near the lower end of the mid-range with respect to cost effectiveness. The project has a low rating for economic and land-use impacts, as it would not satisfy any of the goals in that category. 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
New Station	◗	❍	◗	●	❍	❍	❍

MAP 5C–24 COMMUTER RAIL LINE FROM FRAMINGHAM TO LEOMINSTER



D COMMUTER RAIL LINE FROM FRAMINGHAM TO LEOMINSTER

Description

This project would implement passenger service on an existing rail freight line that connects with the Framingham/Worcester Line at Framingham Station. Passenger service was last operated on the southern end of this route in 1937, and on the remainder in 1931. The MBTA completed work in 2001 on a feasibility study that examined a commuter rail extension from Framingham to Northborough. That study provides detailed cost and ridership information for that segment of this larger service corridor.

Capital Features

This would be a 33-mile extension, including seven new stations, in Framingham, Marlborough, Northborough, Clinton, Sterling, and Leominster. Extensive upgrading of tracks and signals would be required.

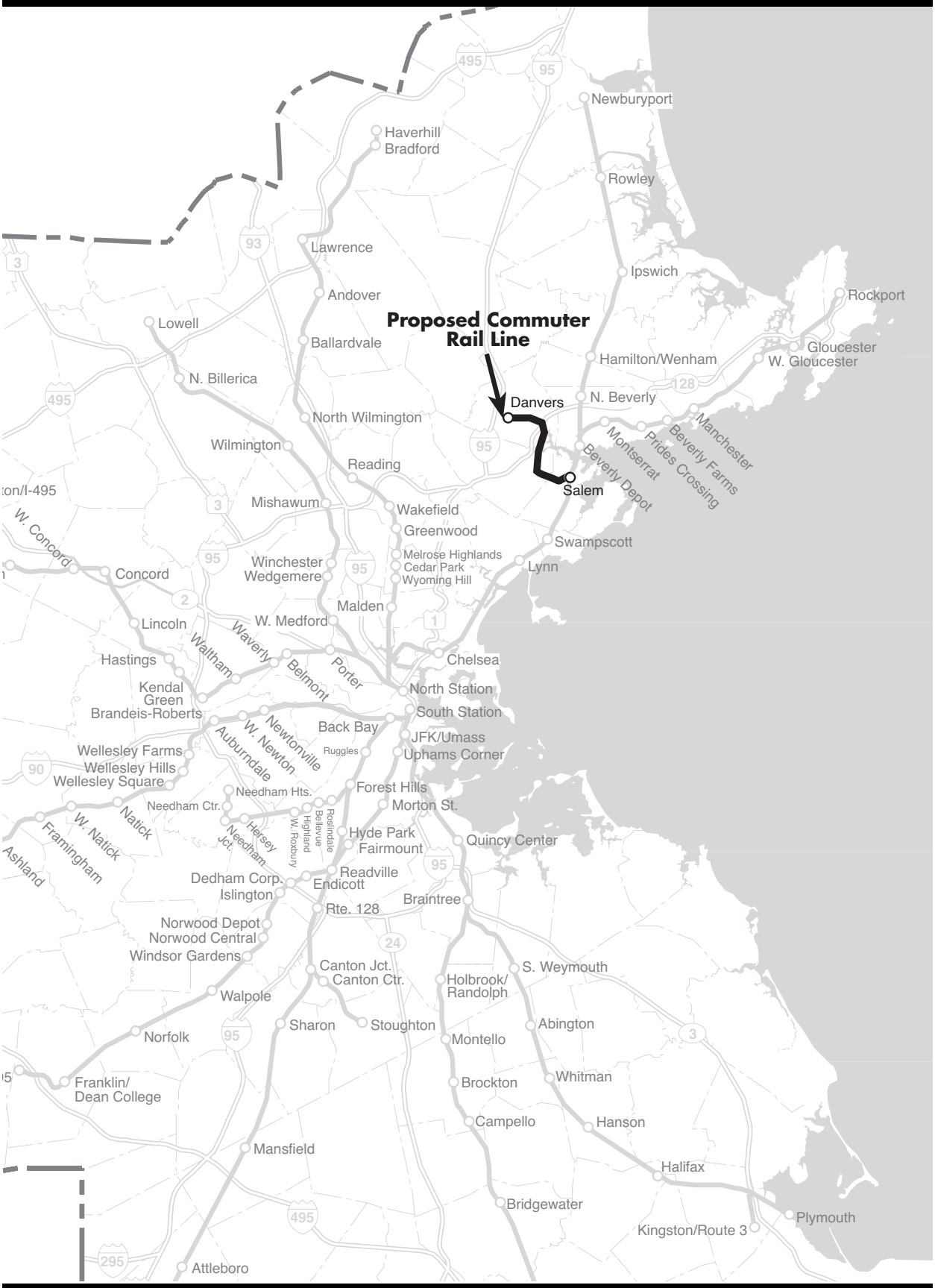
Capital Cost	**$375.4 million (CTPS estimate)**
Operating Cost	**$93,700 per weekday**
Daily Ridership Increase on Mode	**3,000**
Net Increase in Daily Transit Ridership	**1,300**
Capital Cost per New Transit Rider	**$282,300**
Operating Cost per Wkday/New Transit Rider	**$70.40**
Capital Cost/Travel Time Benefit	**$640,100 per hour**
Operating Cost/Travel Time Benefit	**$159.70 per hour**
Travel Time Savings	**587 hours per weekday**

Assessment

The overall rating of this project is medium priority. It would be one of the better commuter rail expansion projects examined in terms of the numbers of new transit riders and total riders served, and would serve an area with very limited existing transit service. Nevertheless, it would rate poorly in terms of capital and operating costs per new transit rider. Benefits to air quality would be very limited, with moderate reductions in emissions of CO and CO2, but increases in emissions of NOx and VOC. Ridership would consist predominantly of work trips from homes in or near the communities with stations to employment locations in Boston or Cambridge. Some of the communities that would be served have had substantial growth in employment in office or industrial parks in recent years. Attraction of reverse commuters and local trips on the extension would, however, require implementation of an extensive network of feeder services because of the distance from the rail line to major trip attractions. Costs of such service are not included above.

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

MAP 5C-25 COMMUTER RAIL LINE FROM SALEM TO DANVERS



D COMMUTER RAIL LINE FROM SALEM TO DANVERS

Description

This project would implement passenger service on a combination of active and inactive rail freight lines from Salem Station on the Newburyport/Rockport Line through Peabody to Danvers. Passenger service was last operated on this line in 1959. This project is currently being evaluated in the North Shore Major Investment Study which will provide more detailed information about its impacts.

Capital Features

This would be a five-mile extension, including two new stations, in Peabody and Danvers. Extensive upgrading of tracks and signals would be required. A new bridge across the Waters River in Danvers would be needed to replace a damaged wooden trestle.

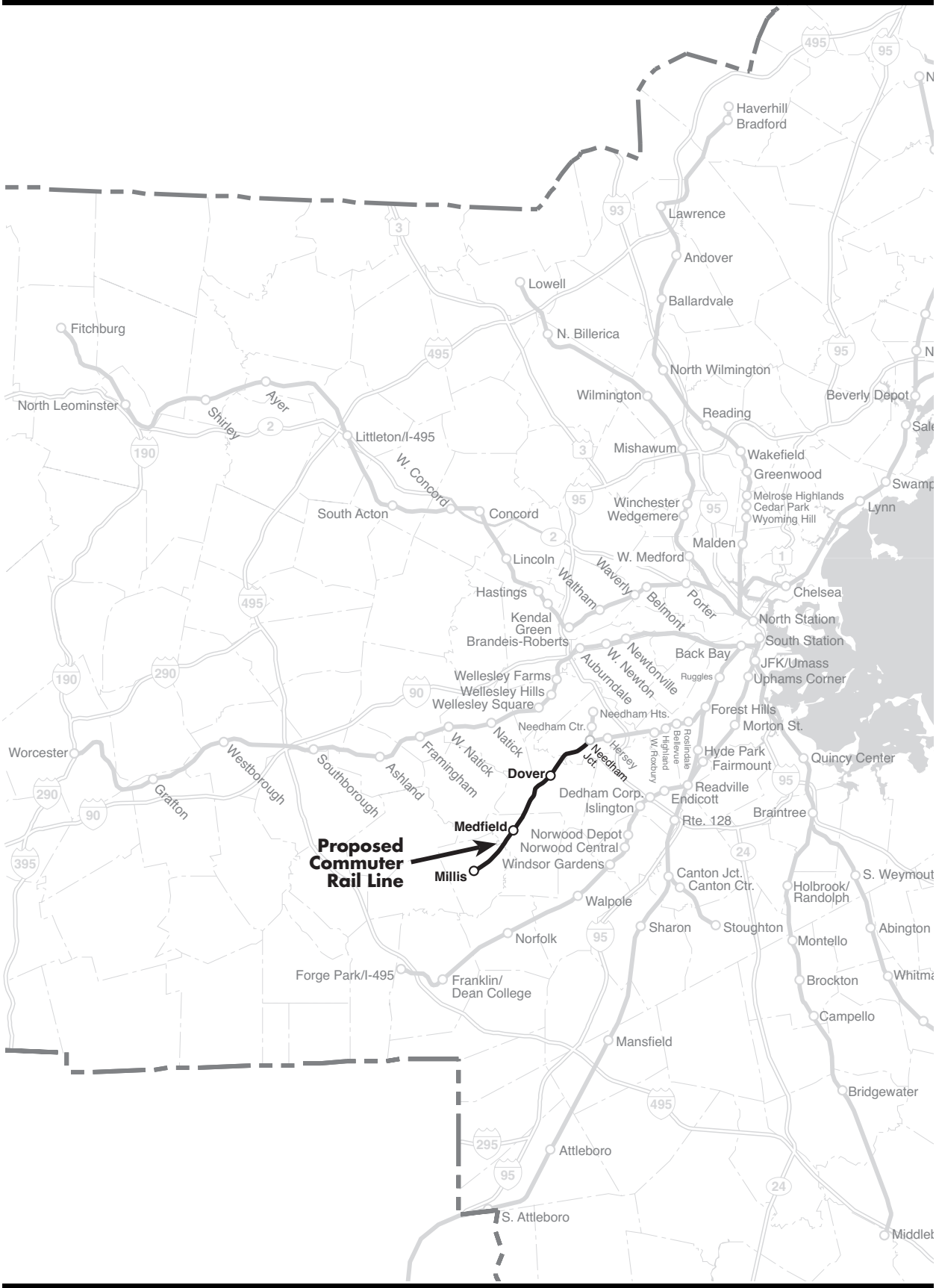
Capital Cost	**$56.1 million (CTPS estimate)**
Operating Cost	**$10,900 per weekday (limited frequency service)**
Daily Ridership Increase on Mode	**1,700**
Net Increase in Daily Transit Ridership	**700**
Capital Cost per New Transit Rider	**$80,000**
Operating Cost per Wkday/New Transit Rider	**$15.50**
Capital Cost/Travel Time Benefit	**$207,000 per hour**
Operating Cost/Travel Time Benefit	**$40.60 per hour**
Travel Time Savings	**271 hours per weekday**

