Chapter 3

Project Definition & Assessment

Project Definition and Assessment

1.0 Introduction

This chapter provides assessments for each of the projects that were considered during the MIS. Section Two of this chapter details the methodology that was used to analyze each project's environmental impacts and transportation benefits.

Project assessments include the following:

- Project description;
- Capital improvements;
- Cost estimates;
- Ridership assessments (where applicable); and,
- Factors considered during project evaluation.

2.0 Methodology

2.1 Environmental Methodology

The assessment of each project in this chapter includes a summary of potential impacts in nine environmental categories: traffic, noise and vibration, air quality, wetlands, vegetation and wildlife resources, archaeological resources, historic resources, environmental justice and land use. Because these projects are being analyzed at the conceptual stage, impact evaluations are general, providing an overview of where impacts are likely to occur.

Some MIS projects are not included in this analysis, because they will be or have been analyzed separately. These projects include Rockport Station, Gloucester Station, Beverly Station and Salem Station. Some of the System Enhancement Projects discussed have minimal potential for impacts, including the Newburyport/Rockport Line Coaches, the North Shore Express Bus Route Improvements and the North Shore Bus Equipment Improvements because they primarily consist of equipment upgrades. The System Expansion Projects, however, have more potential for environmental impacts because they require new construction or the acquisition of property. The Salem-Danvers via Peabody Commuter Rail Service Project, in particular, has the greatest potential for impacts.

This section summarizes the impact methodology used in evaluating projects.

Traffic

The Central Transportation Planning Staff's (CTPS) EMME/2 Travel Forecasting Model has been used in this study to forecast traffic volumes for the future No-Build Project, in addition to the following five MIS Projects:

- Newburyport and Rockport Branch Increased Frequencies
- Revere Commuter Rail Station
- South Salem Commuter Rail Station
- Salem – Danvers via Peabody Commuter Rail Service (terminating at Endicott Street)
- Salem – Danvers via Peabody Commuter Rail Service (terminating at North Shore Mall)

The model has produced morning peak hour volumes for all above-mentioned projects along the following 16 locations:

- Route 1A Southbound, South of Revere Street - Revere
- Route 1A Southbound, North of Butler Circle - Revere
- Route 107 Southbound South of Revere Street - Revere
- Route 1 Southbound, South of Route 60 - Revere
- Canal Street Southbound, North of Ocean Street – Salem
- Canal Street Southbound, North of Loring Avenue – Salem
- Route 1A Southbound, North of Washington Street – Salem
- Route 114 Eastbound, North of Mason Street - Salem
- Route 114 Eastbound, North of Prospect Street - Peabody
- Route 128 Southbound, North of Route 114 – Peabody
- Route 128 Southbound, South of Route 114 – Peabody
- Lowell Street Eastbound, North of Route 128 – Peabody
- Endicott Street Southbound, North of Lowell Street - Peabody
- Route 35 Southbound, South of Endicott Street – Danvers
- Route 128 Southbound, North of Route 35 – Danvers
- Route 35 Southbound, North of Route 128 - Danvers

Noise and Vibration

For most projects, the potential station locations and surrounding areas were examined for potentially impacted receptors. For the Newburyport Branch and Rockport Branch Increased Frequency Project, aerial photos of the entire North Shore corridor were examined for impacts using impact distances derived from the concurrent North Shore DEIS process. Photos of potential siding and tunnel locations were also examined for potentially impacted receptors. For the Salem-Danvers via Peabody Commuter Rail Service, the Peabody-Danvers corridor was examined for potential noise and vibration impacts from a potential commuter rail line, as well as associated crossing signals, and train storage tracks.

Air Quality Analysis

The air quality assessment was conducted as a qualitative screening analysis to identify potential impacts that may necessitate further study in an Environmental Assessment/Environmental Impact Statement (EA/EIS). The primary sources of data for the screening were a description of the MIS improvements and relevant information previously compiled as part of the concurrent North Shore DEIS.

Conformity[1] with the Massachusetts State Implementation Plan (SIP) is not evaluated in the MIS. It is assumed that projects implemented as a result of this MIS will be included in the air quality conformity analysis of the Transportation Plan or Transportation Improvement Program for the region as prepared by the Boston Metropolitan Planning Organization (MPO). Thus, the MIS projects will be presumed by the regulatory agencies to conform to the SIP.

Wetlands

The review of potential impacts to regulated wetland resources for the MIS projects included a review of available information provided on the Massachusetts Geographical Information System (MassGIS) website as well as available National Wetland Inventory information (USFWS). Federal and State jurisdictional wetlands within a 200-foot wide study area were noted. Resource areas such as wetlands, the state-

1 U.S. Environmental Protection Agency, Transportation Conformity Rule, 40 CFR Part 93 Subpart A.

regulated 100-foot "buffer zone" and the 200-foot Riverfront Area and potential impacts to these resources are noted in the description of impacts.

A wetland resource identified on GIS mapping was determined to be impacted if the wetland was crossed or shared a common boundary with the right-of-way (ROW). The number of wetland systems impacted or crossed are identified, while the linear feet of wetland adjacent to the ROW or embankment are listed for each side of the track. In addition, wetland buffer zone impacts and Riverfront Area within the study area are identified separately.

Vegetation and Wildlife Resources

Ecologically Sensitive Areas

The review of potential impacts to ecologically sensitive areas was based on a review of MassGIS data layers relating to protected areas such as ACEC's. In addition, the Open Space and Recreation lands section in the Environmental Notification Form-Restoration of Commuter Rail Service to Newburyport, Massachusetts, (MBTA, 1989), provides information on that part of the study area between Ipswich and Newbury, Massachusetts. Other sources of information included the Commonwealth of Massachusetts' Department of Fisheries and Wildlife website for locations of Wildlife Management Areas.

An identified Ecologically Sensitive Area was considered to be impacted if it abutted or crossed through an ACEC, Wildlife Management Area, or National Wildlife Refuge.

Impacts were listed as numbers of impacted communities as well as linear feet that these communities are adjacent to the ROW.

Protected Species

The review of potential impacts to protected species associated with the MIS study projects included various information sources such as MassGIS data layers relating to protected species including Priority Habitat and Estimated Habitat layers described by Massachusetts Natural Heritage and Endangered Species Program (MassNHESP). The priority habitat maps contained in the Massachusetts Natural Heritage Atlas, 2000-2001 version (MassNHESP) were also checked for consistency and additional data. These maps identify Priority Habitats of rare species protected under the Massachusetts Endangered Species Act regulations (321 CMR10).

An identified habitat was determined to be impacted if the proposed project corridor crossed or shared a common boundary with an identified Priority Habitat. An Indirect Impact was identified for any portion of the corridor occurring within 500 feet of a Priority Habitat.

Cultural Resources

Archaeological Resources

The site files at the Massachusetts Historical Commission (MHC), as well as the existing conditions reports previously undertaken for both the Newburyport and Rockport Branches, were consulted to identify potential impacts to recorded prehistoric and historic archaeological sites in the project corridor. Construction activity conducted within the rail ROW would not have a potential effect on archaeological resources since the sites would have been disturbed by previous construction activities.

There are several spots where rail restoration, station improvements, and siding/passing track installations would be situated in locations favorable for prehistoric sites. According to MHC, Native American groups generally situated their settlements on elevated ground along lakeside and riverine locations for the purpose of exploiting hinterland resources (MHC 1982: 18). Prehistoric archaeological sites associated with seasonal activities such as fishing and hunting migratory fowl during spring and fall will most likely be found along the elevated ground in wetlands and estuaries (MHC 1982: 28). Prehistoric resources may include features, but flake scatters and debitage associated with temporary or seasonal activities are more common. A good indication of seasonal exploitation of natural resources is shell middens. Most of the sites in the elevated regions are documented tool making or repair stations. The types of materials generally found in these locations include small tools such as scrapers, bifaces, and various projectile points. Points range in shape and size including Rossville points. Debitage refers to flake scatters and cores, the remnants or waste from tool making.

Historic Resources

For project areas where previous studies have been conducted by the MBTA, these studies were consulted. This includes the Newburyport Commuter Rail extension study, 1989. For areas not previously studied, the Massachusetts Historical Commission Inventory files were consulted to identify previously surveyed properties in or near the project area. The names of streets in the project area were discerned through the use of black and white aerial maps, MBTA transit maps found online, and street atlases. Precise locations of existing historic properties were not determined in this study, except where they had been mapped in previous MBTA reports. Because of the preliminary nature of the planning and the absence of an area of potential effects (APE), the review included a broad listing of resources in the general area listed on or eligible for the National Register or included in the MHC Inventory, and the estimates of level of impact were based on these listings.

Environmental Justice

The Boston Metropolitan Planning Organization (MPO) has developed criteria that identifies environmental justice neighborhoods, based on minority and low-income populations. "Neighborhoods" are defined by US Census geographic units: Census Blocks for minority population information and Census Block Groups for low-income information. The MPO uses US Census Bureau information to determine how each neighborhood relates to the minority population and low-income population in the entire MPO. Specifically, if the neighborhood is either more than 21.4 percent minority (the percent minority population within the MPO) or has a median income less than 75 percent of the median household income for the MPO ($55,800), then it is considered an environmental justice neighborhood. This Census information was mapped, using Geographic Information Systems (GIS) for the MIS study area. These maps are color-coded to show the location of environmental justice communities. The location of MIS projects, and their potential impacts were compared to these graphics to determine whether environmental justice communities would be affected.

The purpose of this section is to determine whether environmental justice neighborhoods would experience disproportionate environmental impacts from each of the projects. When environmental justice neighborhoods are affected by environmental impacts, it does not necessarily constitute environmental justice burdens. Other factors, including benefits and whether other populations are also affected, must be considered. If an environmental justice community experiences noise impacts due to increased service but it is also located proximate to the station and experiences service improvements, the project may not be one of disproportionate burden. Impacts to other populations are also considered. If project impacts are spread out along the ROW, with some occurring within environmental justice communities, it does not necessarily constitute an environmental justice impact. If, however, all of the project burdens along the ROW are concentrated within the environmental justice neighborhoods,

there is potential for negative environmental justice impacts. The analysis of each project takes these factors into account in determining its potential for environmental justice impacts.

Land Use

There are two types of land use impact analyses. For direct impacts, which require property takings, mapped property ownership information is compared to plans that show the area required to build or implement each MIS project. Direct property impacts occur when the area required for the MIS project is not under MBTA ownership and must be acquired. Property ownership information is obtained from local assessors offices. A detailed analysis of direct land use impacts would include more specific information on the square feet of property to be acquired. At this level, however, a preliminary determination was made as to whether new ROW would be required and the scope of those ROW takings.

The information needed to analyze indirect impacts includes existing land use information, which is described in Chapter 2; local land use controls; and planning documents. The process for analyzing indirect impacts is explained in the following paragraph. In general, it involves identifying which projects would encourage secondary development, and determining whether or not that development would be consistent with the community's goals.

