

# *Hewlett Traffic Study*

Nassau County, New York

Submitted to

Nassau County Planning Department  
Nassau County Department of Public Works  
New York Metropolitan Transportation Council

Prepared by

 *Engineering, Surveying and Landscape Architecture, P.C.*

2150 Joshua's Path, Suite 300  
Hauppauge, New York 11788  
(631) 234-3444



December 31, 2009

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# 1

## Introduction

This report summarizes the traffic study undertaken to improve the traffic flow conditions in the hamlet of Hewlett, Town of Hempstead, Nassau County, New York. The study quantifies existing and projected traffic conditions and compares changes in operating conditions with the proposed alternative options. The purpose of this study is to identify and evaluate alternative plans of mitigation to improve the travel time on each of the three arterial segments. This report presents the findings of the traffic study and summarizes the data collection process, traffic analysis procedures, and study conclusions.

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### Project Description

VHB Engineering, Surveying and Landscape Architecture, P.C. (VHB) has performed the Hewlett Traffic Study under the auspices of the Nassau County Planning Department and the Nassau County Department of Public Works to identify traffic problems in the Hewlett community and to develop solutions to help ease congestion. If left unaddressed, the congestion will worsen in time. An assessment was made of the constraints to flow of traffic on three arterial segments - Broadway from East Rockaway Road to Woodmere Boulevard; West Broadway from Broadway to Woodmere Boulevard; and Woodmere Boulevard from West Broadway to Broadway, in the hamlet of Hewlett located in southwestern Nassau County, New York. The study area roadways included in the project consist of 28 intersections, signalized and unsignalized.

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### Study Methodology

The methodology used in this traffic study consisted of the following items:

- The related documents provided by Nassau County were reviewed to obtain an understanding of the scope of the project.
- Three arterials were identified which run through the Hewlett central business district and serve the two Long Island Rail Road stations at Hewlett and Woodmere. Those arterials are Broadway, West Broadway and Woodmere Boulevard. The study area extends along Broadway from Woodmere Blvd to East Rockaway Road; along West Broadway from Woodmere Boulevard to Broadway; and along Woodmere Boulevard from Broadway to West Broadway.
- Within this study area, 28 intersections were identified along the three arterials as key intersections for detailed analysis. Of these, there were 15 intersections along Broadway at: East Rockaway, Everit Avenue, West Broadway, Piermont Avenue, Ives Avenue, Franklin Avenue, Crescent Street, Trinity Place, Johnson Place, Hartwell Place, Conklin Avenue, Franklin Place, Irving Place/Brower Avenue, Lafayette Boulevard and Woodmere Boulevard; along West Broadway there were ten intersections at: Harris Avenue, Mill Road, Hewlett Parkway, Franklin Avenue, Serena Road, Felter Avenue, Eastwood Road, Irving Place, Westwood Road and Woodmere Boulevard; and three intersections on Woodmere Boulevard at: Central Avenue, Cedar Lane and Station Plaza.
- The prevailing traffic conditions, geometric parameters, and on-street parking along the three arterials were observed in the field.
- Field inventories were made of geometric features, traffic control devices and the number and direction of travel lanes at and near the key intersections.
- Manual turning movement counts were collected at the key intersections during typical weekday AM, Midday and PM peak periods.
- 24 hour counts of the traffic on the three arterials were made using automatic traffic recorders.
- Travel times were recorded to assess the length of time it took to travel on each of the three arterial segments from one end of the study area to the other.
- The background traffic was adjusted to the project build year 2015 to obtain No Build volumes.
- Signal timing sheets were obtained from the Nassau County Department of Public Works.

- The traffic analysis software package Synchro was used to model and analyze the three arterials and its companion software SimTraffic was used to simulate the traffic.
- The travel times were developed for the projected future traffic in 2015.
- The major issues were identified at the various intersections along the three arterial segments.
- Possible options to mitigate the issues were identified.
- Two alternatives options were developed to improve the flow conditions and travel times on the three arterial segments.
- Time space diagrams were developed and evaluated for the alternatives.

# 2

## Existing Conditions

Evaluation of the transportation impacts associated with the proposed alternatives requires a thorough understanding of the current transportation system in the study area. An inventory of available information on local roadways, traffic control, and traffic signal parameters in the vicinity of the proposed development was compiled.

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### Roadway and Intersection Conditions

The study area, as shown in Figure 1 (all figures can be found in Appendix A), is located in the central business district of the hamlet of Hewlett. The principal roadways and intersections in the study area are described below. The descriptions of the three principal arterials and study intersections include the geometric conditions and traffic control characteristics.

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#### Broadway

*Broadway* is a major north-south arterial under the jurisdiction of the Nassau County. It extends from Sunrise Highway in a southwesterly direction to the Nassau Expressway. The posted speed limit on the section of the road under study is 30 miles per hour. The Automatic Traffic Recorder tube counts conducted during April 2007 show that the AADT on the section of Broadway between East Rockaway and West Broadway to be 30,263 vehicles per day. The AADT on the section between West Broadway and Woodmere Boulevard is 18,704 vehicles per day. Broadway provides one travel lane in each direction through most of the study area.

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#### West Broadway

*West Broadway* is an east-west arterial under the jurisdiction of the Nassau County. It runs in a southwesterly direction from Broadway to Rockaway Turnpike. The posted

speed limit on the section of the road under study is 30 miles per hour. The Automatic Traffic Recorder tube counts conducted during April 2007 show that the AADT on the section of West Broadway west of Mill Road to be 21,332 vehicles per day. West Broadway provides one travel lane in each direction.

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### Woodmere Boulevard

*Woodmere Boulevard* is a north-south collector distributor under the jurisdiction of Nassau County. It runs north from Broadway and terminates in the residential area north of West Broadway. The posted speed limit on the section of the road under study is 30 miles per hour. The Automatic Traffic Recorder tube counts conducted during April 2007 show that the AADT on the section of Woodmere Boulevard under study to be 6,814 vehicles per day.

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### Study Intersections

The following key intersections were modeled and analyzed for the Existing, No Build and Build conditions:

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### Broadway at East Rockaway Road





The signalized intersection of Broadway and East Rockaway Road is a T-intersection with Broadway running north-south. The northbound approach provides two through lanes and a right turn lane, the southbound approach provides a left turn lane and two through lanes and westbound East Rockaway Road provides a shared left and right turn lane.

The intersection is controlled by a three phase signal. The phasing is southbound left and through movement leads, followed by the north-south movement with permitted southbound left turns, and then the westbound movement with northbound right turn movement overlapping.

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### Broadway at Everit Avenue



The signalized intersection of Broadway and Everit Avenue is a four-legged intersection with Broadway running north-south. The north and southbound approaches provide a shared left turn and through lane and a shared through and right turn lane. The eastbound Everit Avenue approach to the intersection provides a shared left, through and right turn lane and the westbound Everit Avenue approach provides a left turn lane and a shared through and right turn lane.

The intersection is controlled by a three phase signal. The phasing is a northbound left and through movement leads followed by a north-south movement with permitted northbound left turns and then an east-west movement.

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## Triangle Intersections



Broadway at Piermont Avenue and West Broadway at Harris Avenue. Each one of the intersections is three-legged. In the report the area is referred to as the Triangle. The signals at the three triangle intersections share the same controller and operate with tight coordination.

**Broadway at West Broadway** - The signalized intersection of Broadway and West Broadway is a three-legged intersection with Broadway running north-south. The northbound approach provides two through lanes and the southbound approach provides a through lane, a shared through and right turn lane and a right turn lane. The eastbound West Broadway approach to the intersection provides two left turning lanes for traffic merging onto Broadway.

The phasing at this intersection is a north-south movement on Broadway followed by an eastbound movement on West Broadway overlapped by a southbound right turn movement onto West Broadway.

**Broadway at Piermont Avenue** - The signalized intersection of Broadway and Piermont Avenue is a three-legged intersection with Broadway running north-south. The north and the southbound approaches provide a shared left turn and through lane, a through lane and a shared through and right turn lane. The southeast bound Piermont Avenue approach to the intersection provides a left turn lane and a shared

through and right turn lane. The northwest bound Piermont Avenue approach provides a shared left turn, through and a right turn lane.

The phasing at this intersection is a north-south movement on Broadway followed by a leading southeast movement on Piermont Avenue followed by northwest-southeast movements on Piermont Avenue.

**West Broadway at Harris Avenue** - The signalized intersection of West Broadway and Harris Avenue is a three-legged intersection with West Broadway running east-west. The eastbound approach provides a left turn lane, a through lane and a shared through and right turn lane. The westbound approach provides two through lanes and a right turn lane for traffic turning onto Harris Avenue. The northbound approach to the intersection provides a shared left turn, a through lane and a right turn lane. The southbound Harris Avenue approach provides a shared left turn, through lane and right turn lane.

The phasing at this intersection is an eastbound protected left and through movement followed by an east-west movement with permitted left turn movements and then a north-south movement on Harris Avenue with permitted left turn movements followed by a westbound movement in coordination with the southbound right movement at Broadway and West Broadway.

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## Broadway at Ives Road





The intersection of Broadway and Ives Road is an unsignalized T-intersection with Broadway running north-south. The northbound approach provides a shared through and right turn lane and the southbound approach provides a shared left turn and through lane. The westbound Ives Road approach provides a shared left turn and right turn lane.

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### Broadway at Franklin Avenue



The signalized intersection of Broadway and Franklin Avenue is a four-legged intersection with Broadway running north-south. All four approaches provide a shared left turn, through and right turn lane.

The intersection is controlled by a two phase signal. The phasing at this intersection is a north-south movement on Broadway with permitted left turn movement followed by an east-west movement on Franklin Avenue with a permitted left turn movement.

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Broadway at Crescent Street



The intersection of Broadway and Crescent Street is an unsignalized T-intersection with Broadway running north-south. The northbound approach provides a shared through and right turn lane and the southbound approach provides a shared left turn and through lane. The westbound Crescent approach is one-way for eastbound traffic only.

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Broadway at Trinity Place





Broadway running north-south. The northbound approach provides a shared through and right turn lane and the southbound approach provides a shared left turn and through lane. The westbound Trinity Place approach provides a shared left turn and right turn lane.