Assessment

The overall rating of this project is medium priority. It would be moderately successful in attracting riders. The areas it would serve have limited direct transit service but are fairly close to existing stations on the Newburyport/Rockport Line. Capital costs for this project would be in the mid-range of costs among commuter rail extensions examined. Capital and operating costs per new transit rider would also be in the mid-range for commuter rail projects. It would have only a moderate impact on air quality. Emissions of CO, CO2, and VOC would be reduced, but those of NOx would increase. Coordination of schedules of Danvers trains with those of Newburyport and Rockport trains between Salem and Boston could be difficult. Shuttle trains between Salem and Danvers could prove to be preferable to through trains from Danvers to Boston both from an operations standpoint and in quality of service provided.

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

MAP 5C–26 COMMUTER RAIL FROM NEEDHAM JUNCTION TO MILLIS



D COMMUTER RAIL FROM NEEDHAM JUNCTION TO MILLIS

Description

This project would implement passenger service on an existing rail freight line from Needham Junction Station on the Needham Line to Millis. Passenger service was last operated on this line in 1967.

Capital Features

This would be a ten-mile extension, including three new stations, in Dover, Medfield, and Millis. Extensive upgrading of tracks and signals would be required.

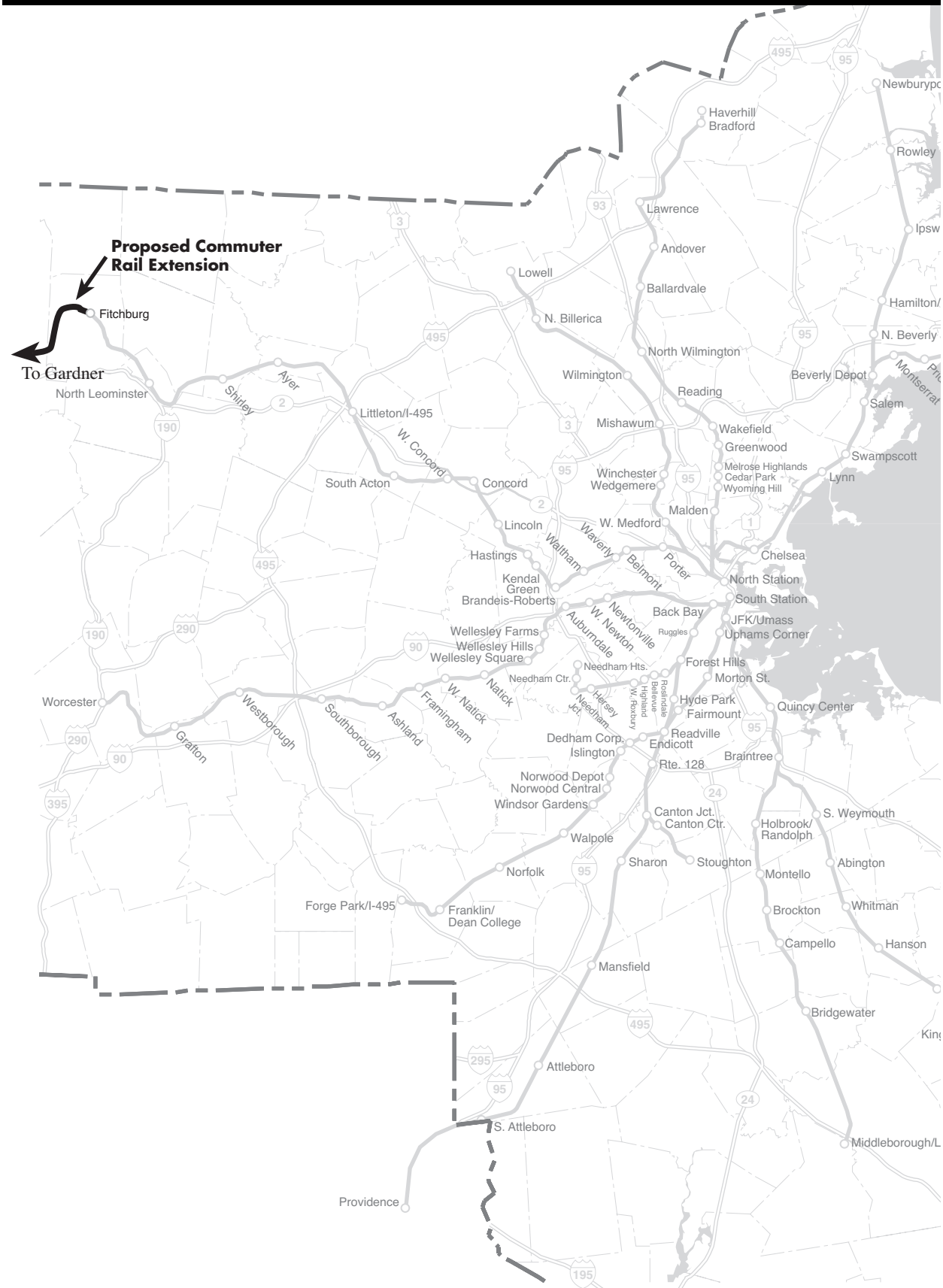
Capital Cost	**$128.8 million (Based on 1998 Millis Feasibility Study, adjusted to 2003)**
Operating Cost	**$35,800 per weekday**
Daily Ridership Increase on Mode	**4,000**
Net Increase in Daily Transit Ridership	**2,700**
Capital Cost per New Transit Rider	**$47,700**
Operating Cost per Wkday/New Transit Rider	**$13.30**
Capital Cost/Travel Time Benefit	**$334,900 per hour**
Operating Cost/Travel Time Benefit	**$93.60 per hour**
Travel Time Savings	**385 hours per weekday**

Assessment

The overall rating of this project is medium priority. It would be one of the more successful commuter rail expansion projects in attracting riders, but capital costs would be at the upper end of the mid-range among extensions examined. Therefore it would have a medium rating in terms of capital and operating costs per new transit rider. Some of the new ridership would be attracted by increased frequency and faster travel times at existing Needham Line stations, and the same improvements could be made without a Millis extension. Emissions of CO, CO2, and VOC would be reduced, but those of NOx would increase. The overall impact on air quality would be medium. This project 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–27 EXTEND COMMUTER RAIL FROM FITCHBURG TO GARDNER



D EXTEND COMMUTER RAIL FROM FITCHBURG TO GARDNER

Description

This project would implement commuter service on an existing rail freight line from the end of the Fitchburg Line to Gardner. Passenger service was last operated on this line in 1986.

Capital Features

This would be a 15.6-mile extension, including one new station in Gardner with parking facilities. Extensive upgrading of tracks and signals would be required.

