TRAFFIC and PARKING STUDY

Open Door Medical Offices Relocation
Village of Sleepy Hollow, New York

Prepared for:
Open Door Family Medical Center, Inc.

June 28, 2012
Project 111229

TABLE OF CONTENTS

List of Figures
List of Tables
Executive Summary

A. Introduction 1
B. Project Description 1
C. Scope of Study 2
D. Adjacent Roadway Network 6
E. Study Locations 8
F. Pedestrian Facilities and Equipment 11
G. Pedestrian Field Studies 20
H. Vehicle Field Studies 23
I. Peak Hours 25
J. Existing Traffic Volumes 25
K. Capacity Analyses Procedures 26
L. Existing Traffic Operating Conditions 29
M. Vicinity Developments 31
N. No-Build Traffic Volumes 32
O. No-Build Capacity Analysis Results 33
P. Proposed Project Generated Traffic 35
Q. Future Traffic Operating Conditions 41
R. Parking Data Collection 44
S. Drop-offs at the Site 55
T. Traffic-Related Safety Issues in the Webber Park Neighborhood 56
U. Accident Data 57
V. Accident Analyses 61
W. Conclusions 65

List of Figures

Figure	*Title*	*Following Page*
1.	*Site Location Map*	*1.*
2.	*Pedestrian Volumes, Weekday AM Peak Hour*	*21.*
3.	*Pedestrian Volumes, Weekday Midday Peak Hour*	*21.*
4.	*Pedestrian Volumes, Weekday PM Peak Hour*	*21.*
5.	*AM Peak Hour Traffic Volumes - November 2011*	*26.*
6.	*PM Peak Hour Traffic Volumes - November 2011*	*26.*
7.	*AM Peak Hour Traffic Volumes - March 2012*	*26.*
8.	*PM Peak Hour Traffic Volumes - March 2012*	*26.*
9.	*No-Build AM Peak Hour Traffic Volumes*	*33.*
10.	*No-Build PM Peak Hour Traffic Volumes*	*33.*
11.	*Build AM Peak Hour Traffic Volumes*	*40.*
12.	*Build PM Peak Hour Traffic Volumes*	*40.*
13.	*Vehicle Drop-off/Pick-up Turn-around in Parking Lot*	*56.*
	Suggested Pedestrian Route Map	*64.*

List of Tables

Table	*Title*	*Page*
1.	*Level-of-Service Summary, Existing Conditions*	*30.*
2.	*Level-of-Service Summary, No-Build Conditions*	*34.*
3.	*Project generated Peak Hour Vehicular Trip Summary*	*40.*
4.	*Level-of-Service Comparison*	*42.*
5.	*On-Street Parking Supply and Demand (November 2011)*	*48.*
6.	*On-Street Parking Supply and Demand (February 2012)*	*50.*
7.	*Parking Demand at Phelps Memorial Hospital Garage*	*54.*
8.	*Accident History*	*59.*
9.	*Accident Rates*	*63.*

Adler Consulting, Transportation Planning & Traffic Engineering, PLLC
235 Main Street
White Plains, NY 10601-2401
Tel # (914) 997-8510
Fax # (914) 997-7140

June 28, 2012

EXECUTIVE SUMMARY

Adler Consulting has been retained by Open Door Family Medical Center, Inc. in support of the approval process for the relocation of the existing Open Door medical offices. The current Open Door facility is located at 80 Beekman Avenue and its operations would be relocated to 300 North Broadway, in the Village of Sleepy Hollow, New York. This report combines and expands the information previously provided to the Sleepy Hollow Planning Board in letter reports, dated, February 1, 2012, April 2, 2012 and May 11, 2012 and responds to comments raised by the public and the Village's consultants at the earlier informational meetings.

The analyses conducted for this study indicate that the proposed relocation to the 12,389 square feet (sf) facility from the current 5,000 sf facility would not have a significant impact on the area-wide traffic operating conditions nor on local parking conditions.

A. PROJECT DESCRIPTION

The proposed Sleepy Hollow Open Door medical office is being developed on a parcel located at the intersection of North Broadway and New Broadway. The Project Site would consist of a total of 12,389 sf on two levels. The upper level of Clinic space would include emergency egress only to New Broadway. The lower level would have access to North Broadway from the existing driveway and the ten (10) at-grade parking spaces on the Site.

B. SCOPE OF STUDY

1. Traffic Data. To determine baseline traffic conditions, vehicle turning movement counts data were collected in November, 2011, summarized and

balanced to yield the "Existing" traffic volumes for the weekday Peak AM Roadway Hour as well as the weekday Peak PM Roadway Hour at strategic locations surrounding the Site. In response to concerns raised about the timing of the data collection, vehicle turning movement counts data, parking data and pedestrian data were also collected in March, 2012, which replicated the earlier collected data. "No-Build" traffic volumes were determined by generating traffic for the developments identified in the vicinity of the Site, as well as by applying a generalized background growth factor to the existing traffic volumes.

Trips anticipated to be generated by the proposed development were calculated by projecting the existing trips to account for the projected increased size of the medical office. This resulted in a very conservative or "worst case" estimate of future traffic volumes with the Project.

Site-generated traffic was assigned to the adjacent roadway network based on arrival and departure patterns derived from the existing turning movement counts. The assigned Site-Generated traffic volumes were added to the No-Build volumes to determine the "Build" traffic volumes.

The Existing, No-Build and Build traffic volumes were analyzed with respect to current roadway capacities to determine operating and queuing conditions.

2. Adequacy of Pedestrian Facilities and Equipment. To evaluate the adequacy of pedestrian facilities and equipment (i.e., sidewalks, curb ramps, detectable warning tiles, and/or pedestrian crossing equipment), the pedestrian facilities were inventoried and pedestrian travel patterns observed at four (4) intersections in the vicinity of the proposed Open Door medical offices.

3. Availability of Parking Spaces Off-Site. To determine the sufficiency of on-street parking to meet the requirements for the Open Door facility on those limited occasions when on-Site parking spaces may be insufficient for patients who drive to the Medical Office, supply and demand data were collected in November, 2011 and February, 2012 for on-street parking near/in the vicinity of the proposed Open Door, as well as Phelps Memorial Hospital Garage where physicians and other staff will be required to park.

