

Executive Summary

ES.1 Introduction

The Northern Branch Corridor Project calls for transit improvements in northeastern Hudson and southeastern Bergen Counties through the restoration of passenger rail service on an existing freight rail line. The Northern Branch Corridor Draft Environmental Impact Statement (DEIS) was prepared by NJ TRANSIT in cooperation with the Federal Transit Administration (FTA) to evaluate the benefits, costs and social, economic and environmental impacts of constructing and operating passenger rail service between North Bergen in Hudson County and Tenafly or Englewood in Bergen County. The DEIS was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended, the Council on Environmental Quality (CEQ) guidelines, and the FTA's environmental impact regulations, as well as Section 4(f) of the Department of Transportation Act of 1966 (recently amended at Title 49 USC Section 303) and Section 106 of the National Historic Preservation Act of 1966.

The DEIS evaluates two Build Alternatives for the restoration of passenger rail service in the Northern Branch Corridor. The Build Alternatives are comprised of an electric light rail system that would operate along an existing freight rail right-of-way from North Bergen, Hudson County to Bergen County. The Preferred Alternative, referred to as Light Rail to Tenafly, would terminate at a station near the Tenafly/Cresskill border. The second Build Alternative, referred to as Light Rail to Englewood Route 4 would terminate at a station near Route 4 in Englewood (refer to Figure ES-1). The project includes a direct connection to the existing Hudson-Bergen Light Rail (HBLR) system at Tonnelle Avenue in North Bergen. As part of this project, due to the need to separate light rail vehicles from freight vehicles, freight service would be moved to the overnight hours, when light rail vehicles would not be operated.

The Northern Branch service would operate primarily on existing railroad right-of-way owned by the New York, Susquehanna & Western (NYS&W) in North Bergen and CSX Transportation (CSX) between North Bergen and Tenafly or Englewood and would introduce new station stops in North Bergen, Ridgefield, Palisades Park, Leonia, and Englewood, as well as Tenafly under the Preferred Alternative.

ES.2 Project Background

The Northern Branch Corridor Project is an outgrowth and continuation of the *West Shore Region Study*, begun jointly in 1996 by NJ TRANSIT and the counties of Bergen, in New Jersey, and Rockland, in New York. The study was initiated in response to growing concerns about roadway congestion in northeastern New Jersey and adjacent areas in New York State. Previous studies in the area, including the *West Shore Commuter Rail Planning Study Phase I Final Report* (Kaiser Engineers, December 1988) and the *West Shore Line Evaluation Study* (Sverdrup, April 1995), had examined only specific corridors and modes. The *West Shore Region Study* was undertaken to provide a comprehensive examination of potential congestion solutions in several corridors and for all modes. Subsequent to the West Shore Region Study, the *West Shore Region Study Alternatives Analysis Report* (Edwards and Kelcey, December 1999) described the evaluation of a broad range of preliminary alternatives resulting in the selection of three corridors throughout Bergen, Passaic, and Rockland Counties for further analysis, including the Northern Branch Build Alternative.

The Northern Branch Build Alternative consisted of the extension of the Hudson-Bergen Light Rail system from the vicinity of 85th Street in North Bergen to Tenafly and utilized light rail as the mode of rail service. This Northern Branch Build Alternative was described in the *Northern Branch Corridor MIS/DEIS Final Scoping Document* distributed in December 2001.

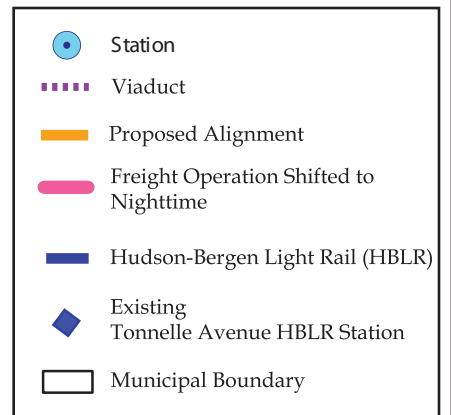
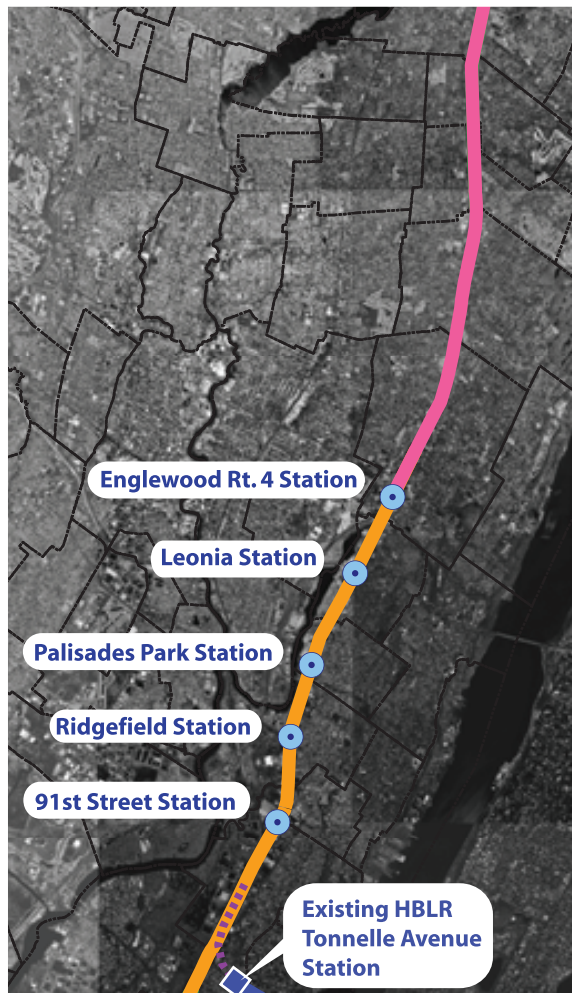
NORTHERN BRANCH DEIS BUILD ALTERNATIVES

Northern Branch Corridor
Figure ES-1

Light Rail to Tenafly
(Preferred Alternative)



Light Rail to Englewood Route 4



Between 1996 and 2001 several significant developments occurred that suggested a re-evaluation of how passenger rail service in the Northern Branch Corridor could best serve the area. These developments include:

- **HBLR terminus at Tonnelle Avenue** –The *West Shore Region Study Alternatives Analysis Report* (Edwards and Kelcey, December 1999) assumed the northern terminus of the HBLR to be at 85th Street in North Bergen (the original planned terminus of the HBLR system). This is significant in that it anticipated the construction of a highly expensive and difficult section through the North Bergen freight yard. Ultimately, however, the HBLR terminated at Tonnelle Avenue in North Bergen and never confronted the obstacles of running light rail vehicles (which are not compatible with Federal Railroad Administration’s (FRA) structural requirements for vehicles operating in mixed freight traffic) through or over an active freight yard.
- **Diesel Multiple Unit (DMU) technology** – New DMU vehicles that met FRA’s structural requirements for vehicles operating in mixed freight traffic were introduced in 2002. (Although, as described below, the DMU is no longer considered to be an option for this alignment.)
- **Access to the Region’s Core** – The Trans-Hudson Express Tunnel emerged as the preferred alternative in an NJ TRANSIT-sponsored EIS for increasing trans-Hudson commuting capacity. This project opened the possibility of a future direct connection between Bergen County and Midtown Manhattan. The FEIS was published in October 2008 and the Record of Decision (ROD) was issued in January 2009. However, the project was terminated in October 2010.
- **Meadowlands** – The emergence of American Dream-Meadowlands (formerly known as Xanadu) as a major entertainment destination refocused the attention on the application of light rail as a suitable transportation alternative, possibly extending the HBLR to the new rail location in Secaucus.

Due to the above developments, it was determined that both the DMU vehicle and the light rail vehicle were viable modes for use on the Northern Branch Corridor, and both were selected for evaluation in the DEIS. FTA and NJ TRANSIT, therefore, reissued the NOI to prepare an EIS for the Northern Branch Corridor to include a DMU alternative as well as the previously recommended light rail alternative, an extension of the HBLR (the reissued NOI dated October 2, 2007 supersedes the NOI of June 18, 2001).

Following these significant events, NJ TRANSIT revised the Northern Branch Build Alternatives to focus on FRA-compliant DMU service to deliver new transit capacity for Hudson, Bergen, and Passaic Counties. Public outreach specific to the Northern Branch Project included several public meetings beginning in October 2004 describing the DMU technology and its use on the Northern Branch instead of light rail. Additional outreach was conducted through 2006, introducing the revised technology to the study area residents, elected officials, and other stakeholders.

In response to the outreach effort and under the assumption that DMU service would provide a new and needed bridge between New Jersey’s existing mixture of electrified rail service and diesel-powered service, NJ TRANSIT reconsidered the elimination of light rail as a vehicle technology proposed for Northern Branch service. In 2007, early questions arose regarding the potential near-term availability of DMU technology, and as a consequence a new scoping initiative re-introduced the project with four alternatives representing two different vehicle modes – light rail and DMU. It was decided that the Northern Branch DEIS would evaluate not only the extent of service, but the impacts and benefits of the proposed vehicles modes as well. To that end, NJ TRANSIT published a Draft Scoping Document in October 2007 and a Final Scoping Document in March 2008.

During the scoping period and in subsequent Citizen Liaison Committee (CLC) meetings, study area residents, elected officials, transit rider support groups, and environmental advocates provided input regarding the scope of the study and issues of particular concern. Many individuals expressed preference for light rail over DMU, citing air quality and other environmental concerns. Other individuals expressed concerns about the potential for traffic congestion near proposed station sites, potential property acquisition, and the potential for loss of parkland and its associated impacts on the adjacent community. As a result of these comments, the potential station site in Leonia was relocated out of Overpeck Park. Although the light rail Alternatives would affect freight service, no comments were received from freight operators during either scoping period or at any CLC meeting.

