9. Traffic and Parking

9.1. Chapter Overview

9.1.1. Introduction

The transportation infrastructure in the Northern Branch study area has remained largely unchanged over the last 50 years while population density and automobile ownership have increased. The result is traffic congestion on many of the area roadways. The goal of the Northern Branch project is to reduce traffic congestion on local roadways and improve mobility within the study area; however, the creation of new station sites may result in some changes, including increases in traffic on local roadways as rail passengers drive to and from proposed Northern Branch stations.

Traffic and parking are related as a result of the development pattern of the study area and are discussed together in the following analysis. Parking availability in the study area is affected two ways by the proposed project. First, mitigation to improve the movement of street traffic (a result of increased traffic driving to the proposed stations) can include the creation of additional driving lanes. These improvements may require right-of-way currently used for on-street parking. Consequently, traffic mitigation has a direct effect on parking availability. Walk-up stations are the other circumstance in which parking may be affected. Although walk-up stations are specifically located in areas with nearby residential development and pedestrian infrastructure, the reality is that some riders will choose to drive to the station. Walk-up stations do not provide parking on-site, requiring the additional riders to find parking among the existing on- and off-street parking spaces.

A traffic and parking analysis was completed to examine the effect of the proposed project on the local street network and parking availability. The traffic and parking analysis evaluated the existing traffic and parking conditions and the future conditions with and without the proposed project.

9.1.2. Summary of Findings

Traffic on the local street network will change as a result of increased vehicular traffic to and from the proposed Northern Branch stations and increased grade crossing closures. In order to improve traffic conditions in the study area, mitigation measures have been proposed for the Build Alternatives. Mitigation measures focus on the addition of turning lanes or adjustments to turning movements, signalization of intersections, lane widening, and adjustment of signal timing. In some instances, the Build Alternatives with mitigation will operate better than conditions under the No Build Alternative.

Following are the key findings and conclusions of the traffic and parking analysis:

- Traffic Conditions
    - Under the No Build Condition, 8 intersections operate at a poor level of service (LOS F) as summarized by Table 9-13.
    - Under the Build Alternatives without mitigation, the number of intersections operating at a poor LOS (LOS F) is 26 for Light Rail to Tenafly (Preferred Alternative) and 12 for Light Rail to Englewood Route 4 (See Table 9-14).
    - Under Light Rail to Tenafly (Preferred Alternative) with mitigation, failing conditions or excessive delays can be improved at 22 intersections, and up to 10 would be improved under the Light Rail to Englewood Route 4 Alternative (See Table 9-14). However, mitigation measures require coordination between NJ TRANSIT and the municipal government in the location where the mitigation is proposed.

- Parking Impacts
    - Under Light Rail to Tenafly (Preferred Alternative) roadway improvements proposed in the mitigated Build Condition will result in the loss of a total of approximately 225 on-street and off-street parking spaces in the vicinity of the proposed walk-up stations, including approximately 32 on-street parking spaces near Englewood Route 4 Station, 128 on-street parking spaces at Englewood Town Center Station, 15 spaces on-street at Englewood Hospital Station, and 50 on-street and off-street at Tenafly Town Center Station. The on-street parking loss may only be a factor during weekday AM and PM peak periods. On-street parking restrictions are one method to mitigate the impact of parking commuters at walk-up station locations. Coordination with local municipalities will take place to determine the nature of these restrictions and whether they should be implemented outside the peak periods.
    - Under the Light Rail to Englewood Route 4 Alternative, roadway improvements proposed in the mitigated Build Condition will result in the loss of approximately 32 on-street parking spaces near Englewood Route 4 Station.

9.2. Traffic

9.2.1. Methodology

The traffic analysis involved the assessment of the following:

- Existing Traffic Conditions;
- Projected No Build Traffic Conditions;
- Project Trip Generation of the Build Alternatives;
- Build Alternative Traffic Conditions and Identification of Impacts; and,
- Future Traffic Conditions with the Implementation of Proposed Mitigation.

To compare the traffic conditions among the existing, No Build and Build conditions, the Level of Service is determined for each intersection using the Highway Capacity Manual 2000 (HCM 2000) procedures. LOS is based on a scale of letters from A to F, with A being the best and F being the worst. According to the HCM 2000, LOS at signalized intersections is defined as follows:

- **LOS A** describes operations with very low delays, i.e., 10.0 seconds or less per vehicle. This occurs when signal progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all.

- **LOS B** describes operations with delays in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. Again, most vehicles do not stop at the intersection.

- **LOS C** describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.

- **LOS D** describes operations with delays in the range of 35.1 to 55.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity (v/c) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines.

- **LOS E** describes operations with delays in the range of 55.1 to 80.0 seconds per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios.

- **LOS F** describes operations with delays in excess of 80.0 seconds per vehicle. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios with cycle failures. Poor progression and long cycle lengths may also contribute to such delays. Often, vehicles do not pass through the intersection in one signal cycle.

For a signalized intersection, LOS is determined for the intersection and its individual lane groups, and is defined in terms of the average control delays experienced by all vehicles that arrive in the analysis period. The intersection LOS is a weighted average of all of the individual traffic movements. For instance, in an intersection where all the through lanes (traffic going straight) moved freely, but drivers making left-turns often had to wait until near the end of the green light to make their turn, the left-turn movement may be a LOS D, but the through movement could be an LOS A, so the intersection's overall LOS would likely be reported as LOS B.

For context, it is important to keep in mind that all new roadways are designed to function at LOS C. The number of vehicles stopping at an intersection is substantial at this level, although many still pass through without stopping. Drivers who are stopped at a red light will move through the intersection freely when the light turns green. At LOS D, the influence of congestion becomes more noticeable resulting in longer delays. Many vehicles stop, and the proportion of vehicles that do not stop declines. At LOS E congestion becomes obvious to motorists, and very long traffic delays are experienced at the intersection. LOS F represents a failure where drivers experience excessive congestion and high delays which are considered unacceptable to most drivers. Motorists may have to wait more than one signal cycle to proceed through the intersection or make a turn.

LOS applies to unsignalized (stop controlled) intersections but the seconds of delay are adjusted slightly to account for some differences in the way drivers behave at stop signs as compared to signalized intersections. For the purposes of this traffic assessment, overall intersection delay were reported to provide a simplified means to compare the impacts of the proposed project to traffic conditions at unsignalized intersections. The methodology followed to determine average overall delay for unsignalized intersections are described in Appendix E. Delay levels for unsignalized intersections are as follows:

- **LOS A** – less than 10 seconds per vehicle
- **LOS B** – between 10.1 to 15.0 seconds per vehicle
- **LOS C** – between 15.1 to 25.0 seconds per vehicle
- **LOS D** – between 25.1 to 35.0 seconds per vehicle
- **LOS E** – between 35.1 to 50.0 seconds per vehicle
- **LOS F** – greater than 50.0 seconds per vehicle

Grade crossings (locations where the railroad crosses the roadway on the same plane) can result in delays similar to those experienced at signalized intersections. Within the Northern Branch study area, 23 streets will cross the rail alignment at the same grade as the railroad tracks. For both Build Alternatives, when the Northern Branch service is in operation south of Route 4, gates will come down every 3 minutes in the peak period, and every 6 minutes during the off-peak period. For Light Rail to Tenafly (Preferred Alternative), north of Route 4, gates will come down every 6 minutes in the peak period and every 12 minutes during the off-peak period. The effect is that the flow of traffic stops and delay is created. Grade crossing delay is measured by the impact of the delay on the nearest intersection using a similar method as the one used to determine control delay, described above. Appendix E describes that analysis of grade crossings in more detail.

Presently, freight traffic operates on the Northern Branch during the day and results in delays in traffic at grade crossings; however, freight traffic is infrequent, less than twice per day, and the effects of freight crossings are minimal. Thus they have not been included in this analysis.

9.2.1.1. Definition of Study Area and Operational Assumptions

In order to assess traffic impacts associated with the Build Alternatives, the roadway network study area was defined by identifying the key intersections that would most likely be affected by the increase in vehicle traffic accessing the proposed stations. Intersections near grade crossings were also included. As described above the effect of the grade crossing is measured by the effect grade crossing queues have on adjacent intersections, resulting congestion, and increased vehicle delays.

Weekday traffic counts, including manual turning movement and vehicle classification counts at the study area intersections, as well as 24-hour ATR machine counts were initially conducted in 2002. In order to update traffic volumes to a more recent year, ATR machine counts were collected at a select number of sample locations in 2006. Existing traffic volumes from 2002 were validated or adjusted based on the sample ATR data as necessary to approximate existing conditions for the year 2006, which is the existing year used for this analysis.

Traffic count data were reviewed to determine the hour in which the greatest volume of traffic passed through key project intersections. Traffic data indicate that, as a result of the linear nature of the study area, the peak hour is not the same for all municipalities. This is because commuters traveling to New York City and the Hudson River Waterfront start their journey incrementally earlier as a function of the increasing distance of their home from their place of work. That is, a driver from Tenafly who needs to be at work in Hoboken at 9:00 a.m. may need to leave his house at 8:00 a.m., while a driver from North Bergen who works in the same building can leave home at 8:30 a.m. and still get to work on time. The PM peak functions a little differently, as workers leave work at different times and there is less emphasis on getting back home at a precise time than getting to work. As a result, the PM peak hour often carries lighter traffic volumes than the AM peak, and the distance-time issue that affects the AM peak is less of a consideration. The peak hours were determined to be as follows (refer to Appendix E for traffic volumes):

- 8:00-9:00 a.m. was the AM peak hour in North Bergen, Ridgefield, Palisades Park, Leonia and Englewood;
- 7:30-8:30 a.m. was the AM peak hour in Tenafly and Cresskill; and,
- 5:00-6:00 p.m. was the PM peak hour for all study area municipalities.

9.2.1.2. Establishment of No Build Conditions

While the project is expected to be completed and in service by the year 2014, 2030 was selected as the future No Build and Build analysis year since it was determined to have a greater potential for adverse impacts. Based upon an assumption of 1% annual growth in background traffic per year, traffic is anticipated to be at least 7% less during the first year of implementation (2014) when compared to the 2030 build year. Additionally, the year 2030 is consistent with other major transportation projects that are included in the No Build analysis and the ridership forecasting.

The No Build traffic volumes were developed by applying an annual background growth rate to the existing conditions traffic volumes. The growth rate was determined by reviewing New Jersey Department of Transportation's (NJDOT) traffic count permanent station locations (within the study area) for growth patterns. For this area, an annual growth rate of one percent was identified. This growth rate was compounded to the year 2030 and applied to the existing conditions data. Similarly, demand for parking was assumed to increase proportionally by one percent per year. The growth rate was assumed to

reflect expected growth in overall travel through and within the area, including larger real estate developments. In addition, one site-specific development, a BJ's/Walmart retail development on Tonnelle Avenue and 91st Street opened in early 2010 was included in the No Build condition. This development was incorporated into the analysis since site related traffic generated by the development would directly affect study area traffic operations at the 91st Street station. BJ's/Walmart related traffic operations incorporated into the No Build condition was based on a traffic study performed for the retail development in 2005.

9.2.1.3. Estimate of Build Conditions

The analysis of the Build Alternatives involves the following: the determination of the vehicle trips expected to be generated by the proposed project; the assignment of these vehicle trips to the street network; and the determination of projected LOS at the critical locations analyzed.

The NJ TRANSIT Demand Forecasting Model (NJTDFM) (described in Chapter 3: Alternatives Considered) was used to estimate the number of passengers that would be attracted to each station, and how they would access the station. A percentage is applied to the total number of estimated parkers (commuters who drive to the station and leave their vehicle parked there during the day) and drop-off/pickups to estimate the number of commuters that would access the station sites during the peak hours. Traffic is especially affected by drop-offs/pickups as these trips interact with the intersection twice. Table 9-1 identifies the projected vehicle trip generation at each station.

Table 9-1: Project Peak Hour Vehicle Trip Generation

Station	Build Alternative	Peak Hour Vehicle Trip Generation (number of cars)		
		Parkers	Drop-Off/ Pickup	Total Trips
91st Street Station	Light Rail to Tenafly (Preferred Alternative) *and* Light Rail to Englewood Rt. 4	27	120	267
Ridgefield Station	Light Rail to Tenafly (Preferred Alternative) *and* Light Rail to Englewood Rt. 4	149	141	431
Palisades Park Station	Light Rail to Tenafly (Preferred Alternative) *and* Light Rail to Englewood Rt. 4	174	189	552
Leonia Station	Light Rail to Tenafly (Preferred Alternative) *and* Light Rail to Englewood Rt. 4	226	118	462
Englewood Route 4 Station	Light Rail to Tenafly (Preferred Alternative)	196	65	326
	Light Rail to Englewood Rt. 4	372	126	624
Englewood Town Center Station	Light Rail to Tenafly (Preferred Alternative)	30	85	200
	Light Rail to Englewood Rt. 4	N/A		
Englewood Hospital Station	Light Rail to Tenafly (Preferred Alternative)	0	22	44
	Light Rail to Englewood Rt. 4	N/A		
Tenafly Town Center Station	Light Rail to Tenafly (Preferred Alternative)	16	96	208
	Light Rail to Englewood Rt. 4	N/A		
Tenafly North Station	Light Rail to Tenafly (Preferred Alternative)	232	88	408
	Light Rail to Englewood Rt. 4	N/A		

Source: NJ TRANSIT, 2008

The traffic volumes used for analysis of the Build Alternatives were determined by combining the volumes under the No Build condition and the vehicle trips generated by the project. Although an increase in traffic is expected to local areas around the proposed Northern Branch Stations, a decrease in overall commuter and retail traffic that would otherwise drive to their destination is anticipated. As a conservative measure, no credit was taken for this reduction in traffic.

To screen out intersections that would not experience a significant increase in traffic, only intersections that met the following criteria were included in the detailed analysis: (1) at least a 5 percent increase in traffic over the No Build condition; and (2) at least 50 project-generated vehicular trips. As a result of the screening, 37 intersections were identified for analysis (Refer to Table 9-2).

Table 9-2: Intersections Included in Detailed Analysis

Municipality	Intersection and Reference Number
North Bergen	(1) Tonnelle Avenue/91st Street
	(2) 85th Street and Tonnelle Avenue
Ridgefield	(3) Broad Avenue/Hendricks Causeway
	(4) Broad Avenue/Edgewater Avenue
Palisades Park	(5) Grand Avenue/Ruby Avenue
	(6) Grand Avenue/Fairview Avenue
	(7) Grand Avenue/Central Boulevard
Leonia	(8) Fort Lee Road/Overpeck Park Road
	(9) Fort Lee Road/Station Parkway/ Willow Tree Road
	(10) Grand Avenue/Fort Lee Road
Englewood	(11) Nordhoff Place/Van Brunt Street
	(12) Forest Avenue/South Dean Street
	(13) Englewood Avenue/Van Brunt Street
	(14) Englewood Avenue/South Dean Street
	(15) Palisade Avenue/North Dean Street
	(16) Palisade Avenue/Van Brunt Street
	(17) Demarest Avenue/Van Brunt Street
	(18) Demarest Avenue/North Dean Street
	(19) Hamilton Avenue/North Dean Street
	(20) Hudson Avenue/Curry Avenue
	(21) Hudson Avenue/North Dean Street
	(22) Ivy Lane/Curry Avenue
	(23) Ivy Lane/North Dean Street
Tenafly	(24) East Clinton Avenue/New Street
	(25) West Railroad Avenue/West Clinton Avenue/Franklin Street
	(26) Clinton Avenue/County Road/Piermont Road
	(27) Washington Street/West Railroad Avenue
	(28) Washington Street/Hillside Avenue/ Piermont Road/Highwood Road
	(29) Riveredge Road/Jay Street/W Railroad Avenue
	(30) Riveredge Road/Jay Street/Piermont Road
	(31) Central Avenue/West Railroad Avenue
	(32) Central Avenue/Piermont Road
	(33) Piermont Road/Hudson Avenue
	(34) Piermont Road/North Summit Street
	(35) Piermont Road/Madison Avenue
	(36) Piermont Road/Union Avenue
	(37) County Road/North Summit Street

Source: Jacobs 2010

9.2.1.4. Evaluation of Mitigation Measures

Generally, intersections found to result in a further decline over the No Build LOS conditions were analyzed to determine what mitigation measures would improve the LOS to an acceptable level, indicated by LOS D or better, or not result in a further decline of LOS as compared to the No Build. For the township of Tenafly, traffic improvement strategies were proposed where possible regardless of future

traffic conditions in an effort to improve traffic circulation. Mitigation improvements were then modeled to determine their effectiveness in improving intersection LOS operations and delay. Mitigation measures which ranged from signal timing adjustments to lane geometry modifications were developed with the goal of improving LOS operations and being cost effective to implement. Furthermore, consideration was given, where possible, to identify mitigation measures that would not aggravate traffic conditions elsewhere and improve the overall driving experience through the project study areas.