4. Accident Data. Accident data at the intersections in the vicinity of the proposed Open Door medical office were reviewed to identify the types, frequency and nature of the accidents that occur at them and determine whether such accident data demonstrates a safety problem for pedestrians expected to travel to and from the proposed Open Door medical offices.

5. Vehicle Turning Movements. Recognizing that some patients will arrive at the Open Door medical offices by way of taxi, taxi turning movements in the on-Site parking lot were examined to determine whether vehicle drop-offs can be handled safely and effectively when cars are parked in the lot.

C. FINDINGS

1. Capacity Analysis Results. Analysis of Existing traffic operating conditions revealed that, overall tolerable operating conditions (Level-of-Service "D" or better) currently prevail at all intersections studied. The analysis of the anticipated No-Build traffic operating conditions revealed that, overall tolerable operating conditions (Level-of-Service "D" or better) would continue to prevail at the intersections studied.

During the Peak AM Highway Hour, the proposed development is anticipated to generate 29 new entering trips and 14 exiting trips while during the Peak PM Highway Hour the development is anticipated to generate 14 entering trips and 17 exiting trips.

2. Adequacy of Pedestrian Facilities and Equipment. Pedestrian facilities and equipment (i.e., sidewalks, curb ramps, detectable warning tiles, and/or pedestrian crossing equipment), are in place at the studied intersections and are adequate (both in physical condition and crossing signal duration) to accommodate pedestrians arriving at and leaving the proposed Open Door medical offices. Further, for the most part, the physical features of such facilities are in compliance with the Americans with Disability Act Guidelines (AADAG).

3. Availability of Parking Spaces Off-Site. There are a sufficient number of on-street parking spaces available in the vicinity of the Open Door medical offices should on-Site parking not be available for patients. The parking accumulation study at the Phelps Memorial Hospital Garage indicated that there are hundreds of parking spaces

available throughout the day which is far greater than the number required to meet the demands of the Open Door staff that drive to work.

4. Accident Data. Over the last five (5) years, the overwhelming majority of accidents studied (87 percent) have involved property damage only. The accident rate for the intersection of North Broadway with New Broadway, at which the overwhelming majority of walking patients would be expected to cross North Broadway to obtain access to the proposed medical office, is well below the calculated Critical Accident Rate for the intersection.

5. Vehicle Turning Movements. Using an automobile/taxi turning template, it was found that there is sufficient area in the on-Site parking lot to permit a vehicle to turn around and exit the Site safely onto North Broadway when cars are parked on the Site.

D. Proposed Improvements

To reduce the number of vehicle trips that would be generated by the Open Door Clinic, all of the staff will be required to travel to Phelps Memorial Hospital, park in the garage using existing available spaces and then board a shuttle to travel to and from Sleepy Hollow. To enhance the safety of patrons walking to and from the clinic, Open Door has agreed to reimburse the Village for the costs of a crossing guard to aid pedestrians at the intersection of North Broadway with New Broadway.

E. Conclusions

Based on the findings contained herein, it is the considered professional opinion of **Adler Consulting** that the operation of the proposed Open Door Clinic in the Village of Sleepy Hollow will not have a significant impact on area wide traffic operating conditions. Because of the low volume of cars expected to be generated by the Open Door Clinic, it is anticipated that the relocation of the existing Open Door Clinic to 300 North Broadway will not have a significant impact on the accident rate for the intersections and roadway segments that were studied.

Based on the analysis of the on-street parking, there would be sufficient number of spaces available to accommodate the anticipated needs of the Open Door facility for patients. Analyses also indicate that there would be sufficient parking spaces available at the Phelps Memorial Hospital garage for use by the Open Door staff. Therefore, it is considered professional opinion of **Adler Consulting** that there are sufficient parking spaces available to accommodate the anticipated needs of the Open Door Clinic. Further, a safe pedestrian crossing of North Broadway is provided directly opposite the new facility.

Respectfully Submitted,
Adler Consulting,
Transportation Planning & Traffic Engineering, PLLC

Bernard Adler, P.E.
President
NY Professional Engineer No. 048373

Michael P. O'Rourke, P.E., PTOE
Senior Associate
NY Professional Engineer No. 061375

A. INTRODUCTION

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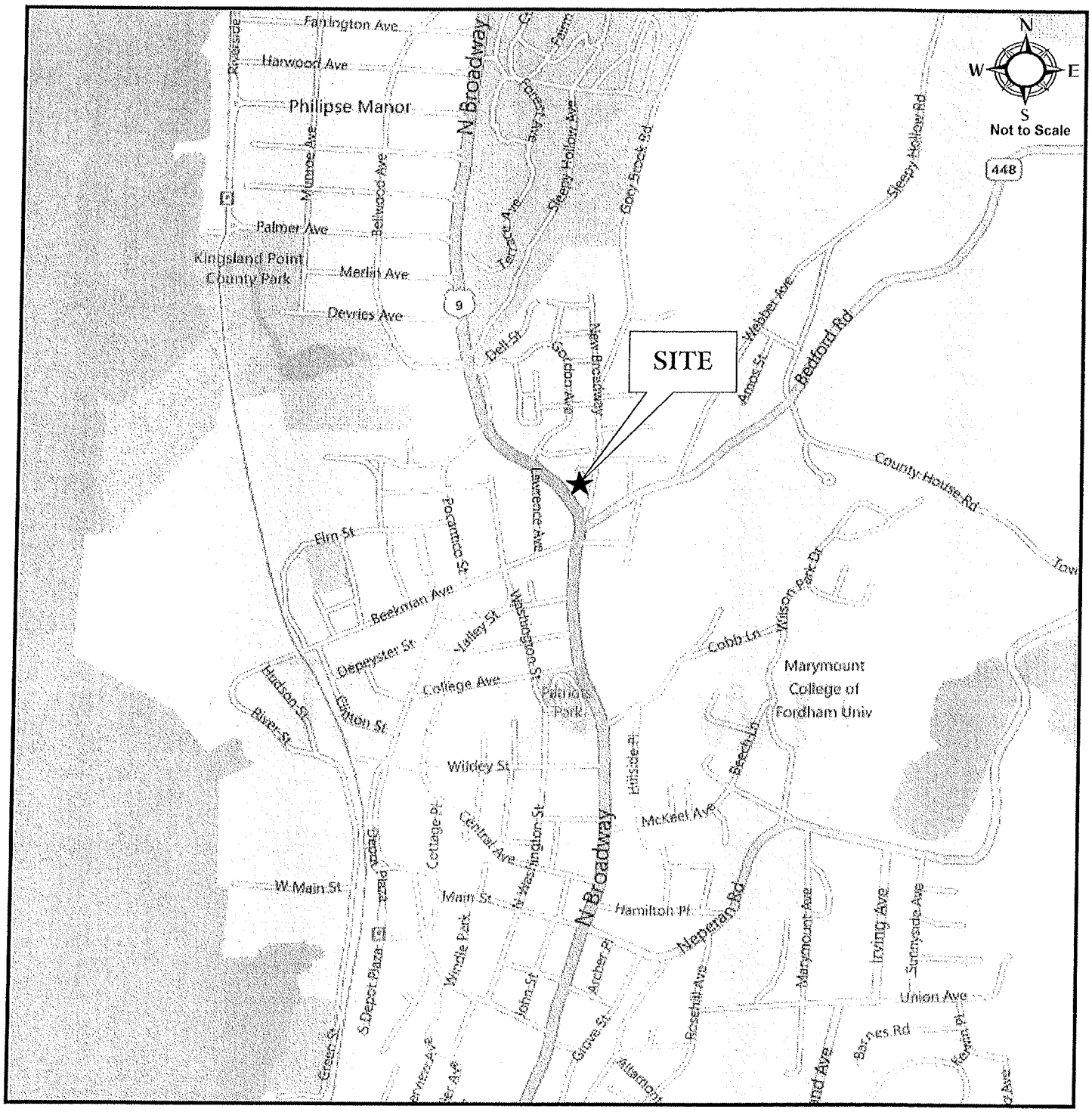
B. PROJECT DESCRIPTION