The availability of the FRA-compliant DMU vehicle and its future as a viable alternative to other passenger rail technologies abruptly changed in 2008. In December of that year, Colorado Railcar Manufacturing, the manufacturer of the FRA-compliant DMU vehicle proposed for this project, declared bankruptcy. Although US Railcar, now American Railcar, has announced that it would resume production of the former Colorado Railcar DMU, the company has not yet started production. Although a different company is proposing to build DMU vehicles for a California project, the design is still being modified in an attempt to attain compliance with FRA safety and structural standards. Given the DMU's uncertainty, the public's preference for light rail over DMU, and the benefits of continuing light rail service through the corridor, instead of adding a new technology, the DMU alternatives included in the 2008 Final Scoping Document have been eliminated from further analysis in this document.

Additional detail on the project background is presented in Chapter 1 of the Northern Branch Corridor DEIS – Background and Setting.

ES.3 Purpose and Need

The current transportation system within the densely-settled Northern Branch Corridor is characterized as a substantial roadway-based transportation system. This system includes limited-access highways as well as a variety of local and commuter bus routes, all of which contribute to the recurring traffic congestion prevalent within the corridor and on the region's roadways and crossings.

Rail transit, once a fundamental travel option for corridor residents, is now only available to the west and south of the corridor. Growing roadway congestion is creating saturated conditions on corridor roadways during peak commuting hours, increasing travel times for both private automobiles and buses. The most overwhelmed roadways and transit routes are those providing access south to Hudson and Essex Counties and east to New York City. Trends involving increasing population, a rise in the number of workers per household, and increasing use of single occupant automobiles, among others, are expected to exacerbate congestion.

The purpose and need of the proposed project is to improve mobility within Hudson and Bergen Counties, alleviate some traffic congestion, and support continued economic growth. Provision of new transportation service in the Northern Branch corridor would address the following goals and objectives:

Goal 1: Meet the needs of travelers in the project area

Objectives:

- Attract riders to transit.
- Improve travel time and reliability for travelers in the region.
- Improve convenience by providing frequent service, adequate parking at stations, competitive travel times, and convenient connections to other transit services, such as ferries, PATH, and feeder services.
- Provide more options for travelers.

- Improve services for low-income/minority/transit-dependent travelers.

Goal 2: Advance Cost-Effective Transit Solutions

Objectives:

- Support favorable farebox recovery to help ensure that the provision of transit service in the corridor is financially sustainable.
- Advance cost-effective transit solutions by advancing a project that, from a cost-benefit perspective, provides the greatest overall benefit at the lowest capital cost.
- Support future expansion, scalability and affordability.

Goal 3: Attract growth and support development in Bergen and Hudson Counties, including the Hudson River Waterfront.

Objectives:

- Provide transportation capacity to support future population and employment growth.
- Help attract new businesses by introducing new transportation choices that improve access to New York and the rest of the region, which will help Bergen and Hudson Counties to maintain their competitive advantage in the region.

Goal 4: Improve regional mobility and access.

Objective:

- Provide connections to a variety of locations within the region including the growing Hudson River Waterfront area, Newark, Trenton, and major recreational attractions like the Meadowlands and the New Jersey Shore.

Goal 5: Reduce roadway congestion.

Objective:

- Provide more travel options for travelers trying to avoid highway congestion.

Goal 6: Enhance the transit network.

Objectives:

- Eliminate gaps in the rail network.
- Eliminate gaps in the bus network.

Additional detail on the purpose and need and goals and objectives is presented in Chapter 2 of the Northern Branch Corridor DEIS – Purpose and Need of Project.

ES.4 Alternatives

The DEIS examines three alternatives including the No Build Alternative and two Build Alternatives. The No Build Alternative assumes that the proposed project would not be implemented and provides a basis of comparison with the Build Alternatives. The No Build Alternative is required under NEPA. The Build Alternatives are both light rail systems on the same alignment, one with a terminus in Tenafly, and one with a terminus at Englewood Route 4. Following is a brief description of the alternatives. Refer to Chapter 3: Alternatives Considered for more detail.

ES.4.1 No Build Alternative

The No Build Alternative represents the current transportation network plus other reasonably foreseeable transportation improvements that will be implemented by the year 2030. Specifically, the elements of the No Build Alternative consist of NJ TRANSIT Bus Service, private bus service, NJ TRANSIT HBLR service terminating at Tonnelle Avenue Station in Hudson County, NJ TRANSIT Commuter Rail Service, PATH Service and Ferry Service. It is assumed that the basic attributes of the bus system in eastern Bergen County will remain relatively unchanged in 2030. Committed transportation elements of the No Build Alternative include US Route 1/9 widening and a new grade separation at 69th Street in North Bergen over the railroad corridor.

ES.4.2 Build Alternatives

The Build Alternatives for the Northern Branch Corridor DEIS are comprised of an electric light rail system, an extension of the existing Hudson-Bergen Light Rail, which would operate along an existing rail right-of-way from North Bergen, Hudson County to Bergen County. The Light Rail to Tenafly Alternative (Preferred Alternative) extends from North Bergen, Hudson County to Tenafly in Bergen County for a distance of approximately 12 miles and includes nine proposed stations (refer to Figure ES-1). The Light Rail to Englewood Route 4 Alternative follows the same alignment as the Preferred Alternative but terminates in Englewood at Route 4 for a total distance of approximately eight miles and five proposed stations. The two Build Alternatives are the same through the portion common to both (North Bergen to Englewood Route 4). The notable differences between the Build Alternatives are the termination points.

Light Rail to Englewood Route 4 begins in North Bergen and terminates at a proposed station located adjacent to NJ State Route 4, accessed via Nordhoff Place. This terminal station was selected because Route 4 is a major east-west route connecting the study area to New York City. A station with direct access from Route 4 is convenient for single-occupancy vehicle drivers and helps the project achieve its goals of drawing commuters from the local roadways onto transit.

Light Rail to Tenafly (Preferred Alternative) includes the Englewood Route 4 Station and provides service through the town centers of both Englewood and Tenafly, terminating at a station located on the Tenafly-Cresskill border accessed via Piermont Road in Tenafly. This terminal station was selected because the land use development pattern begins to change north of Tenafly from denser older-suburban mixed use and small-lot residential to less dense residential with more open space. These suburban locations are typically auto-dependent and as a result are contributors to surface road congestion. Providing a station in Tenafly opens the northern suburbs to transit service, which helps the project achieve its goals of improving mobility and reducing roadway congestion. Additionally, this alternative provides service through the business districts of Englewood and Tenafly, providing job access and supporting economic development.

Both Build Alternatives propose to use light rail vehicles, which are powered by electricity and are lighter in weight than traditional commuter rail vehicles; however they are not certified by the FRA to run in mixed rail traffic with heavy rail and freight rail. This means that both Build Alternatives would require freight service to operate at night, when light rail service is not operating, thereby affecting nighttime sound levels. Additionally, to provide the necessary electricity, small substations will be placed approximately one mile apart along the alignment.

The Build Alternatives would provide service to municipalities along the corridor between North Bergen and Tenafly, linking to the Hudson River Waterfront via an extension of the Hudson-Bergen Light Rail System. Mobility would be improved to and from municipalities along the line, providing access to Manhattan via transfer at Weehawken (ferry) or Hoboken (ferry and PATH). This service would be time-

separated from the freight operations – passenger service would operate between 5:30 a.m. and 10:30 p.m. while freight service would operate between 11:00 p.m. and 5:00 a.m.

Both Build Alternatives would run on headways of six minutes during the peak hours and 12 minutes during the off-peak period between North Bergen and Englewood Route 4. North of Englewood under Light Rail to Tenafly (Preferred Alternative), the headways would be 12 minutes during the peak hours and 24 minutes during the off-peak period. Light rail service ends at 10:30 p.m., which may have an impact on those who work late shifts or would like to use the service in the late evening for non-work trips.

The proposed service offers a one-seat ride from each of the Build Alternatives northern terminus options (Tenafly or Englewood) directly onto the HBLR service. One-seat ride service is considered more desirable than service that requires transfers, as transfers create delay and enter an element of uncertainty into a passenger's commute.

Alternative Elements

Project elements are summarized in Table ES-1. Both Build Alternatives will include a vehicle base facility (VBF) in the vicinity of North Bergen. An optional location for the VBF in the vicinity of the Englewood Route 4 Station is also proposed (the Englewood location would replace the North Bergen location, not be constructed in addition to the North Bergen VBF). Both Build Alternatives will include viaducts to cross over the freight yard and tracks between the Tonelle Avenue HBLR Station and the western side of the alignment and between 69th Street and 83rd Street. Additionally, to improve safety at the undergrade crossing at 83rd Street, the 83rd Street grade crossing will be closed, and a new crossing will be opened at 85th Street. 85th Street will be extended to Westside Avenue, and traffic will be diverted from 83rd Street to 85th Street.

Light Rail to Tenafly (Preferred Alternative) will include the development of nine station sites; Light Rail to Englewood Route 4 will include five station sites. Station site details are discussed in Section E.S. 4.2.1: Stations. Table ES-1 summarizes the elements associated with each alternative. Refer to Chapter 2: Alternatives Considered for more detail.