In Englewood and Tenafly proposed traffic mitigation measures have resulted in the loss of on-street parking. While the effect could be minimized by having the turning-lanes only operate during peak hours – thereby allowing parking during the off-peak hours – the ultimate decision lies with each municipality. In addition, for mitigation measures requiring the installation of a new traffic signal, signal warrant analyses may be required. 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.

Due to the projected increase in traffic as a result of the proposed project and the overall background growth, not all traffic study area locations were successfully mitigated using readily available mitigation techniques. In such cases, mitigation strategies were proposed to minimize traffic congestion and delay to the greatest extent possible.

9.2.2. Environmental Review

The following sections describe the environmental review as it pertains to traffic conditions by municipality. Each municipal discussion is divided into rail right-of-way and station site analyses that address the conditions in the area surrounding the station location. To provide the reader with a snapshot of conditions, each municipal discussion begins with an overview table summarizing the overall intersection operations. Parking issues are addressed in Section 9.3.

9.2.2.1. North Bergen

Table 9-3 summarizes the traffic analysis in North Bergen, comparing existing levels to No Build, Build without mitigation, and finally Build with mitigation. This information is described fully in the following discussion.

Table 9-3: Level of Service Summary for North Bergen Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4

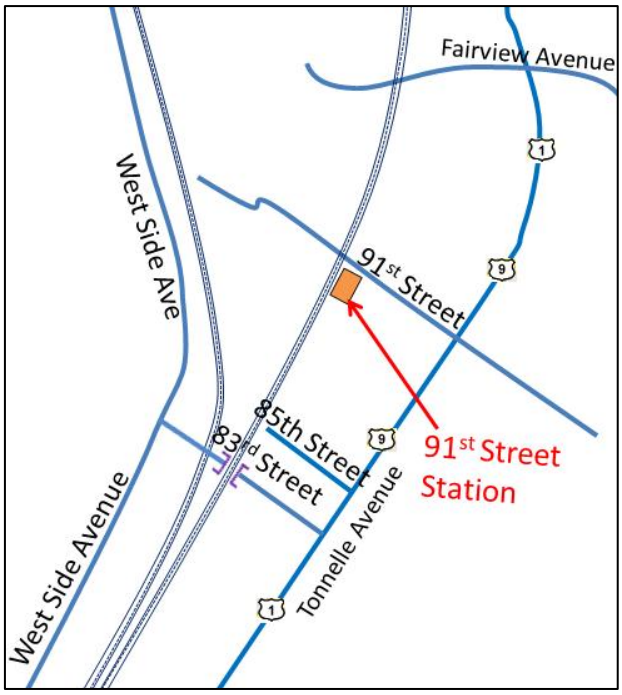
Intersection	Existing (AM/PM)	No Build (AM/PM)	Build (AM/PM)	Build with Mitigation (AM/PM)
(1) Tonnelle Avenue/91st Street	C/C	D/F	F/F	E/E
(2) 85th Street and Tonnelle Avenue	A/A	A/A	F/F	C/C

Jacobs, 2010

Existing Conditions

Rail Right-of-way

The major north-south roadways through North Bergen are Tonnelle Avenue (Route 1/9) on the east side of the rail right-of-way and West Side Avenue on the west side (refer to illustration at right). In the study area, the main grade crossing that connects these two major roadways is 83rd Street. Although it is a major crossing, the roadway characteristics include poor sight distance while crossing under a rail overpass, and across the Northern Branch alignment. North of 83rd Street, West Side Avenue deadends into an industrial area. The majority of traffic turns onto 83rd Street to connect with Tonnelle Avenue.



There are two additional streets that cross the alignment at grade, but only connect to pockets of activity and not to another major roadway: 91st Street provides access to an industrial area and the North Bergen pool, and Fairview Avenue/95th Street connects to an industrial area.

91st Street Station

The roadways in the vicinity of the proposed 91st Street Station are Tonnelle Avenue, 91st Street and 85th Street. As discussed above, Tonnelle Avenue is a major north-south thoroughfare. 91st Street and 85th Street intersect Tonnelle Avenue in an east-west direction. Both are relatively minor local roads. 91st Street provides access to an industrial area and the North Bergen Pool on the west side of the right-of-way. 85th Street functions mostly as a driveway/access to North Bergen Vocational/Technical High School and its associated recreational facility. The majority of traffic on 85th Street occurs off-peak, associated with the opening and closing of the high school. Both 91st Street and 85th Street intersect Tonnelle Avenue at signalized intersections.

The traffic analysis indicated that during both the AM and PM peak hours the LOS at the intersection of Tonnelle Avenue and 91st Street is LOS C (Refer to Table 9-3). As described above, this LOS is acceptable; all drivers stopped at the traffic signal can be expected to clear the intersection before the light changes. As may be expected, given the low volume of traffic traveling on 85th Street, the intersection of Tonnelle Avenue and 85th Street functions at LOS A in both the AM and PM peak hours. Figures 9-1a and 9-1b at the end of the chapter graphically show the existing roadway configurations in the vicinity of 91st Street Station.

Potential Impacts and Mitigation

No Build Alternative

Rail Right-of-Way

Under the No Build Alternative, rail freight service is anticipated to continue with minimal changes. As such, there would not be any changes to the traffic impact associated with grade crossings.

91st Street Station

The No Build condition assumes that a northbound left-turn lane from Tonnelle Avenue to 91st Street would be included as part of the Routes 1/9 improvement program/Walmart development. Additionally, growth is expected to occur in the study area as described in Section 9.2.3 – Establishment of No Build Traffic Conditions, above.

This effect of more cars from background growth and the addition of the Walmart development results in a decline in LOS at the intersection of Tonnelle Avenue and 91st Street (Refer to Table 9-3). In 2030, modeling projections anticipate that the LOS will decline to LOS D in the AM peak and LOS F in the PM peak. This decline means increased congestion and queuing at the traffic light. Many drivers, especially those desiring to make a left turn, will be required to stop before proceeding through the intersection.

Minimal background growth is anticipated along 85th Street in the future, owing to the fact that 85th Street dead-ends at the high school, unless the driveway to the new commercial development is opened and shoppers are encouraged to use the driveway off of 85th Street to access the development. The effect of future growth on the intersection of 85th Street and Tonnelle Avenue is anticipated to be minimal, resulting in no measurable decline in LOS between today and 2030. The overall intersection LOS is projected to continue to operate at LOS A.

Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood

Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 are identical in their potential impacts and mitigation through North Bergen. Consequently, the discussion below applies to both alternatives.

Rail Right-of-way/85th Street

Impacts - As part of the Northern Branch project, 83rd Street will be closed and 85th Street will be extended through to West Side Avenue; whereas today, 85th Street deadends at the rail right-of-way. Roadway characteristics at the grade crossing of 83rd Street including poor sight distance and alignment make the current crossing unsafe to vehicular traffic. Opening 85th Street to serve as a new at-grade crossing will improve safety over the current configuration. It is anticipated that the majority of traffic will move from 83rd Street to 85th Street. As West Side Avenue currently deadends into an industrial complex beyond 83rd Street, extending traffic along West Side Avenue to 85th Street will not affect the traffic on West Side Avenue or at the new intersection of 85th Street and West Side Avenue. The LOS at 85th Street and Tonnelle Avenue would decline to F in the AM and PM peak.

85th Street will experience frequent closures due to the crossing of light rail vehicles, every 3 minutes in the peak period and every 6 minutes during the off-peak. Each closure is expected to last approximately one minute. Although they are anticipated to cause a backup of traffic, once the crossing is opened, all drivers stopped at the crossing signal can be expected to clear the crossing before the next closure.

Mitigation – To improve the flow at 85th Street and Tonnelle Avenue, a right-turn lane is recommended to be added on Tonnelle Avenue at the southbound approach to 85th Street and a left-turn lane is recommended on the northbound approach. Additionally, the existing single eastbound lane from 85th Street to Tonnelle Avenue would be divided into two lanes, dedicated to right and left-turn movements. This would allow drivers to queue in the lane dedicated to their intended movement, reducing delay for drivers wishing to turn in the opposite direction. These improvements would mirror the roadway layout that is currently found at 83rd Street. The traffic signal is also recommended to be adjusted to allow protected left-turns, further reducing the potential for long left-turn queues. These modifications would improve the intersection to LOS C in the AM and PM peak hours and would not affect existing parking. Figures 9-2a and 9-2b at the end of the chapter graphically show the proposed mitigation measures.

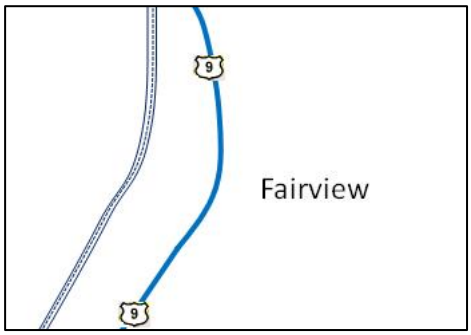
91st Street Station

Impacts – During the AM peak hour, which represents the worst-case scenario for traffic congestion, it is projected that 27 vehicles would park at the station. An additional 120 vehicles are projected to drop off passengers at the station, requiring them to travel to and from the station during the peak hour, for a total of 267 movements through the intersection during the peak hour. The reverse is expected to occur in the PM peak hour. The effect of the additional traffic traveling to and from the station site will have an

impact on traffic LOS at the intersection of 91st Street and Tonnelle Avenue. The LOS would be F in both the AM and PM peak hours (Refer to Table 9-3).

Mitigation – To reduce queuing and improve the function of the intersection of 91st Street and Tonnelle Avenue, the traffic signal is recommended to be adjusted to allow northbound movements from Tonnelle Avenue to proceed before the rest of the movements are given the green light to proceed (if this change was not added when the left-turn lane was added, as described above in No Build). This change would reduce the queue of left-turning drivers from Tonnelle Avenue onto 91st Street. In addition to proposed signal timing changes, the lane geometry/configuration would be revised to increase capacity. New left-turn lanes are proposed at the eastbound, westbound and southbound approaches. On the southbound approach, the existing thru/left turn lane would be separated into a single through and an exclusive left-turn lane. The mitigated condition scenario assumes that an additional northbound left-turn lane will be provided as part of the Routes 1/9 improvement program/Walmart development (See No Build Alternative.) The result of these modifications would be an improvement in overall intersection LOS as compared to the Build condition to LOS E in the AM and PM peak hours. The traffic mitigation measures would not affect on-street parking. Figures 9-2a and 9-2b at the end of the chapter graphically show the proposed mitigation measures.

9.2.2.2. Fairview



Existing Conditions

Broad Avenue (the continuation of Tonnelle Avenue/U.S. 9) is a major north-south arterial connecting the study area through the Borough of Fairview (refer to illustration at right). There are no grade crossings along the rail alignment in Fairview.

Potential Impacts and Mitigation

No Build Alternative
Under the No Build Alternative, rail freight service is anticipated to continue with minimal changes. As such, there would not be any traffic impacts associated with rail freight operations.

Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4
Impacts - There are no station sites or grade crossings proposed for Fairview. Consequently, no traffic impacts are anticipated.

Mitigation – None required.

9.2.2.3. Ridgefield

Table 9-4 summarizes the traffic analysis in Ridgefield, comparing existing levels to No Build, Build without mitigation, and finally Build with mitigation. This information is described fully in the following discussion.

Table 9-4: Level of Service Summary for Ridgefield Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4

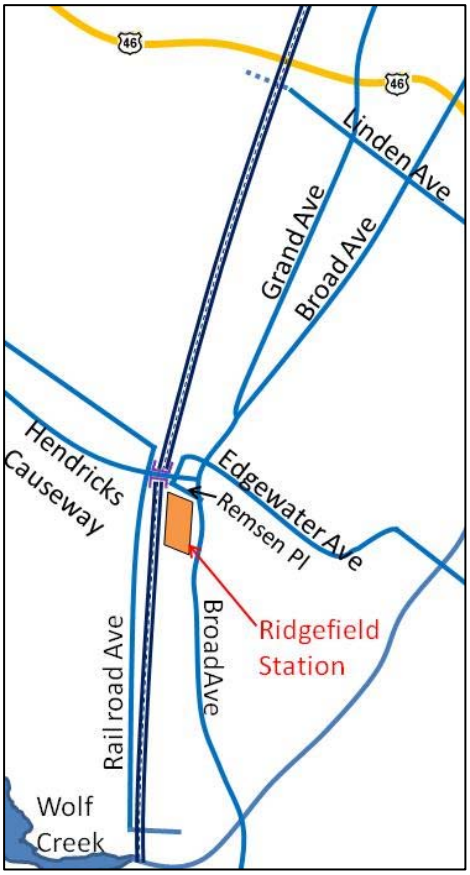
Intersection	Existing (AM/PM)	No Build (AM/PM)	Build (AM/PM)	Build with Mitigation (AM/PM)
(3) Broad Avenue/Hendricks Causeway	C/C	E/E	F/E	E/E
(4) Broad Avenue/Edgewater Avenue	C/D	E/D	F/E	D/E

Jacobs, 2010

Existing Conditions

Rail Right-of-way

In Ridgefield, there are two grade crossings, one at a driveway near Wolf Creek and one at Linden Avenue. Neither of the grade crossings connects major roadways or areas of concentrated activity. Linden Avenue is an east-west roadway that terminates at a vacant industrial site located west of the rail right-of-way. The driveway adjacent to Wolf Creek connects to Railroad Avenue located west of the right-of-way and an adjacent industrial area (Refer to illustration).



Ridgefield Station

The roadways most likely to be affected by the proposed Ridgefield Station are Broad Avenue, Hendricks Causeway, and Edgewater Avenue. Broad Avenue (the continuation of Tonnelle Avenue) is a major north-south arterial connecting the study area to locations south in Hudson County.

Hendricks Causeway intersects Broad Avenue from the west, terminating at a signalized intersection with Broad Avenue. It is a major east-west connector joining Broad Avenue and areas west, crossing over the Northern Branch right-of-way. Edgewater Avenue is a residential street east of Broad Avenue, and crosses Broad Avenue at a signalized intersection to serve industrial uses west of the rail right-of-way.

The traffic analysis indicated that during the AM and PM peak hours, the intersection of Hendricks Causeway and Broad Avenue functions at LOS C. The intersection of Edgewater Avenue and Broad Street functions at LOS C during the AM peak and LOS D in the PM peak (Refer to Table 9-4). Figure 9-3 at the end of the chapter graphically shows the existing roadway configuration in the vicinity of Ridgefield Station.

Potential Impacts and Mitigation

No Build Alternative

Rail Right-of-Way

Under the No Build Alternative, rail freight service is anticipated to continue with minimal changes. As such, there would not be any changes to the traffic impact associated with grade crossings.