Capital Cost	**$104.2 million (CTPS estimate)**
Operating Cost	**$16,900 per weekday**
Daily Ridership Increase on Mode	**50**
Net Increase in Daily Transit Ridership	**50**
Capital Cost per New Transit Rider	**$2,084,200**
Operating Cost per Wkday/New Transit Rider	**$337.70**
Capital Cost/Travel Time Benefit	**$5,437,100 per hour**
Operating Cost/Travel Time Benefit	**$887.00 per hour**
Travel Time Savings	**19 hours per weekday**

Assessment

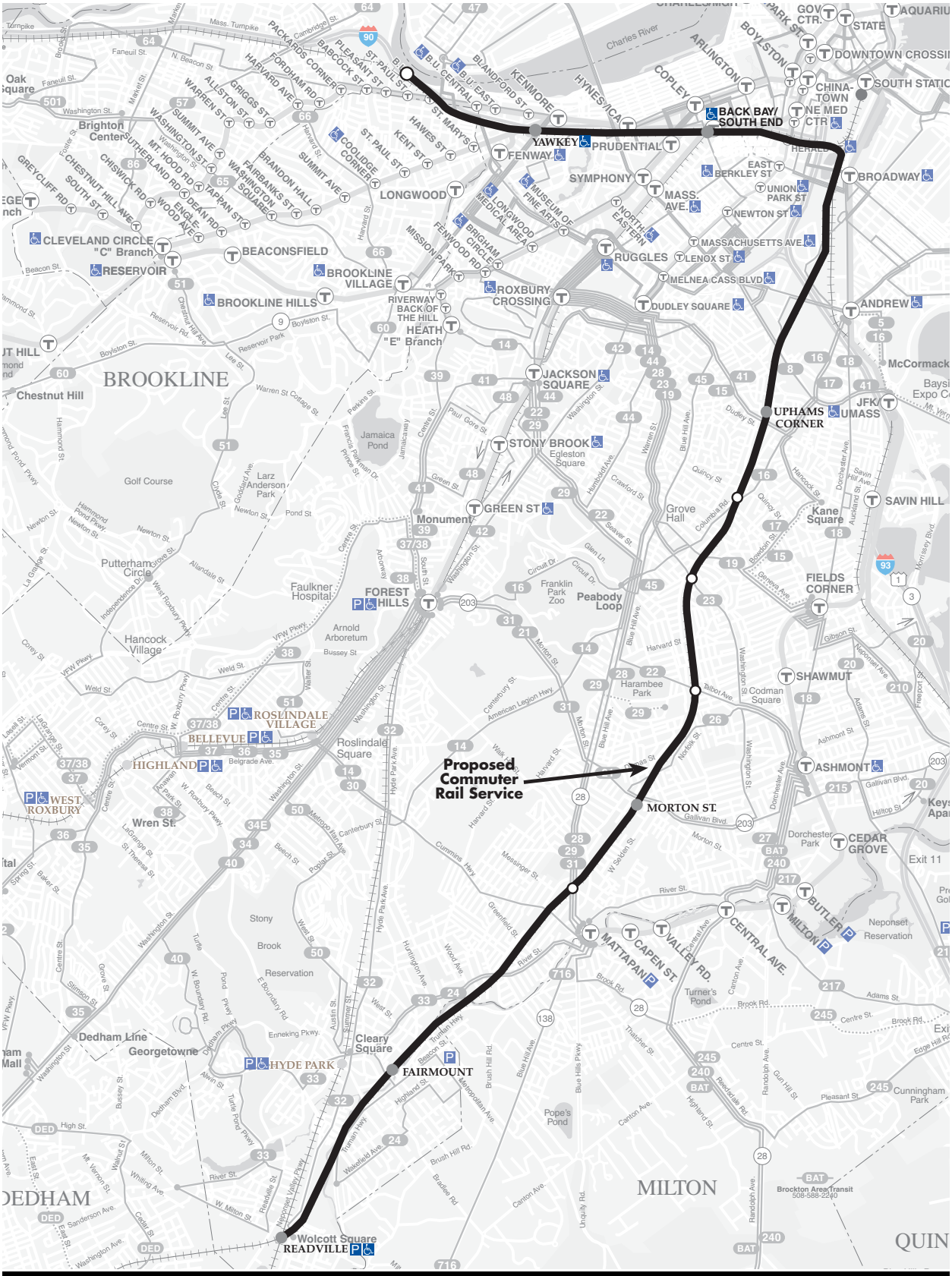
Overall, this project is rated medium priority. It would extend direct rail transit service to an area that currently has only an infrequent feeder bus connection to rail service at Fitchburg. It would, however, attract few riders, resulting in the highest capital and operating costs per new transit rider of any commuter rail expansion project analyzed for the PMT. It would be of little benefit to air quality, reducing emissions of CO and CO2, slightly, while increasing those of VOC and NOx.

Fitchburg and Gardner are located on opposite sides of the Wachusett Mountain range. In order to maintain acceptable grades, the rail line between them is 35% longer than the state highway. The fastest feasible train time from Gardner to Fitchburg would be 20 minutes.

This project has substantial support from local elected officials, as reflected in their Regional Transportation Plan. It is viewed as a means of facilitating access to older urban centers with substantial low-income populations and as a tool for economic development. The Gardner station would be in a state-designated revitalization area.

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

MAP 5C-28 OPERATE HIGH-FREQUENCY READVILLE-ALLSTON LANDING COMMUTER RAIL SERVICE



D OPERATE HIGH-FREQUENCY READVILLE–ALLSTON LANDING COMMUTER RAIL SERVICE

Description

This project would institute new commuter rail service between Readville Station and a new station in Allston using portions of the routes of the Fairmount Line and the Framingham/Worcester Line, but by-passing South Station. This service would be in addition to rather than in place of other service on those lines.

Capital Features

This project would consist of new service over existing lines. It would require one new station, at Allston Landing, and four new train sets. The cost calculations assume that these would each be two-car diesel multiple unit (DMU) trains.

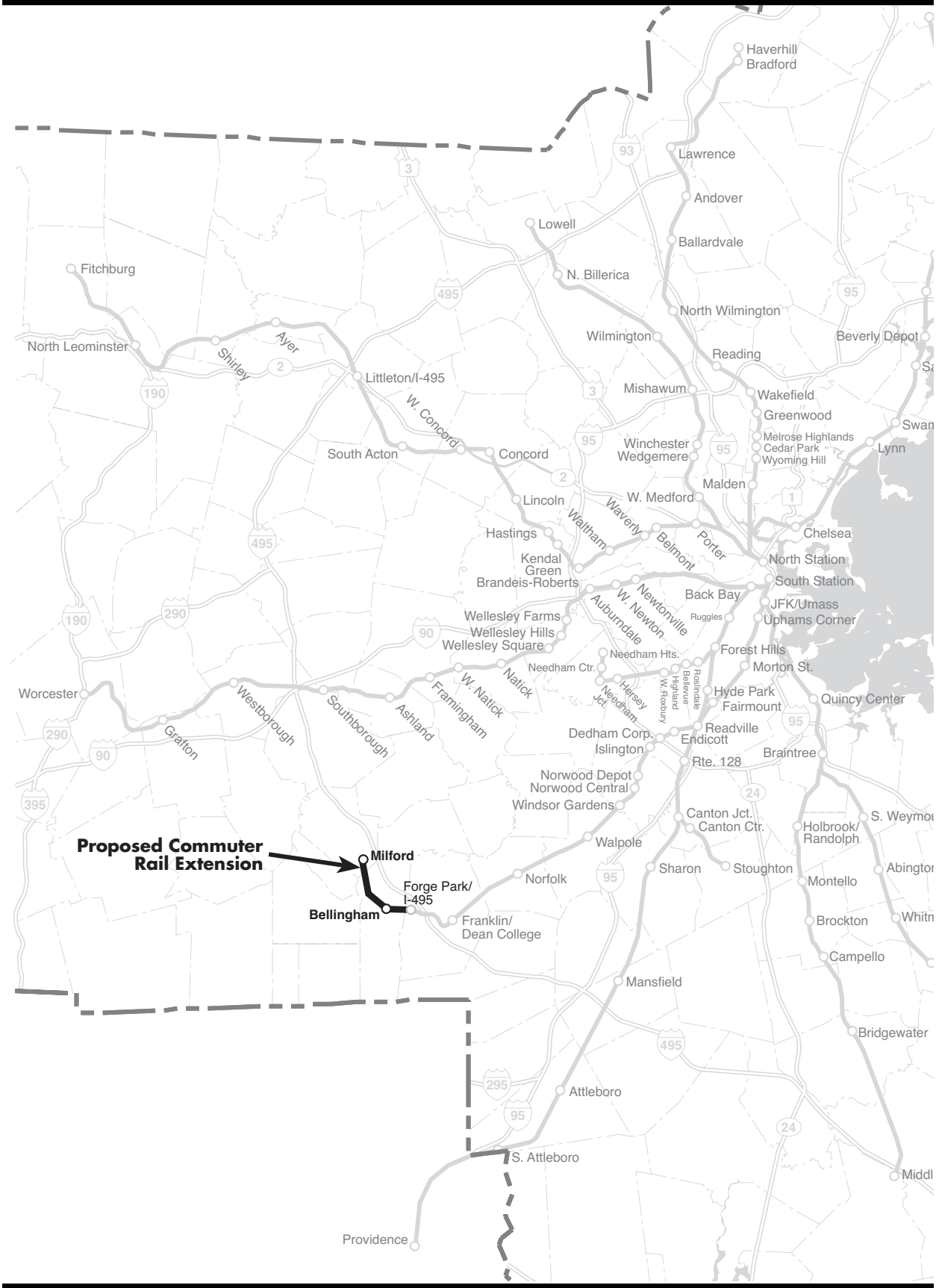
Capital Cost	**$34.3 million (CTPS estimate)**
Operating Cost	**$16,200 per day**
Daily Ridership Increase on Mode	**900**
Net Increase in Daily Transit Ridership	**80**
Capital Cost per New Transit Rider	**$428,600**
Operating Cost per Wkday/New Transit Rider	**$201.90**
Capital Cost/Travel Time Benefit	**$482,900 per hour**
Operating Cost/Travel Time Benefit:	**$228.60 per hour**
Travel Time Savings	**71 hours per weekday**

Assessment

Overall, this project is rated medium priority. It would attract relatively low numbers of total riders or new transit riders. The capital cost would be near the lower end of the mid-range among commuter rail projects in absolute terms, but because of the limited ridership, the cost per new rider would be among the highest for all such projects. Likewise, the absolute operating cost would be relatively low, but the cost per new transit rider would be high. Because most of the riders would be diverted from other transit services, and the route would be operated with internal combustion powered trains, it would result in a net worsening of air quality. The main benefit of this project would be in providing new through service between two environmental justice target areas. It would, however, be among the more costly projects in both capital and operating cost per hour of travel time saved per day. Routing conflicts between this service and other South Side commuter rail routes could result in an overall degradation of service on the system.