Specifically, the first step in determining potential indirect impacts was to determine which projects provide new service or construct new facilities and then to locate the access points for these services. Indirect impacts are most likely to occur at access points like stations or ferry terminals because of the additional pedestrian and automobile traffic rather than along railways or bus routes. Next, this study analyzed the existing land use information to determine whether there is potential for development and/or redevelopment around these access points. Some indications of development potential include parcels of vacant land. Redevelopment is most likely to occur in areas with vacant or underutilized buildings. After identifying access points with development or redevelopment potential, the final step is to determine whether potential development would be consistent with the goals of the community. At the national and state level there are planning initiatives that encourage specific types of development, including transit-oriented-development (TOD), which emphasizes dense, mixed-use activity centers that are proximate to transit and the redevelopment of existing infrastructure. Development that is consistent with these goals can benefit the communities interested in such development, while projects that are not consistent with community goals could negatively affect traffic circulation and quality of life for the community. A more detailed analysis of the proposed projects would include more information on existing land use, zoning regulations and other local planning documents. The purpose of this analysis is to provide a general evaluation of the potential for indirect impacts.

2.2 Ridership Methodology

The following section presents an overview of the travel model used in this project and describes each major step in the modeling process. It also includes a description of how the calibrated model was applied to the MIS alternatives.

The Central Transportation Planning Staff (CTPS) prepared weekday ridership forecasts for many of the proposed MIS service expansion projects. The transportation model that CTPS has built and maintains is the most accurate and sophisticated model for predicting future travel in the Boston Metropolitan Area. The forecasts from this model guide most of the transportation planning conducted by public agencies in Eastern Massachusetts.

The travel model simulates existing travel conditions and projects future-year travel on the region's transportation system. The model contains all MBTA rail and bus lines, all private express bus carriers, all

express highways and principal arterials, and many minor arterials and local roadways. The region is subdivided into small areas, called traffic analysis zones (TAZs). The model simulates transportation supply and demand characteristics from and to each TAZ combination. The model relies on many inputs, which include population, employment, automobile ownership, transit fares, automobile operating costs, and transit and highway levels of service. The most recent available date is utilized to make sure the model simulation is reliable.

The travel model used for the North Shore Major Investment Study is based on the traditional four-step urban transportation planning process of trip generation, trip distribution, mode choice, and trip assignment. This process is used to estimate the daily transit ridership and highway traffic volumes, primarily on the basis of forecasts of study area demography and projected highway and transit improvements. For transit services the model also contains:

- service frequency (i.e. how often trains and buses arrive at any given transit stop),
- routing, and
- travel time.

Results from the computer model provide detailed information relating to transit ridership demand. Estimates of passenger boardings on all existing and proposed transit services can be obtained from the model output. The information derived from the model for each service analyzed included:

- New Transit Trips,
- Daily Transit Mode Share,
- Peak hour mode share (from study area to downtown Boston and Cambridge),
- Ridership Impact on other North Shore area transit services,
- Daily fare revenues,
- Air Quality Impacts, and
- Travel Time Savings.

A summary of the modeling results is provided in Appendix A.

Figure 3-1 Insert graphic of overall project locations

Gloucester Station Improvements

Description

This project includes the development of expanded commuter parking in a new, at-grade parking facility. Design and construction of approximately 100 new spaces in a new satellite parking lot, with dedicated vehicular access, application of ITS components, and an improved handicapped person accessible pedestrian grade crossing from the existing platform to the new parking facility and miscellaneous cosmetic improvements to the existing platform and canopy.

Capital Cost	**$3.6 million**
Existing Spaces	**78 spaces**
Net Additional Spaces from Project	**75 spaces**
2025 Forecasted Demand	**150 to 200 spaces**
Percent of 2025 Demand Met	**75 to 100%**

Assessment

Presently there are up to 78 potential parking spaces in the area of the Gloucester Commuter Rail Station to be used by commuters. Of these spaces, only 25 are owned and operated by the MBTA. The remaining 53 spaces are in private lots in the station area. Most spaces in the station area are used each weekday; those not used are typically a result of the lack of striping and the configuration of the spaces. The projected demand for parking at the Gloucester Station in 2025 calls for approximately 150-200 spaces.[2] This station has a significant pedestrian access percentage that is likely due to the station's convenient access from the developed downtown area. A review of potential environmental impacts has been conducted as a part of the project design phase efforts with no significant impacts identified.

[2] Commuter Rail and Rapid Transit Parking and Ridership Demand Forecasts, CTPS, January 2002.

Beverly Depot Station Improvements

Description

This project includes the development of expanded commuter parking in a multi-level structure and associated pedestrian and vehicular access improvements at the Beverly Depot Commuter Rail Station. Design and construction of a realigned station drop-off and sidewalks; improved handicapped person pedestrian access; new station canopies; a 500 to 645 space, multi-level parking garage and pedestrian bridge access from the station platform.

Capital Cost	**$13.8 million**
Existing Spaces	**309 spaces**
Net Additional Spaces from Project	**363 to 508 spaces**
2025 Forecasted Demand	**700 to 800 spaces**
Percent of 2025 Demand Met	**100%**

Assessment

Presently there are up to 309 parking spaces in the vicinity of the Beverly Depot Commuter Rail Station that may be available for passenger parking. Of these spaces, 131 are privately owned and require a permit to utilize, while the other 137 are owned by the City of Beverly and are either in a lot or on the street. The public spaces are primarily full each day, while the usage of the privately permitted spaces varies. The projected demand for parking at Beverly Depot station in 2025 is approximately 700-800 spaces. [3] This high demand is due to the frequent service between Beverly and Boston.

Since there is no available MBTA land in the vicinity of the station, a preferred site needs to be identified and acquired. A study to identify the specific site and design of the proposed parking garage is currently underway. The design of this project is approximately at the 15% level of completion. Following a number of early work items, including the appraisal of properties necessary for the structural footprint of the proposed garage, a notice to proceed with design to the 30% level of completion will be issued. The possibility exists that this project could be a significant part of a larger commercial-residential transit-oriented development project currently under discussion for the area fronting Rantoul Street in Beverly.

[3] Commuter Rail and Rapid Transit Parking and Ridership Demand Forecasts, CTPS, January 2002.

Salem Station Improvements

Description

This project includes the development of expanded commuter parking in a 700 to 1,000 space multi-level structure and associated pedestrian and vehicular access improvements at the Salem Commuter Rail Station. Additional project scope items include improved handicapped person pedestrian access from the street level grade to the station platform below. Passenger retail amenities could be included as part of the finished structure.

The possibility exists that the Department of Capital Asset Management (DCAM) could use part of the new structure to augment parking at the proposed, expanded Essex County Courthouse campus. If this occurs, a corresponding, per-space capital contribution to the project will match DCAM's requirements for parking.

Capital Cost	**$19,800,000**
Existing Spaces	**491 spaces**
Net Additional Spaces from Project	**209 to 509 spaces**
2025 Forecasted Demand	**700 to 725 spaces**
Percent of 2025 Demand Met	**100%**

Assessment

Presently there are 491 paid parking spaces at the Salem Commuter Rail Station. Of these spaces 340 are owned and controlled by the MBTA and 123 are owned and controlled by the City of Salem. Typically the only spaces that are not filled on a weekday are the 10 handicap spaces located in the MBTA owned lot. The projected demand for parking at the Salem station in 2025 is approximately 700-725 spaces. [4] The frequent service between Salem and Boston makes the commuter rail an attractive transportation option for commuters that drive to the station and park. The proposed garage could possibly serve multiple functions in downtown Salem serving not only MBTA commuter rail passengers but also possibly patrons of the Essex County Courthouse campus located only a block away. Currently, the project is undergoing schematic design. A review of potential environmental impacts will be considered in association with that effort.

[4] Commuter Rail and Rapid Transit Parking and Ridership Demand Forecasts, CTPS, January 2002.

Winthrop to Boston Ferry Service

Description[5]

This Project includes implementation of a new commuter boat service from Winthrop to the downtown Boston waterfront. The proposed service would operate utilizing two 65 foot, 75 passenger vessels to operate along the 25 minute trip between the Winthrop Public Access Board's property on Shirley Street and Long Wharf in Boston with possible expansion to include a stop at the South Boston waterfront. The proposed service is anticipated to be operated by a contract operator hired directly by the Town of Winthrop.

Capital Cost	**$4,000,000**
Public Operating Cost	**$0**
Daily Ridership Increase on Mode	**600-900 trips**
Capital Cost/Transit Rider	**$4,500 to $6,700**
Operating Cost per Weekday Transit Rider	**$0**

Assessment

The Town of Winthrop is located on a peninsula only a few miles away from downtown Boston. Due to the topography and the configuration of the existing transportation network, opportunities to improve the surface transportation system in the Winthrop area are limited. The proposed ferry service would operate using two 65-foot long, 25-knot catamarans that have a capacity for 75 customers. It is projected that the 25-minute trip would attract approximately 600-900 trips daily with a one-way fare of $4.00. The proposed operating plan would include approximately four round trips each peak period and an off-peak service that may be conducive to non-commuter uses. This would serve primarily Winthrop commuter trips destined to Boston. Implementation of the service would require construction of a terminal in Winthrop with approximately 150 parking spaces at the proposed site on Shirley Street at the existing boat ramp facility. Improvement to the Winthrop Ferry Terminal would require a new pier and float, passenger waiting areas, public bathrooms, and office space.

The new terminal in Winthrop could result in increased traffic in the Shirley Street area. It is projected that approximately half of all passengers will access the ferry via automobile. Other passengers are projected to access the service by MBTA bus service, bicycle or walking. The impact to local Shirley Street traffic is projected to increase by approximately 5%.

The Town of Winthrop has determined that the ferry service could be self-sustaining through the use of a private operator if the capital costs associated with developing the terminal and pier facilities in Winthrop were paid for publicly. It is also projected that approximately $1.4 million of private investment in a vessel and other startup costs would be covered through the fares paid by passengers.

The existing study identified a number of optional configurations and site locations for consideration. Potential environmental effects include impacts from dredging, floodplain, and other coastal zone impacts. This project will be required to conform to federal and state permitting requirements prior to being implemented.

[5] Sources: Winthrop Commuter Boat Feasibility Study, VHB et. al. January 2001.
Winthrop Commuter Boat Follow-on Study, CTPS, November 2003.

North Shore Bus System Improvements

Description

This Project includes the improvement of buses, bus-related equipment, passenger amenities and assessment of existing bus services in the North Shore. Specifically the Project will include the replacement of existing conventional diesel buses with compressed natural gas buses and environmentally clean diesel (ECD) buses; and installation of an Intelligent Transportation System (ITS) including Automatic Vehicle Locator systems and Automatic Passenger Counters. In addition to vehicle improvements, additional bus shelters would be installed at stops with high ridership and adequate space for shelters.

A study effort was undertaken to determine whether available bus system resources are being used as effectively as possible. The study examined current bus service on twenty-one bus routes in the North Shore, and recommended changes to all of the routes.

Assessment

Vehicles: One of the MBTA's strategic priorities during the coming years is to improve bus service throughout the service area. One way this priority is being realized is through investment in the bus fleet and related systems. System wide almost two-thirds of the bus fleet will be replaced by 2005; hundreds of buses from the 1980s will be retired, and the remaining fleets will be overhauled. Since the MBTA is continually assessing new types of bus technologies for use on the system, specific long-term details have not been finalized regarding what equipment will be employed on North Shore routes. However, it is certain that major investments are planned on the entire system, the North Shore routes included.

ITS: Part of this bus system improvement program includes implementation of recent technological advancements in bus operating and information systems. One of the primary improvements being considered is an ITS application that includes the Automatic Vehicle Locator technology. Providing real-time service performance data would give bus dispatchers more information with which to make immediate service adjustments and would give passengers information on the time of the next bus arrival.

Services: The study effort that was undertaken to examine the effectiveness of current bus service on twenty-one bus routes in the North Shore recommended changes to all of them. Changes ranged from route modifications to headway changes. All of the recommendations were implemented in June 2002.