Ridgefield Station

The No Build Alternative assumes that the existing roadway configuration will remain unchanged in the future. At the same time, growth is expected to occur in the study area as described in Section 9.2.3 –

Establishment of No Build Traffic Conditions, above. This effect of more cars results in a decline in LOS at the intersections of Hendricks Causeway and Broad Avenue and Edgewater Avenue and Broad Avenue (Refer to Table 9-4). At Hendricks Causeway and Broad Avenue, the LOS in the AM and PM peak declines to LOS E. At the intersection of Broad Avenue and Edgewater Avenue, the LOS declines to LOS E in the AM peak and D in the PM peak. LOS D is still acceptable, meaning that while drivers experience increased congestion, the intersection generally operates with acceptable delays. LOS E indicates that traffic operations are near capacity with high volume-to-capacity ratios (v/c). Drivers may experience heavy congestion and is considered to be the limit of acceptable conditions to motorists

Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4
Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 are identical in their potential impacts and mitigation through Ridgefield. Consequently, the discussion below applies to both alternatives.

Rail Right-of-Way
Impacts - Linden Avenue and the roadway adjacent to Wolf Creek will experience frequent closures due to the crossing of light rail vehicles, every 3 minutes in the peak periods and every 6 minutes during the off-peak period. Each closure is expected to last approximately one minute. Although they are anticipated to cause a backup of traffic, once the crossing is opened, all drivers stopped at the crossing signal can be expected to clear the crossing before the next closure.

Mitigation – None required.

Ridgefield Station
Impacts - During the AM peak hour, which represents the worst-case scenario for traffic congestion, it is projected that 149 vehicles would park at the station. An additional 141 vehicles are projected to drop off passengers at the station, resulting in additional travel to and from the station during the peak hour, totaling 431 trips. The reverse is expected to occur in the PM peak hour.

The effect of the additional traffic traveling to and from the station site will have an impact on traffic LOS at the intersection of Hendricks Causeway and Broad Avenue, with the AM peak hour decreasing to an LOS F and the PM peak hour remaining at an LOS E; and at the intersection of Edgewater Avenue and Broad Avenue the AM peak hour would decrease to LOS F and the PM peak hour would decrease to an LOS E due to increased traffic to and from the proposed station. (Refer to Table 9-4).

Mitigation – Signal timing modification is recommended for the intersection of Hendricks Causeway and Broad Avenue. The intersection would improve to No Build levels of LOS E in the AM and PM peak hours.

To reduce queuing and improve the function of the intersection of Edgewater Avenue and Broad Avenue, an additional turning lane is recommended in each direction on Edgewater Avenue. This would allow drivers turning left to form their own queue instead of waiting in the same queue with other drivers who intend to continue straight or make a right turn. No changes to the lane configuration are recommended for Broad Avenue; however, a new actuated traffic signal is recommended to improve the functioning of the intersection. An actuated signal responds to the presence of vehicles stopped in a queue. As Broad Avenue is the primary arterial, preference should be given to Broad Avenue so as not to create congestion up or downstream in the traffic flow if there are no vehicles waiting to cross Broad Avenue along Edgewater Avenue. These improvements could be made within the existing road right-of-way. The result of these modifications would be to bring the LOS up to a D in the AM peak hour and remain at LOS E in the PM peak hour. The traffic mitigation measures would have no effect on on-street parking. Figure 9-4 at the end of the chapter graphically shows the proposed mitigation measures.

9.2.2.4. Palisades Park

Table 9-5 summarizes the traffic analysis in Palisades Park, comparing existing levels to No Build, Build without mitigation, and finally Build with mitigation. This information is described fully in the following discussion.

Table 9-5: Level of Service Summary for Palisades Park Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4

Intersection	Existing (AM/PM)	No Build (AM/PM)	Build (AM/PM)	Build with Mitigation (AM/PM)
(5) Grand Avenue/Ruby Avenue	C/C	D/D	F/F	C/C
(6) Grand Avenue/Fairview Avenue	C/C	E/D	F/F	F/F
(7) Grand Avenue/Central Boulevard	D/C	E/E	F/F	E/E

Jacobs, 2010

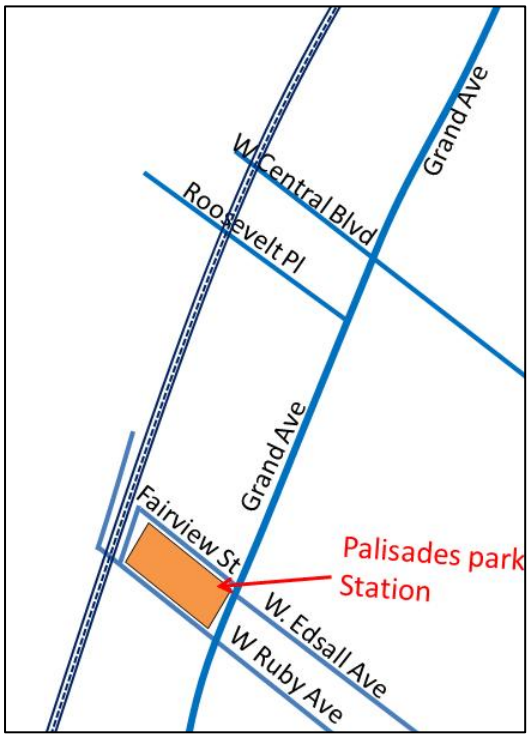
Existing Conditions

Rail Right-of-way

There are three grade crossings in Palisades Park: West Ruby Avenue, Roosevelt Place, and West Central Boulevard. These roadways provide access to pockets of activity west of the rail right-of-way. They do not provide a connection between major arterials. West Ruby Avenue provides access to an industrial use west of the right-of-way. Roosevelt Place provides a connection from the east to the municipal pool and ball fields in Overpeck Park. West Central Boulevard provides access to a retail grocery store located west of the right-of-way (Refer to illustration).

Palisades Park Station

The roadways most likely to be affected by the proposed Palisades Park Station are Grand Avenue, Ruby Avenue, Fairview Street and Central Boulevard. Grand Avenue is a major north-south thoroughfare through Palisades Park and runs parallel on the east side of the rail right-of-way. Ruby Avenue, Fairview Avenue and Central Boulevard intersect Grand Avenue in an east-west direction.



During the AM and PM peak hours, the intersections of Grand Avenue and Ruby Avenue and Grand Avenue and Fairview Avenue function at LOS C. The intersection of Grand Avenue and Central Boulevard functions at LOS D during the AM peak and LOS C during the PM peak (Refer to Table 9-5). Figures 9-5 and 9-6 at the end of the chapter graphically show the existing roadway configuration in the vicinity of Palisades Park Station.

Potential Impacts and Mitigation

No Build Alternative

Rail Right-of-Way

Under the No Build Alternative, rail freight service is anticipated to continue with minimal changes. As such, there would not be any changes to the traffic impact associated with grade crossings.

Palisades Park Station
The No Build condition assumes that the existing roadway configuration will remain unchanged in the future. At the same time, growth is expected to occur in the study area as described in Section 9.2.3 - Establishment of No Build Traffic Conditions, above. The result is more cars traveling on the existing roadways and in some places, an increase in traffic congestion and parking demand. A deterioration in LOS operations at the intersections of Grand and Ruby Avenues, Grand and Fairview Avenues, and Grand Avenue at Central Boulevard are expected as a result of non-project related background traffic growth (Refer to Table 9-5).

Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4
The impacts and mitigation proposed are identical for both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4. Consequently, the following discussion applies to both alternatives.

Rail Right-of-way
Impacts – West Ruby Avenue, Roosevelt Place, and West Central Boulevard will experience frequent closures due the crossing of light rail vehicles, every 3 minutes in the peak periods and every 6 minutes during the off-peak period. Each closure is expected to last approximately one minute. Although they are anticipated to cause a backup of traffic, once the crossing is opened, all drivers stopped at the crossing signal can be expected to clear the crossing before the next closure.

Mitigation – None required.

Palisades Park Station
Impacts –During the AM peak hour, which represents the worst-case scenario for traffic congestion, it is projected that 174 vehicles would park at the station. An additional 189 vehicles are projected to drop off passengers at the station, resulting in additional travel to and from the station during the peak hour, for a total of 552 trips. The reverse is expected to occur in the PM peak hour.

The effect of the additional traffic traveling to and from the station site results in a decline in LOS from the No Build condition. The project would result in a significant increase in northbound left-turns at the intersection of Grand Avenue and Fairview Street, especially during the AM peak hour. The intersections of Grand Avenue and Ruby Avenue and Grand Avenue and Central Boulevard would also experience an increase in traffic, primarily through movements, since the primary access for the station is located on Fairview Avenue.

This increase in traffic would result in increased congestion at these intersections. The intersections of Grand Avenue and Fairview Avenue and Grand Avenue and Central Boulevard and Grand Ave and Ruby Avenue would operate at LOS F in both the AM and PM peak hours(Refer to Table 9-5).

Mitigation – At the intersection of Grand Avenue and Ruby Avenue, left turning lanes are proposed in the eastbound, westbound, and northbound directions; and the installation of a new traffic signal is recommended. The signalization of this intersection would allow vehicles to enter/exit the station lot via Ruby Avenue without causing excessive delays at the intersection of Grand Avenue and Ruby Avenue. In addition, the new signal would improve traffic operations at the downstream unsignalized intersection of Grand Avenue and Fairview Street by providing gaps in traffic for vehicles crossing or merging with northbound Grand Avenue. The traffic mitigation measures would have no effect on on-street parking.

At the intersection of Grand Avenue and Fairview Street, exclusive left turning lanes are recommended in the eastbound and northbound directions to reduce potential queuing issues. These improvements could be made within the existing roadway. No road changes are proposed at the intersection of Grand Avenue and Central Boulevard, but the existing signal controller is recommended to be upgraded to provide semi-

actuation for the Grand Avenue left-turn movements improving the intersection to LOS E in the AM and PM peak hours.

Figures 9-7 and 9-8 at the end of the chapter graphically show proposed mitigation measures.

9.2.2.5. Leonia

Table 9-6 summarizes the traffic analysis in Leonia, comparing existing levels to No Build, Build without mitigation, and finally Build with mitigation. This information is described fully in the following discussion.

Table 9-6: Level of Service Summary for Leonia Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4

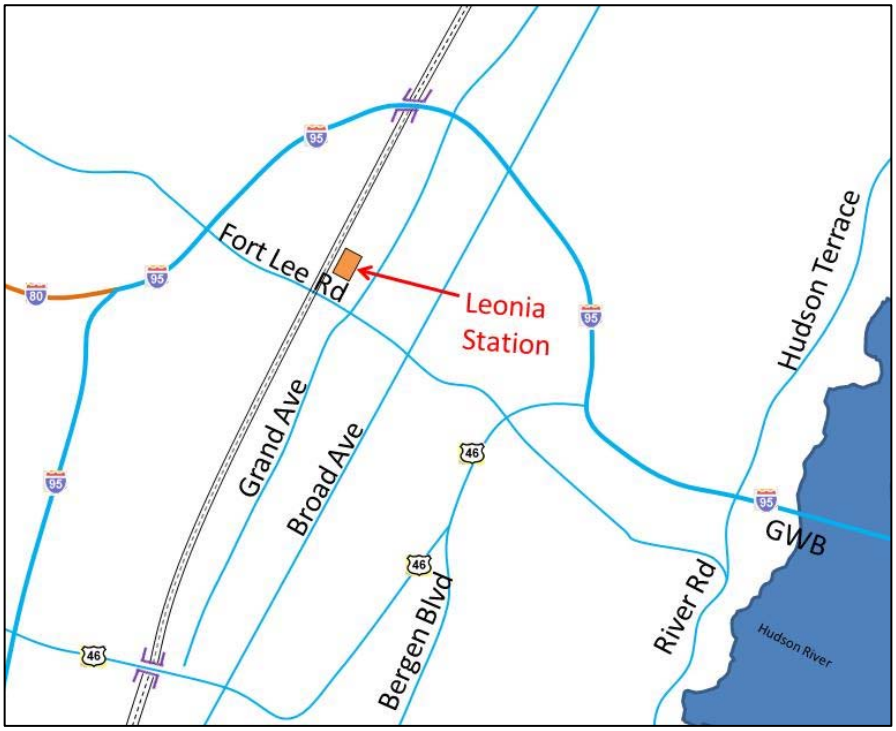
Intersection	Existing (AM/PM)	No Build (AM/PM)	Build (AM/PM)	Build with Mitigation (AM/PM)
(8) Fort Lee Road/Overpeck Park Road	B/C	F/F	F/F	C/C
(9) Fort Lee Rd/Station Pkwy/ Willow Tree Rd	C/C	D/F	F/F	D/E
(10) Grand Avenue/Fort Lee Road	D/D	F/F	F/F	F/F

Jacobs, 2010

Existing Conditions

Rail Right-of-way

Fort Lee Road is the only grade crossing in Leonia and is a major east-west roadway connecting Hudson Terrace/River Road, which accesses the George Washington Bridge, to municipalities west of Leonia (refer to illustration).



Leonia Station

The roadways in the vicinity of the proposed Leonia Station most likely to be affected by the proposed station are Fort Lee Road, Station Parkway/Willow Tree Road, Grand Avenue, and Overpeck Park Road. As discussed above, Fort Lee Road is a major east-west roadway through Leonia. Fort Lee Road crosses the entrance to Overpeck Park Road at an nonsignalized intersection. The park entrance carries a light volume of traffic consisting of park patrons and users of the equestrian center. During the AM and PM peak hours, the intersection functions at LOS B and LOS C, respectively. The next eastward intersection is Fort Lee and Station Parkway (from the south) and Willow Tree Road (from the north). This intersection is signalized, and the

majority of vehicles turn onto Fort Lee Road. The majority of turns from Station Parkway are left onto Fort Lee Road and from Willow Tree Road, the majority of turns are right onto Fort Lee Road during both the AM and PM peak hours. This means that the majority of vehicles traveling on Willow Tree Road and Station Parkway travel westbound on Fort Lee Road. The LOS for this intersection in both the AM and PM peaks is LOS C (Refer to Table 9-6).

Fort Lee Road and Grand Avenue is a major intersection of two primary arterials. Fort Lee Road is the east-west route, and Grand Avenue is the north-south route that carries about 1,300 vehicles in each direction in the AM and PM peak hours. This intersection is signalized. In the AM and PM peak, the intersection functions at LOS D..Figure 9-9 at the end of the chapter graphically shows the existing roadway configuration in the vicinity of Leonia Station.

Potential Impacts and Mitigation

No Build Alternative

Rail Right-of-Way

Under the No Build Alternative, rail freight service is anticipated to continue with minimal changes. As such, there would not be any changes to the traffic impact associated with grade crossings.

Leonia Station

The No Build condition assumes that the existing roadway configuration will remain unchanged in the future, and that a signal will be installed at the intersection of Fort Lee Road and Overpeck Park Road as part of another project. At the same time, growth is expected to occur in the study area as described in Section 9.2.3- Establishment of No Build Traffic Conditions, above. The result is more cars traveling on the existing roadways, and in some places, an increase in traffic congestion and parking demand.

A deterioration in LOS operations at all of the study area intersections are expected (Refer to Table 9-6). The intersection of Fort Lee Road and Station Parkway/Willow Tree Road declines to LOS F in the PM peak. This is a failing condition where motorists experience excessive delays at the intersection. LOS operations at the intersection of Fort Lee Road and Grand Avenue and Fort Lee Road and Overpeck Park Road deteriorate to LOS F in both the AM and PM peak in the No Build.

Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4

The impacts and mitigation proposed are identical for both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4. Consequently, the following discussion applies to both alternatives.