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

MAP 5C-29 EXTEND COMMUTER RAIL FROM FORGE PARK TO MILFORD



D EXTEND COMMUTER RAIL FROM FORGE PARK TO MILFORD

Description

This project would implement commuter service on an existing rail freight line from the end of the Franklin Line to Milford. Extensive upgrading of tracks and signals would be required. Passenger service was last operated on the inner end of this line in 1940 and on the outer end in 1920.

Capital Features

This would be a six-mile extension, including two new stations, in Bellingham and in Milford. Extensive upgrading of tracks and signals would be required.

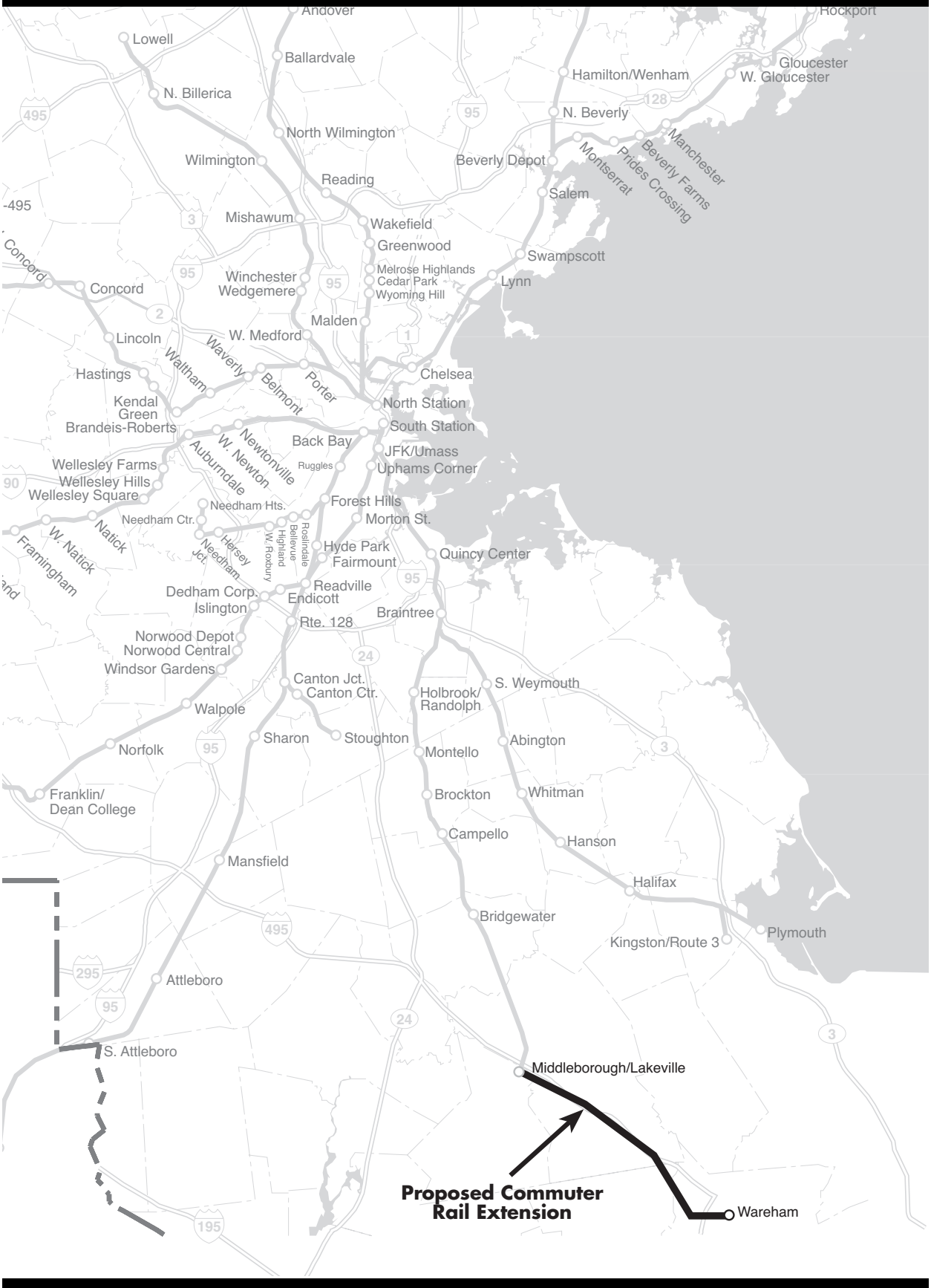
Capital Cost	**$70.5 million (CTPS estimate)**
Operating Cost	**$10,100 per weekday**
Daily Ridership Increase on Mode	**1,800**
Net Increase in Daily Transit Ridership	**800**
Capital Cost per New Transit Rider	**$93,100**
Operating Cost per Wkday/New Transit Rider	**$13.20**
Capital Cost/Travel Time Benefit	**$227,100 per hour**
Operating Cost/Travel Time Benefit	**$32.20 per hour**
Travel Time Savings	**310 hours per weekday**

Assessment

The overall rating of this project is medium priority. It would be moderately successful in attracting riders. The areas it would serve have very limited direct transit service but are fairly close to the present end of the Franklin Line at Forge Park. Capital costs for this project would be in the mid-range of costs among commuter rail extensions examined. It would be among the more cost-effective projects in terms of capital and operating costs per new transit rider. It would be in the mid-range of projects in terms of air quality impacts. Emissions of CO, CO2, and VOC would be reduced, but those of NOx would increase. It is rated low in economic and land use impacts. A downtown Milford station would serve a state-designated revitalization area, but there are no current plans for new high-density development there.

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

MAP 5C-30 EXTEND COMMUTER RAIL FROM MIDDLEBOROUGH TO WAREHAM



D EXTEND COMMUTER RAIL FROM MIDDLEBOROUGH TO WAREHAM

Description

This project would extend commuter rail along an existing rail freight line from the end of the Middleborough/Lakeville Line to Wareham. Through passenger service from Wareham to Boston on this route was last operated in 1959. During summer months from 1984 to 1988 connecting service was operated from Cape Cod and Wareham to the Braintree Red Line station.

Capital Features

This would be a 13.5-mile extension, with one new station, including a park-and-ride lot. This line was extensively rehabilitated in the 1980s for seasonal intercity passenger service. Upgrading for commuter rail service would include completion of a signal system that is already partly in place and some replacement of ties. Increased running time would require one additional train set to maintain schedules.

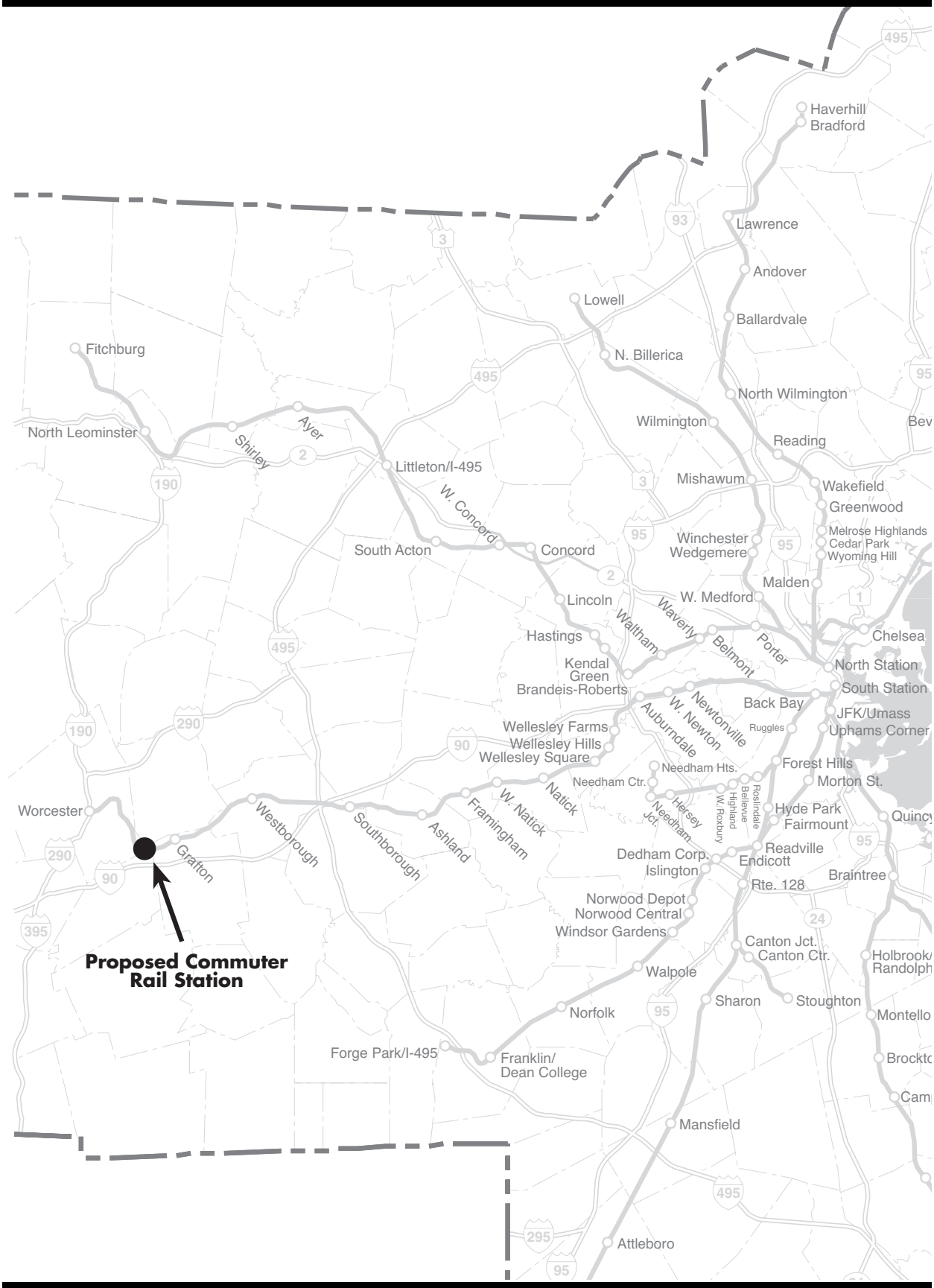
Capital Cost	**$35.8 million (CTPS estimate)**
Operating Cost	**$16,500 per weekday**
Daily Ridership Increase on Mode	**1,300**
Net Increase in Daily Transit Ridership	**420**
Capital Cost per New Transit Rider	**$85,200**
Operating Cost per Wkday/New Transit Rider	**$39.20**
Capital Cost/Travel Time Benefit	**$179,400 per hour**
Operating Cost/Travel Time Benefit	**$82.50 per hour**
Travel Time Savings	**200 hours per weekday**