Potential Impacts

Traffic Impacts

No traffic impacts are anticipated from the North Shore Bus System Improvements or the Equipment Improvements.

Potential Noise and Vibration Impacts

There are no noise or vibration impacts anticipated from the North Shore Bus System Improvements or the Equipment Improvements.

Air Quality Impacts

Some air quality improvements would result from the North Shore Bus System/Equipment Improvements components, as newer, cleaner, more environmental friendly vehicles are introduced into the system.

Wetland Impacts

No wetland impacts are anticipated from the North Shore Bus System Improvements or the Equipment Improvements.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources from the North Shore Bus System Improvements or the Equipment Improvements.

Protected Species Impacted

There are no anticipated impacts to protected species from the North Shore Bus System Improvements or the Equipment Improvements.

Impacted Archaeological Resources

There are no archaeological impacts anticipated from the North Shore Bus System Improvements or the Equipment Improvements.

Historic Properties Affected

There are no historic impacts anticipated from the North Shore Bus System Improvements or the Equipment Improvements.

Environmental Justice Impacts

The environmental justice effects of these improvements are fairly balanced. For example, increasing bus route frequency in an environmental justice community could be seen as an impact, but improving access to mass transit in these areas and for these populations would create a positive benefit. Benefits could also be realized by the community as newer, cleaner, more environmental friendly vehicles are introduced into the system

Land Use Impacts

This Project includes structure changes to major bus routes in the Lynn and Salem bus networks. Because the changes are only modifications of existing service, no land use impacts are anticipated.

Bus Equipment Improvements component

Because there is no new service or construction proposed, there are no anticipated land use impacts.

Newburyport Branch and Rockport Branch
Increased Frequencies

Description

This Project includes increasing commuter rail service frequencies along both the Newburyport and Rockport Lines to maximize peak period service and provide increased off-peak service. In order to accommodate the proposed improved frequencies along the line, infrastructure improvements would be necessary. These improvements would include construction of passing/double track on the Newburyport Branch and three new commuter rail trainsets (See Figures 3-2 and 3-3).

The construction of passing/double track would be needed in two locations along the Newburyport Line, in Ipswich and Rowley. The proposed location of the second track / passing siding in Ipswich is approximately from Milepost 28.7 to 29.3. It would begin approximately 500 feet north of the High Street bridge and extend 3000 feet, over a private crossing (Perkins) and end before another private crossing (Mitchell's). The new track would be located within the existing ROW, along the existing double track embankment. The additional track would also require minor modifications to the signal system within the railroad ROW. These impacts are considered separately in the following Assessment section.

The location of the other proposed siding track is in Rowley approximately from Milepost 31.5 to 32.1. The siding would begin approximately 1,500 feet north of the Main Street Bridge and end approximately 1,500 feet south of the Main Street Bridge. The new track would be located within the existing ROW, along the existing double track embankment. The additional track would also require minor modifications to the signal system within the railroad ROW.

Capital Cost	**$62,000,000**
Operating Cost	**$9,492 per weekday**
Daily Ridership Increase on Mode	**5,500**
Net Increase in Daily Transit Ridership	**2,400**
Capital Cost/New Transit Rider	**$25,833**
Operating Cost per Weekday/New Transit Rider	**$3.95**
Capital Cost/Travel Time Benefit	**$101,974 per hour**
Operating Cost/Travel Time Benefit	**$15.61 per hour**
Travel Time Savings	**608 hours**

Assessment

For weekday service to Rockport, the scheduled travel time varies between 64 and 73 minutes, depending on the number of intermediate station stops. There are presently three morning peak period/inbound trains that operate from Rockport with one peak period/outbound train in operation. In the evening peak period, there are four peak period/outbound trains operating to Rockport with two peak period/inbound trains operating. During the off-peak period, service from Rockport generally operates on a 2-hour headway in both directions.

The scheduled travel time between Newburyport and North Station for weekday service varies between 59 minutes and 67 minutes, depending on the number of intermediate station stops. There are presently five morning peak period/inbound trains that operate from Newburyport and one that starts at Hamilton/ Wenham with one peak period/outbound train in operation that terminates in Hamilton/Wenham and another one that terminates in Newburyport. In the evening peak period, there are four peak

period/outbound trains operating to Newburyport with two peak period/inbound trains operating. During the off-peak period, service from Newburyport generally operates on a two-hour headway in both directions.

Under this project, peak and off-peak commuter rail frequencies would be increased on the existing Newburyport and Rockport Lines. On both lines, total daytime operations would increase from 27 to 39 trains per day. The number of trains on the Rockport line during the morning commute would increase from four to six; on the Newburyport line, they would increase from seven to nine in the morning, while in the evening the number of trains on both the Rockport and Newburyport lines would increase from six to seven.

The proposed Project would ultimately add one additional peak period train on both the Newburyport and Rockport Branches in both inbound and outbound directions. In addition, the proposed Project would include substantial increases in the operation of off-peak services to result in hourly service in each direction on each branch, thereby doubling the amount of service presently operated in the off-peak.

The proposed service plan for the full implementation of the Project would add 10 to 13 new trains in each direction running between the terminals and North Station in Boston. Additional service would be included between Lynn and Boston as a shuttle service to offer ten minute peak-period service between those two cities. In order to balance the system schedule, without clustering trains, modifications to the service schedules of many of the off-peak trains would be necessary. However, the result would be a schedule which generally improves headways to no longer than one hour at any time of day. The new service trains would predominantly be operated during the off-peak with one train added in each direction during peak periods. The limitation on additional peak period trains is a result of known constraints in Salem, at the single track Salem Tunnel, and the constrained ability of the North Station terminal area to accommodate any additional peak-period trains.

Potential Impacts

Traffic Impacts

Under this Project, the morning peak hour volumes decrease at ten of the sixteen locations, compared to the No-Build Project. All four locations in Revere, two locations in Salem, two locations in Peabody, and two locations in Danvers indicate volume decreases. Volume increases occur at two locations in Salem and two locations in Peabody. The volumes at one location in Peabody and one location at Danvers remain unchanged. The largest volume decreases occur in Revere, while the largest increase is in Salem, along Route 114 Eastbound, north of Mason Street.

The Newburyport Branch and Rockport Branch Double/Passing Track component
No traffic impacts are anticipated.

Noise and Vibration Impacts

These service increases are expected to affect residential and office receptors differently. According to Federal Transit Administration (FTA) guidelines, impacts are assessed relative to current conditions. This means that by definition, no areas are currently impacted along the existing line. For residential receptors along portions where the line will not be double tracked, average hourly noise levels are expected to increase by about 1 decibel on each line. By increasing the operations along the line by a third, the actual day-night sound level from the new trains alone will be about 4 decibels less than from the existing trains. However, this will still be loud enough to result in impacts along the line; nearby residential locations within about 300-400 feet of grade-crossings, and within about 100-150 feet of the line will be impacted for trains moving at 70 MPH, depending on the existing background noise level and

local building, terrain, and vegetation conditions. A detailed examination of impacts will be necessary for this Project. Vibration impacts will be unchanged along the route assuming train speeds do not increase under this Project. An examination of aerial photos along the Newburyport lines shows that only a few noise impacts should occur in Newburyport, about a dozen in Rowley, about 25-35 in Ipswich, and between 40-80 in Beverly. Along the Rockport line, between 50-100 locations are expected to have noise impacts due to service increases in Beverly, about ten in Manchester, between 40-80 in Gloucester, and none in Rockport.

For commercial receptors, the peak number of trains per hour would not change during the business hours of 9 to 5. Therefore, there will be no additional impacts at commercial receptors along these routes. Vibration impacts would be unchanged along both routes for locations not near passing sidings, as vibration impact determination is not based on service frequency.

The Newburyport Branch and Rockport Branch Double/Passing Track component

This Project would result in differing impact condition changes for noise and vibration. For noise, this component would result in operations being occasionally moved over from one track to another about 15 feet along the passing sidings. This would result in a slight increase or no increase in noise levels for the area on the side near the new track, depending on the train speeds on the passing track. It would cause a slight decrease in noise levels on the side near the old track, equivalent to moving the existing track over by between 3 and 7 feet, depending on the number of trains per day using the passing siding. Overall, this by itself would result in only a few noise impacts along the corridor; it should be evaluated in conjunction with proposed changes in service levels accompanying the installation of passing sidings.

For vibration, the construction of passing sidings would increase the impact distance on the side nearest the passing sidings track by 15 feet for all areas, including the Salem tunnel. For the Rowley passing siding, there should be no new impacts, as the siding is located in an uninhabited area north of Rowley Station. For the Ipswich passing siding, there appears to be only one receptor that would be affected by the proposed passing siding.

Air Quality Impacts

The additional ridership attracted by these service improvements would increase the volumes of vehicles accessing and parking at the affected stations. To the extent that there are consequent increases in traffic congestion and delays at key intersections, local pollutant concentrations may increase. Air quality impacts at a regional scale will be positive because increased rail ridership will reduce the total vehicle-miles traveled (VMT) in the region. This reduction in VMT is expected to more than offset the increase in locomotive emissions from the additional trains. The net regional effects will be beneficial, but there is also the potential for increases in local pollutant concentrations.

The Newburyport Branch and Rockport Branch Double/Passing Track component

These improvements could increase the frequency for Newburyport Branch, and therefore would have similar impacts on air quality. Though the net regional effects will be beneficial, there is the potential for increases in local pollutant concentrations.

Wetland Impacts

There are no anticipated wetland impacts for this Project. The area along the Newburyport Branch, north of Ipswich, however, is within the Parker River/Essex Bay Area of Environmental Concern (ACEC). As this Project progresses, further investigation would be required as to impacts to this ACEC.

The Newburyport Branch and Rockport Branch Double/Passing Track component

Although there are wetlands that occur along the ROW, none are in the same location as the proposed passing siding. Therefore, there are no anticipated wetland impacts for this Project. The area along the Newburyport Branch, north of Ipswich, however, is within the Parker River/Essex Bay ACEC. As this Project progresses, further investigation would be required as to impacts to this ACEC.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

The Newburyport Branch and Rockport Branch Double/Passing Track component

As mentioned in the previous section, in the area north of Ipswich along the Newburyport line, the ROW crosses the Parker River/Essex Bay ACEC.

Protected Species Impacted

There are no anticipated impacts to protected species.

The Newburyport Branch and Rockport Branch Double/Passing Track component

As mentioned in the description, work along the Newburyport Branch north of Ipswich is the only area with the potential for impacts to protected species. There are direct impacts from the Ipswich Siding (1500 feet on the east side of track), and the Rowley Siding (2000 feet on the east side of the track). There could also be 600 feet of direct impact from Gloucester to Rockport.

Impacted Archaeological Resources

No archaeological impacts are anticipated.

Newburyport Branch and Rockport Branch Double/Passing Track component

There are at least seven known sites in the area that are associated with seventeenth and eighteenth century house-lots. The sites include remnants of residential lots with features such as privies, wells, cisterns, and building foundations. The potential construction activities are located within the ROW, however, which has been previously disturbed, so there are no anticipated impacts.

Historic Properties Affected

This project does not require work outside of the existing ROW.

Newburyport Branch and Rockport Branch Double/Passing Track component

No historic impacts are anticipated from increased frequencies of commuter rail service on the double/passing track component.