The proposed Sleepy Hollow Open Door medical offices are being developed on a parcel located at the intersection of North Broadway and New Broadway. The



Project:
Open Door
Sleepy Hollow, NY

Title:
Site Location Map

Prepared By:
Adler Consulting, White Plains, NY
Transportation Planning & Traffic Engineering, PLLC

FIGURE 1

Project Site will consist of a total of 12,389 sf on two levels. The upper level of medical office space will include emergency egress only to New Broadway. The lower level would have access to North Broadway from the existing driveway and the ten (10) at-grade parking spaces on the Site.

C. Scope of Study

This traffic study follows the standard engineering principles and practices and examines the potential traffic and parking impacts associated with the proposed relocation/redevelopment of the Open Door medical offices. During the course of this study, **Adler Consulting** performed the following tasks:

- Visually collected traffic-related information about the strategic locations and the roadway system in the near vicinity of the Site as it affects intersection capacities;

- Collected manual intersection turning counts and pedestrian counts during the AM and PM peak periods on a typical weekday for the

intersections considered to be strategically important to define the impacts of the proposed development;

- Categorized the traffic data and determined the highest periods of adjacent street traffic for the Peak AM and PM Highway Hours (Existing Conditions);

- Conducted trip generation surveys of the people entering/exiting the existing medical facility with an emphasis on identifying their mode of travel to the facility;

- Conducted an inventory of the number of on-street parking spaces available in the near vicinity of the Proposed Site, covering sections of New Broadway, Pine Close, Hudson Terrace, Beekman Avenue, Lawrence Avenue and North Washington Street as well as the municipal parking lot located on Beekman Avenue west of the intersection with Broadway;

- Conducted parking supply and demand surveys at the Phelps Memorial Hospital parking garage, to determine the availability of parking for the staff;

- Analyzed the parking data to determine whether sufficient parking spaces exist;

- Projected the Existing traffic volumes to the Horizon Year using a generalized annual growth rate based on discussions with the Village of Sleepy Hollow planning consultant;

- Based on discussions with the Village planning consultant, identified planned projects which are anticipated to affect traffic flows in the vicinity of the Site;

- Added the traffic from these adjacent developments to the Horizon Year data to determine the "No-Build" condition;

- Generated traffic for the new Open Door medical offices based on the surveyed traffic activity at the current facility and by increasing projected volumes proportionately to represent the size of the new facility;

- Assigned the project-generated trips to the roadway system in accordance with the arrival/departure traffic patterns that were previously observed;

- Added additional traffic volumes to account for the shuttle bus service that is expected to transport staff from the Phelps Memorial Hospital Garage to the medical offices; and,

- Executed intersection capacity analyses for the Existing, No-Build and Build conditions during the Peak AM and PM Highway Hours to determine future operating conditions for the intersections of Lawrence Avenue/Gordon Avenue with North Broadway; New Broadway with

North Broadway/Bedford Road; and, Beekman Avenue/Hudson Terrace with North Broadway.

D. ADJACENT ROADWAY NETWORK

The following is a description of the roadways in the vicinity of the Site:

North Broadway (US Route 9)

North Broadway (US Route 9) is generally a two-lane roadway traveling in a north/south direction that connects the Sleepy Hollow and the Tarrytown commuters with the Phelps Memorial Hospital while providing access to I-87/I-287 and the Tappan Zee Bridge. In the vicinity of the Site, North Broadway is approximately 40 feet wide with one travel lane in the northbound direction and two travel lanes in the southbound direction. South of Beekman Avenue/Hudson Terrace, North Broadway operates as a two lane roadway with one lane in each direction and with on-street parking on both sides of the roadway. North of the Site, North Broadway is a four lane roadway with two lanes in each direction. The posted Village speed limit is 30 miles per hour (mph).

Lawrence Avenue/Gordon Avenue

Lawrence Avenue is a short roadway with one lane in each direction that connects Beekman Avenue to the west with North Broadway. Lawrence Avenue is an undivided roadway with on-street parking permitted on both sides of the Avenue. East of North Broadway (US Route 9) Lawrence Avenue becomes Gordon Avenue. Gordon Avenue is also short street that provides access to a residential area.

New Broadway

New Broadway runs northeast from North Broadway and ends south of Douglas Park, providing access to the neighboring residential area. In the vicinity of the Site, there is one travel lane in each direction. Truck traffic is prohibited. On-street parking is permitted on the east side of the roadway. The posted speed limit along this roadway is 25 mph.

Bedford Road (NY Route 448)

Bedford Road is a State Route that runs east from North Broadway towards the Town of Mount Pleasant and intersects with NY Route 117. In the vicinity of the Site, there is one travel lane in each direction, with a posted speed limit of 30 mph.