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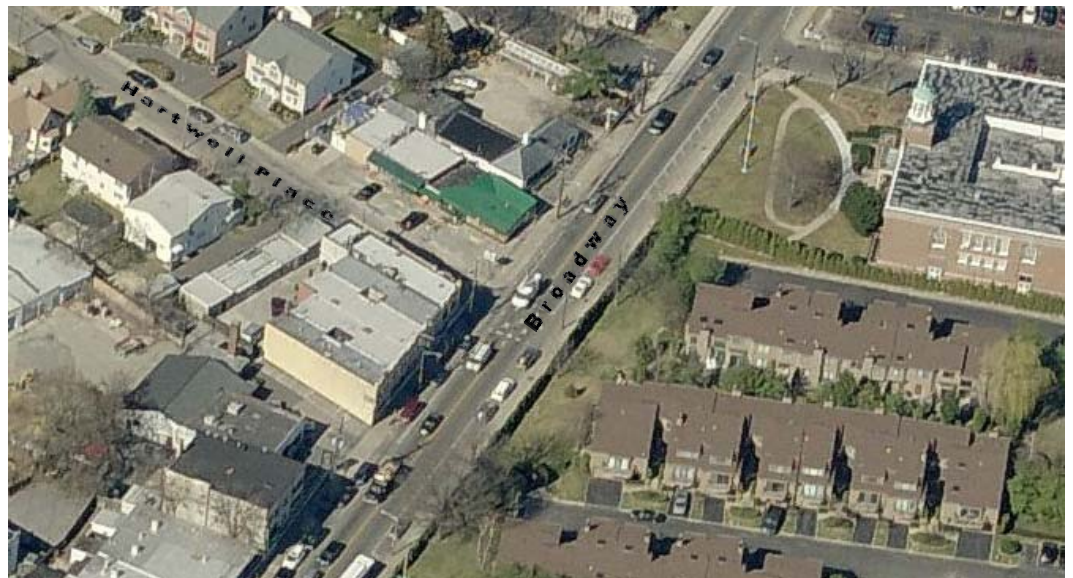
## Broadway at Johnson Place



The intersection of Broadway and Johnson Place is an unsignalized T-intersection with Broadway running north-south. The northbound approach provides a shared through and right turn lane and the southbound approach provides a shared left turn and through lane. The westbound Johnson Place approach provides a shared left turn and right turn lane.

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## Broadway at Hartwell Place



The intersection of Broadway and Hartwell Place is an unsignalized T-intersection with Broadway running north-south. The northbound approach provides a shared left turn and through lane and the southbound approach provides a shared through and right turn lane. The eastbound Hartwell Place approach provides a shared left turn and right turn lane.

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### Broadway at Conklin Avenue



The intersection of Broadway and Conklin Avenue is a signalized T-intersection with Broadway running north-south. The northbound approach provides a shared through and right turn lane and the southbound approach provides a shared left turn and through lane. The westbound Conklin Avenue approach provides a shared left turn and right turn lane.

The intersection is controlled by a two phase signal which also controls the signal immediately south of this intersection, Broadway at Franklin Place. The proximity of the signals and the geometry of these intersections calls for a tight coordination between them and hence the two signals share the same controller.



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## Broadway at Franklin Place



The intersection of Broadway and Franklin Place is a signalized T-intersection with Broadway running north-south. The northbound approach provides a shared left turn and through lane and the southbound approach provides a shared through and right turn lane. The eastbound Franklin Place approach provides a shared left turn and right turn lane.

The intersection is controlled by a two phase signal which also controls the signal immediately north of this intersection, Broadway at Conklin Avenue. The proximity of the signals and the geometry calls for a tight coordination between them and hence the two signals share the same controller.



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Broadway at Irving Place / Brower Avenue



The intersection of Broadway and Irving Place and Brower Avenue is an offset four-way signalized intersection with Broadway running north-south. Brower Avenue runs east from Broadway and Irving Place runs north-west from Broadway. Each approach consists of a shared left turn, through, and right turn lane. The intersection is controlled by a two phase signal.

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Broadway at Lafayette Boulevard / Burton Avenue



The intersection of Broadway and Lafayette Boulevard and Burton Avenue is an offset four-way unsignalized intersection with Broadway running north-south. Burton Avenue is a one-way street in the westbound direction east of Broadway. Lafayette Boulevard runs west from Broadway. Both Lafayette Boulevard and Burton Avenue are stop controlled. The Broadway approaches consist of one lane for all movements. Similarly, Lafayette Boulevard has one approach lane for all movements. Burton Avenue is not striped but there is enough pavement width that it effectively acts as two approach lanes, for left and right turns onto Broadway.

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### Broadway at Woodmere Boulevard



The intersection of Broadway and Woodmere Boulevard is a signalized four-way intersection. Due to the geometry and the direction of the intersecting roads Broadway is analyzed as an east-west road and Woodmere Avenue as a north-south road. Each approach consists of a shared left turn, through, and right turn lane. The intersection is controlled by a two phase signal.



## West Broadway at Mill Road



The intersection of West Broadway and Mill Road is a signalized T-intersection with West Broadway running north-south. The eastbound approach provides one left turn lane and one through lane. The westbound approach consists of a through lane and a shared through and right turn lane. Southbound Mill Road provides one left turn lane and one right turn lane.

The intersection is controlled by a three phase signal. The phasing is east-west through movement with permitted eastbound left followed by a lagging eastbound protected left turn movement and through with southbound right overlap and then a southbound movement.

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### West Broadway at Hewlett Parkway



The intersection of West Broadway and Hewlett Parkway is an unsignalized T-intersection with West Broadway running east-west. The eastbound approach provides a shared left turn and through lane and a through lane. The westbound approach provides a through lane and a shared through and right turn lane. Southbound Hewlett Parkway provides a shared left turn and right turn lane.

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### West Broadway at Franklin Avenue



The intersection of West Broadway and Franklin Avenue is a signalized four-way intersection. West Broadway runs east-west and Franklin Avenue runs north-south.



The eastbound West Broadway approach provides one shared approach lane for all movements. Westbound West Broadway provides one left turn lane and one shared through and right turn lane. Southbound Franklin Avenue consists of one shared approach lane for all movements. Northbound Franklin Avenue consists of one left turn lane and one through and right turn lane.

The intersection is controlled by a three phase signal. The phasing is westbound protected left and through followed by east-west movement with permitted westbound left turns followed by north-south movement.

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### West Broadway at Serena Road



The intersection of West Broadway and Serena Road is an unsignalized T-intersection with West Broadway running east-west. The eastbound West Broadway approach consists of one shared left turn and through lane. Westbound West Broadway provides one shared through and right turn lane. Southbound Serena Road is a one-way for northbound traffic only.

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### West Broadway at Felter Avenue



The intersection of West Broadway and Felter Avenue is an unsignalized T-intersection with West Broadway running east-west. The eastbound West Broadway approach consists of one shared left turn and through lane. Westbound West Broadway provides one shared through and right turn lane. Southbound Felter Avenue provides a shared left turn and right turn lane.

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### West Broadway at Eastwood Road





The intersection of West Broadway and Eastwood Road is an unsignalized T-intersection with West Broadway running east-west. The eastbound West Broadway approach consists of one shared left turn and through lane. Westbound West Broadway provides one shared through and right turn lane. Southbound Eastwood Road provides a shared left turn and right turn lane.

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### West Broadway at Irving Place



The intersection of West Broadway and Irving Place is a signalized T-intersection with West Broadway running east-west. The eastbound West Broadway approach provides one shared through and right turn lane. The westbound West Broadway approach consists of a shared left turn and through lane. The northbound Irving Place approach provides a shared left turn and right turn lane. The intersection is controlled by a two phase signal.

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West Broadway at Westwood Road/Mosher Avenue



The intersection of West Broadway and Westwood Road/Mosher Avenue is an off-set unsignalized T-intersection with West Broadway running east-west. The eastbound West Broadway approach consists of one shared left turn and through and right turn lane. Westbound West Broadway provides shared left turn and through and right turn lane. Both the Westwood Road and Mosher Avenue approaches provide shared left turn and through and right turn lane.

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West Broadway at Woodmere Boulevard





The intersection of West Broadway and Woodmere Boulevard is a signalized four-way intersection. West Broadway runs east-west and Woodmere Boulevard runs north-south. The West Broadway approaches provide one shared approach lane for all movements. Southbound Woodmere Boulevard consists of one left turn lane and one shared through and right turn lane. Northbound Woodmere Boulevard also consists of one left turn lane and one through and right turn lane.

The intersection is controlled by a two phase signal.

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### Woodmere Boulevard at Central Avenue



The intersection of Woodmere Boulevard and Central Avenue is a signalized four-way intersection. Central Avenue runs east-west and Woodmere Boulevard runs north-south. The Central Avenue approaches provide one shared approach lane for all movements. The Woodmere Boulevard approaches also consist of one shared approach lane for all movements.

The intersection is controlled by a two phase signal.

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Woodmere Boulevard at Station Plaza



The intersection of Woodmere Boulevard and Station Plaza is an unsignalized 4-way intersection with Station Plaza running east-west. Station Plaza is a one-way street heading westbound at Woodmere Boulevard. The eastbound Railroad Avenue approach provides one shared left turn, through, and right turn lane. Both Woodmere Boulevard approaches provide a shared left turn, through, and right turn lane.

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Woodmere Boulevard at Cedar Lane



The intersection of Woodmere Boulevard and Station Plaza is an unsignalized 4-way intersection with Cedar Lane running east-west. The eastbound Cedar Lane approach consists of one shared left turn, through, and right turn lane. Westbound Cedar Lane provides one shared left turn, through, and right turn lane. Both Woodmere Boulevard approaches provide a shared left turn, through, and right turn lane.

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## Existing Traffic Volumes

Intersection turning movement counts were manually collected at the key intersections during a typical weekday morning from 7:00 a.m. to 9:00 a.m., weekday midday from 12:00 p.m. to 2:00 p.m., and a weekday evening from 4:00 p.m. to 6:00 p.m. These times reflect the heaviest traffic flows coinciding with commuter and shopping activities. The existing peak hour volumes for these periods are shown in Figures 2, 3 and 4. The detailed manual turning movement count data can be found in Appendix B.

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## ATR Data Collection

Automatic Traffic Recorders (ATR's) were placed at various locations of the study area to record traffic patterns in April 2007. The ATR data can be found in Appendix B. The locations of the ATR's were as follows:

- ..... West Broadway west of Eastwood Road
- ..... Broadway north of Brower Avenue
- ..... West Broadway east of Hamilton Avenue
- ..... Broadway north of Ives Road
- ..... Broadway south of East Rockaway Road
- ..... Woodmere Boulevard north of Central Avenue

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## Accident History

Accident data from the most recent available Nassau County Police Department records for the three year period from January 1, 2005 to December 31, 2007 was obtained and tabulated. Table 1 presents the accident data by severity and accident type. The data received from the NCPD can be found in Appendix B.

Table 1  
Accident Data

| SEGMENT   | Accident Severity |            |                 | Total      | Accident Type |            |           |            |              |            |            |                    |           |                |
|---|-------------------|------------|-----------------|------------|---------------|------------|-----------|------------|--------------|------------|------------|--------------------|-----------|----------------|
|   | Fatality          | Injury     | Property Damage |            | Right Angle   | Rear End   | Left Turn | Right Turn | Fixed Object | Overtaking | Backing Up | Pedestrian/Bicycle | Head On   | Other/ Unknown |
| Broadway – East Rockaway Road to Woodmere Boulevard | 0                 | 92         | 369             | <b>461</b> | 58            | 135        | 19        | 3          | 122          | 42         | 39         | 15                 | 10        | 18             |
| West Broadway – Broadway to Woodmere Boulevard      | 0                 | 48         | 154             | <b>202</b> | 36            | 89         | 8         | 5          | 26           | 12         | 14         | 5                  | 2         | 5              |
| Woodmere Boulevard – Broadway to West Broadway      | 0                 | 14         | 33              | <b>47</b>  | 14            | 15         | 2         | 2          | 1            | 4          | 2          | 0                  | 1         | 6              |
| <b>Total</b>  | <b>0</b>          | <b>154</b> | <b>556</b>      | <b>710</b> | <b>108</b>    | <b>239</b> | <b>29</b> | <b>10</b>  | <b>149</b>   | <b>58</b>  | <b>55</b>  | <b>20</b>          | <b>13</b> | <b>29</b>      |

On the three roadway segments analyzed for this project, a total of 710 accidents occurred during the study time period. There were no fatalities, 154 accidents resulted in personal injuries, and 556 accidents involved property damage. The most frequent accident types were rear end (239 accidents) followed by fixed object (149 accidents).