Environmental Justice Impacts

There would not be environmental justice impacts associated with this alternative. Noise impacts along the ROW would be the major impact resulting from this alternative, but they would not disproportionately affect environmental justice neighborhoods. First, the majority of the neighborhoods along the ROW are relatively affluent and do not fit the MPO definition of environmental justice neighborhoods. In addition, the few environmental justice neighborhoods that are located along the ROW are clustered around station areas where they would benefit from the increased service, off-setting any potential noise impacts.

Newburyport Branch and Rockport Branch Double/Passing Track component

The siding would be located in Ipswich and Rowley where there are no environmental justice communities. No environmental justice impacts are anticipated.

Land Use Impacts

This Project refers to increasing commuter rail frequencies along both the Newburyport and Rockport lines to maximize peak period service and provide increased off-peak service. Improving commuter rail service on an active line to existing stations would not cause any land use impacts.

Newburyport Branch and Rockport Branch Double/Passing Track component

Because all of the new track would be located within the existing rail ROW, there would not be any indirect or direct land use impacts.

3-2 Ipswich Siding Graphic

3-3 Rowley Siding Graphic

Rockport Station Improvements

Description

This Project includes access improvements to the station platform, and physical and operational improvements to the adjacent layover facility. Additional improvements would include the construction of approximately 90 additional parking spaces and improved station amenities.

The proposed improvements would encompass the modifications envisioned in a previous MBTA design study that examined potential improvements to the Rockport Station site. These proposed improvements include construction of approximately 90 additional parking spaces and repaving and striping the existing parking lot at the station. Additional improvements such as lighting and station entrance improvements may be necessary. Other improvements at the site include:

- Consolidation of layover tracks at the location of existing Tracks #2 & #4.
- Construction of a full length high-level platform from the end of the station to the present location of Poole's Lane next to Tracks #2 & #4.
- Remove Track #6 and replace it with a pedestrian walkway to the baseball field.
- Close Poole's Lane grade-crossing, providing access to baseball field and adjacent business via the MBTA parking lot

Capital Cost	**$6 million**
Existing Spaces	**85 spaces**
Net Additional Spaces from Project	**90 spaces**
2025 Forecasted Demand	**100 to 125 spaces**
Percent of 2025 Demand Met	**100%**

Assessment

The Rockport Commuter Rail Station presently has 85 parking spaces located off of Railroad Avenue that are all owned by the MBTA. There presently is no daily charge for parking in the lot. The lot is not effectively striped and many users park in unpaved sections. The parking lot is presently over capacity and demand exceeds the capacity of existing spaces, (118% usage of spaces).[6] Projected 2025 demand for parking calls for 100 to 125 spaces. In addition, tracks for the layover facility are scattered around the site without any fencing or security. The station platform is a low-level platform without high-level access, rendering the station inaccessible for disabled passengers. This station, the Prides Crossing Station in Beverly and the Chelsea Station are the only non-accessible stations on the Newburyport/Rockport Line. The Rockport Station is also the only terminal station on the MBTA's commuter rail system that is not handicap accessible.

Potential environmental impacts have been investigated and are noted in the Rockport Commuter Rail Station Improvements, Schematic Design Report (1999). The potential adverse affects primarily relate to the areas historic and wetland resources. There are two historic structures, the Boston and Maine Railroad Freight Yard Crane and Freight House that would be potentially affected. The MBTA's goal is to preserve these resources, if they can be maintained on site, while still making improvements. The report also identified wetland resources that would be affected: work will occur within the 100-foot buffer zone to a Bordering Vegetated Wetland and within the riverfront zone of Mill Brook.

[6] Commuter Rail and Rapid Transit Parking and Ridership Demand Forecasts, CTPS, January 2002.

3-4 Rockport Station Graphic

Lynn to Boston Ferry Service

Description

This Project includes implementation of a new high-speed commuter boat route from Lynn to Logan Airport and the downtown Boston waterfront. The proposed ferry service would require the construction of a ferry terminal with parking in Lynn, and the acquisition of new vessels (See Figure 3-5).

Terminal: A ferry terminal would need to be sited in Lynn Harbor. The proposed site at Blossom Street would require construction of a new 120 foot by 30 foot dock, parking for approximately 300 to 350 cars and a small shelter and drop off area for bus passengers[7]. The existing pier would require repair and stabilization but appears to be sufficient to accommodate the needs of the ferry service. Although some dredging may be required to accommodate the proposed ferry it appears unlikely until more detailed bathymetry is conducted.

Vessels: The proposed ferry is a 149 passenger vessel with low wake and wash and is capable of speeds of 30 to 35 knots. The vessel would be fully compliant with the Americans with Disabilities Act of 1990 and would be similar to the Flying Cloud which operates to Martha's Vineyard and Nantucket.

Capital Cost	**$9,000,000**
Operating Cost	**$935,000 annually**
Daily Ridership Increase on Mode	**600**
Capital Cost/New Transit Rider	**$15,000**
Operating Cost per Weekday/New Transit Rider	**$1,558**

Assessment

The proposed service would provide direct commuter ferry service between Lynn and downtown Boston during weekdays. Other routes and services originating from Lynn may be possible during off-peak periods during the summer season. The route would run from the proposed terminal in Lynn 15 statute miles (13.6 nautical miles) to Long Wharf in downtown Boston. The proposed service would operate each weekday between 6 AM and 9:30 PM providing service every 30 minutes during peak periods and every 2 hours during off-peak periods. The estimated peak-period trip time between the two terminals is approximately 35 minutes. During summer season off-peak trips, it is proposed that the ferry would make an additional stop at the Harbor Islands, thereby extending the one-way trip time to approximately 55 minutes.

Potential Impacts

Traffic Impacts

While there would be some increase in traffic levels due to this project, no substantial traffic impacts are anticipated.

Noise and Vibration Impacts

This Project would result in no residential noise impacts, as there are no residences in the proposed dock area or on the access roads leading to it. There may be one or two commercial noise impacts along

[7] Draft Water Transportation Planning for Eastern Massachusetts: A Strategic Assessment of Passenger Ferry Services, Massachusetts Executive Office of Transportation and Construction, March 2003.

Blossom Street. There should be no vibration impacts due to this Project. Construction noise and vibration may impact one or two receptors on Blaney Street, especially during pile driving.

Air Quality Impacts

This project is expected to generate some ferry-related traffic volumes. This combined with an increase in emissions from ferry engines would generally characterize the nature of the new emissions sources associated with this project. However, it is expected that the overall impact would be a net reduction in emissions, which would mainly be attributable a reduction in regional automobile emissions. Depending on the age and power rating of the ferry engines, mitigation of these emissions might be recommended. On the other hand, a net reduction in regional emissions from vehicles would be expected.

Wetland Impacts

This Project would have wetland impacts. The ferry terminal is within the harbor area and the ferry berth is within a Marine Subtidal resource area. 4,800 feet of the ferry service parking lot edge is within a wetland buffer.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

Protected Species Impacted

There are no anticipated impacts to protected species.

Impacted Archaeological Resources

No archaeological impacts are anticipated.

Historic Properties Affected

No historic impacts are anticipated.

Environmental Justice Impacts

There would be ROW impacts associated with this Project. However, there are no residences in the proposed dock area or on access roads leading to it so no environmental justice impacts are anticipated. This project would also relieve the environmental justice neighborhoods from the existing burden of through trains by providing commuter rail service to residents.

Land Use Impacts

There would be direct and indirect land use impacts with this Project. The proposed site for the Lynn Ferry Terminal is located off of Blossom Street. This facility would include 300-350 parking spaces and a small shelter and drop off area for bus passengers. Property acquisition would be required to construct this facility. The existence of the new transit station could also create new opportunities/pressures for transit-oriented development to service the ferry riders.

3-5 Lynn Ferry Terminal Graphic

Revere Commuter Rail Station

Description

This Project includes a new station on the Newburyport/Rockport commuter rail line in Revere near the existing Wonderland Blue Line station. The proposed station would consist of two high-level side platforms with a canopy and an accessible pedestrian overpass between the two platforms. The station would also include a bus/automobile waiting area in front of the station along Dunn Road (See Figure 3-6). No parking is included at this time because of ongoing redevelopment discussions associated with the Wonderland Racetrack. It is assumed that parking would be incorporated as part of a new station.

Capital Cost	**$10,500,000**
Operating Cost	**Negligible**
Daily Ridership Increase on Mode	**400**
Net Increase in Daily Transit Ridership	**200**
Capital Cost/New Transit Rider	**$52,500**
Operating Cost per Weekday/New Transit Rider	**Negligible**
Capital Cost/Travel Time Benefit	**$145,833 per hour**
Travel Time Savings	**72 Hours**

Assessment

The Project would improve accessibility to the commuter rail system from the City of Revere and the Wonderland area. Presently access to the commuter rail system from Revere requires either a bus trip north to Lynn Station or use of the Blue Line at Wonderland to connect to the Orange Line at State Street Station before reaching North Station. Both of these circuitous routes effectively eliminate use of the commuter rail for travel in Revere even though 60 trains pass through the City each weekday.

The proposed station would be located northwest of the Wonderland Greyhound Park. Facilities at the station would be similar to other MBTA commuter rail stations providing high-level platforms, passenger shelters and a canopy. Access to the station would be from the east side of the tracks off of Route 1A, using Dunn Road as the primary access point. An accessible pedestrian overpass would be constructed to provide safe access to the west side (inbound) platform. Infrastructure improvements would include realignment of the track necessary to accommodate the station.

Potential Impacts

Traffic Impacts

Under this Project, the morning peak hour volumes decrease at three locations, increase at two locations, and remain unchanged at the other eleven locations, compared to the No-Build Project. All three decreases occur at locations in Revere, while the two locations with volume increases are at Revere and Salem. Volumes at three locations in Salem, all five locations in Peabody, and all three locations in Danvers remain unchanged.

Noise and Vibration Impacts

For this Project, noise and vibration levels for residential areas along the tracks approaching the station should decrease due to lower train speeds coming in and out of the station, with a slight increase near the station due to passenger activity and train idling at the station

For this project, peak vibration levels will decrease by between 4 and 10 VdB for receptors near the tracks in the vicinity of the new station due to slower train speeds, resulting in fewer impacts along the track entering and leaving the area. Overall, since there appear to be no residents directly adjacent to the station, there should be no noise or vibration impacts at this station. A few receptors north of the station within 50 feet of the track may experience slightly higher vibration levels if the track is realigned more than 5- 10 feet closer. There may be some impacts due to construction activities north and south of the station associated with track realignment into the station.

Air Quality Impacts

The lack of additional parking at the Revere Commuter Rail Station; the fact that vehicle access to the station will be relatively circuitous via Dunn Road and residential streets; and the presence of existing transit services at the Blue Line Wonderland Station, suggest that the vehicle volumes accessing the station may be less than would otherwise occur. In that event, both the reduction in regional emissions and any increase in local pollutant concentrations would be relatively slight.

Wetland Impacts

Some of the improvements would be within wetland buffer zones. Specifically, 250 feet of the Dunn Road Improvements would occur within 100 feet of the buffer zone of one wetland and 875 feet of platform and canopy would be within a 100 feet of the buffer zone for the ditch and wetland on the west side Since these are minor impacts to buffer zones, there are no anticipated wetland impacts for this Project.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

Protected Species Impacted

There are no anticipated impacts to protected species.

Impacted Archaeological Resources

No archaeological impacts are anticipated.

Historic Properties Affected

Because this project potentially requires the acquisition of property, the Wonderland Dog Racing Track, (State listed as MHC # 900), could potentially be affected.