Beekman Avenue/Hudson Terrace

Beekman Avenue generally runs from the Hudson River to North Broadway in the east. East of North Broadway, the roadway continues as Hudson Terrace for a short stretch and intersects with Bedford Road. Hudson Terrace provides access to residential areas with one travel lane in each direction.

E. STUDY LOCATIONS

Based on the direction from the Village of Sleepy Hollow planning consultant, it was concluded that the potential traffic impact of the proposed redevelopment of the property would be greatest at the following three intersections:

- **North Broadway** at **Lawrence Avenue/Gordon Avenue**

  The intersection of North Broadway and Lawrence Avenue/Gordon Avenue is a four-legged unsignalized intersection. The northbound North Broadway approach provides one 20-foot wide, travel lane for all the movements. The southbound North Broadway approach provides one 10-foot wide shared left-turn/through lane and one 10-foot wide shared through/right-turn lane. The

eastbound Lawrence Avenue approach is controlled by a STOP-sign and provides one, approximately 8-foot wide shared lane at the intersection. The westbound Gordon Avenue approach is also controlled by a STOP-sign and provides one 12-foot wide shared lane. Lawrence Avenue and Gordon Avenue are undivided roadways with no lane markings.

- **North Broadway at New Broadway/Bedford Road**

  There are four (4) approaches to the intersection of North Broadway at New Broadway/Bedford Road. The North Broadway roadway approaches provided access from the northwest and the south. The operations of this signalized intersection are co-ordinated with the adjacent intersection of North Broadway at Beekman Avenue/Hudson Terrace. The northbound approach of North Broadway provides one 20-foot wide lane that operates as one shared through/right-turn lane. The southbound approach of North Broadway operates with one 10-foot wide shared left-turn/through lane and one 10-foot wide through lane. The southbound New Broadway approach operates with one 14-foot wide shared lane for all movements at the intersection. The westbound Bedford Road approach operates with one 11-foot wide shared left-

turn/through lane and one 12-foot wide exclusive right-turn lane. There are marked crosswalks on the New Broadway approach, Bedford Road approach and the southbound approach of North Broadway.

- **North Broadway at Beekman Avenue/Hudson Terrace**

  The intersection of North Broadway with Beekman Avenue/Hudson Terrace is four-legged signalized intersection. The operation of this signalized intersection are co-ordinated with the adjacent intersection of North Broadway at New Broadway/Bedford Road. The northbound approach of North Broadway operates with one 20-foot wide lane that accommodates all movements. The southbound approach of North Broadway operates with one 10-foot wide shared left-turn/through lane and one 10-foot wide shared through/right-turn lane. The eastbound Beekman Avenue approach operates with one 13-foot wide shared left-turn/through lane and one 11-foot wide exclusive right-turn lane. The westbound Hudson Terrace approach operates with one 12-foot wide shared lane. There are marked crosswalks on the Beekman Avenue approach, the Hudson Terrace Approach and the northbound approach of North Broadway.

F. PEDESTRIAN FACILITIES AND EQUIPMENT

Information regarding pedestrian facilities and equipment currently provided within the near vicinity of the new location was gathered through a field inventory performed in February, 2012. The inventory included the existing sidewalks, crosswalks, curb ramps and pedestrian crossing signal equipment in the vicinity of the proposed new Open Door facility. The scope of the field study encompassed inventorying four intersections (North Broadway with Beekman Avenue, Bedford Road, New Broadway and Lawrence Street) and noting the conditions and widths of the sidewalks, crosswalks, and curb ramps in the area. It was determined from the information gathered for each intersection that facilities are provided to accommodate pedestrian activity arriving at and leaving the medical offices and are, for the most part, in compliance with American with Disabilities Act Accessibility Guidelines (ADAAG).

The following details **Adler Consulting**'s findings regarding existing provision of sidewalks, crosswalks, curb ramps, and pedestrian crossing signal equipment.

1. North Broadway (US 9) at Beekman Avenue/Hudson Terrace

At the signalized intersection of North Broadway (US 9) and Beekman Avenue/Hudson Terrace, there are crosswalks present on the western, southern, and eastern legs of the intersection. On the southwest corner of the intersection, handicap accessible ramps are provided for both the northbound and eastbound directions together with pedestrian signals and pushbutton controls. The sidewalks at this corner are in good condition. The sidewalks along the south side of Beekman Avenue and along the west side of North Broadway are continuous and are each six (6) feet wide. On the western leg of the intersection, there is a 15-foot center island with handicap accessible ramps. The ramp on the north side of the center island is in excellent condition. On the south side of the center island, the pavement shows some cracking and repaving work where the roadway pavement meets the ramp. Two crosswalks are provided across Beekman Avenue, one on each side of the center island. Each of the crosswalks is ten (10) feet wide and in relatively good condition. The crosswalk from the southwest corner of the intersection to the center island is approximately 49 feet long and the crosswalk from the center island to the northwest corner of the intersection is 58 feet long. A pedestrian pushbutton and a handicap accessible ramp is provided on the northwest corner of the intersection. The

pedestrian crossing signals for the Beekman Avenue crosswalk provide approximately eight (8) seconds for the WALK interval and 14 seconds for the Flashing DON'T WALK interval. Sidewalks are present along the north and west sides of Beekman Avenue and North Broadway, respectively. The sidewalks are approximately ten (10) feet and 12 feet wide, respectively. The sidewalk along the west side of North Broadway appears to be in newer condition than the sidewalk along the north side of Beekman Avenue.

On the northeast corner of the intersection, sidewalks exist along the east and north sides of North Broadway and Hudson Terrace, respectively. These sidewalks also appear to be in good condition. The sidewalk along the east side of North Broadway is approximately four (4) feet wide and the sidewalk along the north side of Hudson Terrace is five (5) feet wide. No sidewalk is provided on the south side of Hudson Terrace. The crosswalk crossing Hudson Terrace is approximately six (6) feet wide and 29 feet long and in good condition. Detectable warning tiles are provided on the handicap accessible ramps at both ends of the crosswalk. There are no pedestrian signals on either corner. Detectable warning tiles are features used at curb ramps consisting of a series of small domes that contrast in color with the surrounding

sidewalk and are integrated into the walking surface. These detectable warning tiles are designed to alert pedestrians who are visually impaired that they are about to enter a street where cars pass. These features at handicap accessible ramps inform pedestrians that they need to stop and assess the situation where the curb meets the roadway. The groove matrix on the detectable warning tile also provides a grip surface for wheelchair and walking cane users on a sloping curbside ramp where detectable warning tiles are used.