Assessment

The overall rating of this project is medium priority. Ridership would be near the lower end of the mid-range among commuter rail extension projects examined, but many of the riders would be diverted from other transit services. Wareham itself has very limited express bus service to Boston, but towns south of the Cape Cod Canal from which the extension could draw riders have frequent express bus service. Capital costs for this project would be near the lower end of the mid-range of costs among commuter rail extensions examined, but because of the limited ridership, capital cost per new rider would be among the highest for projects with similar absolute costs. Operating cost per new rider would also be relatively high. The project would have only a moderate impact on air quality. Emissions of CO, CO2, and VOC would be reduced, but those of NOx would increase.

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

MAP 5C–31 NEW STATION AT MILLBURY ON FRAMINGHAM/WORCESTER LINE



D NEW STATION AT MILLBURY ON FRAMINGHAM/WORCESTER LINE

Description

This project would add a new commuter rail station on the Framingham/ Worcester commuter rail line in Millbury, near Massachusetts Turnpike Interchange 11. It would be between the existing Worcester and Grafton stations.

Capital Features

This project would consist of one new station with a regional parking facility on an existing line. No upgrading of tracks would be needed. Peak capacity would need to be increased by one coach. A new access road would be needed to reach the site from the nearest highway, but the cost of that has not been calculated.

Capital Cost	**$7.4 million (CTPS estimate)**
Operating Cost	**Increased fuel from extra starts and stops, too small to calculate.**
Daily Ridership Increase on Mode	**300**
Net Increase in Daily Transit Ridership	**140**
Capital Cost per New Transit Rider	**$52,900**
Operating Cost per Wkday/New Transit Rider	**Too small to calculate**
Capital Cost/Travel Time Benefit	**$119,000 per hour**
Operating Cost/Travel Time Benefit	**Too small to calculate**
Travel Time Savings	**62 hours per weekday**

Assessment

Overall, this project is rated medium priority. It would attract a relatively small number of riders. Nevertheless, because it would not require any upgrading of track, it would rank high on cost-effectiveness among commuter rail projects relative to new ridership and to air quality improvements. The largest sources of ridership at this station would be expected to be the towns of Millbury and Auburn, and the southeast corner of the city of Worcester. The towns of Sutton, Oxford, Webster, Dudley, Douglas, and Charlton would also originate a few trips each. Ridership from more distant points would be too small to enumerate.

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

MAP 5C-32 NEW STATION AT SOUTH SALEM ON ROCKPORT/NEWBURYPORT LINE

D NEW STATION AT SOUTH SALEM ON ROCKPORT/NEWBURYPORT LINE

Description

This project would add a new station on the Newburyport/Rockport commuter rail line south of downtown Salem, between the existing Salem and Swampscott stations. A previous station known as Castle Hill at about the same location was discontinued in the 1950s, and had been served mostly by trains on a branch to Marblehead that diverged there.

Capital Features

This project would consist of one new station on an existing line. No upgrading of tracks would be needed. Peak capacity would need to be increased by three coaches.

Capital Cost	**$8.2 million (MBTA Planning Dept. estimate)**
Operating Cost	**Increased fuel from extra starts and stops, too small to calculate.**
Daily Ridership Increase on Mode	**1,100**
Net Increase in Daily Transit Ridership	**840**
Capital Cost per New Transit Rider	**$9,800**
Operating Cost per Wkday/New Transit Rider	**Too small to calculate**
Capital Cost/Travel Time Benefit	**$80,400 per hour**
Operating Cost/Travel Time Benefit	**Too small to calculate**
Travel Time Savings	**102 hours per weekday**

Assessment

Overall, this project is rated medium priority. It would provide direct commuter rail service to a section of Salem now served by a bus route that can also be used as a commuter rail connection. It would attract only a moderate amount of new transit ridership, but because no upgrading of track would be required, the capital cost per new rider would be among the lowest of all commuter rail expansion projects analyzed for the PMT. It would have medium ratings in terms of environmental justice and economic/land use impacts. It would be located in a state-designated revitalization area, and it would improve access to Salem State College, a major institution of higher education. The new station would have a positive effect on air quality, and would be among the more cost-effective commuter rail projects with respect to these improvements.

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

MAP 5C–33 CONNECT FITCHBURG CRR LINE WITH RED LINE AT ALEWIFE

D CONNECT FITCHBURG COMMUTER RAIL LINE WITH RED LINE AT ALEWIFE

Description

This project would add a new station on the Fitchburg commuter rail line near the Alewife Red Line station in Cambridge, between the existing Porter Square Station in Cambridge and Belmont Station. A previous station at this location was discontinued in 1938.

Capital Features

This project would consist of one new station on an existing line. No upgrading of tracks and no rolling stock would be needed, but a pedestrian connection between the commuter rail station and the Red Line station would have to be provided. Costs for this connection have not been included.

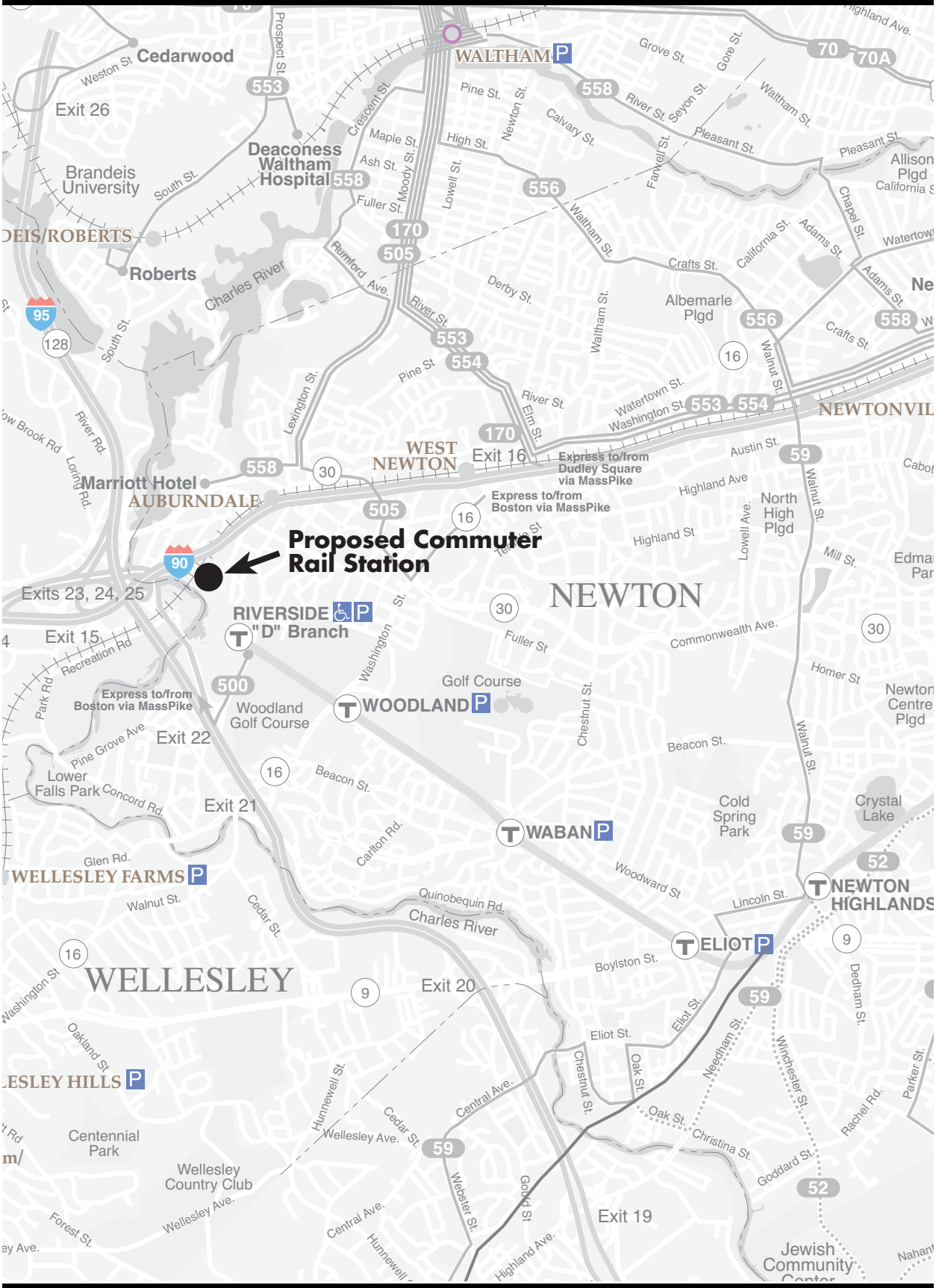
Capital Cost	**$4.1 million (CTPS estimate)**
Operating Cost	**Increased fuel from extra starts and stops, too small to calculate.**
Daily Ridership Increase on Mode	**60**
Net Increase in Daily Transit Ridership	**40**
Capital Cost per New Transit Rider	**$101,600, excluding cost of pedestrian connection**
Operating Cost per Wkday/New Transit Rider	**Too small to calculate**
Capital Cost/Travel Time Benefit	**$1,219,700 per hour**
Operating Cost/Travel Time Benefit	**Too small to calculate**
Travel Time Savings	**3 hours per weekday**