The Nassau County Police Department accident data does not differentiate between property damage accidents and non-reportable accidents. Non-reportable accidents are defined by New York State to be accidents involving no injuries and property damage of under \$2,000.00. The New York state-wide average accident rate excludes non-reportable accidents. To account for this practice in developing the accident rate analysis, it was assumed that one-half of the reported property damage accidents by NCPD are non-reportable.

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### Accident Rates

Accident rates were calculated for each of the study arterials based on the accident records provided by the Nassau County Police Department and traffic volume data collected by the Automatic Traffic Recorders. The rates were calculated to determine the number of accidents per million vehicle miles (ACC/MVM) to normalize the

results to account for traffic volumes and the length of the roadways. The results were then compared to New York state-wide averages for similar facilities, as published by the New York State Department of Transportation.

Broadway (East Rockaway Road to Woodmere Boulevard)

Length of the roadway segment: 1.06 miles

Average Daily Traffic: 18,704 vehicles (April 2007 ATR Data)

Total number of accidents: 461

Total number of non-reportable accidents (assumed): 184

$$\text{Accident Rate} = \frac{\text{Total Accidents}}{365 \text{ days} \times 3 \text{ years} \times \text{AADT} \times \text{Length of segment}} \times (1,000,000)$$

Accident Rate = 12.76 ACC/MVM

NYS average: 2 lane undivided free access facility: 1.98 ACC / MVM

West Broadway (Broadway to Woodmere Boulevard)

Length of the roadway segment: 0.80 miles

Average Daily Traffic: 21,332 vehicles (April 2007 ATR Data)

Total number of accidents: 202

Total number of non-reportable accidents (assumed): 77

$$\text{Accident Rate} = \frac{\text{Total Accidents}}{365 \text{ days} \times 3 \text{ years} \times \text{AADT} \times \text{Length of segment}} \times (1,000,000)$$

Accident Rate = 6.69 ACC/MVM

NYS average: 2 lane undivided free access facility: 1.98 ACC / MVM

Woodmere Boulevard (Broadway to West Broadway)

Length of the roadway segment: 0.39 miles

Average Daily Traffic: 6,814 vehicles (April 2007 ATR Data)

Total number of accidents: 47

Total number of non-reportable accidents (assumed): 16

$$\text{Accident Rate} = \frac{\text{Total Accidents}}{365 \text{ days} \times 3 \text{ years} \times \text{AADT} \times \text{Length of segment}} \times (1,000,000)$$

Accident Rate = 10.65 ACC/MVM

NYS average: 2 lane undivided free access facility: 1.98 ACC / MVM



While the calculations yielded significantly higher results than the state-wide average rates, they are not surprising given the nature of the roads under study. State-wide rates for two-lane roadways are based on this type of roadway in urban areas throughout New York State. However, these arterials traversing the Hewlett community are intersected by cross streets at such frequent intervals, they are essentially continuous intersections without any significant distance between the intersections, thus raising the accident rate. Given the high traffic volumes and congestion of the area and the predominance of rear-end type accidents, these higher than average rates are to be expected.

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## Software

As specified in the scope of the project, the three arterial segments were modeled and the analyses conducted using specific traffic analysis and simulation software. Since the conclusions drawn from this study are based on results from SimTraffic simulation, it is necessary to highlight the differences between Synchro and SimTraffic software packages and to explain the use of SimTraffic results versus Synchro results.

The traffic analysis software Synchro and its companion simulation software SimTraffic are computer programs developed by Trafficware Ltd. Synchro is a complete software package for modeling networks and optimizing traffic signal timing. Synchro adheres to and implements the guidelines and methods set forth in the 2000 Highway Capacity Manual, Chapters 16 and 17. Synchro is widely used when evaluating the ability of an intersection or roadway to efficiently handle the number of vehicles using the facility. It is also used when coordinating or optimizing signals in a network. Generically, Synchro is a macroscopic model. These models take into consideration the aggregate traffic stream characteristics (speed, flow, and density) and their relationships to each other. Typically, macroscopic models employ equations on the conservation of flow and on how traffic disturbances (shock waves) propagate in the system. They can be used to predict the spatial and temporal extent of congestion caused by traffic demand or incidents in a network. However, a major limitation of the macroscopic model is they cannot model the interactions of vehicles. Thus, in this case, Synchro is unable to identify or recognize gaps in a traffic flow. In order to obtain a perspective of the network or the intersection in a dynamic environment, other software has to be used to simulate the model.

For simulating the model, SimTraffic is a powerful traffic simulation and animation software program that takes into consideration vehicle and driver performance characteristics developed by the Federal Highway Administration. Simulation models are designed to emulate the behavior of traffic in a transportation network over time and space to predict system performance. Simulation models include the mathematical and logical abstractions of real-world systems implemented in computer software. Generically, SimTraffic is a microscopic model. Microscopic models simulate the characteristics and interactions of individual vehicles. They essentially produce trajectories of vehicles as they move through the network. The processing logic includes algorithms and rules describing how vehicles move and interact, including acceleration, deceleration, and lane changing and passing maneuvers. Every vehicle that enters the network is traced and the performance is recorded as it moves through the network until it exits. Thus the results from SimTraffic are found to be appropriate for this analysis.

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## Measure of Effectiveness

Based on the specific needs and the scope of this study, it was determined that travel time would be the preferred Measure of Effectiveness (MOE) to be used to compare the Existing, No Build and Build Alternatives. The travel times were obtained from SimTraffic simulations of the model for a perspective of the model in a dynamic mode. To avoid variation due to randomization, an average of 5 simulations were taken as the final result.

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## Time Travel Study

A travel time study was conducted on the three arterial segments of Broadway, West Broadway and Woodmere Boulevard. Three runs were made in each direction and Table 2 summarizes the average of the three runs. The signal delay is shown separately along with average travel time for the three runs and the average speed at which the segment was traversed. The detailed travel time study field summary sheets can be found in Appendix B.

Table 2  
Travel Time Study Results

| ARTERIAL DIRECTION       | END POINTS                         | MEASURE OF EFFECTIVENESS | AM PEAK HOUR | MIDDAY PEAK HOUR | PM PEAK HOUR |
|--------------------------|------------------------------------|--------------------------|--------------|------------------|--------------|
| BROADWAY NORTHBOUND      | Woodmere Blvd to E. Rockaway Ave.  | Signal Delay (sec)       | 68           | 169              | 268          |
|                          |                                    | Average Travel Time(sec) | 240          | 357              | 426          |
|                          |                                    | Average Speed (MPH)      | 15.9         | 10.7             | 9.0          |
| BROADWAY SOUTHBOUND      | E. Rockaway Ave. to Woodmere Blvd. | Signal Delay (sec)       | 138          | 162              | 166          |
|                          |                                    | Average Travel Time(sec) | 313          | 344              | 352          |
|                          |                                    | Average Speed (MPH)      | 12.3         | 11.1             | 10.9         |
| WEST BROADWAY EASTBOUND  | Woodmere Blvd to Broadway          | Signal Delay (sec)       | 54           | 124              | 414          |
|                          |                                    | Average Travel Time(sec) | 162          | 241              | 536          |
|                          |                                    | Average Speed (MPH)      | 17.7         | 11.9             | 5.3          |
| WEST BROADWAY WESTBOUND  | Broadway to Woodmere Blvd.         | Signal Delay (sec)       | 55           | 29               | 74           |
|                          |                                    | Average Travel Time(sec) | 161          | 135              | 193          |
|                          |                                    | Average Speed (MPH)      | 17.8         | 21.2             | 14.8         |
| WOODMERE BLVD NORTHBOUND | Broadway to W. Broadway            | Signal Delay (sec)       | 42           | 43               | 22           |
|                          |                                    | Average Travel Time(sec) | 109          | 101              | 83           |
|                          |                                    | Average Speed (MPH)      | 13.0         | 14.0             | 17.0         |
| WOODMERE BLVD SOUTHBOUND | W. Broadway to Broadway            | Signal Delay (sec)       | 52           | 12               | 52           |
|                          |                                    | Average Travel Time(sec) | 118          | 71               | 117          |
|                          |                                    | Average Speed (MPH)      | 12.0         | 19.8             | 12.0         |

Table 2 shows that during AM peak hour the Broadway southbound direction has the highest delay. During midday peak the delays on Broadway northbound and southbound directions and eastbound on West Broadway are almost similar. During the PM peak hour, the eastbound direction on West Broadway has the highest delays, followed by the two directions on Broadway.

### Existing Condition Results

The existing conditions were modeled and simulated and the travel time measure of effectiveness was obtained. Table 3 summarizes the results for both directions for each of the arterials for the AM, Midday and PM peak hours.



**Table 3**  
Existing Travel Times from the Simulation

| ARTERIAL / DIRECTION     | LIMITS                             | MEASURE OF EFFECTIVENESS* | Existing 2007 |        |      |
|--------------------------|------------------------------------|---------------------------|---------------|--------|------|
|                          |                                    |                           | AM            | Midday | PM   |
| BROADWAY NORTHBOUND      | Woodmere Blvd to E. Rockaway Ave.  | Signal Delay (sec)        | 174           | 158    | 254  |
|                          |                                    | Average Travel Time(sec)  | 315           | 298    | 395  |
|                          |                                    | Average Speed (MPH)       | 14.0          | 14.0   | 11.0 |
| BROADWAY SOUTHBOUND      | E. Rockaway Ave. to Woodmere Blvd. | Signal Delay (sec)        | 581           | 289    | 548  |
|                          |                                    | Average Travel Time(sec)  | 724           | 431    | 690  |
|                          |                                    | Average Speed (MPH)       | 7.0           | 10.0   | 7.0  |
| WEST BROADWAY EASTBOUND  | Woodmere Blvd to Broadway          | Signal Delay (sec)        | 234           | 160    | 1667 |
|                          |                                    | Average Travel Time(sec)  | 331           | 258    | 1768 |
|                          |                                    | Average Speed (MPH)       | 14.0          | 14.0   | 4.0  |
| WEST BROADWAY WESTBOUND  | Broadway to Woodmere Blvd.         | Signal Delay (sec)        | 72            | 58     | 124  |
|                          |                                    | Average Travel Time(sec)  | 172           | 157    | 226  |
|                          |                                    | Average Speed (MPH)       | 18.0          | 19.0   | 13.0 |
| WOODMERE BLVD NORTHBOUND | Broadway to W. Broadway            | Signal Delay (sec)        | 66            | 68     | 80   |
|                          |                                    | Average Travel Time(sec)  | 121           | 124    | 136  |
|                          |                                    | Average Speed (MPH)       | 14.0          | 14.0   | 13.0 |
| WOODMERE BLVD SOUTHBOUND | W. Broadway to Broadway            | Signal Delay (sec)        | 69            | 60     | 72   |
|                          |                                    | Average Travel Time(sec)  | 120           | 111    | 125  |
|                          |                                    | Average Speed (MPH)       | 14.0          | 15.0   | 13.0 |

\*Average Travel Time is an average of 5 simulations

The travel times obtained from the simulation, when compared to the field travel time study, varied. As the travel time study was not performed on the same day as the traffic data was collected, that is to be expected. The software results are based on the vehicle volumes on the day the traffic counts were taken.