On the southern leg of the intersection, the crosswalk is approximately nine (9) feet wide and 47 feet long. A pedestrian signal, pedestrian pushbutton control and handicap accessible ramp are provided for eastbound pedestrian traffic crossing North Broadway. However, no handicap accessible ramp is provided at the northern corner (on the east side of North Broadway). A traffic signal pole is located on the sidewalk at the crosswalk. The eastbound pedestrian countdown display on this signal pole does not appear to function and the pushbutton control also appears to be in a state of disrepair. A three (3)-foot sidewalk exists along the east side of North Broadway south of the crosswalk. However, this sidewalk is not continuous along the frontage of Tornello's Auto Repair to the corner of North Broadway and Hudson Terrace.

2. North Broadway and Bedford Road (NYS Route 448)

At the signalized intersection of North Broadway and Bedford Road, a crosswalk is provided for pedestrian traffic crossing Bedford Road. The crosswalk is approximately 8.5 feet wide and 83 feet long. The crosswalk markings are in fair condition. Pedestrian crossing signals, pushbutton controls and handicap accessible ramps are provided on both ends of the crosswalk. The pedestrian crossing signals for the Bedford Road crosswalk provide approximately eight (8) seconds for the WALK interval and approximately 14 seconds for the Flashing DON'T WALK interval. The detectable warning tile on the ramps at both ends of the crosswalk appear to have been installed some time ago. In addition, sidewalks in good condition are provided along the east side of North Broadway (approximately five (5) feet wide), the south side of Bedford Road (also approximately five (5) feet wide), and the north side of Bedford Road (approximately four (4) feet wide). The sidewalks are continuous along the east side of North Broadway and the north side of Bedford Road. It should be noted, though, that no sidewalk is present north of the driveway for The Horseman Restaurant, which is situated at the intersection of North Broadway with Bedford Road, for a distance of approximately 420 feet.

3. North Broadway and New Broadway

At the signalized intersection of North Broadway and New Broadway, two crosswalks are provided. The markings of the crosswalks are in good condition. The crosswalk for pedestrian traffic crossing North Broadway is approximately ten (10) feet wide and 51 feet long, while the crosswalk for pedestrians crossing New Broadway is also approximately ten (10) feet wide and 37 feet long. Pedestrian crossing displays, pushbutton controls and handicap accessible ramps are provided on each side of the crosswalk for pedestrians crossing North Broadway. The pedestrian crossing displays for the North Broadway crosswalk provide approximately eight (8) seconds for the WALK interval and 14 seconds for the Flashing DON'T WALK interval. At the west end of this crosswalk, the detectable warning tile appears to have been installed some time ago, while the detectable warning tile on the ramp at the east end of the crosswalk appears to be in newer condition. Pedestrian crossing displays and pushbutton controls are not provided for the New Broadway crosswalk. A handicap accessible ramp with new detectable warning tile is provided at the west end of the New Broadway crosswalk. No ramp has been constructed for the east end of the crosswalk. The sidewalk along the east side of New Broadway is approximately 3.5 feet wide and in good condition. The sidewalks along both sides of the site are new

and are approximately five (5) feet wide. On the east side of North Broadway, handicap accessible ramps are provided on both sides of the site driveway for pedestrians crossing the driveway. Field observations revealed that the detectable warning tile on the ramp on the south side of the driveway has deteriorated. The new sidewalk along the east side of North Broadway continues north of the driveway for a distance of approximately 50 feet and is approximately 8.5 feet wide. North of the newly installed sidewalk, the sidewalk is in good condition and at least six (6) feet wide.

4. North Broadway and Lawrence Avenue/Gordon Avenue

Pedestrian amenities are not provided across North Broadway at its intersections with Lawrence Avenue and Gordon Avenue. Handicap accessible ramps are provided on both sides of North Broadway just west of Lawrence Avenue as well as for those crossing Lawrence Avenue and Gordon Avenue. A sidewalk is provided along the north side of North Broadway on both sides of Gordon Avenue. West of Gordon Avenue, the sidewalk is approximately 6.5 feet wide; east of Gordon Avenue, the sidewalk is approximately eleven (11) feet wide. Along the frontage of the BP gasoline station on the south side of North Broadway, the sidewalk is approximately

six (6) feet wide while the sidewalk east of Lawrence Avenue is approximately eight (8) feet wide. Sidewalks are also provided along both sides of Lawrence Avenue south of North Broadway and are at least six (6) feet wide. All of the sidewalks were observed to be in good condition. The handicap accessible ramps provided on both sides of North Broadway have detectable warning tile that were installed some time ago as are the two ramps on both sides of Gordon Avenue. The sidewalks along the south side of North Broadway on either side of Lawrence Avenue are in good condition. It was observed that the detectable warning tile on the two ramps provided for those crossing Lawrence Avenue are well-worn.

5. Additional Field Measurements Related to Crossing Streets

North Broadway (US Route 9) is under the jurisdiction and control of NYSDOT who determine the timing and phasing for both vehicle and pedestrian signals at the intersections. The curb-to-curb width of North Broadway is approximately 51 feet at the intersection with New Broadway. The pedestrian signal phasing currently provides approximately 22 seconds of time, including the WALK interval and the flashing DON'T WALK interval, to cross the street. The 2010 edition of the Highway Capacity Manual indicates that a crossing speed of 3.5 feet per second

should be used if no more than 20% of the pedestrians are elderly and a crossing speed of 3.0 feet per second be used if elderly people constitute more than 20% of the total number of pedestrians. At a walking speed of three (3) feet per second, there is sufficient time to cross North Broadway.

The curb-to-curb width across Beekman Avenue is approximately 121 feet including the 15-foot traffic island. The northerly crosswalk is approximately 58 feet long while the southerly crosswalk is approximately 49 feet in length. At an average walking speed of three (3) feet per second (that recommended by the 2010 Highway Capacity Manual to be used if more than 20% of the pedestrians are elderly), a pedestrian could safely walk across one section of Beekman Avenue in one phase, wait on the traffic island, and then cross the remaining section of Beekman Avenue in a second pedestrian phase.