Table ES-1: Project Element Summary

Feature		Light Rail to Tenafly (Preferred Alternative)	Light Rail to Englewood Route 4
Track		10.75 miles of double track 1.25 miles of single track	8 miles of double track
Stations		9	5
New Viaduct		2	2
Culvert Improvements		4	4
Bridge Improvements		6	6
Substations		10	6
Grade Crossing Improvements		33	33
Grade Crossing Closures (83 rd Street, North Bergen)		1	1
New Undergrade Bridge/Grade Crossing (85 th Street, North Bergen)		1	1
Vehicle Base Facility		1	1
Surface parking lots		5	3
Parking Garages		1	2
Land Acquisition	With VBF in North Bergen	20 private properties (23 acres) and seven public properties (7 acres).	8 private properties (15 acres) and 6 public properties (7 acres).
	With VBF in Englewood	25 private properties (24 acres) and five public properties (0.6 acres).	13 private properties (17 acres) and 4 public properties (0.4 acres).

Source: Jacobs, 2010.

ES.4.2.1 Stations

Following are descriptions of each of the stations. Parking needs for each station are generally identical between the two Build Alternatives with the exception of the Englewood Route 4 Station which under Light Rail to Englewood Route 4 serves as the northern terminal, requiring a greater parking capacity than when it is a station under Light Rail to Tenafly (Preferred Alternative).

As discussed in section ES.5.1, ridership for each of the Build Alternatives was projected to the year 2030 using the North Jersey Transit Demand Forecasting Model (NJTDFM, the model). The model was used to estimate total LRT riders by zone to each station. NJ TRANSIT then used data from the model (such as percentage of people that would walk, drive, carpool, be dropped off, or take the bus based upon distance from each station, and the type and density of development) to estimate how riders would travel to each station. This produced an initial parking demand at each station. The station locations were then reviewed to determine the maximum amount of parking spaces that could reasonably be provided at each location, without overwhelming the communities. The model was then constrained with these maximum parking numbers, and a second iteration of the forecasting model was run. This resulted in adjustments to individual access modes to each station and a final, revised parking demand at each station. The resulting station parking requirements for each alternative are shown in Table ES-2. Plans for each station are shown in Appendix B: Site Plans of Project Elements.

Table ES-2: Parking Demand and Spaces to be Provided by Alternative, 2030

Station	Parking Demand		Parking Spaces to be Provided	
	Light Rail to Tenafly (Preferred Alternative)	Light Rail to Englewood Route 4	Light Rail to Tenafly (Preferred Alternative)	Light Rail to Englewood Route 4
Tenafly North	570	0	570	NA
Tenafly Town Center	40	0	0*	NA
Englewood Hospital	0	0	0	NA
Englewood Town Center	70	0	0*	NA
Englewood Rt. 4	480	870	480	870
Leonia	550	550	550	550
Palisades Park	320	320	320	320
Ridgefield	350	350	350	350
91st Street	40	40	40	40
TOTAL	2420	2130	2310	2130
* Parking for these locations is assumed to be accommodated through on-street parking. The parking availability for these areas is analyzed in Chapter 9: Traffic and Parking.				

Source: NJ TRANSIT, 2008

91st Street Station (Both Build Alternatives)

A new station would be constructed at 91st Street comprised of side platforms and an at-grade pedestrian track crossing (refer to Figure 5 in Appendix B). A surface parking facility for 40 vehicles and a passenger drop-off area would be located east of the alignment and south of 91st Street on property currently occupied by a parking lot for an industrial use. This would require the partial acquisition of one privately-owned property, approximately 0.5 acres.

Ridgefield Station (Both Build Alternatives)

A new station consisting of side platforms would be constructed immediately south of Hendricks Causeway, west of Broad Street (refer to Figure 6 in Appendix B). A parking facility with capacity for 350 vehicles and a passenger drop-off area would be constructed on the east side of the right-of-way.

Vehicle access would be provided from Remsen Place. The surface parking area site is currently occupied by an industrial building and would require the acquisition of five properties (2 privately-owned, 3 publicly-owned), approximately 3.53 acres.

Palisades Park Station (Both Build Alternatives)

The proposed station site is located north of Ruby Avenue, south of Fairview Avenue and west of Grand Avenue (refer to Figure 7 in Appendix B). The station would consist of side platforms, a surface parking facility with capacity for 320 vehicles, and a passenger drop-off area. Vehicular access would be provided via West Ruby Avenue. Industrial and commercial buildings currently occupy the 2.64-acre site, requiring the acquisition of three privately-owned properties.

Leonia Station (Both Build Alternatives)

The Leonia Station, composed of side platforms, would be located both north and south of Fort Lee Road (refer to Figure 8 in Appendix B). Station parking for 550 vehicles would be accommodated in a six-story parking deck located above an existing parking lot associated with an office building (Kulite) east of the Northern Branch right-of-way. The parking deck would be large enough to accommodate the project's need, as well as the existing parking for the Kulite business. Vehicular and pedestrian access would be provided via Willow Tree Road. Bus pull-off lanes would be provided on Fort Lee Road to accommodate transfers between buses and the station. No land acquisition is anticipated at this location, Negotiation with the land owners would be required to develop a parking deck in place of the existing surface parking area.

Englewood Route 4 Station (Both Build Alternatives)

The Englewood Route 4 Station, located under Route 4 at W. Nordhoff Place, would consist of a center-island platform and a surface parking area with capacity for 480 vehicles (Light Rail to Tenaflly (Preferred Alternative)) or a parking deck with capacity for 870 vehicles (Light Rail to Englewood Route 4) located south of Route 4 to the west of the right-of-way (refer to Figure 9 in Appendix B). A passenger drop-off area would be provided in all alternatives. The site is currently occupied by an industrial building. Englewood Route 4 is the terminal station for Light Rail to Englewood Route 4. This station site would require the acquisition of one privately-owned property of approximately 5.18 acres.

Englewood Town Center Station (Light Rail to Tenaflly (Preferred Alternative) Only)

This station would be located between Englewood and Palisade Avenues, between S. Van Brunt Street and S. Dean Street (refer to Figure 11 in Appendix B). The station platform would be located on the eastern side of the single track. No designated station parking would be provided at this location but it is assumed that riders will be able to utilize a new municipal parking deck on the corner of Englewood Avenue and Dean Street (refer to Chapter 9: Parking and Traffic for the parking capacity analysis). No acquisition is anticipated at this location.

Englewood Hospital Station (Light Rail to Tenaflly (Preferred Alternative) Only)

The Englewood Hospital Station would have side platforms located across from the hospital along Dean Street (refer to Figure 12 in Appendix B) at Durie Avenue. Commuter parking would not be provided at this station. No acquisition is anticipated at this location.

Tenaflly Town Center Station (Light Rail to Tenaflly (Preferred Alternative) Only)

The Tenaflly Town Center Station platform would be constructed on the west side of the right-of-way south of West Clinton Avenue behind the Clinton Inn, between Franklin Street and Dean Drive (refer to Figure 13 in Appendix B). A passenger drop-off area would be located west of the right-of-way on Franklin Street in a site currently used for municipal parking, requiring the acquisition of one publicly-owned property of approximately 0.24 acres. No designated station parking would be provided at this location but it is assumed that riders will be able to use on-street parking (refer to Chapter 9: Parking and Traffic for the parking capacity analysis).

Tenaflly North Station (Light Rail to Tenaflly (Preferred Alternative) Only)

The Tenaflly North Station, located south of the Cresskill border along Piermont Road, would have a center island platform (refer to Figure 14 in Appendix B). A surface parking lot with capacity for 570 vehicles and passenger drop-off area would be located on a site currently occupied by residential, commercial, industrial and light manufacturing/warehousing uses. These parcels are located on three municipal blocks bordered by Summit Street to the north, Hudson Avenue to the south, Piermont Road to the west and Madison Avenue to the east. This station site would require the acquisition of 12 privately-owned properties, totaling approximately 7.16 acres.

Although not included in this analysis, the project has been designed so as not to preclude the construction of a station in Fairview, should anticipated development in the area warrant its construction.

ES.4.2.2 Vehicles and Operations

The light rail vehicle is the same as those currently in operation on the Hudson-Bergen Light Rail System. These HBLR vehicles are powered by electricity conveyed to the vehicle by an overhead catenary system. Both Build Alternatives would use a combination of two- and three-car trains to accommodate projected ridership.

Current FRA regulations require that vehicles not meeting the structural requirements must operate with either a physical or temporal (time) separation from freight operations. As such, the Build Alternatives are assumed to operate between the hours of 5:30 a.m. and 10:30 p.m., allowing the freight providers to use the alignment between 11:00 p.m. and 5:00 a.m. This will affect freight service and freight service customers. The addition of freight service to the overnight hours also increases noise impacts to the communities along the alignment as currently there is no rail service in the overnight hours.

ES.5 Operating Plan

The service for the Northern Branch is assumed to operate daily from 5:30 a.m. to 10:30 p.m. Three-car trains (maximum consist size) are assumed, with 68 seats per car, from Tenaflly to Hoboken; two-car trains are assumed to operate between Englewood Route 4 and Jersey City. Each service is assumed to operate on headways of 12 minutes in the peak period and 24 minutes in the off-peak period. Accordingly, south of Englewood Route 4 the service would effectively be six minutes in the peak period and 12 minutes in the off-peak period. Travel times for the Northern Branch light rail service are presented in Tables ES-3 and ES-4.