Environmental Justice Impacts

There are both environmental justice neighborhoods and non-environmental justice neighborhoods surrounding this station and there would be land use impacts associated with this Project. It is not likely that potential land takings would affect residences, however, because there are none in the immediate vicinity. Potential indirect impacts, as noted in the land use impacts section, could be positive with appropriate planning. Additionally, this station would improve access for area residents by providing another transit alternative. As such, potential impacts would not disproportionately affect environmental justice neighborhoods because they would benefit from improved access to transit options. This project would also relieve the environmental justice neighborhoods from the existing burden of through trains by providing commuter rail service to residents.

Land Use Impacts

Direct land acquisition would be required for the station area site as MBTA does not own adequate property to construct the station. Indirect impacts to this area could be positive, given the potential for

transit-oriented development (TOD). Although the commuter rail station would complement and enhance existing redevelopment proposals, adequate planning should occur to assure that the station construction does not create negative indirect impacts.

3-6 Revere Station Graphic

South Salem Commuter Rail Station

Description

This Project includes a new station on the Newburyport/Rockport commuter rail line south of downtown Salem, between the existing Salem and Swampscott stations (See Figures 3-7 and 3-8). The proposed station would consist of a single center island platform with a canopy and an accessible pedestrian overpass between the roadway and the platform. The station would also include a bus/automobile waiting area in front of the station near the intersection of Ocean Avenue and Broadway.

Capital Cost	**$12,200,000 to $13,800,000**
Operating Cost	**Negligible**
Daily Ridership Increase on Mode	**600**
Net Increase in Daily Transit Ridership	**400**
Capital Cost/New Transit Rider	**$30,500 to $34,500**
Capital Cost/Travel Time Benefit	**$203,334 to $230,000/hour**
Travel Time Savings	**60 Hours**

Assessment

The proposed station would be located near the intersection of Broadway and Ocean Avenue, although an exact location has not been established. Currently there is not a commuter rail station in South Salem although over 60 trains pass through the area each weekday. The new station would provide direct commuter rail service to a section of Salem now served only by a bus route that requires a transfer at either the Salem, Swampscott, or Lynn commuter rail stations to travel to downtown Boston.

Facilities at the proposed station would be similar to other MBTA commuter rail stations providing a high-level platform and canopy, and a drop-off and pick-up area, however the amount of parking would depend on the selected site and the City. Access to the station would be from the east side of the tracks off of Canal Street. In addition to the bus connection, pedestrian connections between Canal Street and the station would be improved. Additional necessary infrastructure improvements would include the realignment of mainline and freight spur tracks in order to accommodate the station.

Two schematic designs have been developed for this Project. One design utilizes the so-called "former bowling alley" site, while the other design uses a parcel that is just to the north of Ocean Avenue. Neither Project locations have parking spaces dedicated to commuters although some short-term parking spaces could be developed to aide people waiting to pick up commuters. Both designs integrate space for a bus/shuttle stop to accommodate any possible shuttle service between Salem State College and the station.

Potential Impacts

Traffic Impacts

Under this Project, the morning peak hour volumes decrease at five of the sixteen locations, compared to the No-Build Project. All four locations in Revere and one location in Salem indicate a volume decrease. The only two locations with volume increase are in Salem: Canal Street, Southbound, north of Ocean Street, and Route 1A Southbound, north of Washington Street. Volumes at all five locations in Peabody, all three locations in Danvers, and one location in Salem remain unchanged.

Noise and Vibration Impacts

Noise impacts along the track due to train operations should be expected to substantially decrease near the station due to slower train speeds; however, noise levels near any potential parking facilities could affect some local nearby receptors.

Peak vibration levels will decrease by between 4 and 10 VdB for receptors near the tracks due to slower train speeds, resulting in fewer impacts in this area, although some receptors within 50 feet of the track may experience higher vibration levels if the track is realigned more than 5- 10 feet closer. Some residential receptors near the station may experience noise and vibration impacts during construction, as well as receptors near locations where the track will be realigned leading into the station.

Air Quality Impacts

Local pollutant concentrations may increase due to traffic increases in the vicinity of the South Salem Station. Air quality impacts at a regional scale would be positive because new rail ridership would slightly reduce the total vehicle miles traveled (VMT) in the region. Though the net regional effects will be slightly beneficial, there is potential for increases in local pollutant concentrations.

Wetland Impacts

There are no anticipated wetland impacts for this Project.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

Protected Species Impacted

There are no anticipated impacts to protected species.

Impacted Archaeological Resources

Because this Project requires the taking of land outside the ROW, there is potential for archaeological impacts to Prehistoric Site 19-ES-538.

Historic Properties Affected

There are no previously identified historic properties in the vicinity of this project area and no historic impacts are anticipated.

Environmental Justice Impacts

This Project would have some noise and ROW impacts. There would be some decrease in impacts to the environmental justice community located southeast of the proposed station area because of slower train speeds near the station. These residents would also benefit from having a direct commuter rail connection. Therefore, no disproportionate environmental justice impacts are anticipated. This project would also relieve the environmental justice neighborhoods from the existing burden of through trains by providing commuter rail service to residents.

Land Use Impacts

Because this project requires new construction on land not presently owned by the MBTA, property acquisition would be required. However, there could be both positive and negative impacts associated with potential transit-oriented or transit-induced development created by the addition of the station.

3.7 South Salem Station (North) Graphic

3.8 South Salem Station (South) Graphic

Salem-Danvers via Peabody Commuter Rail Service

Description

This proposed Project would implement a new commuter rail service on the Danvers Secondary Branch between Salem and Danvers, passing through Peabody Square (See Figure 3-9, sheets 1 through 3). This line would branch off the Eastern Route Main Line (ERML) north of the Salem Tunnel, travel to downtown Peabody along an active freight line, and then follow one of two inactive railroad lines west of Wall Street in downtown Peabody. The two alignment options beyond Peabody Square would both terminate near Route 128 exits. The southern branch (North Shore Mall Option) would terminate near Route 128/Exit 26; the northern branch (Danversport Option) would run into Danvers and terminate near Route 128/Exit 23. For either alternative alignment a new commuter rail station is proposed at Peabody Square. A station would be located near Exit 26 for the North Shore Mall Option and near Exit 23 for the Danversport Option. In addition to the track work and stations construction, bridge replacement and grade crossing upgrades would also be required as part of the project.

Trains would operate along the Eastern Route Main Line originating at North Station in Boston making station stops between Boston and Salem. North of Salem the service would serve a new station at Peabody Square before serving the terminal station adjacent to Route 128, in either Danversport or the North Shore Mall in Peabody. This Project would be approximately a 3.5 mile extension, including the new stations and a train layover facility. Capital improvements would include the upgrade and construction of track, grade crossing improvements, new bridges across Proctor Brook and the Waters River, a parking structure at both Peabody Square and the terminal station and the purchase of new commuter rail equipment.

	Danversport Option	North Shore Mall Option
Capital Cost	**$119,500,000**	**$125,000,000**
Operating Cost	**$5,555 per weekday**	**$5,555 per weekday**
Daily Ridership Increase on Mode	**5,600**	**6,000**
Net Increase in Daily Transit Ridership	**2,200**	**2,600**
Capital Cost/New Transit Rider	**$54,300**	**$48,100**
Operating Cost per Weekday/New Transit Rider	**$2.53**	**$2.14**
Capital Cost/Travel Time Benefit	**$191,200**	**$165,600**
Operating Cost/Travel Time Benefit	**$8.88**	**$7.32**
Travel Time Savings	**625**	**755**

Assessment

This Project would provide new commuter rail service to Peabody and Danvers. The proposed terminal station locations would be near Route 128, which would serve potential riders not only from Peabody and Danvers but also any other potential rider heading toward Boston from north of Peabody. Approximately 25% of the riders projected to board in Peabody and Danvers would be existing riders diverted from boarding commuter rail in other locations, such as Beverly and Salem. Service along the proposed branch line would operate approximately every half hour during peak periods and one to two hour headways during off peak periods.

Potential Impacts

Traffic Impacts

Danvers via Peabody Commuter Rail Service (Danversport Option)

The morning peak hour volumes decrease at thirteen of the sixteen locations, compared to the No-Build Project. These locations include all four locations in Revere, all four locations in Salem, three locations in Peabody, and two locations in Danvers. The volumes at Route 114 Eastbound, north of Prospect Street in Peabody, and Route 35 Southbound, north of Route 128 increase, compared to the No-Build Project. Volumes at one location in Peabody remain unchanged. The largest decrease in volumes occurs at Route 1 Southbound, South of Route 60 in Revere.

Danvers via Peabody Commuter Rail Service (North Shore Mall Option)

The morning peak hour volumes decrease at ten of the sixteen locations, compared to the No-Build Project. All four locations in Revere, three locations in Salem, two locations in Peabody, and one location in Danvers indicate volume decreases. Volume increases occur at two locations in Peabody and one location in Danvers. The volumes at one location in Salem, one location in Peabody and one location at Danvers remain unchanged. The largest decrease in volumes occurs at Route 1 Southbound, South of Route 60 in Revere.

There are several unsignalized and signalized intersections along the corridors for project options. that currently operate at unacceptable Levels of Service (LOS) of E or F during the morning and evening peak hours. The addition of vehicles that would be entering and exiting the new commuter rail station parking facilities, coupled with additional trains operating over the grade crossings along the corridor would adversely impact the traffic operation in the area, specifically at several locations in Peabody.

Noise and Vibration Impacts

Potential noise and vibration impacts may occur at several locations along both proposed alignment options. These locations would be in each corridor community, Salem, Peabody, and Danvers. Overall, the total number of potential impacts along each alignment option would appear to be under 200; however, the longer alignments included in the Danversport Option would appear to have more impacts than the shorter alignments of the North Shore Mall Option..

In Salem, both Options travel near Bridge Street, Flint Street, Oak Street, Friend Street, River Street, Grove Street and Silver Street, so it would appear likely that some noise and vibration would occur at residences along these streets. Train horns blowing at grade crossings near Flint, Oak and Grove Streets should result in additional impacts. In Peabody, there may be a few commercial noise impacts along Main or Walnut Streets and some residential noise and vibration impacts along Endicott Streets for all options. Commercial vibration impacts along Main and Walnut Streets appear unlikely.

For the North Shore Mall Option, it would appear that a few noise impacts would occur along Castle Circle, and Jennifer Lane in Peabody. There may be noise and vibration impacts at one or two locations on Warren Street. Additional noise impacts may occur on Proctor Street due to locomotive idling; vibration impacts appear unlikely due to low train speeds at this location. Some wheel squeal impacts appear possible for residential locations south of the North Shore Mall for the alignment furthest west. (See Figure 3-9, Option 1A).

For the Danversport Option, noise and vibration impacts would appear likely along Smidt, Ash, Bowditch, North Central and Andover Streets in Peabody. Depending on the specific alignment (See Figure 3-9, Option 2A and 2B), Purchase Street, Merrill Street, and Cheever Street in Danvers would appear likely to

have some impacted noise locations; there may be one or two impacted vibration locations along these streets as well. Possible noise impacts would be expected at Hood Terrace and Pleasant Avenue in Danvers if the alignment terminates nearby due to locomotive idling (See Figure 3-9, Option 2-A). Wheel squeal could impact residences near Pleasant Avenue even though they are separated from a tight curve by Route 128 (See Figure 3-9, Option 2A). Impacts could occur along Needham and Hutchinson Streets in Danvers if the alignment that passes nearby where to be implemented. Regardless of the specific alignment and terminal location it does not appear that more than one to two dozen noise and vibration impacts would be likely to occur for the Danversport Option.