At the signalized intersection of North Broadway and Bedford Road, the crosswalk crossing Bedford Road is approximately 83 feet long. The pedestrian crossing signals for the Bedford Road crosswalk provide approximately eight (8) seconds for the WALK interval and approximately 14 seconds for the Flashing DON'T WALK

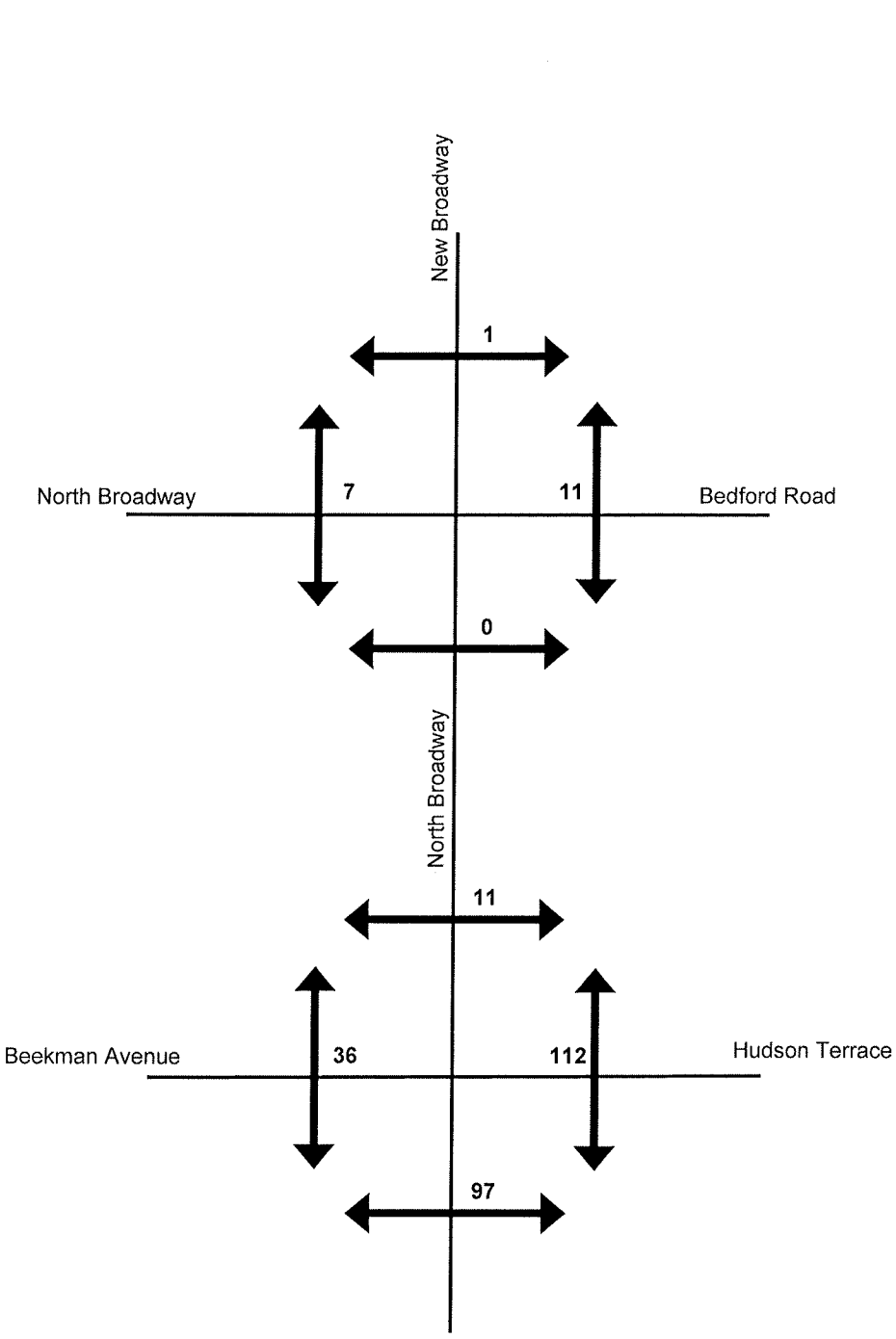
interval. In addition, the yellow vehicular clearance interval for the traffic signal is five (5) seconds long and the all-red clearance interval is one (1) second long. Using the walking speed of 3.5 feet per second, it is possible for a typical pedestrian to cross approximately 77 feet utilizing the time available during 22-second WALK interval provided. It is noted that the pedestrian phase ends at the start of the vehicle clearance interval. The typical pedestrian could safely cross the remaining six (6) feet in the crosswalk utilizing the yellow and all-red clearance interval of six (6) seconds. The total of 28 seconds (including the WALK interval, the flashing DON'T WALK interval and the vehicle clearance interval) provided at this crosswalk would also permit a person crossing at the conservative walking speed of 3.0 feet per second to travel approximately 84 feet which is sufficient to safely cross Bedford Road before the traffic on North Broadway would be permitted to enter into the intersection.

G. Pedestrian Field Studies

Pedestrian counts were conducted by representatives of **Adler Consulting** during the peak AM, Midday, and PM weekday periods at the intersections of North Broadway with Beekman Avenue/Hudson Terrace; North Broadway with Bedford Road; and, North Broadway with New Broadway (the latter two intersections were considered as

one four-legged intersection). The pedestrians crossing at each intersection were counted on Tuesday, February 28, 2012 at 15-minute intervals between 8:00 a.m. and 10:00 a.m., 12:00 p.m. and 2:00 p.m., and from 3:30 p.m. to 6:30 p.m. No unusual weather or traffic events were recorded during these times. Therefore, the data collected is assumed to be representative of field conditions and unaffected by observed holidays. The pedestrian counts were reviewed to verify their validity. The Pedestrian Volumes are depicted on Figure 2, Figure 3 and Figure 4 for the AM Peak Hour, the Midday Peak Hour and the PM Peak Hour, respectively.