**Table ES-3: Northern Branch Corridor Light Rail Travel Times (Minutes)
Light Rail to Tenaflly (Preferred Alternative)**

Station Stop	Incremental Time	Cumulative Time	Travel Time to Port Imperial, Weehawken	Travel Time to Hoboken
Tenaflly North	--	--	0:25	0:37
Tenaflly Center	0:02	0:02	0:23	0:35
Englewood Hospital	0:03	0:05	0:20	0:32
Englewood Center	0:02	0:07	0:18	0:30
Englewood Rt. 4	0:02	0:09	0:16	0:28
Leonia	0:02	0:11	0:14	0:26
Palisades Park	0:02	0:13	0:12	0:24
Ridgefield	0:02	0:15	0:10	0:22
91st Street	0:03	0:18	0:07	0:19
Tonnelle Avenue	0:03	0:21	0:04	0:16

Source: Jacobs, 2008

**Table ES-4: Northern Branch Corridor Light Rail Travel Times (Minutes)
Light Rail to Englewood Route 4**

Station Stop	Incremental Time	Cumulative Time	Travel Time to Port Imperial, Weehawken	Travel Time to Hoboken
Englewood Rt. 4	--	--	0:16	0:28
Leonia	0:02	0:02	0:14	0:26
Palisades Park	0:02	0:04	0:12	0:24
Ridgefield	0:02	0:06	0:10	0:22
91st Street	0:03	0:09	0:07	0:19
Tonnelle Avenue	0:03	0:12	0:04	0:16

Source: Jacobs, 2008

To accommodate the projected riders from the Northern Branch, an additional 13 HBLR vehicles (which includes a 20 percent spare factor) would be required for Light Rail to Tenaflly (Preferred Alternative). Peak service would require eight three-car train sets between Tenaflly North and Hoboken and ten two-car train sets between Englewood Route 4 and West Side Avenue. Off-peak service between Tenaflly North and Hoboken would require five three-car train sets while Englewood Route 4 to West Side Avenue would require six two-car trains.

An additional six HBLR vehicles (which includes a 20 percent spare factor) would be required for the Light Rail to Englewood Route 4 Alternative. Peak service would require six three-car train sets between Englewood Route 4 and Hoboken and ten two-car train sets between Englewood Route 4 and West Side Avenue. Off-peak service would require four train sets to Hoboken and six train sets to West Side Avenue.

The operating plan assumes that in 2030 the Hudson-Bergen Light Rail service operates with three-car consists between Tonnelle Avenue and Hoboken and two-car consists between Tonnelle Avenue and West Side Avenue, requiring a total of 12 additional vehicles beyond the 52 vehicles currently in the HBLR fleet. These 12 additional HBLR vehicles are not included in the capital costs for this project since they will be needed to accommodate ridership growth on the existing HBLR service.

ES.5.1 Ridership

Ridership for each of the Build Alternatives was projected to the year 2030 using the North Jersey Transit Demand Forecasting Model (NJTDFM). The NJTDFM is designed to forecast the demand for travel within northern New Jersey between northern New Jersey and adjacent portions of New York and Pennsylvania.

The 2030 total daily trips for both Build Alternatives are summarized in Table ES-5. The relatively high project ridership is primarily the result of the availability of one-seat rides which offer a seamless connection between the proposed Northern Branch service and existing HBLR service. The total daily trips are comprised of those diverted from other transit modes (e.g., bus and commuter rail) as well as commuters who currently drive. Table ES-5 includes those number of new transit trips – those diverted from automobile – for each Build Alternative.

Table ES-5: Projected Northern Branch Daily Passengers, Trips and New Transit Trips

Station	Boardings and Alightings	
	Light Rail to Tenafly (Preferred Alternative)	Light Rail to Englewood Route 4
Tenafly North	1,170	--
Tenafly Center	1,315	--
Englewood Hospital	150	--
Englewood Center	1,000	--
Englewood Route 4	840	1,750
Leonia	3,200	3,895
Palisades Park	1,745	1,700
Ridgefield	1,440	1,460
91st Street	1,040	1,155
TOTAL Passengers	11,900	9,960
TOTAL Daily Trips	23,800	19,920
<i>New Transit Trips</i>	<i>8,800</i>	<i>6,600</i>

Source: NJ TRANSIT, 2008

ES.5.2 Capacity Analysis

The capacity analysis assumes a “worst case scenario,” which considers the Build Alternative with the greatest projected ridership to determine whether capacity would be available on the HBLR to accommodate HBLR riders as well as new Northern Branch passengers. In this case, Light Rail to Tenafly (Preferred Alternative) is anticipated to attract 23,800 daily trips (11,900 passengers). Light Rail to Englewood Route 4 will attract fewer trips, 19,920 daily trips (9,960 passengers). As a result, the following analysis discusses Light Rail to Tenafly (Preferred Alternative) but applies to Light Rail to Englewood Route 4, as well.

During the peak hour under the Light Rail to Tenafly (Preferred Alternative), 12 HBLR trains would pass through Tonnelle Avenue in the peak hour. Of these 12 trains, ten would continue onto the Northern Branch, and two would start their service at Tonnelle Avenue without crossing onto the Northern Branch. The proposed 91st Street Station would be the southernmost station on the Northern Branch before the service transitioned onto the HBLR. A passenger count of 3,425 would be on board the trains at 91st Street Station during the peak hour, leaving capacity for 750 passengers to board from the existing HBLR Tonnelle Avenue Station and south to Weehawken. The two HBLR trains departing from the existing Tonnelle Avenue Station in the peak hour would have capacity for 835 passengers.

Together, the Northern Branch-originating HBLR trains and the Tonnelle Avenue Station-originating HBLR trains would have capacity for 1,585 passengers after all Northern Branch passengers are accommodated. Existing ridership on the HBLR adds 490 passengers from Tonnelle Avenue to Weehawken, which would be the segment with the highest number of passengers. In 2030, the non-Northern Branch ridership is expected to total 735 passengers. This number is below the projected capacity of the HBLR during the peak hour. Consequently, the Light Rail to Tenafly (Preferred Alternative) will not have an adverse effect on the capacity of the HBLR, and as this is a worst-case analysis, neither will Light Rail to Englewood Route 4.

ES.6 Cost Analysis

ES.6.1 Capital Costs

A capital cost model was developed for the Northern Branch Project following the guidance contained in FTA’s *Standard Cost Categories for Capital Projects*, revised May 2007. Unit costs included in the

model have been developed based on recent experience with the design and cost estimating of capital cost elements on other projects. Costs have been developed based on NJ TRANSIT experience and are reported in 2008 dollars escalated to year of expenditure (refer to Table ES-6). The right-of-way costs reflect the estimated cost for property associated with stations and parking facilities. The costs for the CSX and NYS&W rights-of-way are not included in these estimates.

Table ES-6: Capital Costs by Alternative (costs in 2008 dollars, in millions)

Cost Item	Light Rail to Tenafly (Preferred Alternative)	Light Rail to Englewood Route 4
Guideway and Track Elements	167.50	149.97
Stations, Stops, Terminals, Intermodals	32.83	27.44
Support Facilities: Yards, Shops, Admin Buildings	44.88	44.88
Sitework & Special Conditions	122.11	88.18
Systems	79.19	56.54
ROW, Land, Existing Improvements	38.60	28.90
Professional Services	152.22	120.91
Unallocated Contingency	111.63	91.75
Finance Charges	8.93	7.34
SUBTOTAL (2008 \$)	757.89	615.91
Escalation	56.04	46.06
CONSTRUCTION TOTAL	813.93	661.97
Vehicles	52.00	24.00
PROJECT TOTAL	865.93	685.97
Total Project Miles	12 miles	8 miles
Capital Cost / Mile	72.17	85.75

Source: Gannett-Fleming/HNTB, 2008

As shown in Table E-6, the total project cost to construct the Light Rail to Tenafly (Preferred Alternative) is just over 25 percent more than the Light Rail to Englewood Route 4; however, the Light Rail to Tenafly (Preferred Alternative) travels 33 percent further. Comparing the total project cost by project mile, the cost per mile would be less for the Light Rail to Tenafly (Preferred Alternative) than the Light Rail to Englewood Route 4, \$72.17 million and \$85.75 million per mile, respectively.

ES.6.2 Operating Costs

An operating and maintenance cost (O&M) model was developed following the guidance contained in *Procedures and Technical Methods for Transit Project Planning*, Section 2.4, Operating and Maintenance Cost, Federal Transit Administration, September 1990, as revised. The principles of this guidance were applied to prepare the O&M cost model for the Northern Branch Project, which was developed to a level of detail appropriate for the concept-level work performed in this study. The output of the demand forecasts and operating plans was used as input to the O&M cost model, in the form of operating statistics. Development of the model involved identifying costs that vary with service levels, and then attributing each variable cost to the service characteristics to which it is most closely tied. Refinements were made to the operating cost model to reflect the actual experience of the existing HBLR system.

Annual revenue for each of the Build Alternatives was developed based on the ridership forecasts and assumptions for fares and parking rates. The annual revenue includes revenue loss from Commuter Rail and HBLR but does not consider revenue loss from bus. Revenue recovery is the total revenue (fares and parking fees) divided by the total operating and maintenance costs, expressed as a percentage. The operating subsidy is the total operating and maintenance costs minus the revenue.

Table E-7 summarizes each of these items by Alternative. Both Build Alternatives are predicted to operate at similar revenue recovery rates, between 36.17% and 36.54%. The Light Rail to Tenafly

(Preferred Alternative) has higher annual operating and maintenance costs, but has higher annual revenue. When comparing the annual operating subsidy between the two Build Alternatives, when the subsidy is calculated per mile, the subsidy per mile is approximately the same. Thus the main difference between the alternatives is the distance over which the light rail would operate.