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### Choke Points

The existing models were analyzed and the following choke points were identified on the three arterial segments. The choke points varied throughout the three peak periods. A choke point identified during the AM peak may not be a choke point during the PM peak. The list identifies a location as a choke point based on flow of

traffic through the point measured by the speed during any of the peak periods.

Table 4 lists the choke points identified.

**Table 4**  
**Choke Points**

| Arterial                        | Choke Points   | Arterial                       | Choke Points   |
|---------------------------------|--|--------------------------------|--|
| <b>Broadway Northbound</b>      | Woodmere Boulevard<br>Franklin Place<br>Franklin Avenue<br>Piermont Avenue   | <b>West Broadway Eastbound</b> | Woodmere Boulevard<br>Mosher/Westwood Road<br>Irving Place<br>Eastwood Road<br>Feller Avenue<br>Serena Road<br>Franklin Avenue<br>Mill Road<br>Harris/Piermont<br>Broadway |
| <b>Broadway Southbound</b>      | E. Rockaway Road<br>Everit Avenue<br>W. Broadway<br>Piermont Avenue<br>Franklin Avenue<br>Hartwell Place<br>Conklin Avenue<br>Woodmere Boulevard |                                | <b>West Broadway Westbound</b>   |
| <b>Woodmere Blvd Northbound</b> | Broadway<br>Central Avenue<br>W. Broadway  | <b>West Broadway Westbound</b> |  |
| <b>Woodmere Blvd Southbound</b> | W. Broadway<br>Central Avenue<br>Broadway  |                                |  |

# 3

## Future No Build Conditions

An analysis of future conditions without the proposed mitigation (the No Build condition) was performed to evaluate the impact of additional background traffic expected over an eight year period. The No Build condition presents the expected future traffic conditions and assumes that no measures of mitigation are implemented.

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### Background Traffic Growth

For the purposes of this study, the No Build condition analysis was conducted for the year 2015. To account for background traffic growth, a reasonable and regionally acceptable annual growth rate for this area of Nassau County was obtained from the local Metropolitan Planning Organization, the New York Metropolitan Transportation Council (NYMTC) and applied to the existing traffic volumes. The growth rate anticipated for Nassau County for the functional class 16 - Urban Minor Arterials is 0.37% per year. Compounded for 8 years to 2015, a growth rate of 3% was applied to the existing traffic volumes to develop the background traffic for the year 2015.

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### Other Planned Developments

No other planned developments of any significant size were identified in the study area that may impact the traffic on the three arterial segments.

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### No Build Analysis

The No Build (or No Action) analysis was undertaken for the year 2015 to evaluate the impact of the projected traffic volumes on the travel times on the three arterial segments. Table 5 summarizes the results for both directions for each of the arterials for the AM, Midday and PM peak hours.

Table 5  
No Build Travel Times from the Simulation

| ARTERIAL / DIRECTION     | LIMITS                             | MOE*                     | No Build (2015) |        |      |
|--------------------------|------------------------------------|--------------------------|-----------------|--------|------|
|                          |                                    |                          | AM              | Midday | PM   |
| BROADWAY NORTHBOUND      | Woodmere Blvd to E. Rockaway Ave.  | Signal Delay (sec)       | 180             | 197    | 255  |
|                          |                                    | Average Travel Time(sec) | 321             | 337    | 395  |
|                          |                                    | Average Speed (MPH)      | 13.0            | 13.0   | 11.0 |
| BROADWAY SOUTHBOUND      | E. Rockaway Ave. to Woodmere Blvd. | Signal Delay (sec)       | 1051            | 292    | 589  |
|                          |                                    | Average Travel Time(sec) | 1193            | 434    | 731  |
|                          |                                    | Average Speed (MPH)      | 5.0             | 10.0   | 7.0  |
| WEST BROADWAY EASTBOUND  | Woodmere Blvd to Broadway          | Signal Delay (sec)       | 382             | 261    | 1794 |
|                          |                                    | Average Travel Time(sec) | 485             | 365    | 1900 |
|                          |                                    | Average Speed (MPH)      | 13.0            | 12.0   | 5.0  |
| WEST BROADWAY WESTBOUND  | Broadway to Woodmere Blvd.         | Signal Delay (sec)       | 72              | 62     | 146  |
|                          |                                    | Average Travel Time(sec) | 172             | 161    | 247  |
|                          |                                    | Average Speed (MPH)      | 18.0            | 19.0   | 12.0 |
| WOODMERE BLVD NORTHBOUND | Broadway to W. Broadway            | Signal Delay (sec)       | 70              | 71     | 71   |
|                          |                                    | Average Travel Time(sec) | 126             | 127    | 127  |
|                          |                                    | Average Speed (MPH)      | 14.0            | 14.0   | 14.0 |
| WOODMERE BLVD SOUTHBOUND | W. Broadway to Broadway            | Signal Delay (sec)       | 67              | 64     | 71   |
|                          |                                    | Average Travel Time(sec) | 118             | 116    | 124  |
|                          |                                    | Average Speed (MPH)      | 14.0            | 14.0   | 13.0 |

\*Average Travel Time is an average of 5 simulations

Table 5 shows that the travel times will increase significantly from 2007 to 2015.

## Issues

The major issues that contribute to the poor traffic flow conditions were identified so that the various options for mitigating them can be evaluated. Table 6 lists the issues at each intersection on the three arterial segments.

Table 6  
Issues

Broadway Northbound:

| Intersection                      | Issue   |
|-----------------------------------|---|
| Woodmere Boulevard                | Congestion, Avenue PM Q - 276', Max Q - 309' , PM arterial speed - 6 MPH  |
| Lafayette Boulevard/Burton Avenue |   |
| Irving Place/Brower Avenue        | Left turning vehicles blocking through traffic Avenue Q – 194', Max Q – 418'  |
| Franklin Place                    | Congestion, Avenue PM Q – 326', Max Q – 504' PM Arterial Speed – 7 MPH  |
| Conklin Avenue.                   | Congestion, Q backs up to Franklin Place  |
| Hartwell Place                    |   |
| Johnson Place                     |   |
| Trinity Place                     |   |
| Crescent Street                   |   |
| Franklin Avenue                   | Congestion, Avenue PM Q – 297', Max Q -436' PM Arterial speed – 7 MPH   |
| Ives Street                       |   |
| Piermont Avenue                   | Congestion, Avenue Q - 179', Max Q – 416' Backs up to Franklin PM Arterial Speed – 4 MPH Left turn vehicles block through traffic while yielding to SB traffic – safety issue                                   |
| West Broadway                     | Short segment, problems extension of those at Piermont  |
| Everit Road                       | Congestion, Avenue Q – 144', Max Q – 274' Left turning vehicles block through traffic while yielding to the SB traffic.   |
| E. Rockaway Road                  | Congestion, Avenue Q – 127', Max Q – 260' Q backs up to Everit. Q for right turning Vehicles Avenue – 89', Max – 196. The current storage of right turn lane is 130'. Through traffic blocks right turn storage |

Broadway Southbound:

| Intersection                      | Issue  |
|-----------------------------------|--|
| E. Rockaway Road                  | Congestion, Ave Q – 188', Max Q – 358', SB left turn storage inadequate, AM Arterial Speed -2 MPH  |
| Everit Road                       | Congestion, Ave Q – 418', Max Q – 556', SB Backs up past E. Rockaway, Left turning vehicles block through traffic while yielding to the SB traffic, AM Art. Speed -2 MPH |
| West Broadway                     | Congestion, Ave Q-486', Max Q-626', backs up to Everit. Right turn lane access blocked by through traffic, current storage 175' AM Art. Speed 2 MPH                      |
| Piermont Ave.                     | Congestion, Q is limited by the length of the segment, SBL turn vehicles block through traffic – safety issue AM Art. Speed 5 MPH  |
| Ives Street                       | Congestion back-up from Franklin Avenue  |
| Franklin Avenue                   | Congestion, Avenue Q – 170', Max Q – 410' Backs-up to Ives & beyond, left turning vehicles block through traffic while yielding to NB traffic. Midday Art Speed -9 MPH   |
| Crescent Street                   |  |
| Trinity Place                     |  |
| Johnson Place                     |  |
| Hartwell Place                    | Congestion, backs-up from Conklin  |
| Conklin Avenue                    | Congestion, Avenue Q – 238', Max Q – 285' left turning vehicles block through traffic while yielding to NB traffic. PM Art. Speed – 4 MPH                                |
| Franklin Place                    | PM Art. Speed 10 MPH   |
| Irving Place/Brower Avenue        | Left turning vehicles block through flow Avenue Q – 116', Max Q – 328'   |
| Lafayette Boulevard/Burton Avenue |  |
| Woodmere Boulevard                | Congestion, through traffic blocked by left vehicles, Avenue Q – 162', Max Q – 324'  |

West Broadway Eastbound:

| Intersection           | Issue  |
|------------------------|--|
| Woodmere Boulevard     | Congestion, Avenue Q – 203’, Max Q – 222’<br>Left turning vehicles block through traffic<br>PM Art. Speed – 4 MPH, AM – 7 MPH                                  |
| Westwood / Mosher      | PM Congestion – Art Speed 7 MPH ,<br>Avenue Q – 189’, Max Q – 374’. Back up due to<br>choke point at Franklin Avenue   |
| Irving Place           | PM Congestion Art speed – 5 MPH<br>Avenue Q - 181’, Max Q – 274’ Back up due to<br>choke point at Franklin Avenue  |
| Eastwood               | PM Congestion Art. Speed 5 MPH. Back up<br>due to choke point at Franklin Avenue   |
| Felter Avenue          | PM Congestion Art. Speed 3 MPH Back up<br>due to choke point at Franklin Avenue  |
| Serena Road            | PM Congestion Art. Speed 3 MPH Back up<br>due to choke point at Franklin Avenue  |
| Franklin Avenue        | Main Chock point, PM Art speed 3 MPH<br>The EB Q is almost continuous from Franklin<br>to west of Woodmere. Left turning vehicles<br>blocking through traffic. |
| Hewlett Parkway        |  |
| Mill Road              | Rail road operation impedes free flow  |
| Harris Avenue/Piermont | Congestion, Avenue Q – L, T, TR – 61’, 140’, 143’<br>Max Q – 101’, 240’, 243’. Art. Speed 5 MPH  |
| Broadway               | Short Segment, Problems extension of<br>those at Harris  |