Assessment

Overall, this project is rated medium priority. It would attract very few total riders or new transit riders. The capital cost would be relatively small in absolute terms, but because of the low ridership, the cost per new rider would be at the upper end of the mid-range of such costs among commuter rail expansion projects. It would receive a high rating for economic and land-use impacts, because it would be in a state-designated revitalization area, where local plans call for new mixed-use development, including an office park on a brownfield site along with commercial and residential construction.

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

MAP 5C-34 NEW COMMUTER RAIL STATION AT RIVERSIDE



D NEW COMMUTER RAIL STATION AT RIVERSIDE

Description

This project would add a new station on the Framingham/ Worcester commuter rail line near Route 128 on the border of Newton and Weston. It would be between the existing Wellesley Farms and Auburndale stations, possibly replacing the latter. A previous commuter rail station in this vicinity was discontinued in 1977 because of very low ridership.

Capital Features

This project would consist of one new station with a regional parking facility on an existing line. No upgrading of tracks would be needed. Peak capacity would need to be increased by two coaches. A new or upgraded access road would be needed to reach the site from Route 128, but the cost of that has not been calculated.

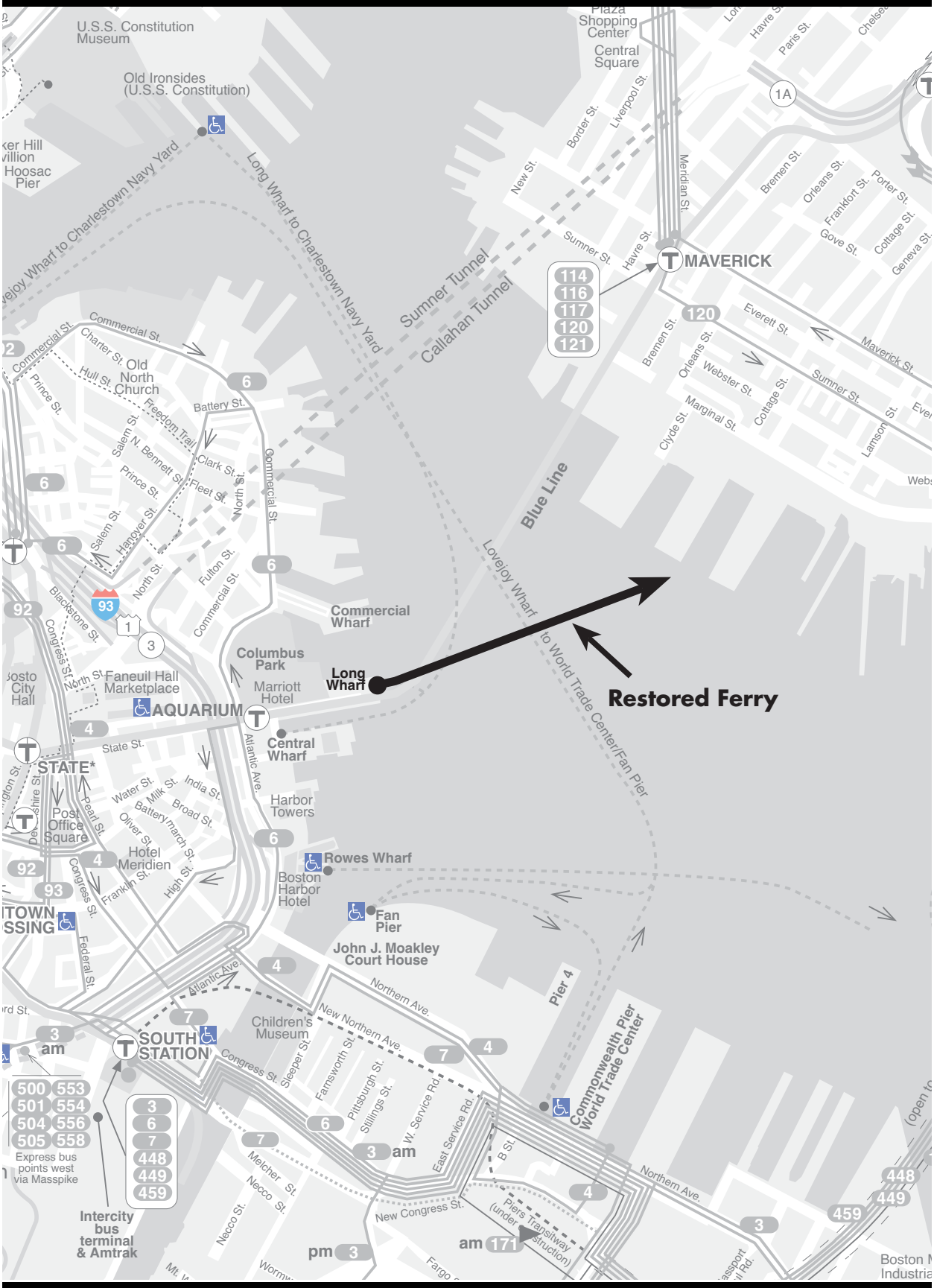
Capital Cost	**$10.7 million (CTPS estimate)**
Operating Cost	**Too small to calculate**
Daily Ridership Increase on Mode	**700**
Net Increase in Daily Transit Ridership	**250**
Capital Cost per New Transit Rider	**$43,000**
Operating Cost per Wkday/New Transit Rider	**Too small to calculate**
Capital Cost/Travel Time Benefit	**$133,300 per hour**
Operating Cost/Travel Time Benefit	**Too small to calculate**
Travel Time Savings	**81 hours per weekday**

Assessment

Overall, this project is rated medium priority. It would attract relatively low numbers of total riders or new transit riders. The capital cost would be relatively small in absolute terms, such that even with limited ridership, the cost per new rider still ranks high among commuter rail expansion projects. Because of the relatively small saving in VMT for each new transit user, cost-effectiveness of air quality improvements would be only moderate. The project would rate low in economic and land-use impacts as it would not serve an area with significant existing or planned development. It would not serve any environmental justice target areas. Its main benefit would be in improving inter-connectivity, as it would provide a new connection between a commuter rail line and the Green Line. Because of the distance separating the two lines, this connection would be only fair.

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

MAP 5C-35 RESTORE EAST BOSTON FERRY



D RESTORE EAST BOSTON FERRY

Description

This project would reinstate ferry service between East Boston and Long Wharf or Rowes Wharf on the downtown Boston waterfront. A similar route was run most recently from 1995 to 1997, but was discontinued because of low ridership. Previous ferry service from East Boston had ended in 1952. The project analyzed for the PMT would use an East Boston terminal closer to new development than that of the 1990s service.

Capital Features

This route would require acquisition of two small low-speed commuter ferries, and construction of a new terminal in East Boston.