Rail Right-of-way

Impacts - Fort Lee Road will experience frequent closures due the crossing of light rail vehicles, every 3 minutes in the peak periods and every 6 minutes during the off-peak period. Each closure is expected to last approximately one minute. Although they are anticipated to cause a backup of traffic, once the crossing is opened, all drivers stopped at the crossing signal can be expected to clear the crossing before the next closure.

Mitigation – To minimize the impacts of the closure of the grade crossing, it is recommended that the signals to the east and west of the crossing on Fort Lee Road be synchronized with the grade crossing, so the non-conflicting traffic movements may flow north and south while the east/west crossing is closed.

Leonia Station

Impacts –During the AM peak hour, which represents the worst-case scenario for traffic congestion, it is projected that 226 vehicles would park at the station. An additional 118 vehicles are projected to drop off passengers at the station, resulting in additional travel to and from the station during the peak hour, for a

total of 462 trips. The reverse is expected to occur in the PM peak hour. The effect of the additional traffic traveling to and from the station site, as well as the frequent grade crossing closures, would be a reduction to LOS F for the AM peak at Fort Lee Road and Station Parkway/Willow Tree Road (Refer to Table 9-6). This would cause all peak hours to be at LOS F for both Build Alternatives. The effect of additional traffic would also worsen the delays and extend the queues at Fort Lee Road and Grand Avenue and Fort Lee Road and Overpeck Park Road, maintaining the LOS F in the AM and PM peaks.

Mitigation – To reduce queuing and improve the function of the intersection of Fort Lee Road and Overpeck Park Road, an additional turning lane is recommended at the eastbound, westbound, southbound and northbound directions. For the eastbound direction (Fort Lee Road), the additional lane would separate the existing through-and-left-turn lane into separate through and left-turn movements. The westbound direction would include the same revisions, separating two lanes into three with a dedicated left-turn, a dedicated through-movement, and a shared through-right turn lane. The southbound and northbound directions (Overpeck Park Road) would be separated into two lanes each from the existing single lanes that currently permit all movements. This recommended configuration would provide for a dedicated right-turn lane and a combined through and left-turn lane. Combined with signal upgrades that would include actuation, this recommended mitigation would improve the intersection to LOS C during both AM and PM peak hours.

All four approaches of the intersection of Fort Lee Road and Willow Tree Road/Station Parkway are recommended to be modified with an additional turning lane. The eastbound and westbound directions (Fort Lee Road) would have an additional lane to separate the combined left/through lane into separate lanes, which would reduce queuing. The northbound and southbound directions (Station Parkway and Willow Tree Road, respectively) would also each receive an additional lane. The northbound direction would receive an additional left-turn lane, resulting in two left-turn lanes and one combined right/through lane. The southbound direction would split the existing combined right/through lane into separate lanes, resulting in one lane for each movement - right, through, and left. These recommended improvements combined with an extended traffic signal light and actuation on the side streets would improve the intersection to LOS D in the AM and LOS E in the PM.

To minimize backup in the westbound direction at the intersection of Fort Lee Road and Grand Avenue, it is recommended to add an additional turning lane to the westbound direction (Fort Lee Road), changing the existing single lane permitting all movements into two lanes: through/left and through/right. The additional lane would reduce intersection delay on the westbound approach. While this would not change the LOS at the intersection, the overall delay would be reduced. It is anticipated that the eastbound approach would experience the largest increase in traffic at the intersection; however, due to geometric constraints, an additional lane cannot be added to the approach within the existing roadway. In addition to the proposed geometrical changes, the signal timing would be modified to improve traffic operations. The traffic mitigation measures would have no effect on on-street parking. Figure 9-10 at the end of the chapter graphically shows the proposed mitigation measures.

9.2.2.6. Englewood

Table 9-7 summarizes the traffic analysis in Englewood, comparing existing levels to No Build, Build without mitigation, and finally Build with mitigation for both Build Alternatives. This information is described fully in the following discussion.

Table 9-7: Level of Service Summary for Englewood

Intersection	Existing (AM/PM)	No Build (AM/PM)	Light Rail to Tenafly (Preferred Alternative)		Light Rail to Englewood Route 4	
			Build (AM/PM)	Build with Mitigation (AM/PM)	Build (AM/PM)	Build with Mitigation (AM/PM)
Englewood Route 4 Station						
(11) Nordhoff Pl./Van Brunt St.	B/B	C/F	F/F	C/C	F/F	D/D
(12) Forest Ave./South Dean St.	C/C	E/E	F/F	C/D	F/F	C/E
Englewood Town Center Station (Light Rail to Tenafly (Preferred Alternative) Only)						
(13) Englewood Ave./Van Brunt St.	B/B	C/C	F/D	D/C	*NA*	*NA*
(14) Englewood Ave./South Dean St.	B/C	C/D	F/F	D/D	*NA*	*NA*
(15) Palisade Ave./North Dean St.	C/D	D/F	F/F	D/E	*NA*	*NA*
(16) Palisade Ave./Van Brunt St.	B/B	D/C	F/D	D/C	*NA*	*NA*
Englewood Hospital Station (Light Rail to Tenafly (Preferred Alternative) Only)						
(17) Demarest Ave./Van Brunt St.	B/B	B/B	F/C	D/C	*NA*	*NA*
(18) Demarest Ave./North Dean St.	B/B	C/C	F/F	D/D	*NA*	*NA*
(19) Hamilton Ave./North Dean St.	B/B	C/B	E/E	B/B	*NA*	*NA*
(20) Hudson Ave./Curry Ave.	C/C	C/C	E/D	D/C	*NA*	*NA*
(21) Hudson Ave./North Dean St.	C/C	D/D	F/F	D/D	*NA*	*NA*
(22) Ivy Ln./Curry Ave.	C/C	C/C	D/C	D/C	*NA*	*NA*
(23) Ivy Ln./North Dean St.	C/C	C/D	F/F	D/D	*NA*	*NA*

Jacobs, 2010

Existing Conditions

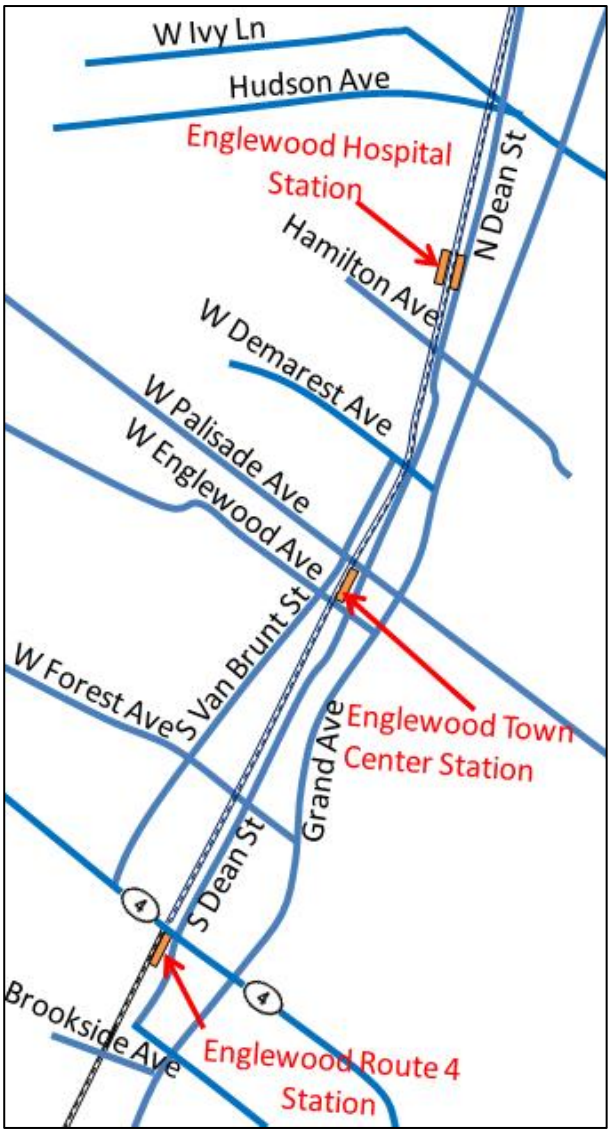
Rail Right-of-way

Unlike the municipalities south of Englewood, there is substantial development on both sides of the rail right-of-way in Englewood, as such there is a greater number of streets crossing the railroad alignment at grade. There are a total of eight grade crossings in Englewood: Brookside Lane, West Forest Avenue, Englewood Avenue, Palisade Avenue, Demarest Avenue, Hamilton Avenue, Hudson Avenue, and Ivy Lane. Brookside Lane provides a connection between Grand Avenue and an industrial development to the west of the alignment. West Forest Avenue, Englewood Avenue, Palisade Avenue, and Demarest Avenue provide connections between Van Brunt Street on the west side of the alignment and Dean Street on the east side of the alignment, in the town center area of Englewood. Further north, Hamilton Avenue, Hudson Avenue, and Ivy Lane provide connections between local streets and North Dean Street (refer to illustration on the next page).

Englewood Route 4 Station

The roadways examined in association with the proposed Englewood Route 4 Station include Nordhoff Place, Van Brunt Street, Forest Avenue, and South/North Dean Street. Nordhoff Place carries local traffic, running parallel to the railroad alignment until it veers west after crossing under State Route 4. Van Brunt Street and South/North Dean Street are north-south local roads that parallel the alignment as well as the major north-south arterials in the study area. Forest Avenue is an east-west local road. During the AM and PM peak hours, the intersection of Nordhoff Place and Van Brunt Street operates at LOS B. The intersection of Forest Avenue and South Dean Street operates at LOS C in both the AM and PM peak

hour (Refer to Table 9-7). Figures 9-11 and 9-12 at the end of the chapter graphically show the existing roadway configuration in the vicinity of Englewood Route 4 Station.



Englewood Town Center Station

Through Englewood, Van Brunt Street and North/South Dean Street run parallel to the Northern Branch alignment, intersecting many east-west local streets. Consequently, the roadways examined in association with Englewood Town Center Station are additional intersections of Van Brunt Street and North/South Dean Street: Englewood Avenue/Van Brunt Street, Englewood Avenue/South Dean Street, Palisade Avenue/North Dean Street, and Palisade Avenue/Van Brunt Street.

The character of Van Brunt Street is the same for this location as described above for Englewood Route 4 Station. North/South Dean Street in the vicinity of the proposed station site is one-way southbound. Englewood Avenue is an east-west roadway that begins at a T-intersection with Grand Avenue (east of South Dean Street) and continues across the Northern Branch alignment. Palisade Avenue is a major east-west road that crosses both North Dean Street and Van Brunt Street and continues beyond the study area boundaries.

The intersection of Englewood Avenue and Van Brunt Street operates at LOS B in both the AM and PM peak hour. The intersection of Englewood Avenue and South Dean Street operates at LOS B in the AM peak and LOS C in the PM peak. The intersection of Palisade Avenue and North Dean Street operates at LOS C in the AM peak and LOS D in the PM peak, and the intersection of Palisade Avenue and Van Brunt Street operates at LOS B in both the AM and PM peaks (Refer to Table 9-7). Figure 9-15 at the end of the chapter graphically shows the existing roadway configuration in the vicinity of Englewood Town Center Station.

Englewood Hospital Station

The roadways potentially affected by the proposed Englewood Hospital Station are north-south streets – Van Brunt Street, Demarest Avenue, North Dean Street, and Curry Avenue; and east-west streets – Demarest Avenue, Hamilton Avenue, Hudson Avenue, and Ivy Lane. The character of both Van Brunt Street and North Dean Street in this portion of the study area is nearly identical to that described above for the Englewood Town Center Station area; North Dean Street continues to be one-way (southbound).

The intersections of Demarest Avenue/Van Brunt Street, Demarest Avenue/North Dean Street, and Hamilton Avenue/North Dean Street all occur south of Englewood Hospital. Demarest Avenue is a major local road that crosses the Northern Branch right-of-way and connects Engle Street, east of North Dean Street, to residential areas west of the railroad alignment. Hamilton Avenue, like Demarest Avenue, is a major east-west local road. It begins west of the rail alignment with a T-intersection with Tenafly Road and continues into large-lot residential areas east of the railroad right-of way.

The intersections of Hudson Avenue/North Dean Street, Ivy Lane/Curry Avenue, and Ivy Lane/North Dean Street/Dean Drive occur north of Englewood Hospital. Hudson Avenue and Ivy Lane both travel east-west across the Northern Branch railroad alignment, with Hudson Avenue traveling more directly east-west and Ivy Lane traveling northwest to southeast. Hudson Avenue and Ivy Lane intersect east of North Dean Street at a nonsignalized intersection. Curry Avenue parallels the Northern Branch alignment on the western side, beginning just north of Englewood Hospital and ending in a signalized T-intersection with Ivy Lane.

The intersection of Demarest Avenue and Van Brunt Street operates at LOS B in both the morning and evening peak hours. The same is true for the intersections of Demarest Avenue/North Dean Street and Hamilton Avenue/North Dean Street. The remaining intersections, those north of Englewood Hospital (intersections 20, 21, 22, and 23), all operate with LOS C in both the AM and PM peak hours. Figures 9-17 through 9-19 at the end of the chapter graphically show the existing roadway configuration in the vicinity of Englewood Hospital Station.

Potential Impacts and Mitigation

No Build Alternative

Rail Right-of-Way

Under the No Build Alternative, rail freight service is anticipated to continue with minimal changes. As such, there would not be any changes to the traffic impact associated with grade crossings.

Englewood Route 4 Station

The No Build condition assumes that the existing roadway configuration will remain unchanged in the future. At the same time, growth is expected to occur in the study area as described in Section 9.2.3-Establishment of No Build Traffic Conditions, above. The result is more cars traveling on the existing roadways, and in some places, an increase in traffic congestion and parking demand.

Due to the anticipated background growth in traffic, the intersection of Nordhoff Place/Van Brunt Street is expected to decline during the AM and PM peak hours. During the AM peak hour, the intersection is projected to operate at a slightly increased delay functioning at an acceptable LOS C. However, during the PM peak, traffic conditions at the intersection are expected to decline to LOS F, with unacceptable delays experienced on the westbound approach. Similarly, traffic operations at the intersection of Forest Avenue and South Dean Street, are expected to decline noticeably from LOS C in both the existing AM and PM peak to LOS E in both the AM and PM peak in the No Build future condition. Level of service E is defined as near failing condition, while LOS F is a failing condition where motorists experience excessive delays at the intersection. (Refer to Table 9-7).

Englewood Town Center Station

The four intersections considered within the Englewood Town Center Station area (intersections 13, 14, 15, and 16) will see some decline in LOS, but only the intersection of Palisade Avenue and North Dean Street will notice a decline to a failing LOS. In the PM peak, it is anticipated that the LOS will decline from LOS D in the existing condition to LOS F in the future No Build condition (Refer to Table 9-7). It is anticipated that motorists would experience excessive delay levels and congestion at the intersection due to the increase in traffic from background growth.

Englewood Hospital Station

None of the seven intersections studied in association with Englewood Hospital Station are expected to experience a decline in LOS to a failing or unsatisfactory level. No change in LOS is anticipated at the intersection of Demarest Avenue/Van Brunt Street, Hudson Avenue/Curry Avenue, and Ivy Lane/Curry Avenue. Only the AM peak condition for the intersection of Hamilton Avenue/North Dean Street will decline from LOS B to LOS C in the future No Build condition. At the intersection of Ivy Lane/North

Dean Street/Dean Drive, the PM peak declines from LOS C to LOS D in the future No Build. The LOS in both the AM and PM peak declines one level for the intersections of Demarest Avenue/North Dean Street and Hudson Avenue/North Dean Street, but the decline does not fall below LOS D for either intersection.