West Broadway Westbound:

| Intersection           | Issue   |
|------------------------|---|
| Broadway               | Short right storage on SB Broadway<br>through traffic blocks right lane   |
| Harris Avenue/Piermont | Starvation due to upstream blocking 57% of<br>the time.   |
| Mill Road              | Rail road operation impedes free flow   |
| Hewlett Parkway        |   |
| Franklin Avenue        | WB roadway goes from two lanes to one lane<br>west of Franklin Avenue – starting point<br>of the WB congestion. Avenue Q – 254’,<br>Max Q – 536’    |
| Serena Road            |   |
| Felter Avenue          |   |
| Eastwood               |   |
| Irving Place           | Congestion, left turning vehicles block<br>through traffic while yielding to EB traffic.<br>Avenue Q – 145’, Max Q – 296’. PM Art. Speed –<br>7 MPH |
| Westwood / Mosher      |   |
| Woodmere Boulevard     | One WB lane, left turning vehicles block<br>through traffic while yielding to EB traffic<br>Avenue Q – 295’, Max Q – 395’.<br>PM Art Speed - 5 MPH  |

Woodmere Boulevard Northbound:

| Intersection   | Issue   |
|----------------|---|
| Broadway       | Congestion, one lane, left turning vehicles block through traffic. Avenue Q – 57', Max Q – 114' Art. Speed 10 MPH |
| Central Avenue | No pavement markings to delineate left turn lane hence travel way being utilized as one lane. Max Q – 196'        |
| West Broadway  | NBT - Avenue Q 143', Max Q – 574'   |

Woodmere Boulevard Southbound:

| Intersection   | Issue   |
|----------------|---|
| West Broadway  | Congestion, SBT Ave Q – 143', Max Q- 207' Insufficient left turn storage bay                      |
| Central Avenue | No pavement markings, travel way being utilized as one lane. Heavy SBR movement SB Max Q – 239'   |
| Broadway       | Congestion, one lane, left turning vehicles block through traffic. Avenue Q – 262', Max Q – 161'. |

# 4

## Future Build Conditions

The Future Build Conditions represent future traffic conditions in the year 2015 but with either of the two mitigation options implemented. The Future Build and Future No Build Conditions can then be compared to see how effective either of the mitigation options would be. Many alternative mitigation options were considered. However, those options that would require major infrastructure improvements and acquisition of private property (and thus would be unlikely to garner support of the local community) were not considered as implementable. Minor “tweaks” in traffic signal coordination were likewise not considered as implementable as they would not realize significant traffic improvements. The two mitigation options considered, that would improve traffic flow without major disruptions to the community and could possibly be supported by the community, are the Restriping Option and the One-Way Pair option.

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### Alternative Options

Two options were considered and analyzed to ease the congestion in the area and improve the traffic flow. They are:

- Restriping Option
- One-Way Pair Option

The alternatives are discussed in detail in the sections following.

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### Restriping Option

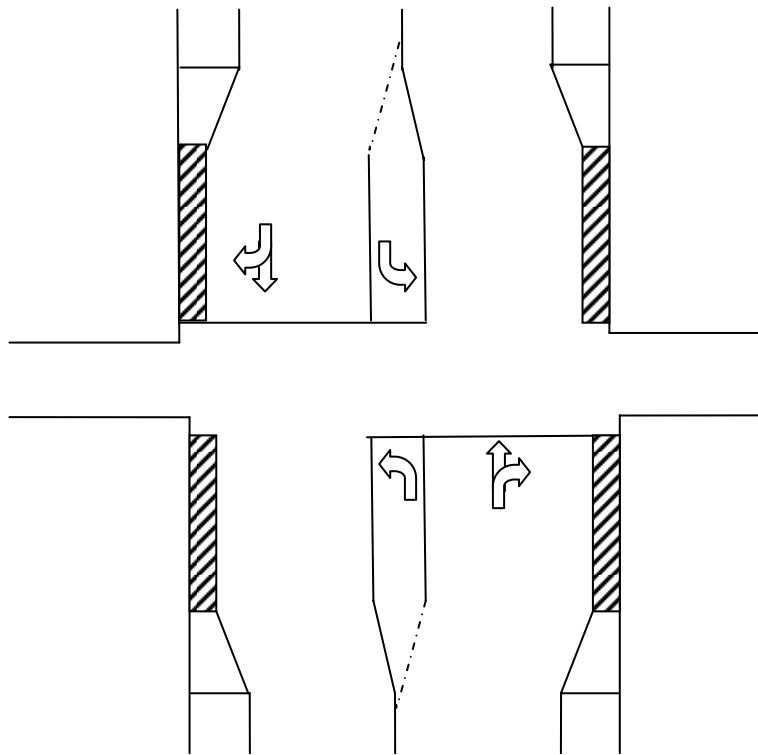
This option is the least expensive option that can be pursued. Essentially, it involves restriping the existing roadway to improve the flow conditions. The salient features of this option are:



- At some identified intersections the roadway would be restriped with left turn lanes. This would solve the issue of left turning vehicles blocking the through flow while they yield to the opposing through traffic before executing the turn.
- Restriping West Broadway with a second eastbound lane between Woodmere Boulevard and Franklin Avenue. This would help in clearing the eastbound PM congestion on West Broadway. The second eastbound lane would terminate as a left turning lane at Franklin Avenue with only one through lane crossing the intersection.

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Typical Intersection restriped with left pockets



**Figure A**

The figure shows a typical intersection after being restriped with left turn pockets. The hash denotes area where the on-street parking would have to be removed.

## Restriping Required and Feasibility

Table 7 shows the restriping recommended at various intersections and examines the feasibility of adopting the option.

**Table 7**  
Restriping required and Feasibility

**Broadway NB:**

| Intersection                      | Pavement Marking  | Feasibility   |
|-----------------------------------|---|---|
| Woodmere Boulevard                | Restripe w/ 11' NBL turn lane w/125' storage, Signal Optimization w/NB progression            | Travel way 38'<br>Eliminate shoulder parking 150' North & South of intersection on the East Side                        |
| Lafayette Boulevard/Burton Avenue |   |   |
| Irving Place/Brower Avenue        | Restripe w/ 11' NBL turn lane w/75' storage   | Travel way 40'  |
| Franklin Place                    | Restripe w/ 11' NBL turn lane w/125' storage, Signal Optimization w/NB progression            | Travel way 39'<br>Eliminate shoulder parking 150' North & South of intersection on the East Side                        |
| Conklin Avenue                    | Offset intersection w/Franklin, Signal works off same controller Restripe w/ 9' NBR turn lane | Travel way 39'<br>Eliminate east side on-street parking on Segment Franklin – Conklin & also 100' North of intersection |
| Hartwell Place                    |   |   |
| Johnson Place                     |   |   |
| Trinity Place                     |   |   |
| Crescent Street                   |   |   |
| Franklin Avenue                   | Restripe w/ 10' NBL turn lane w/125' storage, Signal Optimization w/NB progression            | Travel way 33'<br>Eliminate shoulder parking 150' North & South of intersection on the East Side                        |
| Ives Street                       |   |   |
| Piermont Avenue                   | See section on Mitigation at the Triangle   |   |
| West Broadway                     | See section on Mitigation at the Triangle   |   |
| Everit Road                       | Restripe w/10' NBL turn lane w/125' storage Signal Optimization w/NB progression              | Travel way is 58'. Eliminate on-street 150' North & South of Everit on the east side                                    |
| E. Rockaway Road                  | Increase storage of right turn lane to 225'. Signal Optimization w/ NB progression            | Eliminate part of on-street parking in front of condos to accommodate increase in storage.                              |

**Broadway SB:**

| Intersection                      | Pavement Marking  | Feasibility   |
|-----------------------------------|---|---|
| E. Rockaway Road                  | Increase SBL storage (if possible)<br>Signal opt w/SB prog. Restripe                    | Travel way is 64' adequate to increase left turn lane s<br>eliminate parking<br>North of intersection to accommodate<br>Storage increase. |
| Everit Road                       | Restripe with SBR turn lane w/<br>125' storage. Signal Optimization w/progression       | Broadway travel way 58'. Eliminate<br>Parking 150' south of Everit to<br>accommodate SBR turn lane.                                       |
| West Broadway                     | See section on Mitigation at the<br>Triangle  |   |
| Piermont Avenue                   | See section on Mitigation at the<br>Triangle  |   |
| Ives Street                       | Mitigate at Franklin  |   |
| Franklin Avenue                   | Restripe with SB left turn lane w/<br>125' storage. Signal Optimization w/progression   | Travel way is 33', eliminate on-street<br>parking 150' N/o & S/o intersection on<br>the west side to accommodate turn<br>lane             |
| Crescent Street                   |   |   |
| Trinity Place                     |   |   |
| Johnson Place                     |   |   |
| Hartwell Place                    | Mitigate Conklin  |   |
| Conklin Avenue                    | Restripe with SB left turn lane<br>w/125' storage.<br>Signal Optimization w/progression | Travel way is 40', eliminate on-street<br>parking 150' n/o & s/o Conklin on the<br>west side to accommodate turn lane.                    |
| Franklin Place                    | Restripe with SBR turn lane<br>to increase flow   | Travel way is 39', eliminate on-street<br>parking on the west side to<br>accommodate SBR  |
| Irving Place/Brower Avenue        | Restripe w/SBL turn lane w/125'<br>storage  | Travel way is 41'. Eliminate on-street<br>parking 150' n/o & s/o intersection on<br>the west side   |
| Lafayette Boulevard/Burton Avenue |   |   |
| Woodmere Boulevard                | Restripe w/SBL turn lane w/125'<br>storage. Signal Optimization w/progression           | Travel way is 38'. Eliminate on-street<br>parking 150' n/o & s/o intersection<br>on the west side   |

**West Broadway EB:**

| Intersection           | Pavement Marking   | Feasibility   |
|------------------------|--|---|
| Woodmere Boulevard     | Restripe w/EBL turn lane w/125' storage, second EB through lane from Woodmere to Franklin Ave<br>Signal Optimization w/progression | Travel way is 32'<br>Eliminate shoulder-prkg 150' e/o & w/o intersection on the south side  |
| Westwood / Mosher      | A second EB through lane with config –Combined left & through, and a & through   | Travel way is 33' can accommodate three 11' lanes 1 WB & 2 EB   |
| Irving Place           | Same as above  | Travel way is 29'   |
| Eastwood               | Same as above  | Travel way is 31'   |
| Felter Avenue          | Same as above  | Travel way is 31'   |
| Serena Road            | Same as above  | Travel way is 31'   |
| Franklin Avenue        | A second EB through lane end with EB lane config –left & through.<br>Signal Optimization w/progression                             | **Travel way is almost uniform at 31' except at Irving place where it is 29'.<br>3 lanes 1 WB & 2 EB can be accommodated. There are two receiving lanes e/o Franklin Ave. |
| Hewlett Parkway        |  |   |
| Mill Road              | Signal progression incorporating rail road operations  |   |
| Harris Avenue/Piermont | See section on Mitigation at the Triangle  |   |
| Broadway               | See section on Mitigation at the Triangle  |   |

**West Broadway WB:**

| Intersection           | Pavement Marking  | Feasibility   |
|------------------------|---|---|
| Broadway               | See section on Mitigation at the Triangle   |   |
| Harris Avenue/Piermont | See section on Mitigation at the Triangle   |   |
| Mill Road              | Signal progression w/incorporating rail road operations   |   |
| Hewlett Parkway        |   |   |
| Franklin Avenue        |   |   |
| Serena Road            |   |   |
| Felter Avenue          |   |   |
| Eastwood               |   |   |
| Irving Place           | No scope for turn lanes<br>Improved flow at Woodmere would result in easing the congestion at this point.<br>Signal Optimization w/progression<br>Phase WB lead to clear left turn vehicles |   |
| Westwood / Mosher      |   |   |
| Woodmere Boulevard     | Restripe with a left turning lane<br>Signal Optimization w/progression  | The travel way is 33'.<br>Eliminate shoulder-prkg 125' e/o & w/o intersection on the north side |