Table ES-7: Annual Costs and Revenue by Alternative (costs in 2008 dollars, in millions)

Item	Light Rail to Tenafly (Preferred Alternative)	Light Rail to Englewood Route 4
Annual Operating and Maintenance Costs	\$23.5	\$15.6
Annual Revenue	\$8.5	\$5.7
Annual Revenue Recovery	36.17%	36.54%
Annual Operating Subsidy	\$15.0	\$9.9
Total Project Miles	12 miles	8 miles
Annual Operating Subsidy / Mile	\$1.25	\$1.25

Source: Jacobs, 2008.

Additional detail on the alternatives and their cost is presented in Chapter 3 of the Northern Branch Corridor DEIS – Alternatives Considered.

The source of funding for construction and annual operating and maintenance costs has not been identified at this time.

ES.7 Summary of Environmental Consequences

The No Build Alternative avoids all potential adverse impacts typically associated with new development or reinstatement of rail service in urbanized locations. While the No Build does not introduce significant change to the study area, it fails to provide any benefit in terms of improved mobility and would not meet the project's goals and objectives. Public transit would continue to remain less available to portions of the study area, and over time, roadway congestion on the area's arterials and highways would worsen, which leads to decreased air quality and a compromised quality of life in the study area.

The Build Alternatives provide for improved mobility but result in some changes to the character of the study area. As described above, two Build Alternatives are considered, but the Preferred Alternative was chosen based upon how well that alternative meets the project's purpose and need. Both Build Alternatives provide transit service where service is presently lacking. Light Rail to Englewood Route 4 terminates this service at the proposed Englewood Route 4 Station, while Light Rail to Tenafly (Preferred Alternative) continues past the Englewood Route 4 Station to a proposed terminal station at the border of Tenafly and Cresskill. As a result of the longer linear distance over which Light Rail to Tenafly (Preferred Alternative) travels, a larger geographic area would receive direct access to transit service. Accordingly, Light Rail to Tenafly (Preferred Alternative) is anticipated to result in 2,200 more new transit trips than Light Rail to Englewood Route 4. These new trips represent transit users who would switch from driving personal cars to using the light rail service, reducing auto emissions and roadway congestion.

Light Rail to Tenafly (Preferred Alternative) exposes more neighborhoods and businesses to the benefits of passenger rail service, but also exposes these same neighborhoods and businesses to the impacts associated with the new service, such as increased noise and traffic. For the most part, the impacts associated with the additional service provided under Light Rail to Tenafly (Preferred Alternative) are mitigatable impacts that reduce the environmental cost of this alternative to a level similar to that of the Light Rail to Englewood Route 4. The following discussion highlights the impacts and the differences between the two Build Alternatives.

Land Acquisition and Displacement

Both Build Alternatives will require the acquisition of private property to develop station sites and vehicle maintenance facilities. Both Build Alternatives will require the same number of properties up to the proposed Englewood Route 4 Station— eight private properties (commercial uses) and six public properties. If a vehicle base facility (VBF) is established in Englewood, the total acquisition increases to 13 private properties (commercial uses) and four public properties for both Build Alternatives. The estimated business displacements and employee displacements associated with the property acquisition with the North Bergen VBF are 14 businesses and 236 jobs and with the Englewood VBF are 18 businesses and 321 jobs. The Preferred Alternative extends north to Tenafly, requiring the acquisition of 12 additional private properties and one additional public property, representing six businesses and 85 jobs, along with five residences.

Consistency with Local Plans

The Master Plans of Ridgefield, Leonia, and Englewood support both Build Alternatives. Tenafly's Master Plan supports the concept of passenger rail service but opposes the terminal station's location within Tenafly, and Tenafly has passed a resolution opposing rail service in Tenafly. As a consequence, the Preferred Alternative is not supported by Tenafly; however, the benefit to the greater region is greater than the benefit provided by Light Rail to Englewood Route 4 in that the Preferred Alternative will serve more riders and result in more diversions from personal automobiles to transit.

Parkland

Without mitigation, Huyler Park in Tenafly may experience noise impacts associated with the Light Rail to Tenafly (Preferred Alternative). If they are requested and implemented, Quiet Zones can effectively mitigate this impact. If the Quiet Zones are not implemented, the Light Rail to Tenafly (Preferred Alternative) would impact the park, while the Light Rail to Englewood Route 4 would not impact any parks.

Community Facilities

Potential impacts to community facilities involve the movement of emergency service responders in locations where significant development occurs on both the east and west sides of the Northern Branch rail right-of-way. This land use development pattern is prominent north of the proposed Englewood Route 4 Station. This impact applies mostly to the Preferred Alternative, as it extends north of the proposed Englewood Route 4 Station. Coordination between NJ TRANSIT and local EMS dispatch can mitigate these issues through specially-developed protocols that facilitate emergency service movement across the rail right-of-way.

Traffic and Parking

Throughout the study area, traffic volume is expected to increase between the present and 2030, regardless of the implementation of the Northern Branch Project. It is expected that the study area will continue to have more residents and traffic generators (e.g., business, higher density uses) that will attract more vehicles to the area. Both Build Alternatives will introduce new destinations in the form of rail stations to the study area. Traffic generated by commuters going to these stations will be added to the existing and future congested conditions.

After mitigation, Light Rail to Englewood Route 4 is expected to result in 2 intersections with failing (LOS F) traffic conditions. Traffic mitigation measures will result in the loss of 32 on-street parking spaces in the vicinity of the proposed Englewood Route 4 Station. The Preferred Alternative will result in 4 intersections with failing conditions after mitigation, and mitigation will result in the loss of 225 parking spaces total between Englewood and Tenafly. It is important to note that in both instances, 8 failing intersections were present *before* the addition of the anticipated project-generated traffic, a function of projected traffic volume increases and constrained conditions in the study area in 2030.

The lost parking spaces represent a small percentage of total available public and on-street parking in the areas where the loss will occur. The loss of the additional parking associated with the Preferred Alternative is a result of the additional area served by Light Rail to Tenafly.

Air Quality

Light rail vehicles are electric and do not produce emissions deleterious to ambient air quality. The increase in traffic to get to the stations would result in a slight increase in pollutant concentrations at the intersection level; however, both Build Alternatives would cause a reduction in regional emissions, due to the reduced VMT, with Light Rail to Tenafly (Preferred Alternative) causing the greater reduction in emissions due to the larger reduction in auto VMT.

Noise

The addition of frequent light rail service during the day and evening and the shift of freight service to the overnight hours result in new sources and periods of increased noise in the study area. Noise impacts occur as a result of the warning horns required when a train approaches an at-grade crossing along with the pass-by noise of freight trains and light rail vehicles, although due to their weight and construction, light rail vehicles do not make much pass-by noise. The warning horns would sound during the operating hours of the light rail, between 5:30 a.m. and 10:30 p.m. Additionally, due to the shift of freight service to the overnight hours, warning horns are assumed to be sounded twice each night, once for the northbound trip, and once for the southbound trip of the freight train. These nighttime pass-bys occur along the entire length of the corridor, regardless of the terminal location of the build alternative.

With Light Rail to Englewood Route 4, 1,393 residences would be impacted. With Light Rail to Tenafly (Preferred Alternative), a total of 1,467 residences, one park, and one recording studio would be impacted.

If municipalities request “Quiet Zones” and the proper safety equipment is installed, the horns would not be required to be sounded. With all of the quiet zones implemented, the total number of project-related impacts would be reduced to 212.

Vibration

Light Rail to Englewood Route 4 causes no vibration impacts. The Preferred Alternative, Light Rail to Tenafly, results in two residential impacts and one commercial impact north of the proposed Englewood Route 4 Station. These impacts can be mitigated with specific vibration-dampening materials during project design.

Wetlands

The total quantity of wetlands affected ranges between 4.30 and 4.73 acres, depending upon the length of the Build Alternative and whether the VBF is located in North Bergen or Englewood. The North Bergen VBF would add 0.02 acres of wetlands to the total wetlands impact for both Build Alternatives. The Light Rail to Englewood Route 4 Alternative would impact 4.30 to 4.32 acres. Due to the longer distance traversed, the Preferred Alternative would impact an additional 0.41 acres of wetlands between the proposed Englewood Route 4 Station and the proposed Tenafly North Station, with a total impact of between 4.71 and 4.73 acres.

Table ES-8 summarizes and compares these environmental consequences by Build Alternative. Where there is no difference between the Build Alternatives in terms of an impact or mitigation measure, the details of the impact or mitigation are described once.

Table ES-8: Summary of Environmental Consequences

Category	No Build	Light Rail to Tenafly (Preferred Alternative)		Light Rail to Englewood Route 4	
		North Bergen VBF	Englewood VBF	North Bergen VBF	Englewood VBF
LAND USE AND ZONING					
Compatibility with Local Zoning and Land Use	No Impact	Compliant with local zoning and land use.			
LAND ACQUISITION AND DISPLACEMENT					
Property Acquisition ¹	No acquisitions	20 private properties (23 acres) and 7 public properties (7 acres).	25 private properties (24 acres) and 5 public properties (0.6 acres).	8 private properties (15 acres) and 6 public properties (7 acres).	13 private properties (17 acres) and 4 public properties (0.4 acres).
Business Displacements	0 businesses	20 businesses	24 businesses	14 businesses	18 businesses
Estimated Employee Displacements	0 jobs	321 jobs	406 jobs	236 jobs	321 jobs
Residential Displacements	0 residences	5 residences	5 residences	0 residences	0 residences
¹ All private properties or portions of properties that would be acquired under this proposed project would be purchased at fair market value pursuant to the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970.					
CONSISTENCY WITH LOCAL PLANS					
State and regional plans	Does not support the desire for increased rail transportation.	No conflicts with existing state and regional plans as these plans are generally supportive of the reintroduction of passenger rail transit.			
Local Plans	Does not support the municipal plans' goals of improved transportation circulation.	- Supported by local plans adopted by Ridgefield, Leonia, Englewood, and Tenafly, although Tenafly's Master Plan opposes having the terminal station. - Although not included in the plan, Tenafly passed a resolution opposing the rail service in Tenafly.		Supported by local plans adopted by Ridgefield, Leonia, and Englewood.	
PARKLANDS					
Physical acquisition	None	None			
Visual Impact	None	None			
Noise Impact	None	- Huyler Park in Tenafly may experience noise impacts during its summer concert series due to warning whistles at nearby grade crossings. - Impacts could be mitigated by Quiet Zones and/or relocating the concert series.		None	
Access	No changes	Provides an additional mode of transit to the large, regional, Overpeck County Park, and the new amphitheater via the pedestrian walkway.		No physical acquisition, changes to access, or visual impacts.	