At the intersection of North Broadway with Beekman Avenue/Hudson Terrace, 97 pedestrians were observed crossing the south leg of the intersection during the weekday AM Peak Hour (8:00 a.m. – 9:00 a.m.) with 112 pedestrians crossing the east leg of the intersection. At the North Broadway with Bedford Road intersection, eleven (11) pedestrians were observed crossing Bedford Road. Only one (1) pedestrian crossed New Broadway at the North Broadway with New Broadway intersection. The pedestrians counts conducted during the weekday morning period indicate that the 112 pedestrians observed crossing at the Hudson Terrace crosswalk can be attributed to activity at The Horseman Diner as well as travel to the Middle



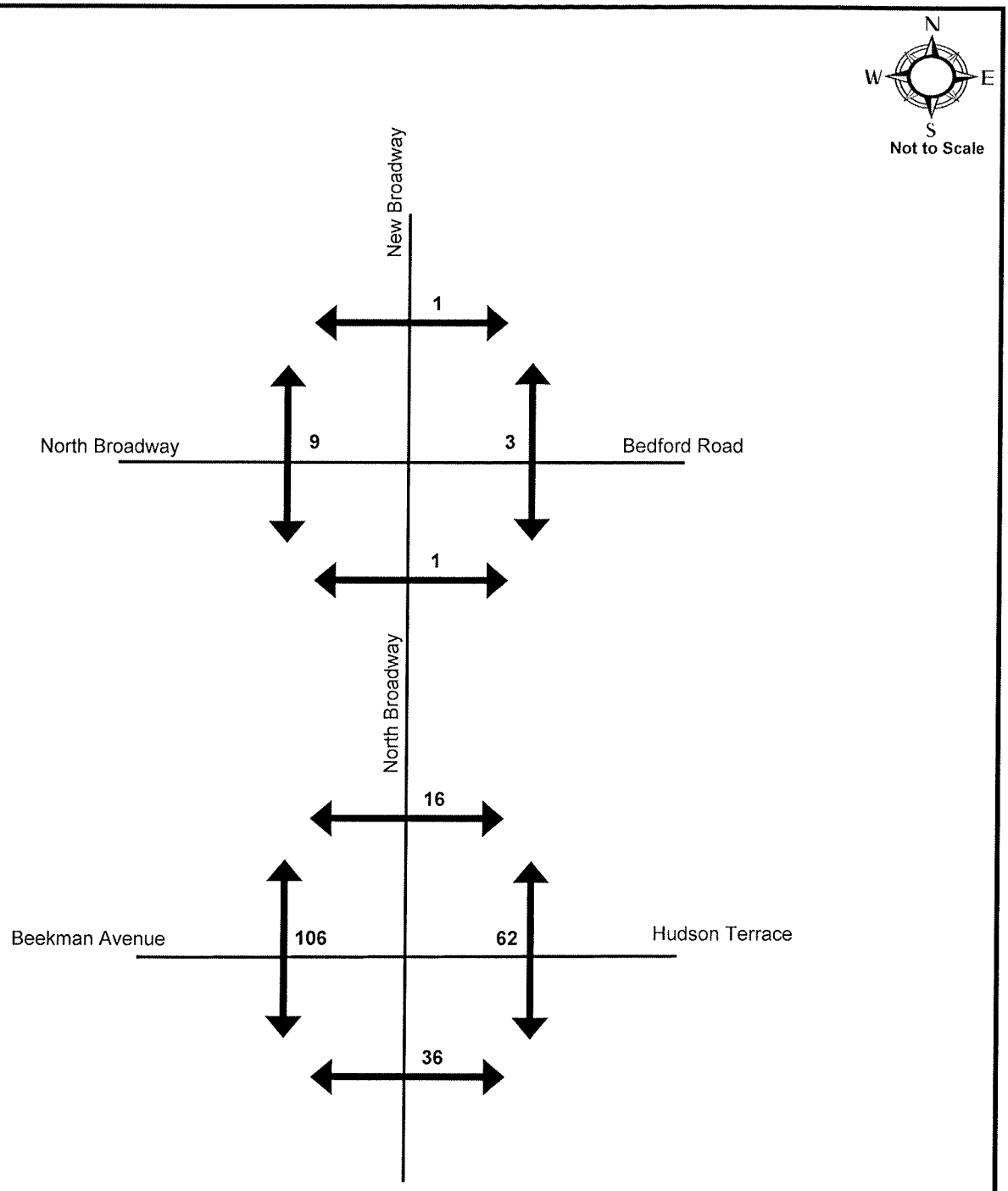
Legend
AM. Peak Hour Volume

Project:
Open Door
Sleepy Hollow, NY

Title:
Pedestrian Volumes
Weekday AM Peak Hour

Prepared By:
Adler Consulting, White Plains, NY
Transportation Planning & Traffic Engineering, PLLC