**Woodmere Boulevard NB:**

| Intersection   | Pavement Marking   | Feasibility   |
|----------------|--|---|
| Broadway       | Restripe w/ NBL turn lanes w/125' storage<br>Signal Optimization | Eliminate on-street prkg 150' n/o & s/o intersection to accommodate turn lane |
| Central Avenue | Restripe w/NBL turn lane<br>Signal Optimization                  | Travel way is 45'   |
| West Broadway  | Signal Optimization  |   |

**Woodmere Boulevard SB:**

| Intersection   | Pavement Marking  | Feasibility  |
|----------------|---|--|
| West Broadway  | Increase storage bay to 150'<br>Signal Optimization               | Eliminate on- street prkg & utilize complete travel way to accommodate increased storage |
| Central Avenue | Restripe with SBR turn lane w/150' storage<br>Signal Optimization | Travel way is 45'  |
| Broadway       | Restripe with SBL turn lane w/150' storage<br>Signal Optimization | Eliminate on- street prkg & utilize complete travel way to accommodate turn lane storage |

**Side Streets:**

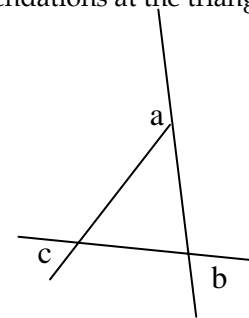
| Intersection                 | Pavement Marking   | Feasibility   |
|------------------------------|--|---|
| WB E. Rockaway & Broadway    | Restripe w/ 3 lanes , one EB and 2 WB – L & LR to reduce delays & Q lengths  | Travel way is 31'   |
| EB Everit & Broadway         | Restripe w/2 EB lanes – L & TR   | Travel way is 31'   |
| Franklin Avenue & Broadway   | Restripe with 11' EBR turn lane w/150' storage to facilitate free flow. Signal Optimization  | Travel way is 40'. Eliminate on-street prkg 175' e/o & w/o of intersection to accommodate turn lane |
| Franklin Place & Broadway    | Restriping w/2 lanes EB – EBL (with 125' storage) & EBR to ease the Q. Run Conklin & Franklin as split phases to overcome problem outlined | Travel way is 34'. Eliminate on-street prkg 150' west of intersection to accommodate addit lane     |
| Irving Place & Broadway      | Restriping w/2 lanes EB – EBL (with 125' storage) & EBTR to increase flow and reduce Q   | Travel way is 40'. Eliminate on-street prkg 150' west of intersection to accommodate addit lane     |
| Irving Place & West Broadway | Restriping w/2 lanes NB – NBL (with 125' storage) & NBR , to reduce Q  | Travel way is 31'. Eliminate on-street prkg 150' s/o intersection to accommodate additional NB lane |

**Restriping at the “Triangle”**

The geometry of the triangle makes it a key location in the study area, so the restriping at this location is being treated separately. The restriping recommendations at the triangle are as follows:

Triangle Intersections:

- (a) Broadway at West Broadway
- (b) Broadway at Piermont Avenue
- (c) Piermont Avenue/Harris Avenue at West Broadway.



Recommendations at intersection (a):

- Broadway – Make SB Broadway at West Broadway four lanes- two through and two right turning lanes. One of the right turn lanes would extend from Everit Avenue and the second lane would have storage of 300'. This can be achieved by eliminating parking on both sides of Broadway between West Broadway and Everit Avenue.

Recommendations at intersection (b):

- Restripe Broadway to 5 lanes – 2 NB & 3 SB (Left + 2 through) - Travel way is 51'

- Prohibit SB right turns at this point
  - Restripe WB Piermont Avenue to 3 lanes – 1 EB & 2 WB (Left + Combined Through & Right)
- Recommendations at intersection (c):
- Restripe SB Harris Avenue to 3 lanes – 1 NB & 2 SB (Right & Combined Left & Through)
  - Prohibit WB left turns at this point

## Analysis Results

The restriping changes were incorporated into the model and SimTraffic simulation results were obtained. Table 8 summarizes the results for the Restriping Option along with the No Build 2015 results for easy comparison of the benefits that would be achieved by the Restriping Option.

**Table 8**  
**Restriping Results and Comparison**

| ARTERIAL / DIRECTION     | LIMITS                                   | MOE*                     | AM PEAK  |                 | MIDDAY PEAK |                 | PM PEAK   |                 |
|--------------------------|--|--------------------------|----------|-----------------|-------------|-----------------|-----------|-----------------|
|                          |  |                          | No Build | Restripe Option | No Action   | Restripe Option | No Action | Restripe Option |
|                          |  |                          | 2015     | 2015            | 2015        | 2015            | 2015      | 2015            |
| BROADWAY NORTHBOUND      | Woodmere Boulevard to E. Rockaway Avenue | Signal Delay (sec)       | 180      | 153             | 197         | 182             | 255       | 238             |
|                          |  | Average Travel Time(sec) | 321      | 294             | 337         | 322             | 395       | 378             |
|                          |  | Average Speed (MPH)      | 13.0     | 14.0            | 13.0        | 13.0            | 11.0      | 12.0            |
| BROADWAY SOUTHBOUND      | E. Rockaway Avenue to Woodmere Boulevard | Signal Delay (sec)       | 1051     | 376             | 292         | 213             | 589       | 171             |
|                          |  | Average Travel Time(sec) | 1193     | 518             | 434         | 355             | 731       | 313             |
|                          |  | Average Speed (MPH)      | 5.0      | 9.0             | 10.0        | 12.0            | 7.0       | 14.0            |
| WEST BROADWAY EASTBOUND  | Woodmere Boulevard to Broadway           | Signal Delay (sec)       | 382      | 90              | 261         | 82              | 1794      | 163             |
|                          |  | Average Travel Time(sec) | 485      | 193             | 365         | 185             | 1900      | 266             |
|                          |  | Average Speed (MPH)      | 13.0     | 17.0            | 12.0        | 17.0            | 5.0       | 13.0            |
| WEST BROADWAY WESTBOUND  | Broadway to Woodmere Boulevard           | Signal Delay (sec)       | 72       | 58              | 62          | 51              | 146       | 71              |
|                          |  | Average Travel Time(sec) | 172      | 159             | 161         | 150             | 247       | 172             |
|                          |  | Average Speed (MPH)      | 18.0     | 19.0            | 19.0        | 20.0            | 12.0      | 18.0            |
| WOODMERE BLVD NORTHBOUND | Broadway to W. Broadway                  | Signal Delay (sec)       | 70       | 77              | 71          | 74              | 71        | 64              |
|                          |  | Average Travel Time(sec) | 126      | 132             | 127         | 130             | 127       | 120             |
|                          |  | Average Speed (MPH)      | 14.0     | 13.0            | 14.0        | 13.0            | 14.0      | 15.0            |
| WOODMERE BLVD SOUTHBOUND | W. Broadway to Broadway                  | Signal Delay (sec)       | 67       | 73              | 64          | 69              | 71        | 71              |
|                          |  | Average Travel Time(sec) | 118      | 124             | 116         | 120             | 124       | 123             |
|                          |  | Average Speed (MPH)      | 14.0     | 13.0            | 14.0        | 14.0            | 13.0      | 13.0            |

Table 8 shows that the travel time has decreased with the implementation of the Restriping Option.

## Conceptual plan for Restriping Triangle

The triangle consists of three signalized intersections:

- a) Broadway at West Broadway
- b) Broadway at Piermont Avenue
- c) West Broadway at Harris Avenue

In order that the restriping at the triangle be effective, it is essential that Broadway at the two intersections immediately to the north of Broadway and West Broadway also be restriped as per the recommendations. The two intersections are Broadway at East Rockaway Road and Broadway at Everit Avenue.

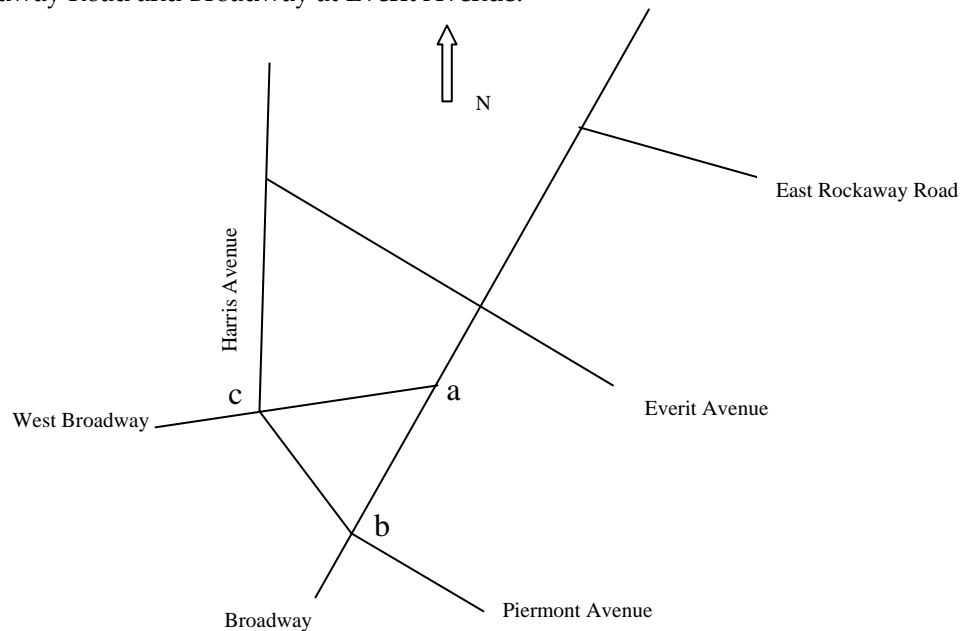


Table 9 summarizes the recommendations and the priorities for implementing the restriping plan at the Triangle. Table 10 summarizes the recommendations and the priorities for implementing the restriping plan throughout the rest of the roadway network.