Table ES-8: Summary of Environmental Consequences (continued)

Category	No Build	Light Rail to Tenafly (Preferred Alternative)		Light Rail to Englewood Route 4	
		North Bergen VBF	Englewood VBF	North Bergen VBF	Eng. VBF
COMMUNITY FACILITIES					
Changes in Access to Community Facilities and Movement of Emergency Service Providers	No Impact	<ul style="list-style-type: none"> - Potential for access issues to community facilities resulting from frequent rail vehicle grade crossings in Englewood and Tenafly since the rail alignment bisects the municipalities. - South of Route 4 developed land uses are concentrated on the east side of the ROW minimizing access issues associated with grade crossing closures. NJ TRANSIT will coordinate mitigation measures with municipalities, such as grade crossing pre-emption, dispatch protocols and information campaigns. 		South of Route 4 developed land uses are concentrated on the east side of the right-of-way minimizing access issues associated with grade crossing closures. NJ TRANSIT will coordinate mitigation measures with municipalities, such as grade crossing pre-emption, dispatch protocols and information campaigns.	
TRAFFIC AND PARKING					
Number of Intersections Anticipated to Operate with a Failing LOS in 2030	8	<ul style="list-style-type: none"> - 26 without mitigation - Mitigation² can relieve failing conditions or excessive delays at 22 intersections 		<ul style="list-style-type: none"> - 12 without mitigation - Mitigation² can relieve failing conditions or excessive delays at 10 intersections 	
Station parking capacity	N/A	<ul style="list-style-type: none"> - Parking demand for Tenafly Town Center (40 spaces) and Englewood Town Center (70 spaces) is assumed to be handled by existing on-street and off-street available parking. Englewood Hospital is assumed to have no parking needs. - The parking lots at all other stations have been sized to accommodate the anticipated number of parking commuters. 		The parking lots have been sized to accommodate the anticipated number of parking commuters.	
Loss of on-street parking	None	<ul style="list-style-type: none"> - Englewood Route 4 – 32 - Englewood Town Center – 128 - Englewood Hospital – 15 - Tenafly Town Center – 50 		<ul style="list-style-type: none"> - Eng. Route 4 – 32 	
On-street parking availability	<ul style="list-style-type: none"> - Eng. Route 4 – 394 - Eng. Town Ctr – 823 - Eng. Hospital – 626 - Ten. Town Ctr – 807 	<ul style="list-style-type: none"> - Englewood Route 4 – 362 - Englewood Town Center – 625 - Englewood Hospital – 611 - Tenafly Town Center – 717 		<ul style="list-style-type: none"> - Eng. Route 4 – 362 - Eng. Town Ctr – 823 - Eng. Hospital – 626 - Ten. Town Ctr – 807 	
² NJ TRANSIT will meet with each municipality to discuss the feasibility of implementing the improvements proposed in their respective municipality. Improvements that are deemed acceptable to the municipalities, and will be implemented as measures to mitigate potential traffic impacts resulting from the project, will be discussed as commitments in the FEIS.					
TRANSIT AND FREIGHT					
Transit and Freight Service	No Impact	<ul style="list-style-type: none"> - Shift in freight service to overnight hours may affect freight customers along the entire Northern Branch corridor, regardless of whether they are in a community served by light rail. - No significant impact on transit service. - NJ TRANSIT would coordinate with the bus providers to identify changes in the bus routes that would improve access to the stations and/or reduce duplications in service. 			

Table ES-8: Summary of Environmental Consequences (continued)

Category	No Build	Light Rail to Tenafly (Preferred Alternative)		Light Rail to Englewood Route 4	
		North Bergen VBF	Englewood VBF	North Bergen VBF	Englewood VBF
AIR QUALITY					
Air Quality Impacts	The No Build Alternative would not reduce regional emissions.	<ul style="list-style-type: none"> - The project is anticipated to cause an increase in localized traffic near proposed stations; however, air quality modeling indicates that even with the increase in localized traffic, the CO levels would be below the National Ambient Air Quality Standards (NAAQS). - Both alternatives would reduce regional emissions of CO, PM_{2.5} and PM₁₀, hydrocarbons (HC), and nitrogen oxides (NO_x). 			
Conformity compliance	N/A	<p>The Northern Branch Rail Corridor Project is listed within the FY2010-2019 Statewide Transportation Improvement Program under Transit Rail Initiatives and in the 2009 Regional Transportation Plan. The regional analysis shows a reduction in PM_{2.5} and PM₁₀. Therefore, it is anticipated that this project will comply with the conformity requirements established by the Clean Air Act Amendments of 1990.</p>			
NOISE³					
Moderate impacts	No impacts	<ul style="list-style-type: none"> - Without Quiet Zones, 791 residences would be moderately impacted. - Impacts could be mitigated by Quiet Zones, reducing the moderate impacts to between 211 and 791, depending upon the number of Quiet Zones that are requested and implemented. 		<ul style="list-style-type: none"> - Without Quiet Zones, 851 residences would be moderately impacted. - Impacts could be mitigated by Quiet Zones, reducing the moderate impacts to between 211 and 851, depending upon the number of Quiet Zones that are requested and implemented. 	
Severe impacts	No impacts	<ul style="list-style-type: none"> - Without Quiet Zones, 676 residences & Bennett Studios in Englewood and Huyler Park in Tenafly would be severely impacted. - Impacts could be mitigated by Quiet Zones, reducing the severe impacts to between 1 and 676 residences (& Bennett Studios), depending upon the number of Quiet Zones that are requested and implemented. Additional mitigation, such as building insulation/acoustic windows, is recommended for the one severe impact that could not be mitigated by Quiet Zones. NJ TRANSIT will confer with the owner of this property to explore and conduct negotiations over potential mitigation strategies. 		<ul style="list-style-type: none"> - Without Quiet Zones, 542 residences would be severely impacted. - Impacts could be mitigated by Quiet Zones, reducing the severe impacts to between 1 and 542 residences, depending upon the number of Quiet Zones that are requested and implemented. Additional mitigation, such as building insulation/acoustic windows, is recommended for the one severe impact that could not be mitigated by Quiet Zones. NJ TRANSIT will confer with the owner of this property to explore and conduct negotiations over potential mitigation strategies. 	
<p>³Noise impacts related to the shift in freight train movement to the overnight hours affect the entire corridor, regardless of the terminal location of the Build Alternative. If light rail service terminates in Englewood, Tenafly would still be affected by a freight delivery to Northvale in the overnight hours.</p>					

Table ES-8: Summary of Environmental Consequences (continued)

Category	No Build	Light Rail to Tenafly (Preferred Alternative)		Light Rail to Englewood Route 4	
		North Bergen VBF	Englewood VBF	North Bergen VBF	Englewood VBF
VIBRATION					
Number of Vibration Impacts	No Impact	- 2 residences (1 in Englewood and 1 in Tenafly) and Bennett Studios in Tenafly. - Potential impacts to these resources can be mitigated during design such that the resources would not be impacted by the project, such as incorporating the use of high resilience fasteners and resiliently supported ties.		No Impact	
WATER QUALITY					
Potential for adverse impact at stream crossings	NA	- Minor rehabilitation work at stream crossings would likely have no impact. - For new crossings, in-stream construction may be required. Sheet piling and small cofferdams may be used to prevent fill materials and excavated solids from entering the water column during this construction. - During the operation of rail service, NJ TRANSIT's inspection and maintenance program will mitigate potential non-point source pollution from rail vehicles traveling on the right-of-way.			
Potential for impact due to stormwater	NA	- Station parking facilities will require stormwater management facilities, including bio-retention systems, stormwater infiltration systems, sand filters, and other measures intended to return the overland flow of stormwater to pre-construction rates and remove pollutants from the stormwater. - The VBF will include separate systems for handling stormwater runoff and wastewater from maintenance activities.			
WETLANDS					
Type of impact	NA	Wetlands identified and delineated within and in close proximity to the existing right-of-way generally function as drainage swales of ordinary resource value collecting adjacent run-off from surrounding impervious surfaces.			
Wetland Area to be Disturbed	No Impact	4.71 acres	4.73 acres	4.30 acres	4.32 acres
		- Mitigation for construction impacts are similar to those used to maintain water quality and focus on preventing siltation of existing wetland resources. - Mitigation for permanent impacts, will require agreement between NJDEP, USACE, and NJ TRANSIT, and is proposed to consist of the purchase of wetland mitigation within the Kane Tract from the Meadowlands Conservation Trust Organization.			