Light Rail to Tenafly (Preferred Alternative)

Rail Right-of-way

Impacts – The eight roadways which cross the rail alignment will experience frequent closures due the crossing of light rail vehicles. The frequency of the closures is related to the service plan, which provides more frequent service from Englewood Route 4 Station south. At Brookside Lane, which is south of the Englewood Route 4 Station, closures would occur every 3 minutes in the peak periods and every 6 minutes during the off-peak period. At the remaining roadways north of Route 4, closures would occur every 6 minutes in the peak periods and every 12 minutes during the off-peak period. Each closure is expected to last approximately one minute. Although they are anticipated to cause a backup of traffic, once the crossing is opened, all drivers stopped at the crossing signal can be expected to clear the crossing before the next closure.

Mitigation – To minimize the impacts of the closure of the grade crossing, it is recommended that the signals to the east and west of the crossings be synchronized with the grade crossings, so the non-conflicting traffic movements may flow north and south while the east/west crossing is closed. These mitigation measures will not affect on- or off-street parking.

Englewood Route 4 Station

Impacts –During the AM peak hour, which represents the worst-case scenario for traffic congestion, it is projected that 196 vehicles would park at the station. An additional 65 vehicles are projected to drop off passengers at the station, resulting in additional travel to and from the station during the peak hour, for a total of 326 trips. The reverse is expected to occur in the PM peak hour.

The effect of the additional traffic traveling to and from the station site will have an impact on traffic LOS at the intersections studied in association with the station site. The LOS at the intersection of Nordhoff Place/Van Brunt Street would be LOS F in the AM and PM peak hours. Similarly, the intersection of Forest Avenue/South Dean Street would operate at LOS F in both the AM and PM peak hours. This means that motorists would experience excessive congestion and delays at the intersection.

Mitigation –To reduce queuing and improve the function of the intersection of Nordhoff Place and Van Brunt Street, the presently nonsignalized intersection is recommended to be signalized with semi-actuation that responds to the presence of vehicles. Additionally, the westbound approach (Nordhoff Place) should have an additional lane added, separating the current single lane permitting left and right-turns into separate left-turn only and right-turn only lanes. These improvements would be contained within the existing roadway and would improve unacceptable delay levels experienced under the nonsignalized configuration on the westbound approach. Furthermore, the intersection LOS operations would improve to the LOS to C during both the AM and PM peak hours.

The signal cycle at the intersection of Forest Avenue and South Dean Street is recommended to be extended to allow more vehicles to pass through the intersection during each signal phase. Also, the southbound approach (South Dean Street) should have a lane added, separating the existing through-right lane into a separate through lane and right-turn only lane. Finally, on the westbound approach, it is recommended that the shared thru-left turn lane should be converted to a left turn only lane to help minimize congestion caused by westbound left-turning vehicles. These improvements would improve the LOS to C in the AM and D in the PM peak hours.

While these improvements would fit within the existing roadway, they would eliminate approximately 32 on-street parking spaces on South Dean Street. Impacts on parking are discussed in Section 9.3. Figures 9-13 and 9-14 at the end of the chapter graphically show the proposed traffic mitigation measures and their effects on parking.

Englewood Town Center Station

Impacts –During the AM peak hour, which represents the worst-case scenario for traffic congestion, it is projected that 30 vehicles would park at or near the station. An additional 85 vehicles are projected to drop off passengers at the station, resulting in additional travel to and from the station during the peak hour, for a total of 200 trips. The reverse is expected to occur in the PM peak hour.

The effect of the additional traffic traveling to and from the station site will have an impact on traffic LOS at all of the intersections studied in association with the station site. The LOS at the intersection of Englewood Avenue/Van Brunt Street is expected to be F in the AM and D in the PM peak hour due to an increase in traffic in the east- and westbound directions. The LOS at the intersection of Palisade Avenue/Van Brunt Street is expected to be LOS F in the AM and LOS D in the PM peak hours. All remaining times and intersections are expected to be LOS F (intersections 14 and 15) due to heavy backups associated with the grade crossing closures (Refer to Table 9-7). Some vehicles queued at a red light maynot clear the intersection before the green light turns red again.

Mitigation –At the intersection of East Englewood Avenue and Van Brunt Street, an additional lane is recommended to be added to the eastbound direction (Englewood Avenue), separating the existing single combined right/through lane into separate right-turn only and through movement only lanes. An additional through lane is recommended in the westbound direction. The additional lane would result in a decrease in delay on the eastbound approach of approximately 73 and 32 seconds in the AM and PM peak hours respectively. Overall intersection LOS operations would improve to LOS D or better during the AM and PM peak hours.

At the intersection of Englewood Avenue and South Dean Street, additional travel lanes are recommended to be added to the westbound (Englewood Avenue) and southbound (South Dean Street) directions. In both instances, combined through/turning lanes would be separated into dedicated through movement and dedicated turning lanes. These changes would reduce queuing and increase capacity at the intersection. In addition, at this intersection, the signal timing would be adjusted to operate with four phases that permit a protected left-turn. As a result, overall intersection operations are improved to LOS D and intersection delay is reduced by approximately 58 and 82 seconds in the AM and PM peak hours respectively.

At the intersection of Palisade Avenue and North Dean Street, additional lanes are recommended for the eastbound, westbound, and southbound directions. The eastbound modification (Palisade Avenue) would add an additional through lane to the existing dedicated through lane and dedicated right-turn lane. The same is true of the westbound direction on Palisade Avenue. The southbound modification (North Dean Street) would separate the two combined through/turning lanes into four lanes: two dedicated through lanes and one dedicated right-turn and one dedicated left-turn lane. With the implementation of the proposed mitigation measures, intersection LOS would improve to D and E during the AM and PM peak hours respectively.

At Palisade Avenue and Van Brunt Street, an additional lane would be added to the eastbound and westbound directions (Palisade Avenue). The eastbound modification would add an additional dedicated through lane. The westbound direction would add to the existing dedicated right-turn lane a through movement, resulting in a combined through/right lane that extends back to South Dean Street. Additionally, the existing crosswalk located on the east-side of Nathaniel Street would be relocated to the west side of Nathaniel Place and Palisade Avenue. In addition, a crosswalk would be added to Palisades

Avenue on the west side of Humphrey Street. These improvements would result in a reduction of overall LOS to D in the AM and C in the PM peak hours.

The roadway improvements will result in the loss of 128 on-street parking spaces distributed along Palisade Avenue, South Van Brunt Street, North Dean Street, and West Englewood Avenue. Impacts on parking are discussed in Section 9.3. Figure 9-16 at the end of the chapter graphically shows the proposed traffic mitigation measures and the effects on on-street parking.

Englewood Hospital Station

Impacts –During the AM peak hour, which represents the worst-case scenario for traffic congestion, it is projected that 22 vehicles would drive to the station to drop off passengers, for a total of 44 trips. The effect of the additional traffic traveling to and from the station, as well as the more frequent grade crossings, will have an impact on traffic LOS at all of the intersections studied in association with the station site. Aside from the PM peak hour of LOS C at the intersections of Demarest Avenue and Van Brunt Street, and Ivy Lane and Curry Avenue, and LOS D during the PM peak hour at Hudson avenenue and Curry Avenue, the studied intersections (intersections 18, 19, 21, and 23) would all operate at LOS E or F due to heavy volumes and queues, especially on North Dean Street, associated with grade crossing closures (Refer to Table 9-7). Motorists experience heavy delays and some vehicles queued at a red light may not clear the intersection before the green light turns red again.

Mitigation –At the intersection of Demarest Avenue and Van Brunt Street, an additional lane is recommended for the eastbound direction, with a new traffic signal. The additional lane would turn the single lane permitting all movements into two lanes, one permitting right-turns and through movements and one permitting left-turns and through movements, reducing the eastbound approach delay by approximately 87 seconds in the AM peak hour, with minimal improvements in the PM peak hour. Overall intersection level of service would improve from F to D during the AM peak hour.

At Demarest Avenue and North Dean Street, only restriping the southbound (North Dean Street) lane configuration is recommended for mitigation. In the existing condition, the right-turn lane is combined with a through-movement lane, and the left-turn lane is dedicated. The revisions would separate the right lane and through lane into separate dedicated lanes, and combine the left-turn and through lane into a combined left-turn/through lane, improving the LOS to D in both the AM and PM.

An additional lane is recommended for the southbound direction (North Dean Street) on Hamilton Avenue and North Dean Street. The additional lane would allow the existing through/right-turn lane to be separated into a dedicated through lane and a dedicated right-turn lane, which would reduce queuing and delay while increasing capacity in the southbound direction. In addition, the southbound left-turn lane would be converted to a shared through and left-turn lane. An additional receiving lane would also be required. These improvements would reduce overall intersection delay by roughly 49 seconds during the AM and PM peak hours, improving overall LOS to LOS B in the AM and PM peak hours.

At the intersection of Hudson Avenue and Curry Avenue, a second lane would be added to the eastbound approach. The modification would change the existing single lane with all movements into two lanes, one dedicated to through and left-turns, and one dedicated to through and right turns. These improvements would improve overall LOS of the AM peak hour to LOS D, the PM peak hour will remain at LOS C.

At the intersection of Hudson Avenue and North Dean Street, an additional lane is recommended for the eastbound (Hudson Avenue) and southbound (North Dean Street) directions. In both cases, the additional lane would transform a single lane, permitting all movements to two lanes to reduce queuing and increase capacity. On the eastbound approach, the new lane would be a dedicated right-turn lane. On the southbound approach, the new lane would create two lanes, one dedicated to through and left-turns, and

one dedicated to through and right-turns. The improvements would result in a reduction of overall delay of over 150 seconds during the AM and PM peak hours, and improve the intersection to LOS D.

No improvements are proposed at the intersection of Ivy Lane and Curry Avenue. The intersection is expected to operate at acceptable level of service D and C during the AM and PM peak hours respectively.

At the intersection of Ivy Lane and North Dean Street, an additional lane is recommended on the southbound approach of North Dean Street. The modification would change the existing single lane with all movements into two lanes, one dedicated to through and left-turns, and one dedicated to through and right-turns. The additional southbound lane would reduce overall intersection delay by approximately 163 seconds and 95 seconds during the AM and PM peak hours respectively. Overall intersection LOS would improve to LOS D in the AM and PM. All of the recommended mitigation could be implemented within the road right-of-way.

The roadway improvements will result in the loss of 15 on-street parking spaces in total between East Demarest Avenue (seven spaces) and East Hudson Avenue (eight spaces). Impacts on parking are discussed in Section 9.3. Figures 9-20 through 9-22 at the end of the chapter graphically show the proposed traffic mitigation measures and their effects on on-street parking.

Light Rail to Englewood Route 4

Rail Right-of-way

Impacts – Under the Light Rail to Englewood Route 4 Alternative, there is one roadway that crosses the alignment in Englewood. Brookside Lane will experience frequent closures due the crossing of light rail vehicles, every 3 minutes in the peak periods and every 6 minutes during the off-peak periods. Each closure is expected to last approximately one minute. Although they are anticipated to cause a backup of traffic, once the crossing is opened, all drivers stopped at the crossing signal can be expected to clear the crossing before the next closure.

Mitigation – To minimize the impacts of the closure of the grade crossing, it is recommended that the signals to the east and west of the crossings be synchronized with the grade crossings, so the non-conflicting traffic movements may flow north and south while the east/west crossing is closed.

Englewood Route 4 Station

Impacts –The Light Rail to Englewood Route 4 Alternative will provide 870 parking spaces at the Englewood Route 4 Station. The station site parking area is designed to accommodate the maximum projected parking passengers in 2030. During the AM peak hour, which represents the worst-case scenario for traffic congestion, it is projected that 372 vehicles would park at the station. An additional 126 vehicles are projected to drop off passengers at the station, resulting in additional travel to and from the station during the peak hour, for a total of 624 trips. The reverse is expected to occur in the PM peak hour. The effect of the additional traffic traveling to and from the station site will have an impact on traffic LOS at the intersections studied in association with the station site. The LOS at both studied intersections (intersections 11 and 12) will be LOS F in the AM and PM peak hours due to queuing associated with passengers accessing the station. This means that motorists would experience heavy congestion and long delays with some vehicles in queue potentially not clearing the intersection before the green light turns red again..

Mitigation – To reduce queuing and improve the function of the intersection of Nordhoff Place and Van Brunt Street, the presently nonsignalized intersection is recommended to be signalized with semi-actuation that responds to the presence of vehicles. Additionally, the westbound approach (Nordhoff Place) should have an additional lane added, separating the current single lane permitting left and right-turns into separate left-turn only and right-turn only lanes. These improvements would be contained

within the existing roadway and would improve unacceptable delay levels experienced under the nonsignalized configuration on the westbound approach. Furthermore, the intersection LOS operations would improve to acceptable LOS D during both the AM and PM peak hours.

The signal cycle at the intersection of Forest Avenue and South Dean Street is recommended to be extended to allow more vehicles to pass through the intersection during each signal phase. Also, the southbound approach (South Dean Street) should have a lane added, separating the existing through-right lane into a separate through lane and right-turn only lane. Finally, on the westbound approach, it is recommended that the shared thru-left turn lane should be converted to a left turn only lane to help minimize congestion caused by westbound left-turning vehicles. These improvements would reduce delay on the southbound approach by approximately 96 and 123 seconds during the AM and PM peak hours respectively. These measures would improve overall intersection LOS operations from failing during both peak hours to LOS to C and E in the AM and PM peak hours respectively.

While these improvements would fit within the existing roadway, they would eliminate approximately 32 on-street parking spaces on South Dean Street. Impacts on parking are discussed in Section 9.3. Figures 9-13 and 9-14 at the end of the chapter graphically show the proposed traffic mitigation measures and their effect on on-street parking.

Englewood Town Center Station

Impact – Since Light Rail to Englewood Route 4 terminates at the Englewood Route 4 Station, no development is proposed north of Englewood Route 4 Station. Although commuters may travel from the north to access the Route 4 station, the number of north-south roadways should sufficiently absorb the increase in traffic. Additionally, the grade crossings in downtown Englewood would not be affected by the project; thereby minimizing this alternative's impact to the Englewood Town Center station area.

Mitigation – None required.

Englewood Hospital Station

Impact – Since Light Rail to Englewood Route 4 terminates at the Englewood Route 4 Station, no development is proposed north of the Englewood Route 4 Station. Although commuters may travel from the north to access the Route 4 station, the number of north-south roadways should sufficiently absorb the increase in traffic. Additionally, the grade crossings in downtown Englewood would not be affected by the project; thereby minimizing this alternative's impact to the Englewood Hospital station area.

Mitigation – None required.

9.2.2.7. Tenafly

Table 9-8 summarizes the traffic analysis in Tenafly, comparing existing levels to No Build, Build without mitigation, and finally Build with mitigation. This information is described fully in the following discussion.