Figures found in the Appendix D show:

- a) Restriping Plan for the Triangle
- b) Parking Reduction Due to Restriping Plan
- c) Restriping Plan for Broadway at Woodmere Boulevard (intersection closest to Village of Woodsburgh) and
- d) Bus Stop Locations throughout the network impacted by the mitigation

Table 9  
Restriping Recommendations for Triangle

|          | <b>Intersection</b>             | <b>Roadway</b>        | <b>Recommendations</b>  | <b>Priority</b> |
|----------|---------------------------------|-----------------------|---|-----------------|
| <b>A</b> | Broadway at East Rockaway Road  | East Rockaway Road WB | Restripe with two WB lanes<br>Configuration: Left turn lane + a shared left turn and right turn lane  | 1               |
|          |                                 | Broadway NB           | Increase storage of NB right turn lane (traffic turning into East Rockaway Road) to 225'  | 2               |
| <b>B</b> | Broadway at Everit Avenue       | Broadway SB           | Restripe with three SB lanes<br>Configuration: Shared left and through lane, a through lane and a shared through and right turning lane   | 1               |
|          |                                 | Broadway NB           | Restripe as three NB lanes<br>Configuration: Left turn lane with 125' storage, a through lane and a shared through and right turn lane  | 1               |
|          |                                 | Everit Avenue EB      | Restripe as two EB lanes<br>Configuration: Left turn lane + a shared through and right turn lane  | 2               |
| <b>C</b> | Broadway at West Broadway       | Broadway SB           | Restripe as four SB lanes<br>Configuration: Two through lanes for traffic southbound on Broadway + two right turning lanes (extreme right lane with a storage of 300') for westbound traffic on West Broadway | 1               |
| <b>D</b> | West Broadway at Harris Avenue* | Harris Avenue SB      | Restripe as two SB lanes<br>Configuration: A shared through and left turn lane + a right turn lane<br>*- On West Broadway prohibit WB left turns to Broadway and Piermont Ave.                                | 1               |
| <b>E</b> | Broadway at Piermont Avenue**   | Broadway SB           | Restripe as three SB lanes<br>Configuration: Left turn lane + two through lanes<br>**- On Broadway prohibit SB right turns to West Broadway and Harris Ave.   | 1               |
|          |                                 | Piermont Avenue WB    | Restripe as two WB lanes<br>Configuration: Left turn lane + a shared through and right turn lane  | 2               |



Table 10  
Restriping Recommendations for Rest of the Network

|          | <b>Intersection</b>                       | <b>Roadway</b>  | <b>Recommendations</b>  | <b>Parking Lost</b>                                       | <b>Priority</b> |
|----------|---|-----------------|---|---|-----------------|
| <b>F</b> | Broadway and Franklin Avenue              | Broadway NB     | Restripe with two NB lanes – Configuration: Left turn lane with 125’ storage + shared through and right turn lane<br>At this intersection parking is allowed on the west side of Broadway on Mon, Wed and Friday and on the east side on Tue, Thurs, Sat and Sunday | Mon,Wed and Fri – 5 space<br>Tue,Th,Sat andSun- 5 space   | 1               |
|          |   | Broadway SB     | Restripe with two SB lanes – Configuration: Left turn lane with 125’ storage + shared through and right turn lane   | Mon, Wed and Fri – 5 space<br>Tue, Th,Sat andSun- 7 space | 1               |
|          |   | Franklin Avenue | Restripe with two EB lanes – Configuration: Left turn lane with 125’ storage + shared through and right turn lane   | 6 spaces  | 2               |
| <b>G</b> | Broadway and Conklin Avenue               | Broadway NB     | Restripe with two NB lanes – Configuration: A through + right turn lane (extends from Franklin Place to Conklin Avenue)   | 5 spaces  | 1               |
|          |   | Broadway SB     | Restripe with two SB lanes – Configuration: Left turn lane with 125’ storage + shared through and right turn lane   | 6 spaces  | 1               |
|          | Broadway and Franklin Place               | Broadway NB     | Restripe with two NB lanes – Configuration: Left turn lane with 125’ storage + shared through and right turn lane   | 5 spaces  | 1               |
|          |   | Broadway SB     | Restripe with two SB lanes – Configuration: A through + right turn lane (extends from Conklin Avenue to Franklin Place)   | 4 spaces  | 1               |
|          |   | Franklin Place  | Restripe with two EB lanes – Configuration: Configuration: Left turn lane with 125’ storage + shared through and right turn lane  | 6 spaces  | 2               |
| <b>H</b> | Broadway and Irving Place / Brower Avenue | Broadway NB     | Restripe with two NB lanes – Configuration: Left turn lane with 125’ storage + shared through and right turn lane   | 8 spaces  | 1               |
|          |   | Broadway SB     | Restripe with two SB lanes – Configuration: Left turn lane with 125’ storage + shared through and right turn lane   | 14 spaces   | 1               |
|          |   | Irving Place    | Restripe with two EB lanes – Configuration: Configuration: Left turn lane with 125’ storage + shared through and right turn lane  | 6 spaces  | 2               |
| <b>I</b> | West Broadway and Irving Place            | Irving Place    | Restripe with two WB lanes – Configuration: Configuration: Left turn lane + right turn lane   | ---   | 2               |

|          |                                  |                     |   |   |   |
|----------|----------------------------------|---------------------|---|---|---|
| <b>J</b> | West Broadway and Woodmere Blvd  | West Broadway EB    | Restripe with two EB lanes – Configuration: Left turn lane + a shared through and right turn lane             | Currently no parking is allowed, so none lost | 1 |
|          |                                  | West Broadway WB    | Restripe with two WB lanes – Configuration: Left turn lane + a shared through and right turn lane             | Currently no parking is allowed, so none lost | 1 |
|          |                                  | Woodmere Blvd NB/SB | Extend storage of existing left turn lanes  | 2 spaces                                      | 2 |
| <b>K</b> | Woodmere Blvd and Central Avenue | Woodmere Blvd NB/SB | Restripe both directions with two lane - Configuration: Left turn lane + a shared through and right turn lane | 20 spaces                                     | 2 |

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## One-Way Pair Option

Under this option, Broadway and West Broadway would each be changed to one-way flow, thereby eliminating the left turn conflicts, which are contributing to intersection delay.

The recommendations for the One-Way Pair Option are as follows:

1. Broadway – one-way northbound
2. West Broadway - one-way westbound
3. Franklin Avenue, Irving Place & Franklin Place would help in re-routing vehicles impacted by the change.
4. The stretch of Woodmere Boulevard between Broadway and West Broadway would remain a two way roadway with an extra lane added in each direction
5. The re-routing of eastbound traffic on West Broadway would involve heavy eastbound right turn movement at Woodmere Boulevard and West Broadway. The southwest corner of W. Broadway & Woodmere Boulevard needs to be acquired for a channelized right turn lane necessary both for safety as well as easing the flow through the intersection.
6. Restripe Broadway in the northbound direction and West Broadway in the westbound direction with left-turn pockets at intersections listed in the restripe option and shown in the figure below.
7. SB Broadway turning into West Broadway would be three lanes
8. West Broadway would have three travel lanes.
9. Restriping of Everit Avenue and East Rockaway Road as listed in the previous option.

Figure B below shows the graphic representation of the One-Way Pair Option.

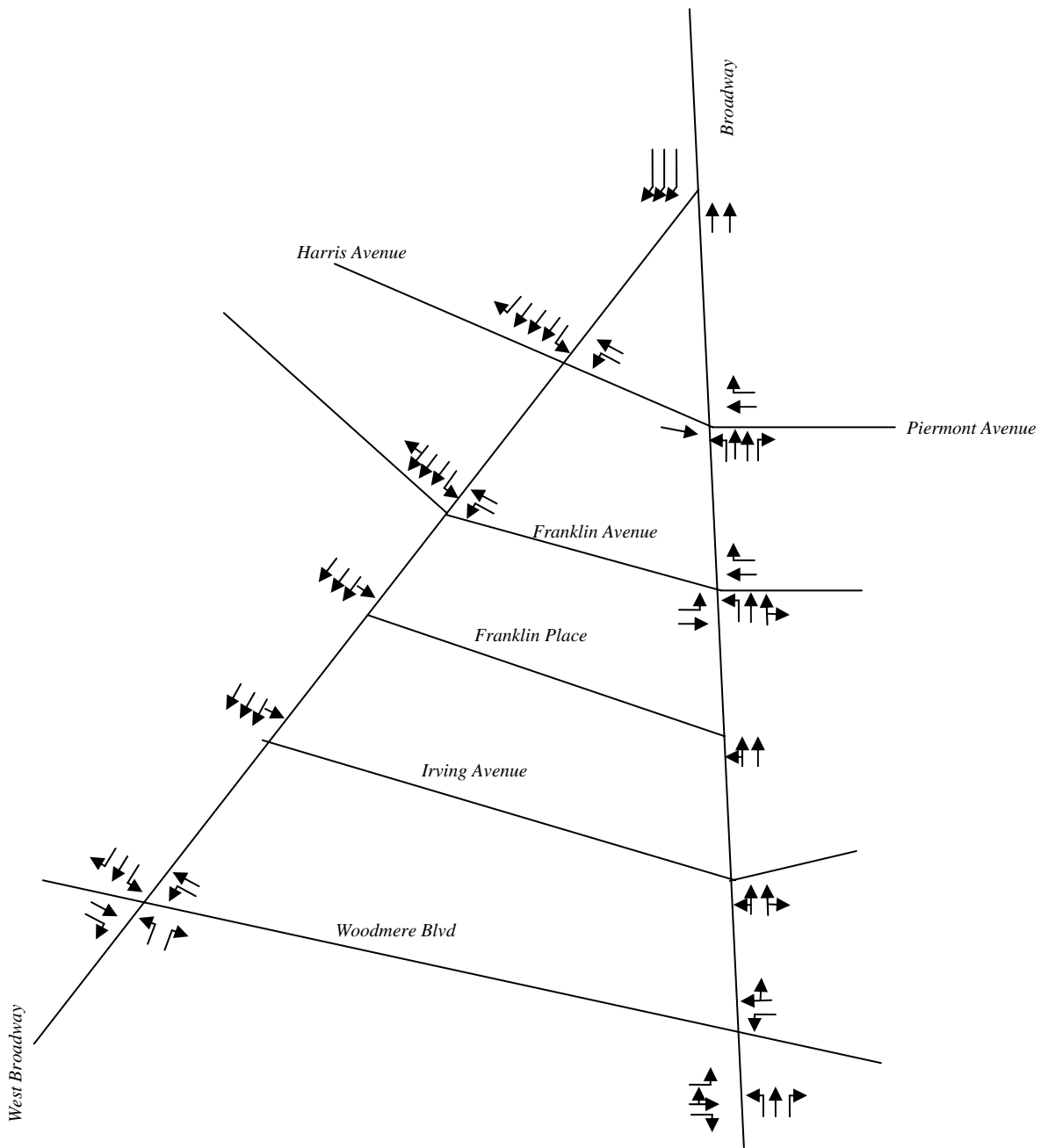


Figure B

## Analysis Results

The recommended changes were included in the model and the SimTraffic simulation results were obtained. Table 11 summarizes the results for the One-way Pair Option along with the results for No Build 2015 and the Restriping Option for easy comparison.