Construction noise and vibration on any proposed project would affect a large fraction of the receptors affected by the operational noise and vibration, especially for track laying and bridge reconstruction. A detailed noise and vibration construction mitigation plan will be necessary prior to the beginning of work.

Air Quality Impacts

The new ridership associated with each project option would result in increased vehicle volumes and may cause greater traffic congestion and delays at key intersections near the new stations. Local pollutant concentrations may increase in the vicinity of these intersections and stations. Air quality impacts at a regional scale would be positive because new rail ridership would reduce the total vehicle miles traveled (VMT) in the region. This reduction in VMT is expected to more than offset the increase in locomotive emissions from additional trains. This pattern of local and regional impacts is expected to occur regardless of the station location selected. Though the net regional effects will be beneficial, there is the potential for increases in local pollutant concentrations at multiple locations.

Wetlands

Each wetland option would result in some wetland impacts. From Salem to Peabody, five wetland communities (3,600 linear feet) would be impacted on the north side and four wetland communities (3,750 linear feet) would be impacted on the south side. Since this route crosses over the Proctor Brook and it's associated wetlands at four locations the overall impacts in this option are expected to be high. The length of Riverfront Area along this route would be approximately 7,500 feet.

Along the Danversport Option, three wetland communities would be impacted on the east side (2,000 linear feet), while three wetland communities would be impacted on the west side (4,000 linear feet). The impacts associated with this option are largely associated with two major waterway crossings. Riverfront Area impacts would be approximately 3,600 linear feet for this option.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

Protected Species Impacted

There are no anticipated impacts to protected species.

Impacted Archaeological Resources

Both options require the acquisition of and construction along new ROW. The following are archaeological resources that could be affected by potential construction:

Salem to Peabody Square

- Salem Prehistoric Sites: 19-ES-592 – Boston Street Site, 19-ES-639 – Historic Indian Settlement, 19-ES-642 – Buffum's Field Site
- Peabody Prehistoric Sites: 19-ES-481 – Shyrnd's Farm, 19-ES-495 – Tremont Site

Danversport Option

- Danvers Prehistoric Sites: 19-ES-389 – Endicott Pear Tree Site, 19-ES-404 – Hussey Estate, 19-ES-575 – Gray's Brickyard Site, 19-ES-265 – Endicott Burial Ground/Creasex Crook Tannery Site, 19-ES-387

North Shore Mall Option

- Peabody Prehistoric Sites: 19-ES-463

Historic Properties Affected

Since both options require the acquisition of land for the right of way and for the new stations, there is the potential for historic impacts. Following is a list of area historic resources, by location.

Salem

- Properties Listed on the National Register: Carpenter Street: seven properties, Flint Street: fifteen properties, Lafayette Street: 51-55 (Salem Laundry), Lynn Street: nine properties, North Street: eight properties, River Street: seventeen properties
- Properties Listed on the State Register: Lafayette Street: 33 properties
- Eligible Properties: 242 Bridge Street (Salem Railroad Signal Tower), 76 Lafayette Street (Elevator Works Building)
- Inventoried Properties: Beckford Street: fifteen properties, Carpenter Street: one property, Goodhue Street: two properties, Grove Street: nineteen properties, Flint Street: eighteen properties, Lafayette Place: three properties, Lafayette Street: 71 properties, Mason Street: twenty-five properties, North Street: fifty-six properties, Oak Street: eight properties, Silver Street: seven properties

Salem to Peabody

There are two bridges along the rail segment between Salem and Peabody that would be replaced. Single-track railroad bridges would be replaced with double-track bridges.

- Inventoried Bridges: Howley Street Bridge over North River, North Central Street Pedestrian Bridge, Water Street Bridge over the Crane River

Peabody Square

- Properties Listed on the National Register: Peabody Civic Center Historic District, Washington Street Historic District

Danversport Option

Danvers

- Properties Listed on National Register: 59 Endicott Street (Sprague House), 15 Sylvan Street (Peabody Institute Library of Danvers),

- Inventoried Properties: Andover Street: two properties, Ash Street: nine properties, Clinton Avenue: twenty-five properties, Endicott Street: eighteen properties, Merrill Street: one property, Purchase Street: one property, Sylvan Street: sixteen properties, Water Street: sixteen properties

- A historic graveyard has been reported in the vicinity of Endicott Plaza containing the graves of several Endicott family members. At this time it is unclear if this graveyard has ever been evaluated for historic significance. Present plans call for avoiding it.

- Inventoried Bridges: Andover Street Railroad Bridge, Endicott Street Bridge, Waters River Bridge, Water Street Bridge over the Crane River

North Shore Mall Option

Peabody

- Inventoried Properties: Andover Street: six properties; Central Street: six properties; North Central Street: one property; Crowninshield Street: one property; Howley Street: several properties; Lowell Street: sixty-one properties; Prospect Street: two properties; Wallis Street: one property; Walnut Street: two properties

Environmental Justice Impacts

There are environmental justice neighborhoods in Peabody Square and one in Danvers. Both of these areas are near proposed commuter rail station sites. Impacts associated with this Project include the acquisition of ROW, noise impacts and impacts to cultural resources. Because of potential access benefits, however, these impacts would be off-set and environmental justice neighborhoods would not be disproportionately impacted.

Land Use Impacts

The options would require right of way acquisition as well as additional land area for station locations. There is potential for indirect land use impacts at the access points. The location of the first access point, in downtown Peabody, is consistent with state and national planning initiatives that encourage the use of existing infrastructure and transit-oriented-development (TOD). The downtown location ensures that the station area would be served by Peabody's infrastructure and services. Also, the Peabody Master Plan has indicated that the City is working on increasing pedestrian safety in the downtown area. The combination of pedestrian improvements with commuter rail service would support an active downtown.

The second access point has two potential locations, depending on which option is chosen. The North Shore Mall Option would end at a new station in the vicinity of the North Shore Mall, while the Danversport Option would terminate at a new station near Endicott Plaza. There are potential indirect impacts at both of these locations. However, since both access points would be located near existing commercial centers (the North Shore Mall or the Endicott Plaza) these access points are also consistent with planning initiatives that support the use of existing infrastructure and TOD.

Salem-Danvers via Peabody Commuter Rail Service

This Project would meet the MIS study goals of (1) Improving Community Access, and (2) Upgrading Existing North Shore Service by adding a new transit service to the area, (3) Promoting North Shore Economic Growth, and (5) Encouraging Community Oriented Design through possible coordination of development opportunities near the Peabody Square station. This Project has been categorized as a medium-term priority. Initial ridership projections indicate that this Project would result in approximately 3,000 commuters boarding the new commuter rail service each weekday. However, these projections assume unconstrained, discounted parking at each new station. Once specific parking and access attributes are further defined, the projected ridership may be affected.

This service would provide transportation benefits to communities throughout the North Shore area by increasing the overall capacity of the transit system thereby relieving pressure on existing services.

Although it is recognized that the service could have significant benefits, additional efforts would need to be advanced prior to implementation, including a more detailed engineering feasibility study, permitting and design. In recognition of the work that would need to occur to advance the project and the financial resources necessary to implement the Project it is projected to occur during a medium-term time frame (10 to 20 years)

After analyzing the alternative alignments and terminal locations it is further recommended that the proposed option for the Project be the Danversport option that terminates near Endicott Street in Danvers (See Figure 3-9, Option 2-D & 2F). This route appears to result in the least potential impacts while minimizing costs and maintaining connectivity between the proposed service and Route 128. The North Shore Mall option, which runs parallel to Lowell Street is adjacent to Proctor Brook and appears to have significant wetland, noise and traffic impacts to the neighborhoods along the route. The Danversport option alignments which extend north of Endicott Street would require additional bridges to cross over the Crane River and significant roadway work to provide access from Route 128. Although this is the recommended project definition, additional studies will need to be undertaken to confirm this preliminary assessment.

The Project could be implemented in a phased approach, initiating service first to Peabody Square and then to the terminal station. The segment of track between the existing Salem Station and the proposed Peabody Square station does not require improvements as substantial as the other proposed segments since it is currently being used by a freight rail operator. Traffic impacts could also be minimized by avoiding use of the grade crossings in Peabody Square. The first phase, providing service to Peabody would cost approximately $72 million, with half for infrastructure improvements and half for new rail equipment. This first phase would attract approximately half of the ridership projected for the full build which would have a Route 128 terminus.

3.9 Peabody Graphic (Sheet 1)

3.9 Peabody Graphic (Sheet 2)

3.9 Peabody Graphic (Sheet 3)

Newburyport/Rockport Line Coaches

Description

This Project would consist of the purchase of 54 bi-level commuter rail coaches for the Newburyport/Rockport Line to accommodate projected growth in demand on the line.

Capital Cost **$135,000,000**

Assessment

Newburyport/Rockport Line ridership projections for 2025 indicate the need for seven-car bi-level trains to operate along the line[8]. Presently the MBTA operates five to seven car trainsets with single level coaches on the Newburyport/Rockport Line. In addition the trainsets rotate during the day between all routes on the MBTA's North Side commuter rail system. In order for a dedicated bi-level fleet large enough to accommodate projected 2025 peak-period demand, 54 bi-level coaches would be required. Purchase of bi-level coaches to meet projected growth would accommodate projected demand without impacting existing schedules or services.

Potential Impacts

Traffic Impacts

No traffic impacts are anticipated.

Noise and Vibration Impacts

New bi–level coaches may cause a slight increase in noise levels, depending on the number and type of vehicles added to the line. Overall, this level should be less than 1-2 decibels. Noise levels from new equipment should be evaluated in conjunction with proposed service frequency changes, if possible.

Air Quality Impacts

No air quality impacts are anticipated.

Wetland Impacts

There are no anticipated wetland impacts for this Project.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

Protected Species Impacted

There are no anticipated impacts to protected species.

Impacted Archaeological Resources

No archaeological impacts are anticipated.

Historic Properties Affected

This project does not require work outside of the existing ROW; therefore, no historic impacts are anticipated.

[8] Commuter Rail and Rapid Transit Parking and Ridership Demand Forecasts, CTPS, January 2002.

Environmental Justice Impacts

There are no environmental justice impacts expected from this project.

Land Use Impacts

There are no anticipated land use impacts.

Newburyport Branch and Rockport Branch
Station Improvement Program

Description

This Project includes passenger amenity improvements to stations along the Newburyport/Rockport Commuter Rail Line. The goal of the program is to improve conditions for train boarding and alighting and provide improved accessibility to service at the Newburyport and Rockport Branch stations. The capital components of the Project that were considered were the construction of high-level platforms at three stations.

	Beverly Farms	Montserrat	North Beverly
Capital Costs	**$3,000,000**	**$4,800,000**	**$8,000,000**

Assessment

The ability to provide high-level platforms depends on the physical constraints in the station area and the community context of the existing station. Many of the stations are contextually sensitive to the existing character of the area and the changes caused by the installation of high-level platforms and the associated stairs and ramps (and possible pedestrian overpasses) could result in dramatic topographic and visual changes to the neighborhood. At many of the stations, existing low-level platforms provide connectivity with neighborhood sidewalks and accommodate passenger walkways which cross the tracks at grade. Therefore, the insertion of high-level platforms at some stations would result in significant impacts likely to be unacceptable.