Table 9-8: Level of Service Summary for Tenafly Light Rail to Tenafly (Preferred Alternative)

Intersection	Existing (AM/PM)	No Build (AM/PM)	Build (AM/PM)	Build with Mitigation (AM/PM)
Tenafly: Tenafly Town Center Station				
(24) East Clinton Avenue/New Street	B/A	D/B	D/C	*NA*
(25) West Railroad Ave/West Clinton Ave/Franklin St	C/C	D/E	F/F	F/F
(26) Clinton Ave/County Rd/Piermont Rd	D/D	E/D	F/F	F/E
(27) Washington St/West Railroad Ave	D/D	D/D	E/E	E/E
(28) Washington St/Hillside Ave/ Piermont Rd/Highwood Rd	C/C	C/D	D/D	D/C
(29) Riveredge Rd/Jay St/W Railroad Ave	C/C	D/E	D/D	D/D
(30) Riveredge Rd/Jay St/Piermont Rd	A/A	B/B	E/D	*NA*
(31) Central Ave/West Railroad Ave	A/A	B/A	D/C	C/C
(32) Central Avenue/Piermont Road	B/B	C/C	D/D	C/C
Tenafly: Tenafly North Station				
(33) Piermont Road/Hudson Avenue	B/B	B/C	C/D	NA
(34) Piermont Road/North Summit Street	B/B	B/C	F/F	B/C
(35) Piermont Road/Madison Avenue	D/C	F/D	F/E	D/E
(36) Piermont Road/Union Avenue	C/C	C/C	F/E	D/D
(37) County Road/North Summit Street	C/C	F/E	F/F	B/C

Jacobs, 2010

Existing Conditions

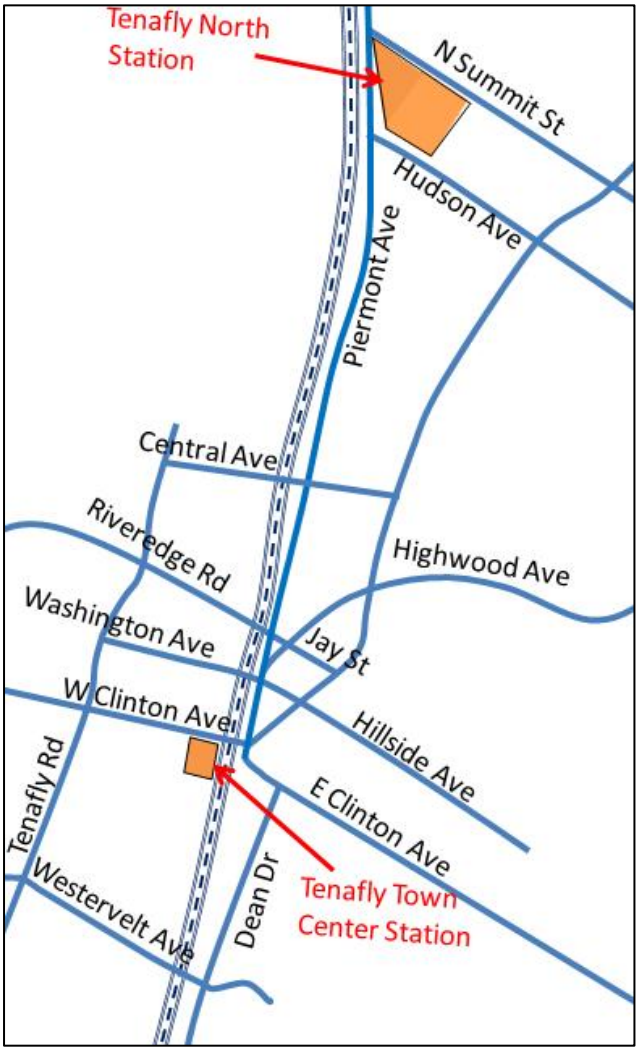
Rail Right-of-way

There is substantial residential and commercial development on both sides of the rail right-of-way in Tenafly. As such, there are a greater number of streets crossing the railroad alignment at grade. There are a total of five grade crossings in Tenafly including Westervelt Avenue, West/East Clinton Avenue, Washington Street, Riveredge Road/Jay Street, and Central Avenue. These crossings provide connections between the highly developed areas on the east and west sides of the rail alignment, ultimately providing access between the major north-south arterial roads, Tenafly Road and Engle Street (refer to illustration on the next page).

Tenafly Town Center Station

The roads that carry the majority of traffic through the Tenafly Town Center Station area were examined to determine the impact of additional traffic on the existing infrastructure. Riveredge Road and Clinton Avenue are major east-west arterials; County Road and Piermont Road are major north-south arterials through Tenafly. Riveredge Road connects Tenafly Town Center to areas west; it intersects County Road at a T-intersection. Clinton Avenue is known as West Clinton Avenue west of its crossing of the rail right-of-way. East of the railroad, Clinton Avenue is known as East Clinton Avenue. County Road intersects with both Riveredge Road and Clinton Avenue at the point where Clinton Avenue changes from East Clinton to West Clinton. Piermont Road parallels the rail right-of-way on the east side.

The intersection of East Clinton Avenue and New Street functions at LOS B in the AM peak and LOS A in the PM peak. The intersection of West Railroad Avenue/West Clinton Avenue/Franklin Street operates at LOS C in both the AM and PM peaks. The intersection of Clinton Avenue/County Road/Piermont Road operates at LOS D in both the AM and PM peaks. The intersection of Washington Street and West Railroad Avenue operates at LOS D in both the AM and PM peak hours. The intersections of Washington Street/Hillside Avenue/Piermont Road/Highwood Road and Riveredge Road/Jay Street/West Railroad Avenue both operate at LOS C in the AM and PM peak hours. The intersections of Riveredge Road/Jay Street/Piermont Road and Central Avenue/West Railroad Avenue both operate at LOS A in the AM and PM peak hours. The intersection of Central Avenue and Piermont Road operates at LOS B in both the AM and PM peak hours (refer to Table 9-8). Figures 9-23 and 9-24 at the end of the chapter graphically show the existing roadway configuration in the vicinity of Tenafly Town Center Station.



Tenafly North Station

Piermont Road and County Road continue from the Tenafly Town Center Station area north through to the Tenafly North Station area. The characteristics of these roads remain similar between the two locations. The major east-west arterials within the vicinity of Tenafly North Station are Hudson Avenue and Madison Avenue (in Cresskill, just north of the station). Hudson Avenue intersects with Piermont Road at a T-intersection, continuing east toward New York. Madison Avenue parallels Hudson Avenue; although it crosses the alignment, providing access between County Road and Jefferson Avenue and Knickerbocker Road further west. Union Avenue crosses Piermont Avenue and turns south where it intersects with Madison Avenue at a T-intersection. East of Piermont Avenue, Union Avenue crosses Madison Avenue east of County Road.

The intersections of Piermont Road/Hudson Avenue and Piermont Road/North Summit Street function at LOS B in both the AM and PM peak hours. The intersection of Piermont Road and Madison Avenue functions at LOS D in the AM peak and LOS C in the PM peak. The intersections of Piermont Road/Union Avenue and County Road/North Summit Street both operate at LOS C in both the AM and PM peak hours. Figures 9-27 through 9-29 at the end of the chapter graphically show the existing roadway configuration in the vicinity of the Tenafly North Station.

Potential Impacts and Mitigation

No Build Alternative

Rail Right-of-Way

Under the No Build Alternative, rail freight service is anticipated to continue with minimal changes. As such, there would not be any changes to the traffic impact associated with grade crossings.

Tenafly Town Center Station

Three intersections in the Tenafly Town Center Station area are expected to decline to LOS E in one peak hour under the No Build condition: West Railroad Avenue/West Clinton Avenue/Franklin Street, Clinton Avenue/County Road/Piermont Road, and Riveredge Road/Jay Street/West Railroad Avenue (refer to Table 9-8). The intersection of Washington Street/West Railroad Avenue is not expected to experience a decline in LOS. The remainder of the intersections (intersections 24, 30, 31, and 32) would experience some decline in LOS and delay but none noticeable enough to be considered an unacceptable condition.

Tenafly North Station

The intersection of Piermont Road and Union Avenue is not expected to experience a decline in LOS in the No Build condition. The remaining intersections do experience a decline in LOS, but only the intersections of Piermont Road/Madison Avenue and County Road/North Summit Street experience a failing LOS in the No Build. At Piermont Road/Madison Avenue, LOS declines from LOS D in the AM peak to LOS F in AM Peak. County Road/North Summit Street experiences a decline in LOS from LOS C in the AM peak to LOS E in the AM peak. An additional lane was striped on the westbound approach of Hudson Avenue at the intersection with Piermont Road resulting in an exclusive left and right turn lane. As a result of this improvement, the intersection would operate at LOS B and C during the AM and PM peak hours.

Light Rail to Tenafly (Preferred Alternative)

Rail Right-of-way

Impacts – The five roadways which cross the rail alignment will experience frequent closures due to the crossing of light rail vehicles, every 6 minutes in the peak periods and every 12 minutes during the off-peak periods. Each closure is expected to last approximately one minute. Although they are anticipated to cause a backup of traffic, once the crossing is opened, all drivers stopped at the crossing signal can be expected to clear the crossing before the next closure.

Mitigation – To minimize the impacts of the closure of the grade crossings, it is recommended that the signals to the east and west of the crossings be synchronized with the grade crossings, so the non-conflicting traffic movements may flow north and south while the east/west crossing is closed. Additional mitigation measures at the roadways studied in the Tenafly Town Center and Tenafly North Station areas are described below.

Tenafly Town Center Station

Impacts –During the AM peak hour, which represents the worst-case scenario for traffic congestion, it is projected that 16 vehicles would park at or near the station during the peak hour. An additional 96 vehicles are projected to drop off passengers at the station, resulting in additional travel to and from the station during the peak hour, for a total of 208 trips. The reverse is expected to occur in the PM peak.

The effect of the additional traffic traveling to and from the station site will have an impact on traffic LOS at the intersections studied in association with the station site. Three of the intersections will operate at LOS E or worse in both the AM and PM peak hours: West Railroad Avenue/West Clinton Avenue/Franklin Street, Clinton Avenue/County Road/Piermont Road, and Washington Street/West Railroad Avenue. Riveredge Road/Jay Street/Piermont Road will decline to LOS E in the AM and LOS D in the PM, from LOS B. Riveredge Road/Jay Street/West Railroad Avenue will actually improve to

LOS D in the AM and PM peak hours due to the change of the signal from just flashing red, to a full signal as part of the project to allow signal pre-emption for grade crossing safety. The remaining intersections (intersections 24, 28, 31, and 32) will operate at LOS C or D in the AM and PM peak hours (Refer to Table 9-8).

Mitigation –At the intersection of West Railroad Avenue/West Clinton Avenue/Franklin Street, it is recommended that the presently nonsignalized intersection be converted to a signalized intersection that would operate with pre-emption. An additional lane is recommended on the eastbound and westbound (West Clinton Avenue) approaches. The eastbound modification would convert the existing combined through-and-left-turn lane into separate dedicated through and left-turn lanes. In the westbound direction, the additional lane would convert the single lane permitting all movements to separate through-and-left-turn and through-and-right-turn lanes. No changes are recommended for the northbound or southbound directions. Additional right-of-way would need to be acquired from property outside of the roadway to implement these recommendations; however, no buildings would be affected, and no on-street parking spaces would be eliminated. With the implementation of these recommendations, overall delay at the intersection would be reduced by 76 and 155 seconds in the AM and PM peak hours respectively. However, although the proposed mitigation would improve overall intersection operations, the intersection would continue to operate with excessive delays and would still be classified as LOS F in the AM and PM peak hours.

At the intersection of Clinton Avenue/County Road/Piermont Road, one additional lane is recommended in the southbound direction on County Road, and two lanes are recommended in the southbound direction on Piermont Road. The County Road modification would convert the single lane permitting all movements to separate through-and-left-turn and through-and-right-turn lanes. Although the southbound intersection approach would continue to experience high delay levels, the extra lane would increase capacity and improve LOS operations at the approach. The southbound direction on Piermont Road would add an additional exclusive right-turn and a through lane. The additional dedicated lanes would reduce delay at the southbound Piermont Road approach by over 167 seconds in the AM and 124 seconds in the PM peak hours. The approach would experience an increase in capacity and a reduction in queuing. Property outside of the roadway would be required to implement these recommendations; however, no buildings would be affected. Approximately 14 on-street parking spaces would be eliminated. With these recommendations implemented, the intersection would improve; however, it would still be classified as failing, with LOS F in the AM and LOS E in the PM peak hours.

At the intersection of Washington Street and West Railroad Avenue, an additional lane is recommended in the eastbound, westbound, and southbound directions. In the eastbound direction (Washington Street) the additional lane would convert the single lane permitting all movements into a combined through-and-right-turn lane and a dedicated left-turn lane. In the westbound direction, the modification would convert the single lane permitting all movements to separate through-and-left-turn and through-and-right-turn lanes. In the southbound direction (West Railroad Avenue), the modification would convert the single lane permitting all movements to separate through-and-right-turn and dedicated left-turn lanes. The improvements could be implemented within the roadway; however approximately 21 on-street parking spaces would be eliminate. Intersection delay would improve, and the intersection would continue to operate at LOS E in the AM and PM peak hours.

At the intersection of Washington Street/Hillside Avenue/Piermont Road/Highwood Road, the eastbound (Washington Street) direction is recommended to be modified from a single lane permitting all movements to separate through-and-right-turn and dedicated left-turn lanes. No other modifications are proposed at this intersection. The improvements could be implemented within the roadway and no on-street parking spaces would be eliminated. With these recommendations implemented, the intersection would reduce queuing due to left-turning vehicles. The intersection would continue to operate at acceptable LOS D in the AM peak hour and improve to LOS C in the PM peak hour.

At the intersection of Riveredge Road/Jay Street/West Railroad Avenue, the single lane permitting all movements in the westbound (Riveredge Road) direction is recommended to be converted to separate through-and-left-turn and through-and-right-turn lanes. The modification in the northbound direction would convert the single lane permitting all movements to separate through-and-left-turn and dedicated right-turn lanes. The improvements could be implemented within the roadway and no on-street parking spaces would be eliminated. As a result, the intersection would continue to operate at acceptable LOS D with a reduction in intersection delay and improved traffic circulation with the improvents in place.

No changes are proposed for the intersections of Riveredge Road/Jay Street/Piermont Road or East Clinton Avenue and New Street.

Further north of the station area, the intersection of Central Avenue/West Railroad Avenue is recommended to add a lane to the eastbound and westbound (Central Avenue) and northbound (West Railroad Avenue) directions. In each case, the additional lane would separate the existing single lane permitting all movements into two separate lanes. In the eastbound and westbound directions, the modification would result in separate through-and-left-turn and through-and-right-turn lanes. In the northbound direction, the modification would result in a combined through-and-left-turn lane and a dedicated right-turn lane. Signalization is also recommended for this intersection. With these recommendations implemented, the intersection would improve to LOS C in the AM peak hour, remaining at LOS C in the PM peak hour.

For the intersection of Central Avenue and Piermont Road, an additional lane is recommended in the eastbound and westbound (Central Avenue) directions, and the southbound direction (Piermont Road). The modifications would create dedicated right-turn and dedicated left-turn lanes on the southbound approach of Piermont, where presently the single lane serves both left- and right-turns. The eastbound and westbound directions would convert the single lane into a dedicated through and left-turn (eastbound) and through and through-and-right-turn lane (westbound). Signalization is also recommended for this intersection. With these recommendations implemented, the intersection would improve to LOS C in the AM and PM peak.

The roadway improvements associated with this station would reduce parking capacity in the study area. Piermont Road between West Clinton Avenue and Hillside Avenue experiences the greatest loss in parking where 14 diagonal spaces are eliminated. In total, proposed roadway improvements result in a loss of 35 parking spaces. Impacts on parking are discussed in Section 9.3. Figures 9-25 and 9-26 at the end of the chapter graphically show the proposed traffic mitigation measures and the effects on parking.

Tenafly North Station

Impacts –During the AM peak hour, which represents the worst-case scenario for traffic congestion, it is projected that 232 vehicles would require parking at the station. An additional 88 vehicles are projected to drop off passengers at the station, resulting in additional travel to and from the station during the peak hour, for a total of 408 trips. The reverse is expected to occur in the PM peak hour. The effect of the additional traffic traveling to and from the station site will cause all but one of the studied intersections to have an LOS of E or F in the AM and PM peak hours (Refer to Table 9-8). In addition to the increase in traffic caused by project related trips, the station site would cause queuing issues for southbound left-turning vehicles since insufficient gaps would exist on the major street to allow for vehicles on the minor streets to process through the intersection without experiencing significant delays.