Table 11  
One-Way Pair Results and Comparison

| ARTERIAL DIRECTION       | END POINTS                               | MOE                        | AM PEAK HOUR |             |                   |                     | MIDDAY PEAK HOUR |             |                   |                     | PM PEAK HOUR |             |                   |                     |
|--------------------------|--|----------------------------|--------------|-------------|-------------------|---------------------|------------------|-------------|-------------------|---------------------|--------------|-------------|-------------------|---------------------|
|                          |  |                            | Exist        | No Build    | Restriping Option | One-Way Pair Option | Exist            | No Build    | Restriping Option | One-Way Pair Option | Exist        | No Build    | Restriping Option | One-Way Pair Option |
|                          |  |                            | 2007         | 2015        | 2015              | 2015                | 2007             | 2015        | 2015              | 2015                | 2007         | 2015        | 2015              | 2015                |
| BROADWAY NORTHBOUND      | Woodmere Blvd to E. Rockaway Avenue      | Signal Delay (sec)         | 174          | 180         | 153               | 98                  | 158              | 197         | 182               | 85                  | 254          | 255         | 238               | 126                 |
|                          |  | Average Travel Time(sec)   | 315          | 321         | 294               | 248                 | 298              | 337         | 322               | 235                 | 395          | 395         | 378               | 275                 |
|                          |  | <b>Average Speed (MPH)</b> | <b>14.0</b>  | <b>13.0</b> | <b>14.0</b>       | <b>17.0</b>         | <b>14.0</b>      | <b>13.0</b> | <b>13.0</b>       | <b>20.0</b>         | <b>11.0</b>  | <b>11.0</b> | <b>12.0</b>       | <b>15.0</b>         |
| BROADWAY SOUTHBOUND      | E. Rockaway Avenue to Woodmere Boulevard | Signal Delay (sec)         | 581          | 1051        | 376               |                     | 289              | 292         | 213               |                     | 548          | 589         | 171               |                     |
|                          |  | Average Travel Time(sec)   | 724          | 1193        | 518               |                     | 431              | 434         | 355               |                     | 690          | 731         | 313               |                     |
|                          |  | <b>Average Speed (MPH)</b> | <b>7.0</b>   | <b>5.0</b>  | <b>9.0</b>        |                     | <b>10.0</b>      | <b>10.0</b> | <b>12.0</b>       |                     | <b>7.0</b>   | <b>7.0</b>  | <b>14.0</b>       |                     |
| WEST BROADWAY EASTBOUND  | Woodmere Boulevard to Broadway           | Signal Delay (sec)         | 234          | 382         | 90                |                     | 160              | 261         | 82                |                     | 1667         | 1794        | 163               |                     |
|                          |  | Average Travel Time(sec)   | 331          | 485         | 193               |                     | 258              | 365         | 185               |                     | 1768         | 1900        | 266               |                     |
|                          |  | <b>Average Speed (MPH)</b> | <b>14.0</b>  | <b>13.0</b> | <b>17.0</b>       |                     | <b>14.0</b>      | <b>12.0</b> | <b>17.0</b>       |                     | <b>4.0</b>   | <b>5.0</b>  | <b>13.0</b>       |                     |
| WEST BROADWAY WESTBOUND  | Broadway to Woodmere Boulevard           | Signal Delay (sec)         | 72           | 72          | 58                | 50                  | 58               | 62          | 51                | 45                  | 124          | 146         | 71                | 57                  |
|                          |  | Average Travel Time(sec)   | 172          | 172         | 159               | 151                 | 157              | 161         | 150               | 144                 | 226          | 247         | 172               | 157                 |
|                          |  | <b>Average Speed (MPH)</b> | <b>18.0</b>  | <b>18.0</b> | <b>19.0</b>       | <b>20.0</b>         | <b>19.0</b>      | <b>19.0</b> | <b>20.0</b>       | <b>21.0</b>         | <b>13.0</b>  | <b>12.0</b> | <b>18.0</b>       | <b>19.0</b>         |
| WOODMERE BLVD NORTHBOUND | Broadway to W. Broadway                  | Signal Delay (sec)         | 66           | 70          | 77                | 60                  | 68               | 71          | 74                | 43                  | 80           | 71          | 64                | 43                  |
|                          |  | Average Travel Time(sec)   | 121          | 126         | 132               | 113                 | 124              | 127         | 130               | 100                 | 136          | 127         | 120               | 101                 |
|                          |  | <b>Average Speed (MPH)</b> | <b>14.0</b>  | <b>14.0</b> | <b>13.0</b>       | <b>19.0</b>         | <b>14.0</b>      | <b>14.0</b> | <b>13.0</b>       | <b>18.0</b>         | <b>13.0</b>  | <b>14.0</b> | <b>15.0</b>       | <b>17.0</b>         |
| WOODMERE BLVD SOUTHBOUND | W. Broadway to Broadway                  | Signal Delay (sec)         | 69           | 67          | 73                | 52                  | 60               | 64          | 69                | 44                  | 72           | 71          | 71                | 49                  |
|                          |  | Average Travel Time(sec)   | 120          | 118         | 124               | 105                 | 111              | 116         | 120               | 96                  | 125          | 124         | 123               | 101                 |
|                          |  | <b>Average Speed (MPH)</b> | <b>14.0</b>  | <b>14.0</b> | <b>13.0</b>       | <b>16.0</b>         | <b>15.0</b>      | <b>14.0</b> | <b>14.0</b>       | <b>17.0</b>         | <b>13.0</b>  | <b>13.0</b> | <b>13.0</b>       | <b>16.0</b>         |

## Benefits and Impacts of the Options

Table 12 shows benefits and the impacts of the two options.

**Table 12**  
**Comparative Statement**

| Options      | Brief Description  | Benefits   | Impacts   |
|--------------|--|--|---|
| Restriping   | <ul style="list-style-type: none"> <li>➤ Restriping existing travel way</li> <li>➤ Left turn lanes</li> <li>➤ Second eastbound travel lane on West Broadway - Woodmere Boulevard to Franklin Avenue</li> </ul> | <ul style="list-style-type: none"> <li>➤ Increased traffic flow</li> <li>➤ Reduction of travel time</li> <li>➤ Reduction in queues</li> <li>➤ Improved air quality</li> <li>➤ Improved safety</li> </ul> | <ul style="list-style-type: none"> <li>➤ Loss of on-street parking at some intersections</li> </ul>   |
| One-way Pair | <ul style="list-style-type: none"> <li>➤ Broadway - Woodmere Blvd to W. Broadway northbound traffic only</li> <li>➤ West Broadway - Woodmere Blvd to Broadway westbound traffic only</li> </ul>                | <ul style="list-style-type: none"> <li>➤ Increased traffic flow</li> <li>➤ Reduction of travel time</li> <li>➤ Reduction in queues</li> <li>➤ Improved air quality</li> <li>➤ Improved safety</li> </ul> | <ul style="list-style-type: none"> <li>➤ Loss of on-street parking at some intersections</li> <li>➤ On-street parking on Woodmere Boulevard eliminated to accommodate additional lane in each direction</li> <li>➤ Acquisition of property at Woodmere &amp; W. Broadway</li> <li>➤ Very substantial increase in traffic volumes on Woodmere Boulevard</li> </ul> |

## Comparative Travel Time

Table 13 shows the comparative travel times in 2007 and in 2015 with no action and with the Restriping and One-Way Pair Options

**Table 13**  
**Comparative Statement – Travel Times (minutes)**

| Arterial / Direction     | Limits                                 | 2007      |          |              |           | 2015     |              |           |          | 2015 with Action |           |          |              |     |
|--------------------------|--|-----------|----------|--------------|-----------|----------|--------------|-----------|----------|------------------|-----------|----------|--------------|-----|
|                          |  | No Action | Restripe | One-way Pair | No Action | Restripe | One-way Pair | No Action | Restripe | One-way Pair     | No Action | Restripe | One-way Pair |     |
| Broadway Northbound      | Woodmere Boulevard to E. Rockaway Road | 5.3       | 4.9      | 4.5          | 5.0       | 5.4      | 4.9          | 4.5       | 5.5      | 5.4              | 3.8       | 6.6      | 6.3          | 5.1 |
| Broadway Southbound      | E. Rockaway Road to Woodmere Boulevard | 12.0      | 8.6      | -            | 7.2       | 7.2      | 5.9          | -         | 7.2      | 5.9              | -         | 11.5     | 5.2          | -   |
| West Broadway Eastbound  | Woodmere Boulevard To Broadway         | 5.5       | 3.2      | -            | 4.3       | 6.1      | 3.1          | -         | 6.1      | 3.1              | -         | 29.5     | 4.4          | -   |
| West Broadway Westbound  | Broadway to Woodmere Boulevard         | 3.0       | 2.7      | 2.5          | 2.6       | 2.7      | 2.5          | 2.4       | 2.7      | 2.5              | 2.4       | 3.8      | 2.9          | 2.6 |
| Woodmere Blvd Northbound | Broadway to West Broadway              | 2.0       | 2.2      | 1.6          | 2.0       | 2.1      | 2.2          | 1.7       | 2.1      | 2.2              | 1.7       | 2.3      | 2.0          | 1.9 |
| Woodmere Blvd Southbound | West Broadway to Broadway              | 2.0       | 2.0      | 1.7          | 1.9       | 1.9      | 2.0          | 1.6       | 1.9      | 2.0              | 1.6       | 2.1      | 2.1          | 1.7 |

## Parking Loss

Both options would result in the loss of on-street parking. This is necessary to accommodate the left turn lanes. Table 14 shows the approximate on-street parking loss on the three arterial segments.

**Table 14  
Comparative Statement**

| Arterial                              | End Points                             | Restriping 2015 | One-Way Pair 2015 |
|---------------------------------------|--|-----------------|-------------------|
| Broadway                              | Woodmere Boulevard to E. Rockaway Road | 93              | 35                |
| West Broadway                         | Woodmere Boulevard To Broadway         | 2               | 2                 |
| Woodmere Boulevard                    | Broadway to West Broadway              | 38              | 85*               |
| Franklin Avenue                       | West Broadway to Broadway              | 5               | 5                 |
| <b>Approximate Total Parking Lost</b> |  | <b>138</b>      | <b>127</b>        |

\* - All on-street parking on Woodmere Boulevard would have to be eliminated to accommodate an additional lane in each direction

## Time –Space Diagrams

Time-Space diagrams for the models can be found in Appendix A.

## Cost Estimate

Based on the scope of work for the project, a cost estimate comparing both alternatives was developed, based on the conceptual intersection plans on the following pages. The Cost Estimate Comparison Table below summarizes the cost estimate results for each of the different options.

**Table 15  
Cost Estimate Comparison Table**

| Option       | Cost      |
|--------------|-----------|
| Restriping   | \$225,000 |
| One-Way Pair | \$175,000 |

# 6

## Conclusions

This report summarizes the traffic study undertaken to improve traffic flow conditions in the hamlet of Hewlett, New York. It summarizes the data collection process and traffic analysis procedures and quantified existing and projected traffic conditions and compared changes in operating conditions with proposed alternative options. The purpose of the study was to consider viable improvement options to mitigate traffic conditions and to improve travel time on the major arteries serving the Hewlett community.

Many alternative mitigation options were considered. Those options that would require major infrastructure improvements and acquisition of private property and thus unlikely to garner support of the local community were not considered as implementable. Minor “tweaks” in traffic signal coordination system were likewise deemed as not implementable as they would not realize significant traffic improvements. The two mitigation options considered most viable, that would improve traffic flow without major disruptions to the community and could be supported by the community, are the Restriping Option and the One-Way Pair Option. Both provide capacity improvements at intersections where there are presently bottlenecks which will only grow more congested with time as traffic volumes grow. Both require the removal of on-street parking at the intersections. The Restriping Option can be implemented at some or all of the intersections and thus can be implemented gradually. The One-Way Option is a more complicated solution which cannot be implemented gradually as the Restriping Option can, but represents a solution which can provide travel benefits that will last much longer into the future than the Restriping Option.

The decision to implement one option or the other, or neither, will be reached with the continuing dialogue between Nassau County, the Town of Hempstead and the community as part of the public outreach effort.