After review of the potential for improvements at all stations along the branches, including track curvature constraints, it is recommended that not every station be reconfigured to include a high-level platform. This Project included specific consideration of the following improvements at certain stations along the Newburyport and Rockport Branches.

Beverly Farms Station
The proposed improvements would include construction of a new high-level platform, approximately 450 feet long on the outbound side between the Beach Street grade crossing and the existing end of the platform (See Figure 3-10). The length of the high-level platform would not be full length (800 feet) so as to minimize impacts to adjacent roadways. The new high-level platform would include an accessible ramp on the southern end. This would permit passengers to cross the tracks at the existing Beach Street grade crossing to access the parking lot and station building, both located on the inbound side of the tracks. In general the new high-level platform would be the same size and in the same location as the existing low-level platform.

Montserrat Station
The proposed improvements would include construction of new high-level platforms on each side of the tracks. The new high-level platforms would be approximately 450 feet long, extending from the Spring St. grade crossing to the Essex St. grade crossing (See Figure 3-11). The length of the high-level platform is would not be full length (800 feet) so as to minimize impacts to the adjacent roadways.

The outbound platform would include a ramp located on the northern end in the vicinity of the existing mini-high level platform and ramp. A set of stairs would be located approximately at the mid-way point of the platform, thereby providing a second means of egress from the platform. The design of the platform would be similar to existing MBTA high-level platforms including benches, railings and lighting.

The inbound platform would include an accessible ramp on the southern end, providing a connection from the platform to Spring St. and the existing Spring St. grade crossing. A set of stairs would be

located on the northern end of the platform, thereby providing a second point of access and providing a connection to the Essex St. side of the station. The new high-level platform would include a new canopy, benches, railings, lighting, as well as the standard tactile warning strip on the track-side of the platform.

North Beverly Station

The proposed improvements would include construction of new high-level platforms on each side of the tracks. These new high-level platforms would be approximately 840 feet long, extending from near the Dodge St. grade crossing northerly, slightly past the end of the existing low-level platform (See Figure 3-12).

The outbound platform would include an accessible ramp located on the southerly end, providing a connection from the platform to Dodge Street and the existing Dodge Street grade crossing. The design of the platform would be similar to existing MBTA high-level platforms, which are approximately 12 feet wide and include benches, railings, lighting and a tactile warning strip on the track-side of the platform.

The inbound platform would include a short accessible ramp between the southerly end of the platform and the existing parking lot. This would provide the most convenient access between the parking lot and the new platform for all passengers. The new high-level platform would include a new canopy, benches, railings, lighting, as well as a tactile warning strip on the track-side of the platform.

Potential Impacts

Traffic Impacts

No traffic impacts are anticipated for any of the projects.

Noise and Vibration Impacts

This Project would not cause noise or vibration impacts at any stations but there may be minor construction impacts associated with work at each location.

Air Quality Impacts

The proposed high-level platforms and accessibility improvements at Beverly Farms, Montserrat, and North Beverly Stations would not alter traffic circulation in and around these stations. Although the improved boarding and accessibility will improve the attractiveness of the stations for passengers, the resulting increases in ridership are expected to generate only minimal increases in traffic volume and parking demand, compared to existing traffic levels.

Wetland Impacts

There are no wetlands within 100 feet of any of the stations. There are no anticipated wetland impacts for the any of the projects.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

Protected Species Impacted

There are no anticipated impacts to protected species.

Impacted Archaeological Resources

Since potential construction activities are located within the ROW, which has been previously disturbed, there are no anticipated impacts.

Historic Properties Affected

This project does not require work outside of the existing ROW; therefore, no historic impacts are anticipated.

Environmental Justice Impacts

There are no environmental justice communities near these stations; therefore, environmental justice impacts are not anticipated.

Land Use Impacts

No land use impacts are expected for any of the stations.

3-10 Beverly Farms Graphic

3-11 Montserrat Graphic

3-12 North Beverly Graphic

Newburyport Branch and Rockport Branch
Highway Grade Crossing Improvements/Elimination Program

Description

This Project includes a program for improvements to and/or elimination of the existing grade crossings along the Newburyport/Rockport Line. A preliminary assessment of grade crossings along the line indicates that the most significant project component of the grade crossing program would be at the Eastern Avenue grade crossing in Chelsea (See Figure 3-13). Since this grade crossing has one of the highest Annual Average Daily Traffic (AADT) volumes along the line and is a segment of track that has a large number of daily train movements over the crossing, it has one of the higher levels of exposure to potential accidents. In addition, since it is not immediately adjacent to another grade crossing, major cross street, natural resource, or intensive land use the ability to grade separate the crossing is not constrained.

There is presently a speed restriction at the Eastern Avenue at-grade crossing in Chelsea that limits train speeds to 30 miles per hour for safety reasons. There are a high percentage of trucks that use the grade crossing due to the adjacent truck-reliant industries. The proposed elimination of the Eastern Avenue grade crossing would not only improve train speeds through the area it would eliminate a rail-related hazard from the roadway network.

The proposed grade crossing elimination would include a roadway bridge to carry Eastern Avenue over the railroad. The proposed bridge would be approximately 26 feet above the existing tracks to allow for sufficient railroad clearance. The roadway approaches to the bridge would be re-graded, using retaining walls to bring the surface of the roadway up to the bridge. Changing the elevation of the roadway would result in the need for some additional roadway changes, such as closing Crescent Avenue at the intersection of Crescent and Eastern Ave. and rerouting traffic along Vila Street and Dudley Street. In addition business entrances just south of the crossing would need to be realigned along a new roadway to provide safe access onto Eastern Avenue.

Capital Cost **$19,600,000**

Assessment

The proposed grade crossing in Chelsea would have some direct land use impacts including the need for land acquisition and the realignment of the adjacent intersection and some adjacent driveways. Traffic would also be affected as a new route would be required for some traffic passing through the area and accessing local businesses.

The Project for the improvement of the Eastern Avenue grade crossing would result in two major benefits. It would improve safety to both commuter rail riders and highway users by minimizing the opportunities for accidents to occur at the grade crossing. It would also improve the travel time of the commuter rail service by eliminating the speed restriction associated with the grade crossing.

Potential Impacts

Traffic Impacts

Although this location has not been modeled, it is expected that some traffic impacts could be created by the rerouting of traffic due to the closure of the existing crossing.

Noise and Vibration Impacts

At this location, noise impacts should decrease due to the cessation of locomotive horns and warning bells, even though the train noise will increase slightly due to higher train speeds. Vibration impacts

should increase slightly due to higher train speeds (increasing from 30 MPH to 60 MPH) which would increase the impact distance by between 30 and 50 feet, depending on location. This may result in a few new commercial receptor impacts at this location. Some receptors nearby also may be affected by construction noise and traffic detours/rerouting.

Air Quality Impacts

This improvement could increase the frequency for the Newburyport Branch, and therefore would have a similar increase on air quality emissions. Though the net regional effects will be beneficial, there is the potential for increases in local pollutant concentrations.

Wetland Impacts

There are no anticipated wetland impacts for this Project.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

Protected Species Impacted

There are no anticipated impacts to protected species.

Impacted Archaeological Resources

No archaeological impacts are anticipated.

Historic Properties Affected

This project does not require work outside of the existing ROW; therefore, no historic impacts are anticipated.

Environmental Justice Impacts

The City of Chelsea has many environmental justice neighborhoods, including some in the area of the grade crossing elimination. The removal of the at-grade crossing in Chelsea would improve traffic safety for the City. Noise impacts would be reduced and vibration impacts increased slightly. Considering the safety and noise benefits, this Project is not anticipated to have substantial environmental justice impacts.

Land Use Impacts

The proposed grade crossing in Chelsea would have some direct land use impacts and traffic impacts. There are a number of trucks that use the existing grade-crossing because of an adjacent truck-reliant industries and eliminating the grade crossing would eliminate potential truck and rail confrontations. This project would also require the realignment of the intersection and some adjacent driveways, resulting in land takings. Traffic would be affected as a new route would be required for traffic passing through the area and accessing local businesses.

3-13 Eastern Avenue Graphic

Beverly to Boston DMU/Shuttle Service

Description

This Project includes the implementation of a new diesel multiple unit (DMU)/Shuttle Service between Beverly Station and North Station in Boston operating on the Eastern Route Main Line to augment the existing services along the line. The proposed service would require the purchase of four DMU vehicles plus new layover and servicing facilities. Although a specific site has not been identified for a possible storage and maintenance facility it has been included in the project analysis and cost estimates as a known project requirement.

Capital Cost	**$18 million**
Operating Cost	**$3,100,000 annually**

Assessment

This Project would make service between Beverly and Boston's North Station more convenient for passengers traveling during off-peak hours since it would allow the MBTA to offer additional service by using Diesel Multiple Units (DMUs) in addition to the MBTA's standard five to eight coach push-pull train sets. The resultant service would allow at least 30 minute headways throughout the day. However, due to constraints along the line, such as the single track Salem tunnel and capacity of North Station, any new service is proposed to operate only during the off peak hours. It is projected that by using a smaller trainset the daily operating costs of the additional trains would be less than if a full trainset were used thereby permitting more flexibility in scheduling.

At present, only one railcar manufacturer in the world offers a model of DMU that complies with current Federal Railroad Administration crash-safety standards. So far, only a single demonstrator car has been built, so there is no experience with actual operating and maintenance costs. Estimates for DMU operating and maintenance costs used are those that have been previously developed based on international and historical DMU operations. The capital cost above is based on an estimate of $3.4 million per car. Any model of DMU would be expected to require some specialized maintenance facilities. Since the MBTA already has a shortage of storage space for existing equipment a new facility would need to be built in a location convenient to the Boston to Beverly corridor. A specific site has not been identified for a possible storage and maintenance facility. Potential impacts below focus on the implementation of DMU service. Depending on the location of maintenance facilities, potential environmental impacts could result.

Potential Impacts

Traffic Impacts

No traffic impacts are anticipated.

Noise and Vibration Impacts

There are no noise or vibration impacts anticipated.

Air Quality Impacts

No air quality impacts are anticipated.

Wetland Impacts

There are no anticipated wetland impacts for this Project.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

Protected Species Impacted

There are no anticipated impacts to protected species.

Impacted Archaeological Resources

No archaeological impacts are anticipated.

Historic Properties Affected

This project does not require work outside of the existing ROW; therefore, no historic impacts are anticipated.

Environmental Justice Impacts

No environmental justice impacts are anticipated.

Land Use Impacts

No land use impacts are anticipated.

Newburyport Branch and Rockport Branch
Signal System Upgrades

Description

This Project includes enhancements to the railroad signal system with the provision of a cab signal system on the Eastern Route Main Line in order to facilitate the operation of additional trains, particularly during peak periods. Installation of the signal system enhancements would predominantly include electrical and signal work within the railroad ROW and the MBTA's Operations Control Center.

Capital Cost **$162,000,000**

Assessment

This Project to install signal system enhancements is projected to result in a reduction of signal delays, improved operating flexibility and improved operational safety. This Project could also facilitate operation of additional trains, particularly during peak periods.

The specific system recommended for this upgrade is a Continuous Cab Signal System. Continuous cab signal systems receive a steady stream of signal information from a system in the rails in order to ensure safe train operation. The data received is continually scrutinized by the system's onboard computer in order to determine speed conditions and to issue subsequent alerts to the train engineer. Although the details of these systems can be customized based on the type of signal data emitted by the railroad, the proposed system would be similar to that presently used on the South Side (lines operating out of South Station) MBTA lines.