Mitigation – No modifications are proposed for the intersection of Piermont Road and Hudson Avenue. With the improvements implemented in the No Build condition, the intersection would operate at acceptable LOS of C and D in the AM and PM peak hours respectively.

At the intersection of Piermont Road and North Summit Road, the recommended mitigation consists of an additional turn lane in the southbound (Piermont Road) direction, converting the single through-and-left-turn lane into separate dedicated through and left-turn lanes and a signal. These improvements could be implemented within the roadway. The LOS would improve to LOS B in the AM and LOS C in the PM.

At the intersection of Piermont Road and Madison Avenue, mitigation is recommended for the eastbound and westbound directions (Madison Avenue). In each case, the single lane permitting all movements would be separated into two lanes. In the eastbound direction, the modification would result in an extra travel lane with a through-and-left-turn lane and a dedicated right-turn lane. In the westbound direction, the modification would result in a dedicated left-turn lane and a combined through-and-right-turn lane. The traffic signal cycle timing would also be adjusted at this location to permit more vehicles to clear the intersection during each signal cycle. The improvements could be implemented within the roadway. The LOS would improve to LOS D in the AM peak hour . During the PM peak hour, the intersection would continue to operate at LOS E, however, overall intersection delay would reduce by approximately 13 seconds.

At the intersection of Piermont Road and Union Avenue, changes are recommended for the eastbound (Union Avenue) and southbound (Piermont Road) directions. The eastbound modification would eliminate the right-turn from Union Avenue onto Piermont Road. The permitted movements would be associated with a dedicated through lane and a dedicated left-turn lane. Traffic that would have previously turned right would be diverted to the Piermont Road and Madison Avenue intersection. The southbound approach (Piermont Road) would be modified to convert the two existing lanes into three lanes, a dedicated right-turn, dedicated through movement, and dedicated left-turn lane. The signal timing at this intersection would also be adjusted. These improvements would allow for more efficient operations, and would reduce traffic at the eastbound approach of the intersection. Vehicles making eastbound right-turns onto Piermont Road would be diverted to Madison Avenue. These improvements could be implemented within the roadway alignment. The LOS would improve to LOS D in the AM and PM peak hours. The traffic mitigation measures would have no effect on on-street parking. Figures 9-30 through 9-32 at the end of the chapter graphically show the proposed mitigation measures.

While no roadway improvements are recommended for County Road and North Summit Street, a signal is proposed for this intersection. With the installation of a new signal, the intersection of County Road and North Summit operate at LOS B in the AM and C in the PM peak hours.

Light Rail to Englewood Route 4

Rail Right-of-way

Impact-No impact is anticipated. Light Rail to Englewood Route 4 Station terminates at Englewood Route 4 Station. No development is proposed north of Englewood Route 4 Station. No mitigation is required.

Mitigation – None required.

Tenafly Town Center Station

Impact – Since Light Rail to Englewood Route 4 terminates at the Englewood Route 4 Station, no development is proposed north of the Englewood Route 4 Station. Although commuters may travel from the north to access the Route 4 station, the number of north-south roadways should sufficiently absorb the increase in traffic. Additionally, the grade crossings in Tenafly would not be affected by the project; thereby minimizing this alternative's impact to the Tenafly Town Center Station area.

Mitigation – None required.

Tenafly North Station
Impact – Since Light Rail to Englewood Route 4 terminates at the Englewood Route 4 Station, no development is proposed north of the Englewood Route 4 Station. Although commuters may travel from the north to access the Route 4 station, the number of north-south roadways should sufficiently absorb the increase in traffic. Additionally, the grade crossings in Tenafly would not be affected by the project; thereby minimizing this alternative's impact to the Tenafly North station area.

Mitigation – None required.

9.3. Parking

9.3.1. Methodology

The parking analysis examined the study area to assess the quantity and availability of both on-street and off-street parking within one-third of a mile of the station areas during the peak hours. The analysis was only performed for station areas for which one or both Build Alternatives have the potential to impact on-street or off-street parking quantity and availability, specifically Englewood Route 4, Englewood Town Center, Englewood Hospital, and Tenafly Town Center.

Parking availability is associated with nearby uses, and as the study area is mostly built out, it is unlikely that retail or residential space will increase in the future such that additional pressures will be placed on existing parking. As demonstrated by the new residential/retail complexes in Englewood, when significant new retail or residential development occurs, parking is typically included in the site plan. As a result, parking demand in the existing condition equals that in the No Build scenario.

In the Build scenario, the parking analysis considered the anticipated parking demand generated by the proposed station sites and examined the impact of traffic mitigation measures on existing on-street and off-street parking. Five of the proposed station sites are proposed to include on-site parking designed to accommodate the peak demand for parking at the station (Table 9-9).

Table 9-9: Parking Spaces 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
91st Street	40	40	40	40
Ridgefield	350	350	350	350
Palisades Park	320	320	320	320
Leonia	550	550	550	550
Englewood Rt. 4	480	870	480	870
Englewood Town Center	70	0	0	NA
Englewood Hospital	0	0	0	NA
Tenafly Town Center	40	0	0	NA
Tenafly North	570	0	570	NA
TOTAL	**2420**	**2130**	**2310**	**2130**

Source: NJ TRANSIT, 2008

The parking demand generated by these stations would not affect existing parking in the vicinity of the station. Stations without parking areas (walk-up stations) may result in some increased demand on both

on-street and municipal parking. Additionally, as described above in Section 9.2, some mitigation measures require the development of additional travel or turning lanes. In order to minimize impacts to adjacent properties, all traffic mitigation improvements are proposed to occur within the existing right-of-way, but some of these measures result in the loss of on-street parking spaces.

The following parking analysis examines the parking conditions resulting from the proposed project. Where the station site provides on-site parking for Northern Branch service users and no existing parking is affected by proposed traffic mitigation, a finding of no impact results and no further analysis is provided. For locations where parking will be affected by walk-up stations and/or traffic mitigation, the parking analysis presents existing/No Build parking conditions and examines the impact of the project on parking capacity.

9.3.2. Environmental Review

9.3.2.1. North Bergen

Traffic mitigation measures described in Section 9.2 will not result in the loss of any on-street parking. The proposed 91st Street Station will provide off-street, on-site parking, either on property acquired by NJ TRANSIT or through a shared-parking agreement with the owner of the new Walmart shopping center for 40 spaces, meeting the projected parking demand. No impact to existing parking will result and no further analysis is required.

9.3.2.2. Fairview

No station site is proposed in Fairview and no traffic impacts are anticipated or associated mitigation proposed. No impact to existing parking will result and no further analysis is required.

9.3.2.3. Ridgefield

Traffic mitigation measures described in Section 9.2 will not result in the loss of any on-street parking. The proposed Ridgefield Station will provide 350 parking spaces on-site, meeting the projected parking demand. No impact to existing parking will result and no further analysis is required.

9.3.2.4. Palisades Park

Traffic mitigation measures described in Section 9.2 will not result in the loss of any on-street parking. The proposed Palisades Park Station will provide 320 parking spaces on-site, meeting the projected parking demand. No impact to existing parking will result and no further analysis is required.

9.3.2.5. Leonia

Traffic mitigation measures described in Section 9.2 will not result in the loss of any on-street parking. NJ TRANSIT proposes to negotiate with the owner of an existing office building to construct a parking deck in place of an existing surface parking lot. The new deck would contain sufficient parking to accommodate the existing 172 spaces dedicated to the office building, as well as the 550 projected demand for parking spaces by light rail passengers. No impact to existing parking will result and no further analysis is required.

9.3.2.6. Englewood

The stations proposed for Englewood include a combination of walk-up stations and stations with parking provided on-site. Traffic mitigation will also affect existing on-street parking. Table 9-10 summarizes parking availability and parking loss anticipated for Englewood as a result of the proposed project.

Table 9-10: Public Parking Availability and Parking Loss Summary for Englewood

Station Area	Capacity	Existing/ No Build Available Parking	Parking Demand for Station	Loss of Parking Due to Traffic Mitigation	Build w/ Mitigation Available Parking
Englewood Route 4 Station	692	394	0	32	**362**
Englewood Town Center Station	1,711*	823	70	128	**625**
Englewood Hospital Station	934	626	0	15	**611**

* An approximate 500-space public parking garage was constructed in the Town Center area after the parking availability analysis was performed in 2006. These spaces are included in the total capacity for the area to be consistent through the analysis.

Source: Jacobs, 2010.

Existing Conditions

Englewood Route 4 Station
Within one-third of a mile from the station there are approximately 692 on-street parking spaces. The peak-hour of the parking analysis showed that approximately 298 parking spaces were occupied, leaving approximately 394 available spaces.

Englewood Town Center Station
Within one-third of a mile from the station there are approximately 1,003 on-street parking spaces and 708 off-street parking. Two municipal lots that currently provide 138 permit spaces, 27 metered spaces, and 43 free public spaces are located near the station site. An approximate 500-space parking deck completed construction after the survey was conducted. The spaces were added to the capacity totals. Observations indicate that time-limit on-street parking restrictions are prevalent near the proposed station. Of the 1,711 spaces that exist in the area, 888 were occupied, leaving approximately 823 available spaces.

Englewood Hospital Station
Within one-third of a mile from the station there are approximately 934 on-street parking spaces. The peak-hour of the parking analysis showed that approximately 308 parking spaces were occupied, leaving approximately 626 available spaces.

Potential Impacts and Mitigation

No Build Alternative
No change to parking demand is anticipated in the future without the proposed Northern Branch project.

Light Rail to Tenafly (Preferred Alternative)
Englewood Route 4 Station
Impacts – The Preferred Alternative will provide 480 parking spaces at the Englewood Route 4 Station. The station site parking area is designed to accommodate the maximum projected parking passengers. Since sufficient off-street parking will be provided for Englewood Route 4 Station, no significant adverse impacts related to parking are anticipated.

Proposed traffic mitigation would eliminate approximately 32 on-street parking spaces on South Dean Street. The loss of 32 parking spaces reduces parking capacity from approximately 394 to 362 on-street spaces within the one-third of a mile parking study radius. While the loss is not significant, as 52% of the public spaces remain available, the location of the loss would be a concern to the adjacent residents and businesses that rely on the parking for visitors or customers. However, the businesses do have a large lot behind the buildings and each of the residences has a driveway that can accommodate multiple vehicles. On-street parking for the visitors/customers would be available further up Dean Street, as well as west of the right-of-way on Forest Avenue.

Figures 9-13 and 9-14 at the end of the chapter graphically show the proposed traffic mitigation measures and their effects on parking.

Mitigation – None required. The loss of parking as a result of traffic mitigation would be noticeable, but sufficient parking exists nearby such that no adverse impact will result from the loss of these parking spaces.

Englewood Town Center Station

Impacts **–** Throughout the day, it is expected that approximately 70 commuters would park in Englewood to access the Light Rail. Englewood Town Center Station is a designated walk-up station where additional parking will not be provided as part of the proposed project. Due to potential commuter use, available parking would reduce from 823 to 753 spaces during the worst case peak hour. Based on existing parking demand and on parking projections for the Englewood Town Center Station, sufficient parking is available within the parking study area to accommodate project-related parking. However, while the parking assessment provides estimates for the physical parking inventory available in the study area, the analysis does not account for the cost of parking permits or their availability to potential Northern Branch commuters.

The roadway improvements will result in the loss of 128 on-street parking spaces distributed along Palisade Avenue, South Van Brunt Street, North Dean Street, and West Englewood Avenue. The greatest loss of parking spaces is found east of the intersection of North Dean Street on Palisade Avenue. At this location 37 diagonal spaces will be taken to accommodate additional turning lanes necessary to improve the functioning of the intersection. The loss of 128 parking spaces reduces parking availability from approximately 753 to 625 spaces within the one-third mile parking study radius. The percentage availability of spaces would be reduced from 48% in the No Build condition to 37% in the Build Condition with mitigation. The location of the loss would also be a concern to the adjacent businesses and residents that rely on the parking for customers or visitors. However, the majority of the businesses have small lots behind their buildings, and a large parking area is located behind the businesses on North Dean Street, north of Palisades Avenue. Another large lot is located on Nathaniel Place north of Palisades Avenue. Additionally, the municipal parking deck is located in the area that would experience the loss of parking. The deck would accommodate the displaced vehicles.

Figure 9-16 at the end of the chapter graphically shows the proposed traffic mitigation measures and the effects on on-street parking.

Mitigation – None required. The loss of parking as a result of traffic mitigation would be noticeable, but sufficient parking exists nearby such that no adverse impact will result from the loss of these parking spaces.

Englewood Hospital Station

Impacts- No parking is expected to be required for Northern Branch passengers. Passengers would either be dropped off, walk or take transit service to the proposed Englewood Hospital Station. However, modeling and predictions cannot account for every variation in human behavior and environmental

condition. It may occur that from time to time some passengers may need to park near the station. Since sufficient on-street parking is available in the study area, no significant adverse impacts related to parking are anticipated.

The roadway improvements will result in the loss of 15 on-street parking spaces in total between East Demarest Avenue (seven spaces) and East Hudson Avenue (eight spaces). The loss of 15 parking spaces reduces on-street parking availability from approximately 626 spaces to 611 spaces. While the loss is not significant, as 65% of public parking spaces will remain available, the location of the loss would be a concern to the adjacent residents and businesses that rely on the parking for visitors or customers. However, on-street parking for the visitors/customers would be available on Van Brunt Street, West Street, and North Dean Street for those used to parking on East Demarest Avenue, and further along East Hudson Avenue and the small lots associated with local businesses.

Figures 9-20 through 9-22 at the end of the chapter graphically show the proposed traffic mitigation measures and their effects on on-street parking.

Mitigation– None required. The loss of parking as a result of traffic mitigation would be noticeable, but sufficient parking exists nearby such that no adverse impact will result from the loss of these parking spaces.

Light Rail to Englewood Route 4

This Build Alternative terminates at Englewood Route 4 Station. As no improvements are proposed north of Englewood Route 4 Station, no impacts to parking are anticipated.

Englewood Route 4 Station

Impacts **–** The Preferred Alternative will provide 870 parking spaces at the Englewood Route 4 Station. The station site parking area is designed to accommodate the maximum projected parking passengers. Since sufficient off-street parking will be provided for Englewood Route 4 Station, no significant adverse impacts related to parking are anticipated.

Proposed traffic mitigation would eliminate approximately 32 on-street parking spaces on South Dean Street. The loss of 32 parking spaces reduces parking capacity from approximately 394 to 362 on-street spaces within the one-third of a mile parking study radius. While the loss is not significant, as 52% of public parking spaces will remain available, the location of the loss would be a concern to the adjacent residents and businesses that rely on the parking for visitors or customers. However, the businesses do have a large lot behind the buildings and each of the residences has a driveway that can accommodate multiple vehicles. On-street parking for the visitors/customers would be available further up Dean Street, as well as west of the right-of-way on Forest Avenue.

Figures 9-13 and 9-14 at the end of the chapter graphically show the proposed traffic mitigation measures and their effect on on-street parking.

Mitigation – None required. The loss of parking as a result of traffic mitigation would be noticeable, but sufficient parking exists nearby such that no adverse impact will result from the loss of these parking spaces.

Englewood Town Center Station

Impacts – Since Light Rail to Englewood Route 4 terminates at the Englewood Route 4 Station, no parking needs or impacts would occur north of the Englewood Route 4 Station.

Mitigation – None required.

Englewood Hospital Station
Impacts – Since Light Rail to Englewood Route 4 terminates at the Englewood Route 4 Station, no parking needs or impacts would occur north of the Englewood Route 4 Station.

Mitigation – None required.

9.3.2.7. Tenafly

The stations proposed for Tenafly include a walk-up station and a station with parking provided on-site. Traffic mitigation will also affect existing on-street parking. Table 9-11 summarizes parking availability and parking loss anticipated for Tenafly as a result of the proposed project.