Table ES-8: Summary of Environmental Consequences (continued)

Category	No Build	Light Rail to Tenafly (Preferred Alternative)		Light Rail to Englewood Route 4	
		North Bergen VBF	Englewood VBF	North Bergen VBF	Englewood VBF
FLOODPLAINS					
Project elements within floodplains	NA	Southern portion of ROW, 91st Street Station, Palisades Park Station, Leonia Station, and North Bergen VBF	Southern portion of ROW, 91st Street Station, Palisades Park Station, and Leonia Station	Southern portion of ROW, 91st Street Station, Palisades Park Station, Leonia Station, and North Bergen VBF	Southern portion of ROW, 91st Street Station, Palisades Park Station, and Leonia Station
		<ul style="list-style-type: none"> - NJDEP Stream Encroachment Permit required for all Build Alternatives. - Although rail projects may be granted an exemption from the zero percent net fill provision of the NJ Flood Hazard Control Act, the project will be designed with the intent to meet this rule by not filling more than 20 percent of the existing floodplain storage on a site. - As compensation, flood storage areas would be provided off-site within the same flood hazard area and watershed as the proposed fill and will not be separated from the proposed fill by a water control structure such as a road or dam. - Excess runoff associated with the project will be mitigated through the use of wet ponds, storm water infiltration or detention facilities and bio-retention best management practices as outlined by the NJDEP Land Use Regulation Program. 			
NAVIGABLE WATERWAYS AND COASTAL ZONES					
Impact to navigable waterways	No Impact	<ul style="list-style-type: none"> - The construction of the bridges over Bellmans Creek and Wolf Creek are not expected to result in impacts to the navigability of the waterways as the bridges would be constructed in accordance with USCG parameters and as stipulated by the Section 10 Permit from the ACOE. - Construction activities are anticipated to include widening and excavation, as well as the placement of materials in and around the structure over the waterways. The navigability of the waterways is expected to remain to the same extent as prior to construction. 			
Impacts to coastal zones	No Impact	According to the state's Coastal Zone Boundary Map, the corridor is not located within the Coastal Zone; therefore, conformance with the state's coastal zone policies is not required.			
ENDANGERED SPECIES					
Threatened, endangered, and species of concern potentially located within the study area	The United States Fish and Wildlife Service (USFWS) and NJDEP Natural Heritage Program (NJDEP NHP) identified the potential for Indiana bat, yellow crowned night heron, wood turtle, cattle egret, glossy ibis, little blue heron, snowy egret, and eastern box turtle habitat to occur along the project corridor. In addition, an occurrence of the wood turtle was documented approximately three-quarters of a mile from the project corridor.				
Potential Impacts	No Impact	<ul style="list-style-type: none"> - No Impact. - Habitat proximate to the railroad right-of-way is not suitable to support the noted species. Additionally, minimal forest habitat was identified for the Indiana bat adjacent to the right-of-way due to its presence in a highly-developed urban area. 			

Table ES-8: Summary of Environmental Consequences (continued)

Category	No Build	Light Rail to Tenafly (Preferred Alternative)		Light Rail to Englewood Route 4	
		North Bergen VBF	Englewood VBF	North Bergen VBF	Englewood VBF
HAZARDOUS MATERIALS					
Number of Stations with Potential Contamination (On-site/Close Proximity)	No Impact	<p>- Palisades Park Station and Englewood Route 4 Station are within close proximity to CERCLIS sites. A complete Phase I study and a Phase II study are likely to be required at these locations to determine if contamination has migrated to the station sites.</p> <p>- The remaining station sites would require Phase I studies, to verify that the station sites are not contaminated with previously undocumented hazardous materials. This would potentially be followed up by Phase II, testing, where necessary, to confirm the presence or absence of hazardous materials.</p> <p>- Based on the records research, it is unlikely that any of the station or VBF sites will be found to be contaminated to the point that an alternate location will need to be identified.</p> <p>- Additionally, active and previously active rail rights-of-way are typically considered to be contaminated as a result of the leakage of fluids (oil, diesel, brake fluid, and lubricants) from rail vehicles. Industry best management practices will be followed to prevent or limit exposure to hazardous materials.</p>			
ENERGY					
Energy Availability	No Impact	The operation of light rail vehicles would require the right-of-way to be electrified via the installation of overhead electric catenary along the alignment. The existing power grid has a sufficient energy supply to support either Build Alternative.			
Net Change in Direct Energy Expenditure	No change	Reduction of 154.8 billion BTU annually.	Reduction of 112.7 billion BTU annually.		
Indirect Energy Expenditure	No change	One-time construction energy expenditure of 349.6 billion BTU	One-time construction energy expenditure of 288.1 billion BTU		
Payback Potential ⁴	NA	2.3 years	2.7 years		
⁴ Payback Potential is the measure of the number of years it will take for the energy savings of a transit project to repay the energy cost associated with construction.					
ELECTRIC AND MAGNETIC FIELDS					
EMF Impacts	NA	The project is not anticipated to exceed suggested acceptable exposure thresholds within rail vehicles or at wayside and platform locations. EMF exposure levels from the proposed project will pose no additional health risk for Northern Branch passenger rail users or study area residents living proximate to the rail alignment.			
SAFETY AND SECURITY					
Number of Grade Crossings requiring improvement	None.	34 grade crossings will be improved, with protection ranging from four-quadrant gates to flashers and pedestrian gates.			
Emergency Medical Provider Response Time	NA	Potential increase in response time in Englewood and Tenafly. Mitigation as described above in community facilities.	No Impact.		

Table ES-8: Summary of Environmental Consequences (continued)

Category	No Build	Light Rail to Tenafly (Preferred Alternative)		Light Rail to Englewood Route 4	
		North Bergen VBF	Englewood VBF	North Bergen VBF	Englewood VBF
HISTORIC PROPERTIES AND RESOURCES					
Number of Historic Resources within Areas of Potential Effect (APEs)	NA	5 resources are within the APEs – Dutch Reformed Church, Ridgefield; US Route 46 Corridor, Ridgefield and Palisades Park; Barrett’s, Palmer & heal Dyeing & Cleaning Establishment, Englewood; Palisades Trust and Guaranty Building, Englewood; Tenafly Railroad Station, Tenafly		3 resources are within the APEs – Dutch Reformed Church, Ridgefield; US Route 46 Corridor, Ridgefield and Palisades Park; Barrett’s, Palmer & heal Dyeing & Cleaning Establishment, Englewood	
Potential Adverse Effects	None	<ul style="list-style-type: none"> - No adverse effects. - Mitigation measures for construction activities are aimed at buffering historic resources from noise, vibration, and dust, and include relatively simple measures such as establishing staging areas away from the resources and establishing truck routes that do not pass by the resources. - - Construction of the catenary may change the visual context of the resource; however, these impacts can be mitigated through the application of context-sensitive design elements that respect the local development patterns and historic resources in the area. These elements will be reviewed by the SHPO through a design review process, as documented in the Draft Programmatic Agreement (refer to Appendix K). 			
ARCHAEOLOGY					
Archaeological Impacts	NA	<ul style="list-style-type: none"> - No impacts are expected to known archaeological resources. No remains of structures or evidence of prehistoric occupation were found during the Phase I Analysis. - The potential exists for buried portions of known resources and previously undocumented resources to be discovered during the development of stations and VBF. If resources are identified, a Phase II Analysis, which requires soil borings, will be performed. - Mitigation for any resources discovered during the Phase II Analysis will be determined in consultation with the SHPO, as documented in the Draft Programmatic Agreement (refer to Appendix K). 			
SECTION 4(F) RESOURCES					
Number of Section 4(f) Resources affected	NA	Neither Build Alternative will require acquisition or constructive use of any Section 4(f) resource.			
ENVIRONMENTAL JUSTICE					
Environmental Justice Impact	NA	<ul style="list-style-type: none"> - No Environmental Justice impact - Though impacts may result under the Build Alternatives in low-income and/or minority communities throughout the corridor, these impacts are not disproportionate among race, origin or low-income populations. - The introduction of passenger rail service along the Northern Branch would generate substantial benefits to the general population as well as low-income and/or minority communities within northeastern Hudson County and southeastern Bergen County. - Additionally, off-site mitigation is not proposed in any predominantly minority or low-income community. - During the public hearing process, specific outreach will be made to predominantly minority and low-income communities via newspaper advertisements and outreach to community representatives. 			

Table ES-8: Summary of Environmental Consequences (continued)

Category	No Build	Light Rail to Tenafly (Preferred Alternative)		Light Rail to Englewood Route 4	
		North Bergen VBF	Englewood VBF	North Bergen VBF	Englewood VBF
CONSTRUCTION IMPACTS					
Freight and Traffic	NA	Freight service will be affected during construction, as well as construction at the 34 grade crossings. Construction at these locations would result in the temporary closure of the crossing and necessitate short-term traffic and pedestrian detours. Coordination between NJ TRANSIT and the local municipalities, NJDOT, NYS&W, and CSX will help minimize disruptions to freight and automobile traffic.			
Air quality	NA	Impacts may occur from emissions from construction vehicles and fugitive dust. The application of moisture can mitigate fugitive dust while operational controls and machinery specifications can control emissions from construction vehicles.			
Noise and Vibration	NA	Impacts are likely to occur in the vicinity of all proposed station sites as well as the rail right-of-way, potentially affecting historic buildings and adjacent parklands. Noise impacts would be limited to approximately 7a.m. to 6 p.m. Additionally, noise barriers and vibration-reduction construction methods (pre-auguring pavement, use of dampeners on vehicles) can be employed to reduce impacts.			
Utilities	NA	The oilostatic line will need to be relocated during construction.			
Water Quality, wetlands, and floodplains	NA	Potentially affected by ground-disturbing and in-water construction activity. BMP's will be implemented to minimize water quality degradation, erosion and sediment control measures will be implemented, all wetlands impacted by construction staging would be restored to pre-construction conditions, and structures would be used to cross floodplains and wetlands.			
Community Safety and Awareness	NA	A construction impact mitigation plan would be developed prior to the start of any construction. The plan would incorporate measures such as the implementation of public outreach efforts to inform local communities of the proposed construction program, the establishment of community construction coordination activities, and custom tailoring of mitigation plans for community specific needs.			
INDIRECT AND CUMULATIVE EFFECTS					
Potential Indirect and Cumulative Effects	NA	<ul style="list-style-type: none"> - Regionally, the Build Alternatives would divert private vehicle trips to rail, helping to alleviate traffic congestion. - Overnight freight wayside noise produced by the project is a by-product of the rail service and cannot be mitigated. In the future, other noise-generating uses may become established in the study area, contributing to the noise generated by the Northern Branch Project. - Water quality, wetlands, and floodplains may be affected by the combined effect of the Northern Branch Project and other improvement projects/private development. The cumulative effects are the result of finite resources and their potential conversion to other uses during the course of additional development in the study area. 			