Infrastructure required to install the system includes new track circuitry and supervisory control facilities along the entire line. Existing MBTA locomotives and control coaches are already equipped with cab signal apparatus for use on South Side MBTA lines.

Potential Impacts

Traffic Impacts

No traffic impacts are anticipated.

Noise and Vibration Impacts

There are no noise or vibration impacts anticipated.

Air Quality Impacts

No air quality impacts are anticipated.

Wetland Impacts

There are no anticipated wetland impacts for this Project.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

Protected Species Impacted

There are no anticipated impacts to protected species.

Impacted Archaeological Resources

No archaeological impacts are anticipated.

Historic Properties Affected

This project does not require work outside of the existing ROW; therefore, no historic impacts are anticipated.

Environmental Justice Impacts

No environmental justice impacts are anticipated.

Land Use Impacts

Because there is no new service or construction proposed, there are no anticipated land use impacts.

Second Salem Tunnel

Description

This Project includes the construction of a second tunnel through downtown Salem to alleviate one of the major constraints to improving peak period commuter rail frequencies both north and south of Salem. The proposed improvements would include construction of a second track within a new tunnel in Salem, between Mill Street and Bridge Street to accommodate additional rail traffic (See Figure 3-14). The new tunnel would approximately follow the same path as the existing tunnel underneath Washington Street. The construction of the new tunnel would need to be conducted in a manner to minimize impacts to the surface environment and to the integrity of the existing tunnel. The construction cost has been estimated based on an initial evaluation of site conditions and design concepts. Details of construction phasing and mitigation for elements such as traffic, utilities, and abutters have yet to be developed.

Capital Cost **$130 million**

Assessment

One of the major constraints to increasing the peak period level of service on the Newburyport/Rockport Commuter Rail Line is the Salem Tunnel. This section of single track in the tunnel and at Salem Station limits the number of trains that can travel between Salem and Boston during peak periods. In fact, during peak periods the tunnel currently operates at or near capacity. Elimination of this physical constraint would contribute to greater flexibility in the scheduling and frequency of trains along the entire Newburyport/Rockport Commuter Rail Line.

The existing single-track Salem tunnel was built in two segments during the 1950's by the Boston & Maine Railroad under Washington Street through the Salem business district. As it was built under the western half of Washington Street, the location seemed to anticipate an eventual widening of the tunnel to accommodate two tracks.

This Project would include a second tunnel that would be built to the east of the existing tunnel. There would be three typical sections:

- Through the narrowest portions of Washington Street, the second tunnel would be built next to the existing tunnel, sharing a common center wall.
- South of this area, there would be some distance between the tunnels, particularly in the vicinity of the existing pump station and vent shaft just north of Mill Street.
- At Mill Street, it would be necessary to remove the existing roof and construct a wider tunnel.

Due to the tunnel's location in downtown Salem, there is a potential for significant disruption to local traffic during construction. The duration and extent would depend on construction staging. It is currently anticipated that the new tunnel would be constructed by the top-down, slurry wall method, which would minimize impacts on adjacent buildings and reopen the street to traffic sooner than other construction methods. Initially the slurry walls would be constructed, followed by the roof. With the roof in place, the street could be restored while the tunnel is mined out below the roof. North of the tunnel, the new double tracked alignment would be carried northwards through the existing station to connect with the existing double tracking at Northey Point. This would necessitate constructing a new Salem Station. The new station would have a single, island platform serving each track. It would be connected to the proposed garage and to Bridge Street.

Potential Impacts

Traffic Impacts

Adequate maintenance and protection of traffic plans would be required to address impacts during construction.

Noise and Vibration Impacts

There should be no changes in noise levels associated with the new Salem tunnel, except for a few receptors near the entrances. Since the Salem tunnel would be constructed using a cut-and-cover method, major construction impacts will likely occur, requiring a construction noise mitigation plan.

For the Salem tunnel, assuming that the train moves at an average speed of 40 mph through the tunnel, as specified by the MBTA for the North Shore Draft Environmental Impact Statement (DEIS), the number of vibration impacts along the Salem tunnel should increase by about 10-15% over the existing number. There may be considerable construction impacts associated with work on the Salem tunnel; depending on specific constructability parameters. A construction vibration mitigation plan will be necessary for any tunnel construction scenario.

Air Quality Impacts

This improvement could increase the frequency for Newburyport Branch, and therefore would have similar increases in air quality emissions. Though the net regional effects will be beneficial, there is the potential for increases in local pollutant concentrations.

Wetland Impacts

There are no anticipated wetland impacts for this Project.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

Protected Species Impacted

There are no anticipated impacts to protected species.

Impacted Archaeological Resources

There is one Prehistoric Site - 19-ES-511 – that has the potential to be impacted because the Second Salem Tunnel requires the acquisition of property outside of the ROW.

Historic Properties Affected

The Second Salem Tunnel would require property outside of the ROW and is located near a number of historic resources, so there is potential for significant historic impacts. The Second Salem tunnel would be located within the Downtown Salem National Register Multiple Resource Area (NRMRA), which is a combination of four National Register Historic Districts. Following is a list of specific properties within the area that could potentially be impacted:

> **Properties Listed on the National Register**: **Historic Districts**: Both sides of Washington Street from New Derby and Norman Streets on the south to Bridge Street through the corridor are within the Downtown Salem NRMRA, which envelops four National Register (NR) Historic Districts including Downtown Salem NR District, Federal Street NR District, Old Town Hall NR District, Essex County Court Building Complex NR District

Individual Properties: Salem City Hall (93 Washington Street), Joshua Ward House (150 Washington Street), Rufus Choate House (14 Lynde Street), U.S. Post Office (4 Margin Street), 3, 10, 13 Barton Square, 30, 33 Church Street, Essex Street: all properties, Federal Street: all properties, Washington Street: all properties

Environmental Justice Impacts

This project has the potential for land use, construction and noise impacts for surrounding residents, and is located in downtown Salem. Downtown Salem does have an environmental justice neighborhood (known locally as The Point) and, therefore, there is some potential for impacts to this environmental justice community. The tunnel, however, would remove one of the major constraints to improving commuter rail frequencies, resulting in the benefit of increased access to transit for these same neighborhoods and off-setting these impacts.

Land Use Impacts

There are potential direct impacts associated with the Second Salem Tunnel. A small amount of property would likely be acquired and there would be some disruption to the surface environment. This disruption would be minimized to the extent possible. Additionally, most of the disruption would be temporary, during construction.

3-14 Second Salem Tunnel Graphic

Salem to Boston Ferry Service

Description

This Project includes implementation of a new seasonal, high-speed commuter boat route from Salem to Logan Airport and the downtown Boston waterfront. A similar route was run experimentally in 1998, but with much less frequent service than analyzed here. Ridership was determined to be for tourist-oriented trips rather than daily commuters. The Project would include the purchase of two medium-size vessels and construction of a new terminal in Salem which would include approximately 190 parking spaces to accommodate riders.

Capital Cost	**$6,000,000**
Operating Cost	**$862,000 annually**

Assessment

Under this Project, seasonal ferry service would be implemented between downtown Salem and the Logan Airport area in Boston. This would assume the use of sea-going ferries of type usable for year-round open ocean conditions, similar to those used between Falmouth and Nantucket. The proposed route would require acquisition of two medium-size high-speed commuter-type boats, and construction of a new terminal in Salem with park-and-ride facilities[9]. The proposed site of the Salem Ferry Terminal would be located off of Blaney Street in Salem (See Figure 3-15). The Salem Ferry Terminal would include parking for approximately 190 cars, a small terminal shelter for ticket sales and passenger waiting and a ferry berth. Landscaping and other passenger and public amenities would be developed pending a final site plan for the parcel[10].

The concept of re-instituted ferry service is a core component of Salem's Harbor Plan and an integral part of development of the North Commercial Waterfront and Industrial Port. The infrastructure necessary for the ferry service could be coordinated with the planned New Salem Wharf project, thereby minimizing capital costs and annual operating costs. Ridership modeling was not conducted for this project since a high percentage of ridership is non-commuter based and highly responsive to marketing, which is not captured in standard transportation modeling. However, the former demonstration project that was run with travel times competitive with commuter rail service established that there is a market for a seasonal ferry service as long as the travel times and schedule are conducive to both commuters and tourist traffic. Average ridership for the demonstration service was about 500 riders per day and approximately 30% were work-based trips.

The expected trip time is approximately 50 minutes and would operate on weekdays between 6 AM and 9 PM. The service would make stops in Boston at Long Wharf or Rowe's Wharf depending on berth availability. Optional stops could be considered at the South Boston waterfront (World Trade Center) during peak periods and the Boston Harbor Islands (Georges or Spectacle Island) during off peak times.

Potential Impacts

Traffic Impacts

While there would be some increase in traffic levels due to this project, no substantial traffic impacts are anticipated.

[9] Draft Water Transportation Planning for Eastern Massachusetts: A Strategic Assessment of Passenger Ferry Services, Massachusetts Executive Office of Transportation and Construction, March 2003.

[10] The City of Salem still does not retain ownership of the parcel at this time.

Noise and Vibration Impacts

This Project might result in a few noise impacts for residents near Salem Harbor at the junction of Blaney Street and Derby Street due to some increased traffic. There may be some impacts for residents at the proposed dock location on Blaney Street due to ferry horns. There should be no vibration impacts due to this Project. There may be some construction noise and vibration impacts on Blaney Street, especially during pile driving.

Air Quality Impacts

Six ferry round trips daily would generate a relatively small amount of emissions from the ferry's engines, and a relatively small volume of vehicle traffic. Because the service would be seasonal, no impacts would occur during cold weather when inefficient fuel combustion in vehicle engines leads to the highest carbon monoxide (CO) emissions and concentrations.

Wetlands

There are potential wetland impacts associated with this Project. The ferry terminal is within the harbor area and the parking area could impact 7,500 square feet of excavated pond. 600 feet of the parking lot edge is within a wetland buffer zone.

Impacted Vegetation and Wildlife Resources

There are no anticipated impacts to vegetation and wildlife resources.

Protected Species Impacted

There are no anticipated impacts to protected species.

Impacted Archaeological Resources

This Project requires the acquisition of new ROW so it has the potential to impact Prehistoric Site 19-ES-599.

Historic Properties Affected

This Project could result in historic impacts because property acquisition is required within a historic district. There are a number of nearby historic resources included in the Derby Waterfront Historic District. The proposed location for the new ferry terminal is also near the Salem Maritime Historic Site.

Environmental Justice Impacts

Most of the neighborhoods surrounding the proposed ferry terminal are not environmental justice communities. There are some environmental justice neighborhoods, however, and these communities would be impacted the same as other surrounding communities. Potential impacts are primarily ROW acquisition. Because there are impacts to both environmental justice neighborhoods and non-environmental justice neighborhoods and because impacts to these neighborhoods would be off-set by improved access to new transit service, there are no anticipated environmental justice impacts.

Land Use Impacts

There would be direct and indirect land use impacts with this Project. The proposed site for the Salem Ferry Terminal is off of Blaney Street in Salem. This facility would include parking for approximately 190 cars, a small terminal shelter for ticket sales and passenger waiting and a ferry berth. Property acquisition would be required to construct this facility. Further, some indirect development could occur as a result of the new facility.

3-15 Salem Ferry Terminal Graphic