Table 9-11: Public Parking Availability and Parking Loss Summary for Tenafly

Station Area	Capacity	Existing/ No Build Available Parking	Parking Demand for Station	Loss of Parking Due to Project	Loss of Parking Due to Traffic Mitigation	Build w/ Mitigation Available Parking
Tenafly Town Center Station	1,314	807	40	15	35	**717**

Source: Jacobs, 2010

Existing Conditions

Tenafly Town Center Station
Within one-third of a mile from the station there are approximately 980 on-street parking spaces and 334 off-street spaces, totaling 1,314 spaces. The off-street parking is comprised of several small municipal lots, containing approximately 200 permit parking spaces and 134 free public spaces limited to three-hour parking. Based on the parking survey, of the 1,314 on- and off-street spaces that exist in the area, 507 spaces were occupied, leaving 807 spaces available during the peak period.

Tenafly North Station
The project will not result in the loss of any on-street parking, as described below. Therefore a parking analysis has not been conducted for this station area.

Potential Impacts and Mitigation

No Build Alternative
No change to parking demand is anticipated in the future without the proposed Northern Branch project.

Light Rail to Tenafly (Preferred Alternative)
Tenafly Town Center Station
Impacts – Throughout the day, it is expected that approximately 40 commuters would require parking in Tenafly to access the Light Rail. Tenafly Town Center Station is a designated walk-up station, where onsite parking would be restricted to handicap and short-term drop-off/pick-up parking locations. This parking area will displace a 15-space off-street lot operated by the Borough of Tenafly, reducing capacity from 1,314 to 1,299. Additional off-street parking will not be provided as part of the proposed project. Light Rail passengers seeking to park will utilize existing on-street and off-street municipal parking. As a result, available parking would be reduced from 807 to 752 spaces during the worst case peak period.

The roadway improvements associated with this station would further reduce parking capacity in the study area. More specifically, Piermont Road between West Clinton Avenue and Hillside Avenue

experiences the greatest loss in parking where 14 diagonal spaces are eliminated. In total, proposed roadway improvements result in a loss of 35 parking spaces. The loss of 35 parking spaces reduces parking capacity from approximately 1,299 to 1,263 total spaces. During the period of greatest occupancy, 717 spaces would be available within a one-third-mile distance of the station.

The percentage availability of spaces would be reduced from 61% in the No Build condition to 55% in the Build Condition with mitigation. The location of the lost parking would be a concern to the adjacent businesses and residents that rely on the parking for customers or visitors. However, the majority of the businesses have parking areas behind their buildings, and there exists an additional parking area between the railroad and Piermont Road.

Figures 9-25 and 9-26 at the end of the chapter graphically show the proposed traffic mitigation measures and the effects on parking.

Mitigation – None required. The loss of parking as a result of traffic mitigation would be noticeable, but sufficient parking exists nearby such that no adverse impact will result from the loss of these parking spaces.

Tenafly North Station
Traffic mitigation measures described in Section 9.2 will not result in the loss of any on-street parking. The proposed Tenafly North Station will provide 570 parking spaces on-site, meeting the projected parking demand. No impact to existing parking will result and no further analysis is required.

Light Rail to Englewood Route 4
This Build Alternative terminates at Englewood Route 4 Station. As no improvements are proposed north of Englewood Route 4 Station, no impacts to parking are anticipated, and no mitigation is required.

9.4. Summary of Environmental Effects

9.4.1. Traffic

Traffic on the local street network changes as a result of increased vehicular traffic to and from the proposed Northern Branch stations and increased grade crossing closures. In order to improve traffic conditions in the study area, mitigation measures have been proposed for the Build Alternatives. Mitigation measures focus on the addition of turning lanes or adjustments to turning movements, signalization of intersections, lane widening, and adjustment of signal timing. Table 9-12 summarizes the LOS for Existing Conditions, No Build, Build for each alternative, and Build with mitigation for each alternative.

Table 9-12: Level of Service Summary

Intersection	Existing (AM/PM)	No Build (AM/PM)	Build (AM/PM)		Build with Mitigation (AM/PM)	
			LR to Tenafly (PA)	LR to Eng. Rt 4	LR to Tenafly (PA)	LR to Eng. Rt 4
North Bergen						
(1) Tonnelle Avenue/91st Street	C/C	D/F	F/F		E/E	
(2) 85th Street and Tonnelle Avenue	A/A	A/A	F/F		C/C	
Ridgefield						
(3) Broad Avenue/Hendricks Causeway	C/C	E/E	F/E		E/E	
(4) Broad Avenue/Edgewater Avenue	C/D	E/D	F/E		D/E	
Palisades Park						
(5) Grand Avenue/Ruby Avenue	C/C	D/D	F/F		C/C	
(6) Grand Avenue/Fairview Avenue	C/C	E/D	F/F		F/F	
(7) Grand Avenue/Central Boulevard	D/C	E/E	F/F		E/E	
Leonia						
(8) Fort Lee Road/Overpeck Park Road	B/C	F/F	F/F		C/C	
(9) Fort Lee Rd/Station Pkwy/ Willow Tree Rd	C/C	D/F	F/F		D/E	
(10) Grand Avenue/Fort Lee Road	D/D	F/F	F/F		F/F	
Englewood						
(11) Nordhoff Pl./Van Brunt St.	B/B	C/F	F/F	F/F	C/C	D/D
(12) Forest Ave./South Dean St.	C/C	E/E	F/F	F/F	C/D	C/E
(13) Englewood Ave./Van Brunt St.	B/B	C/C	F/D	*NA*	D/C	*NA*
(14) Englewood Ave./South Dean St.	B/C	C/D	F/F	*NA*	D/D	*NA*
(15) Palisade Ave./North Dean St.	C/D	D/F	F/F	*NA*	D/E	*NA*
(16) Palisade Ave./Van Brunt St.	B/B	D/C	F/D	*NA*	D/C	*NA*
(17) Demarest Ave./Van Brunt St.	B/B	B/B	F/C	*NA*	D/C	*NA*
(18) Demarest Ave./North Dean St.	B/B	C/C	F/F	*NA*	D/D	*NA*
(19) Hamilton Ave./North Dean St.	B/B	C/B	E/E	*NA*	B/B	*NA*
(20) Hudson Ave./Curry Ave.	C/C	C/C	E/D	*NA*	D/C	*NA*
(21) Hudson Ave./North Dean St.	C/C	D/D	F/F	*NA*	D/D	*NA*
(22) Ivy Ln./Curry Ave.	C/C	C/C	D/C	*NA*	D/C	*NA*
(23) Ivy Ln./North Dean St.	C/C	C/D	F/F	*NA*	D/D	*NA*
Tenafly						
(24) East Clinton Avenue/New Street	B/A	D/B	D/C	*NA*	*NA*	*NA*
(25) West Railroad Ave/West Clinton Ave/Franklin St	C/C	D/E	F/F	*NA*	F/F	*NA*
(26) Clinton Ave/County Rd/Piermont Rd	D/D	E/D	F/F	*NA*	F/E	*NA*
(27) Washington St/West Railroad Ave	D/D	D/D	E/E	*NA*	E/E	*NA*
(28) Washington St/Hillside Ave/ Piermont Rd/Highwood Rd	C/C	C/D	D/D	*NA*	D/C	*NA*
(29) Riveredge Rd/Jay St/W Railroad Ave	C/C	D/E	D/D	*NA*	D/D	*NA*
(30) Riveredge Rd/Jay St/Piermont Rd	A/A	B/B	E/D	*NA*	*NA*	*NA*
(31) Central Ave/West Railroad Ave	A/A	B/A	D/C	*NA*	C/C	*NA*
(32) Central Avenue/Piermont Road	B/B	C/C	D/D	*NA*	C/C	*NA*
(33) Piermont Road/Hudson Avenue	B/B	B/C	C/D	*NA*	NA	*NA*
(34) Piermont Road/North Summit Street	B/B	B/C	F/F	*NA*	B/C	*NA*
(35) Piermont Road/Madison Avenue	D/C	F/D	F/E	*NA*	D/E	*NA*
(36) Piermont Road/Union Avenue	C/C	C/C	F/E	*NA*	D/D	*NA*
(37) County Road/North Summit Street	C/C	F/E	F/F	*NA*	B/C	*NA*

Source: Jacobs, 2010

Without the implementation of any mitigation measures, 31 intersections reflect failing conditions in Light Rail to Tenafly (Preferred Alternative) and 17 in Light Rail to Englewood Route 4. With mitigation, the number of failing intersections is reduced to 12 in Light Rail to Tenafly (Preferred Alternative) and 12 in Light Rail to Englewood Route 4 (Refer to Table 9-13).

Table 9-13: Failing Intersections – No Build, Build, Build with Mitigation

Location	No Build	Build		Build with Mitigation	
		LR to Tenafly (PA)	LR to Eng. Rt 4	LR to Tenafly (PA)	LR to Eng. Rt 4
North Bergen	1	2	2	0	0
Fairview	0	0	0	0	0
Ridgefield	0	2	2	0	0
Palisades Park	0	3	3	1	1
Leonia Station	3	3	3	1	1
Englewood	2	10	2	0	0
Tenafly	2	6	NA	2	NA
TOTAL	8	26	12	4	2

Source: Jacobs, 2010

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. Table 9-14 summarizes the proposed mitigation by municipality and intersection. Additionally, the signals on either side of the grade crossings in Leonia, Englewood, and Tenafly are proposed to be synchronized with the crossing to allow north/south travel during the closed crossing times.

Table 9-14: Summary of Recommended Mitigation Measures

Intersection	Mitigation	
	LR to Tenafly (Preferred Alternative)	LR to Eng Rt 4
North Bergen		
(1) Tonnelle Avenue/91st Street	Add EB, WB, SB turning lanes and signal timing modification	
(2) 85th Street and Tonnelle Avenue	Mirror current 83rd intersection: add right turn lane on SB approach; add left turn lane on NB approach; EB split into two lanes, one to turn left, one to turn right; signal timing to allow protected left turns.	
Ridgefield		
(3) Broad Avenue/Hendricks Causeway	Signal timing modification	
(4) Broad Avenue/Edgewater Avenue	Add EB and WB turning lanes and improve to actuated signal	
Palisades Park		
(5) Grand Avenue/Ruby Avenue	Add EB, WB, and NB turning lanes, and signal	
(6) Grand Avenue/Fairview Avenue	Add EB and NB travel lanes	
(7) Grand Avenue/Central Boulevard	Add semi-actuated signal	
Leonia		
(8) Fort Lee Road/Overpeck Park Road	Add EB, WB, SB, NB turning lanes, and improve to actuated signal	
(9) Fort Lee Rd/Station Pkwy/Willow Tree Rd	Add EB, WB, NB, SB turning lanes and improve to actuated signal	
(10) Grand Avenue/Fort Lee Road	Add WB turn lane	
Englewood		
(11) Nordhoff Pl./Van Brunt St.	Add WB turn lane and add semi-actuated signal	
(12) Forest Ave./South Dean St.	Add SB and WB turn lane and improve signal timing	

Table 9-14: Summary of Recommended Mitigation Measures (*continued*)

Intersection	Mitigation	
	LR to Tenafly (Preferred Alternative)	**LR to Eng Rt 4**
(13) Englewood Ave./Van Brunt St.	Add EB and WB turn lanes	*None*
(14) Englewood Ave./South Dean St.	Add SB and WB turn lanes, and improve signal timing	
(15) Palisade Ave./North Dean St.	Add EB, WB, SB turn lanes	*None*
(16) Palisade Ave./Van Brunt St.	Add EB, WB turn lanes, relocate ped. crossing at Nathaniel Place, and add ped. crossing at Humphrey Street	*None*
(17) Demarest Ave./Van Brunt St.	Add EB turn lane, and signal	*None*
(18) Demarest Ave./North Dean St.	Striping of SB approach	*None*
(19) Hamilton Ave./North Dean St.	Add SB turn lane and SB receiving lane	*None*
(20) Hudson Ave./Curry Ave.	Add EB travel lane	*None*
(21) Hudson Ave./North Dean St.	Add SB and EB travel lanes	*None*
(22) Ivy Lane./Curry Ave.	Change signal timing	*None*
(23) Ivy Lane./North Dean St.	Add SB travel lane	*None*
Tenafly		
(24) East Clinton Avenue/New Street	*None*	*None*
(25) West Railroad Ave/West Clinton Ave/Franklin St	Add EB and WB turn lane, and add signal with pre-emption	*None*
(26) Clinton Ave/County Rd/Piermont Rd	Add SB travel lane at County Road, add 2 SB travel lanes at Piermont Road	*None*
(27) Washington St/West Railroad Ave	Add EB, WB, SB turn lanes	*None*
(28) Washington St/Hillside Ave/ Piermont Rd/Highwood Rd	Add EB turn lane	*None*
(29) Riveredge Rd/Jay St/W Railroad Ave	Add WB and NB turn lanes	*None*
(30) Riveredge Rd/Jay St/Piermont Rd	*None*	*None*
(31) Central Ave/West Railroad Ave	Add EB and WB travel lanes, and NB turn lane and add signal	*None*
(32) Central Avenue/Piermont Road	Add EB, WB, SB travel lanes, and signal	*None*
(33) Piermont Road/Hudson Avenue	*None*	*None*
(34) Piermont Road/North Summit Street	Add SB turn lane, and signal	*None*
(35) Piermont Road/Madison Avenue	Add EB travel lane, WB turn lane, change signal timing	*None*
(36) Piermont Road/Union Avenue	Add EB and SB turn lanes, prohibit EB right turn, and change signal timing	*None*
(37) County Road/North Summit Street	Add a signal	*None*

Source: Jacobs, 2010

9.4.2. Parking

The mitigated conditions, particularly the result of the addition of lanes near intersections, will result in the loss of 225 parking spaces in the vicinity of the station sites. This circumstance is a factor in relation to the proposed walk-up stations at Englewood Town Center, Englewood Hospital, and Tenafly Town Center, as well as mitigation associated with the Englewood Route 4 station. Although there will be some loss of on-street parking, it is anticipated that the additional parking need generated by Light Rail to Tenafly (Preferred Alternative) will not result in a parking shortage, as summarized in Table 9-15. Since Light Rail to Englewood Route 4 terminates at the proposed Englewood Route 4 Station, traffic mitigation, and removal of parking, will not be necessary north of Route 4 (Refer to Table 9-16).

Table 9-15: Parking Loss Summary for Light Rail to Tenafly (Preferred Alternative)

Location	Capacity	Existing/No Build Available Parking	Loss of Parking Due to Project and Traffic Mitigation	Parking Demand for Station	Build w/ Mitigation Available Parking
Englewood Route 4 Station	692	394	32	0	**362**
Englewood Town Center Station	1711	823	128	70	**625**
Englewood Hospital Station	934	626	15	0	**611**
Tenafly Town Center Station	1314	807	50	40	**717**

Source: Jacobs, 2010.

Table 9-16: Parking Loss Summary for Light Rail to Englewood Route 4

Location	Capacity	Existing/No Build Available Parking	Loss of Parking Due to Project and Traffic Mitigation	Parking Demand for Station	Build w/ Mitigation Available Parking
Englewood Route 4 Station	692	394	32	0	**362**
Englewood Town Center Station	1711	823	0	0	**823**
Englewood Hospital Station	934	626	0	0	**626**
Tenafly Town Center Station	1314	807	0	0	**807**

Source: Jacobs, 2010.

NJ TRANSIT will meet with each municipality to discuss the impacts associated with the above loss of parking. Public outreach to discuss the potential impacts has consisted of meetings with elected official, business administrators, town councils, CLC meetings, and when invited, public information sessions. The topic of traffic and parking has been a common topic and will continue to be discussed at future meetings.