Table ES-8: Summary of Environmental Consequences (continued)

Category	No Build	Light Rail to Tenafly (Preferred Alternative)		Light Rail to Englewood Route 4	
		North Bergen VBF	Englewood VBF	North Bergen VBF	Englewood VBF
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES					
Irreversible and Irretrievable Commitments of Resources	NA	<p>- Both Build Alternatives would require a number of partial and total property takings for the construction of the passenger rail system. Although the Uniform Relocation Assistance Act provides assistance, their loss in the study area represents an irreversible change.</p> <p>- The Build Alternatives are expected to require the acquisition of 4.30 to 4.73 acres of wetlands, depending on Build Alternative. These wetland areas represent an irretrievable commitment of resources to the project.</p>			
ADVERSE IMPACTS THAT CANNOT BE AVOIDED					
Noise Impacts	None	Noise impacts are associated with both the proposed passenger rail service and overnight freight service. Although the application for Quiet Zones must be initiated by the municipality, the implementation of Quiet Zones would effectively eliminate all horn noise impacts. However some noise would remain due to nighttime passbys of freight trains. Each passby would result in moderate noise impacts to 211 residences and severe impacts to 1 residence. These impacts cannot be avoided.			
Traffic Impacts	Growth in the study area would result in failing traffic LOS at 8 intersections.	Without mitigation, 26 intersections are predicted to operate with failing traffic level of service (reduced to 4 with mitigation). Traffic mitigation requires coordination between NJ TRANSIT and the local jurisdiction.		Without mitigation, 12 intersections are predicted to operate with failing traffic level of service (reduced to 2 with mitigation). Traffic mitigation requires coordination between NJ TRANSIT and the local jurisdiction.	

Source: Jacobs, 2010

ES.8 Public Outreach

Section 6002 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU 6002), enacted August 10, 2005, requires lead agencies to develop a plan for coordinating public and agency participation during the environmental review process. The purpose of the coordination plan is to facilitate and document the lead agency's structured interaction with the public and other agencies and inform the public and other agencies of how the coordination will be carried out. The intention is to expedite and improve the environmental review process by clearly outlining the coordination process.

Furthermore, the DEIS process as defined by NEPA requires the incorporation of public feedback during initial scoping and again during the DEIS hearing and comment periods. The Northern Branch public outreach program incorporated these minimum requirements into a comprehensive outreach effort providing for community and stakeholder meetings in addition to the NEPA requirements.

The Northern Branch Corridor DEIS began in 1996 as a continuation of the *West Shore Region Study*, which examined transit options from a regional perspective and included the track segment referred to today as the Northern Branch. Between 1997 and 1999 the West Shore Region public outreach program was implemented to inform the public and elected officials of the purpose of the study.

Electric light rail-based alternatives were discussed publicly during the initial 2001 scoping process for the Northern Branch Project. The development of an FRA-compliant DMU vehicle in 2002 presented a solution to the Northern Branch problem of providing passenger rail service through the freight yard and on tracks shared with active freight service. Outreach efforts beginning in October 2004 and carrying through mid-2006 focused on introducing the DMU alternative to the study area elected officials and stakeholders. A new scoping initiative re-introduced the project with four alternatives representing two different vehicle modes — light rail and DMU. Outreach efforts through 2007 focused on the merits of each mode of transit, eliciting feedback from the communities that would be served by the proposed project, and culminating in the analysis presented in this DEIS document.

Public outreach to discuss the potential impacts has been ongoing. Outreach has consisted of meetings with elected officials, business administrators, town councils, and when invited, public information sessions. Periodic meetings of the Citizen Liaison Committee (CLC) provided additional opportunities for the dissemination of information. Topics routinely discussed ranged from quality-of-life issues, such as the project's impact on traffic and parking, emergency response, and school safety, to the larger issues of service frequency, funding and implementation timeline. Whenever possible, quantified data was provided to facilitate stakeholder dialog. For example, as the DEIS analyses advanced, emerging results on the impact to land use, traffic, property and tax base, noise, etc. was made available at CLC meetings to better inform stakeholders and residents. Larger audiences were reached when the same information was posted on the project's website, and project staff was available to address individual concerns via telephone and email. The topic of Quiet Zones was raised more often in communities in which the alignment operated through residential sections, such as Tenafly. In those situations, the outreach stressed the need for applicant municipalities to work with the Federal Railroad Administration to understand the steps necessary to achieve Quiet Zone designation and the incumbent responsibilities. NJ TRANSIT will work with the municipalities to facilitate the establishment of Quiet Zone designations.

Scoping Effort

As described above, an initial scoping effort occurred in 2001, assuming only light rail Alternatives. In 2007, the project alternatives were significantly revised, requiring a new scoping effort. The Notice of Intent for the Northern Branch Project as described in this DEIS was published in *Federal Register*, Volume 72, Number 190, on Tuesday, October 2, 2007, pages 56123 and 56126. The general scoping meetings were held on Wednesday, October 24, 2007 at the Crowne Plaza Hotel in Englewood. Two sessions were held, afternoon from 3:00 p.m. to 5:00 p.m. and in the evening from 7:00 p.m. to 9:00 p.m. The formal scoping comment period closed on November 7, 2007. More than 175 individual comments to the scoping document were submitted by study area residents, municipal officials, and elected representatives. Comments pertaining to the scope of the DEIS as described in the Draft Scoping Document were incorporated into the Final Scoping Document. Comments of a more general nature, and comments too detailed for this preliminary stage of review, were logged and noted. The Final Scoping Document was published in March 2008, and is available on the project's website, www.northernbranchcorridor.com.

Citizens Liaison Committee

A Citizens Liaison Committee (CLC) was developed to foster communication between municipalities in the Northern Branch corridor and the study team. Members of the Committee include mayors and their appointed representatives, town council members, citizens, and Chamber of Commerce members.

The CLC met throughout the various stages of development of the Northern Branch Project, extending back to 1997. The first CLC meeting describing the Northern Branch Build Alternatives as they exist today was held on July 17, 2007 in Englewood. A follow-up meeting was held on November 29, 2007 to present refined project details. A third meeting was held on June 30, 2008 to describe the preliminary environmental findings, discuss the changes to the Overpeck Park roadways, and discuss capital costs. It

is expected that the CLC will continue to meet throughout the environmental review process and will serve as a valuable source of comments during the DEIS public review period.

Technical Advisory Committee

A Technical Advisory Committee (TAC) was assembled to communicate with regulatory and review agencies in the region. The TAC membership includes representatives from CSX Transportation, Norfolk Southern Corporation, NYS&W Railway Corporation, North Jersey Transportation Planning Authority, the Federal Highway Administration, the Federal Transit Administration, the Hackensack Meadowlands Development Commission, NJ Department of Environmental Protection, NJ State Historic Preservation Office, NJ Department of Transportation, NJ TRANSIT, US Army Corps of Engineers, and the US Environmental Protection Agency.

Similar to the CLC, the TAC began meeting during the West Shore-phase of the Northern Branch Project, in 1997. More recently, TAC members received the 2007 Draft Scoping Document and were invited to attend an information meeting on December 19, 2007 at NJ TRANSIT's Headquarters in Newark. It is expected that the TAC will continue to be involved throughout the environmental review phase of the Northern Branch Project.

Other Meetings

Although public officials and their representatives are included on the TAC and CLC, it is also important to have focus meetings with the leaders of each jurisdiction to discuss their unique needs and expectations. A series of public official meetings were conducted throughout the West Shore and Northern Branch phases of this project and will continue through the DEIS and FEIS phases of the project.

Outreach Media

Throughout the history of the project, the Northern Branch outreach program utilized a variety of media to communicate with stakeholders and project-area residents. In the early phases of the project, an informational telephone hotline was established. This was later replaced by an informational website (www.northernbranchcorridor.com) that is frequently updated with new project data and provides contact information for the study team. The DEIS, FEIS, and ROD will be made available to the public via the project website. Newsletters, distributed as inserts in local newspapers, were also an integral component of the early phases of the Northern Branch Project. More recently, newsletters have been replaced by personalized electronic communication as a cost-saving and environmentally-conscious alternative.

Mailing List and Database

Initially, a mailing list of interested individuals, including CLC and TAC members, elected officials, agency representatives, and other stakeholders, was manually maintained and updated by the project study team. The 2007 scoping process initiated a more modern and efficient method of mailing list management via an integrated project database. Comments received during the scoping period were logged in a master database and associated with the contact information of the party submitting the remark. The database will be used during the DEIS public comment period as well, to identify issues of concern and refine the public outreach process for the development of the FEIS.