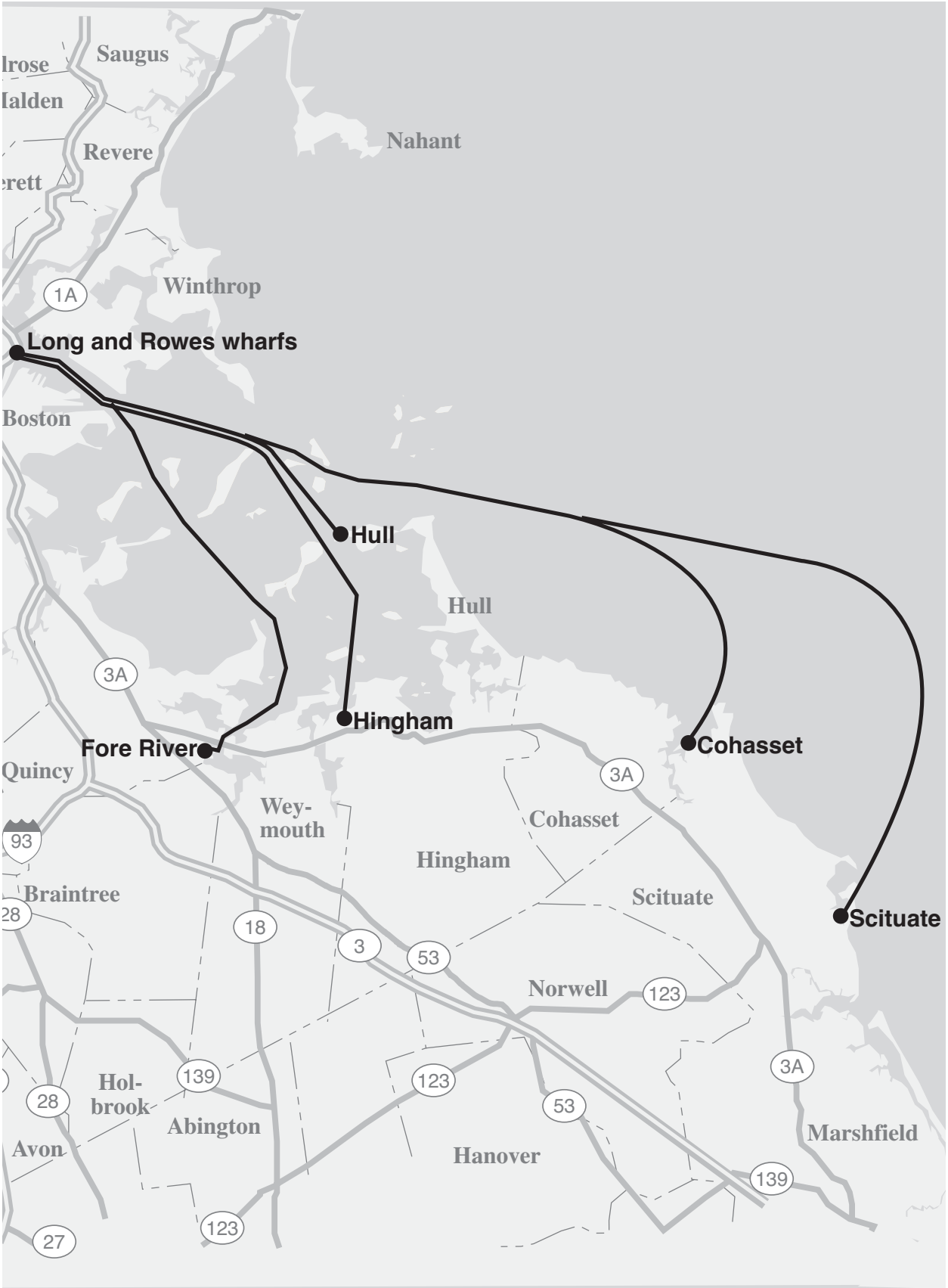
Capital Cost	**$3.5 million (CTPS estimate)**
Operating Cost	**$2,500 per day**
Daily Ridership Increase on Mode	**290**
Net Increase in Daily Transit Ridership	**70**
Capital Cost per New transit Rider	**$50,000**
Operating Cost per Wkday/New transit Rider	**$35.20**
Capital Cost/Travel Time Benefit	**$1,200,000 per hour**
Operating Cost/Travel Time Benefit	**$854.00 per hour**
Travel Time Savings	**3 hours per weekday**

Assessment

This project would provide a new transit alternative for travel from homes in East Boston to work locations in much of the Financial/Retail and Waterfront districts. It would attract few riders that would not otherwise use some form of transit. In absolute terms, the capital and operating costs would be the lowest among all water transportation projects examined for the PMT. Relative to new transit ridership, this project would have the lowest operating cost. It would also have the lowest capital cost per new transit rider if the South Shore projects are considered as a group, and the second-lowest if they are considered individually. However, the costs per unit travel time benefit rank very low. This would be the only one of the water transportation projects that would provide direct service to an environmental justice target community. The overall rating of this project is medium priority.

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

MAP 5C-36 IMPROVED FERRY SERVICE FROM SOUTH SHORE COMMUNITIES TO BOSTON



D IMPROVED FERRY SERVICE FROM SOUTH SHORE COMMUNITIES TO BOSTON

Description

This project would include several elements that could be implemented individually or together. The full project would increase service frequency on the existing Hingham and Quincy/Hull commuter boat routes and establish new routes to Boston from Cohasset and Scituate.

Capital Features

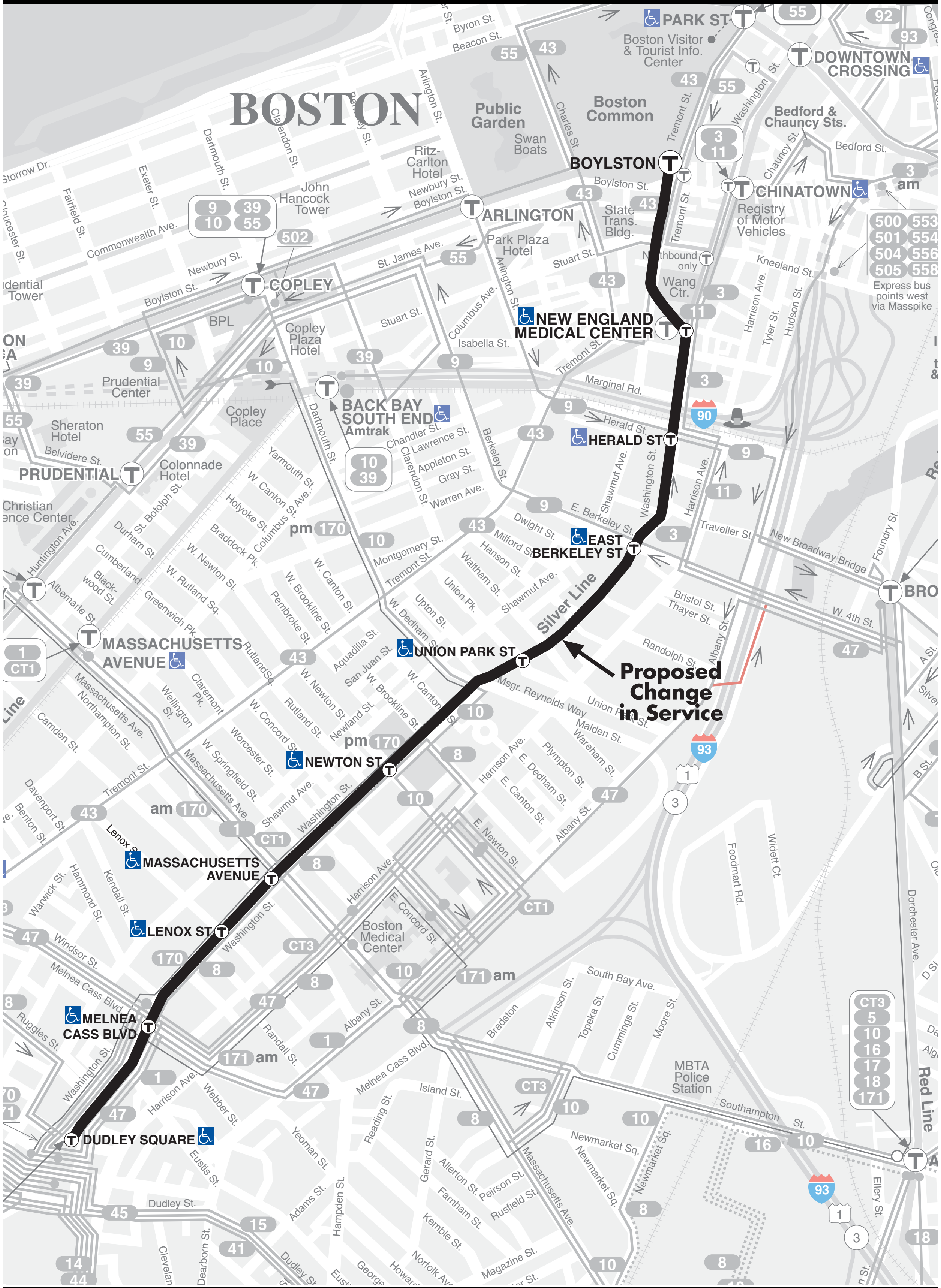
The full alternative would require acquisition of 13 medium-size high-speed commuter boats. Of these, seven would be used to replace slower boats on the Hingham route and increase the frequency of peak service. Each of the other routes would need two new boats. New terminals with parking would be required at Scituate and Cohasset, and some parking expansion at Hingham and Hull would be needed.

Capital Cost	**$39.7 million (CTPS estimate)**
Operating Cost	**$66,300 per day**
Daily Ridership Increase on Mode	**800**
Net Increase in Daily Transit Ridership	**270**
Capital Cost per New transit Rider	**$146,900**
Operating Cost per Wkday/New transit Rider	**$245.50**
Capital Cost/Travel Time Benefit	**$263,900 per hour**
Operating Cost/Travel Time Benefit	**$441.00 per hour**
Travel Time Savings	**150 hours per weekday**

Assessment

This project would add new transit options for travel to Boston from South Shore points, but would have to compete with other transit alternatives including commuter rail and combinations of bus and rapid transit. For all elements of the project combined, the capital cost per new transit rider would be second-highest and the operating cost per new transit rider highest among all water transportation projects examined for the PMT. When the four elements of this project are considered individually, each of them would have higher operating costs per new transit rider than any of the non-South Shore projects. In term of capital cost per new transit rider, a Scituate route and an enhanced Hingham route would both be more costly than any of the other water transportation projects examined, but an enhanced Quincy/Hull route would be the least costly project. A Cohasset route would have the second-lowest capital cost per new transit rider among the South Shore projects, but the second-highest when compared only with the non-South Shore projects. The existing Hingham, Hull, and Quincy terminals serve state-designated revitalization areas, but Scituate and Cohasset terminals would not. Overall, the South Shore commuter boat projects are rated medium priority.

Type of Project	Utilization	Mobility	Cost-Effectiveness	Air Quality	Service Quality	Economic/ Land Use Impacts	Environ. Justice
Frequency Imp./ New Line	●	◗	◗	❍	❍	❍	◗


BOSTON
Public Garden
Swan Boats
Boston Common
Boston Visitor & Tourist Info. Center
PARK ST
DOWNTOWN CROSSING
BOYLSTON
CHINATOWN
Bedford & Chauncy Sts.
Registry of Motor Vehicles
ARLINGTON
Ritz-Carlton Hotel
John Hancock Tower
Park Plaza Hotel
State Trans. Bldg.
Northbound only
Wang Ctr.
COPLEY
BPL
Copley Plaza Hotel
Prudential Center
Sheraton Hotel
PRUDENTIAL
Colonnade Hotel
Copley Place
BACK BAY SOUTH END
Amtrak
NEW ENGLAND MEDICAL CENTER
HERALD ST
EAST BERKELEY ST
Silver Line
UNION PARK ST
Proposed Change in Service
NEWTON ST
MASSACHUSETTS AVENUE
LENOX ST
MELNEA CASS BLVD
DUDLEY SQUARE
Boston Medical Center
MBTA Police Station
Express bus points west via Masspike
500 553
501 554
504 556
505 558
CT3 5 10 16 17 18 171

CONVERT DUDLEY–BOYLSTON SECTION OF SILVER LINE TO LIGHT RAIL

Description

This project would convert the 2.4-mile long Dudley-Boylston section of the Silver Line bus rapid transit service to light rail. Service would be operated as a branch of the Green Line, making use of an abandoned Green Line tunnel segment located under Tremont Street, to access Boylston station. Stops on Washington Street between Herald St. and Dudley would remain the same as the present Silver Line.

Capital Feature

Upgrade abandoned Green Line tunnel for service, construct new portal to tunnel, build new surface light rail line on Washington Street from portal to Dudley, purchase additional vehicles.

Capital Cost	**$373.6 million (CTPS estimate)**
Operating Cost	**$6,100 per weekday**
Daily Ridership Increase on Mode	**34,300**
Net Increase in Daily Transit Ridership	**130**
Capital Cost/New Transit Rider	**$2,873,500**
Operating Cost per Wkday/New Transit Rider	**$46.60**
Capital Cost/Travel Time Benefit	**$642,800 per hour**
Operating Cost/Travel Time Benefit	**$10.40 per hour**
Travel Time Savings	**581 hours per weekday**

Assessment

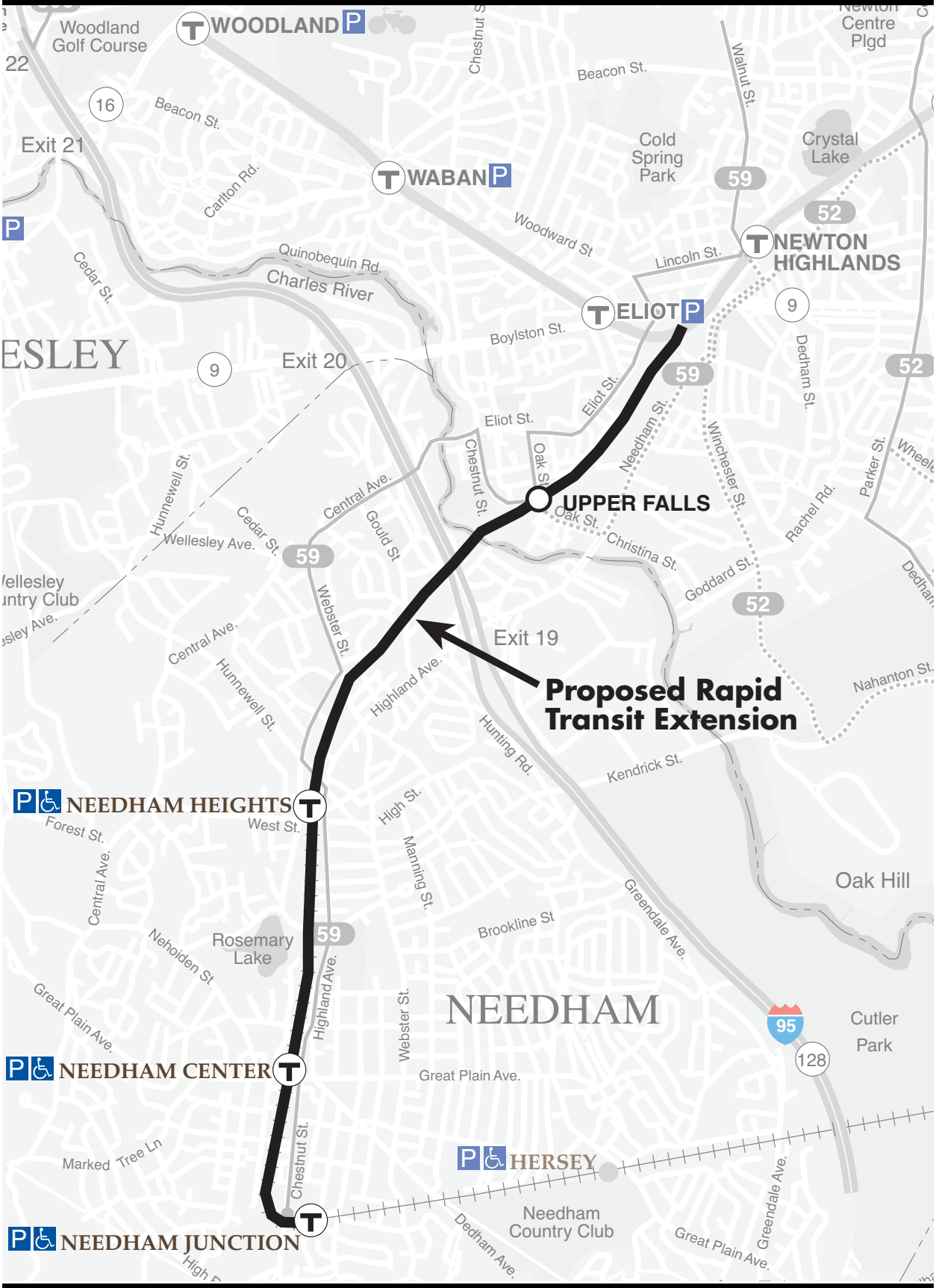
This is a low-priority rapid transit expansion project. Service on the Washington Street corridor between Dudley and Downtown Boston is presently provided by Phase 1 of the Silver Line bus rapid transit project. The MBTA proposes a Phase 3 project which would link the present Phase 1 Dudley-Downtown service with Phase 2 South Station-South Boston waterfront service. However, this project proposes that transit service on Washington Street instead be converted to light-rail and operated as a branch of the Green Line to Government Center.

The projected capital costs would be $373.6 million. Additional typical daily operating costs above the present Silver Line service would be $6,100. There would be 34,300 passengers new to the mode with this project. Only 130 would be new transit riders, since the majority of riders would be diverted from Washington Street Silver Line Bus Rapid Transit service. The capital cost per new transit rider would be the highest of any rapid transit project evaluated at $2,873,500. The additional operating cost per new transit rider would be $46.60. If this project is pursued, Phase III of the Silver Line BRT project would be reduced to only include a South Station-Boylston Street segment. Correspondingly, initial engineering plans for a turn around loop and station at Boylston Street would need to be changed.

The impact on air quality would be low, as few new riders would be diverted from automobiles. The project would provide one-seat rides between locations along Washington Street and Government Center. Transfer opportunities with other parts of the Green Line, the Blue Line and the Red Line would be improved. This project would also provide direct service to areas of Roxbury which are environmental justice target neighborhoods.

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

MAP 5C-38 NEW GREEN LINE NEEDHAM BRANCH



NEW GREEN LINE NEEDHAM BRANCH

Description

This project would add a branch to the Green Line, diverging from the D Branch between the Newton Highlands and Eliot stations and following the alignment of a lightly used rail freight line and the outer end of the Needham Commuter rail line to Needham Junction. Commuter rail service to Needham Center and Needham Heights would be discontinued.

Capital Features

This would be a 3.8-mile extension, including one new station in Newton, a new facility for transfer between commuter rail and Green Line at Needham Junction and substitution of Green Line service for commuter rail at two other stations in Needham.

Capital Cost	**$123.9 million (CTPS estimate)**
Operating Cost	**$16,600 per weekday**
Daily Ridership Increase on Mode	**3,400**
Net Increase in Daily Transit Ridership	**500**
Capital Cost per New Transit Rider	**$247,800**
Operating Cost per Wkday/New Transit Rider	**$33.30**
Capital Cost/Travel Time Benefit	**$2,655,000 per hour**
Operating Cost/Travel Time Benefit	**$356.30 per hour**
Travel Time Savings	**47 hours per weekday**

Assessment

Overall, this project is rated low priority. It would replace the outer end of an existing commuter rail line with a rapid transit extension, providing more frequent service and direct service to a greater number of destinations. It would also provide rail transit service to a densely populated section of Newton that is currently served only by local buses. It would not serve any environmental justice target communities. In absolute terms, this would be one of the less costly rapid transit extensions examined, but it would be among the more costly projects relative to the amount of new ridership attracted. This project would be compatible with a commuter rail extension from Needham Junction to Millis. It would add to the complexity of Green Line operations, as service would need to be coordinated with that of the D Branch above ground and with B, C, and E branch service in the Central Subway. It might necessitate some reduction in the amount of D branch service provided at stations west of Newton Highlands.

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