FIGURE 2



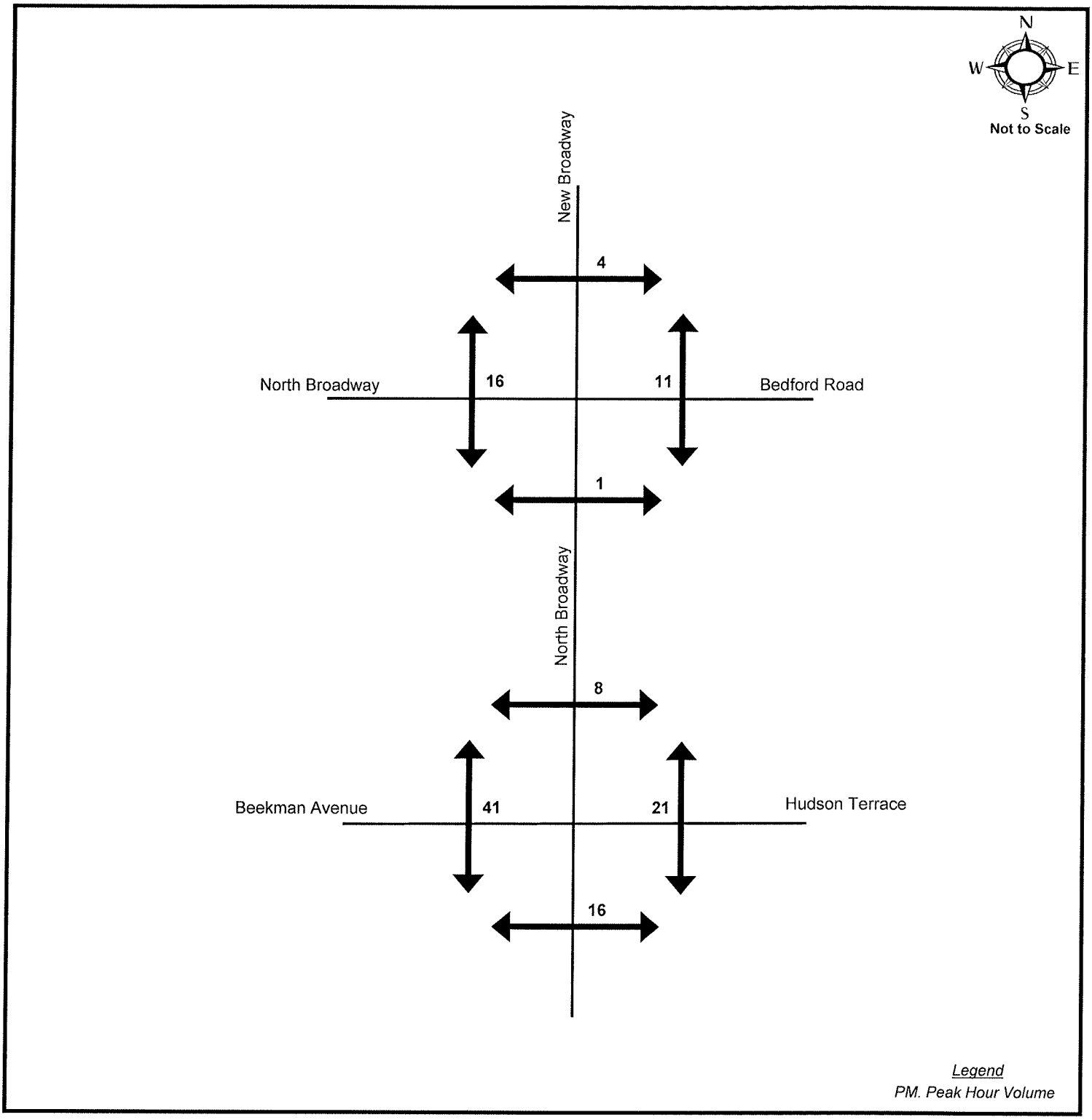
Legend
Midday Peak Hour Volume

Project:
Open Door
Sleepy Hollow, NY

Title:
Pedestrian Volumes
Weekday Midday Peak Hour

Prepared By:
Adler Consulting, White Plains, NY
Transportation Planning & Traffic Engineering, PLLC

FIGURE 3



Project:
Open Door
Sleepy Hollow, NY

Title:
Pedestrian Volumes
Weekday PM Peak Hour

Prepared By:
Adler Consulting, White Plains, NY
Transportation Planning & Traffic Engineering, PLLC

FIGURE 4

and High Schools. Since there is no sidewalk on the south side of Hudson Terrace, it would appear that pedestrians are crossing Hudson Terrace and then walk on the sidewalk along the north side of Hudson Terrace or use the sidewalk along the south side of Bedford Road toward the Schools.

During the weekday Midday Peak Hour (12:00 p.m. – 1:00 p.m.), 106 pedestrians were observed crossing the west leg of North Broadway at the Beekman Avenue/Hudson Terrace intersection, 36 pedestrians crossed the south leg, and 62 pedestrians crossed the east leg of the intersection. At the North Broadway with Bedford Road intersection, three (3) pedestrians were observed crossing at the Bedford Road crosswalk. Only one (1) pedestrian used the New Broadway crosswalk at the North Broadway with New Broadway intersection. The pedestrian counts conducted during the weekday midday period indicate that the majority of the pedestrians observed crossing at the Beekman Avenue crosswalk can be attributed to activity at the Wasabi Japanese Sushi Restaurant located on the northwest corner of the North Broadway/Beekman Avenue intersection. The Restaurant opens at 12:00 p.m. for lunch. It also appears that pedestrians crossing the Hudson Terrace crosswalk can be attributed to those having lunch at The Horseman Restaurant or to

usage of sidewalk along the north side of Hudson Terrace (due to the absence of sidewalk along the south side of Hudson Terrace) and usage of sidewalk along the south side of Bedford Road, similar to what was deduced from the weekday AM period counts.

During the weekday PM Peak Highway Hour (4:00 p.m. – 5:00 p.m.), the majority of the pedestrians (41) were counted crossing the west leg of the North Broadway at Beekman Avenue/Hudson Terrace intersection. The pedestrian counts conducted during the weekday evening period indicate that the 41 pedestrians observed crossing Beekman Avenue can be attributed to activity at the Wasabi Japanese Sushi Restaurant, similar to what was deduced from the weekday Midday period counts. The Restaurant serves dinner until 10:00 p.m.

H. Vehicle Field Studies

Turning movement counts were collected on Tuesday, November 22, 2011 between 7:00 a.m. and 9:30 a.m. and from 4:00 p.m. to 6:30 p.m. at the intersections of North Broadway with Lawrence Avenue/Gordon Avenue; North Broadway with New

Broadway/Bedford Road; and, North Broadway with Beekman Avenue/Hudson Terrace. No unusual weather or traffic events were recorded during these times, therefore the data collected is assumed to be representative of field conditions.

There was a concern raised that the traffic counts conducted on the Tuesday before Thanksgiving which may have been influenced by the Thanksgiving Holiday. Accordingly, additional turning movement counts were collected on Tuesday, March 6, 2012 between 7:30 a.m. and 9:00 a.m. and from 3:45 p.m. to 5:15 p.m. at the intersections of North Broadway with Lawrence Avenue/Gordon Avenue; North Broadway with New Broadway/Bedford Road; and, North Broadway with Beekman Avenue/Hudson Terrace. There were no holidays during the week the traffic data were collected. No unusual weather or traffic events were recorded during these times. Therefore, the data collected is considered to be typical field conditions and unaffected by observed holidays.

The March 2012 traffic volume count data were reviewed to verify their validity and were compared with the November 2011 data. A review of the surveyed traffic data revealed slight increases as well as slight decreases in some of the movement volumes

at the three study intersections during the AM Peak Highway Hour. A comparison of the data collected in the PM Peak Highway Hour indicated lower volumes in March than previously counted in November. Overall, the two sets of data are quite similar, confirming that the counts and analyses performed initially using the November 2011 data were not skewed by the Thanksgiving holiday.

I. Peak Hours

A review of the surveyed vehicular traffic data revealed the peak hours of traffic activity on the roadway system in the vicinity of the Site to be:

- Peak AM Highway Hour 7:45 to 8:45 a.m.
- Peak PM Highway Hour 4:00 to 5:00 p.m.

J. Existing Traffic Volumes

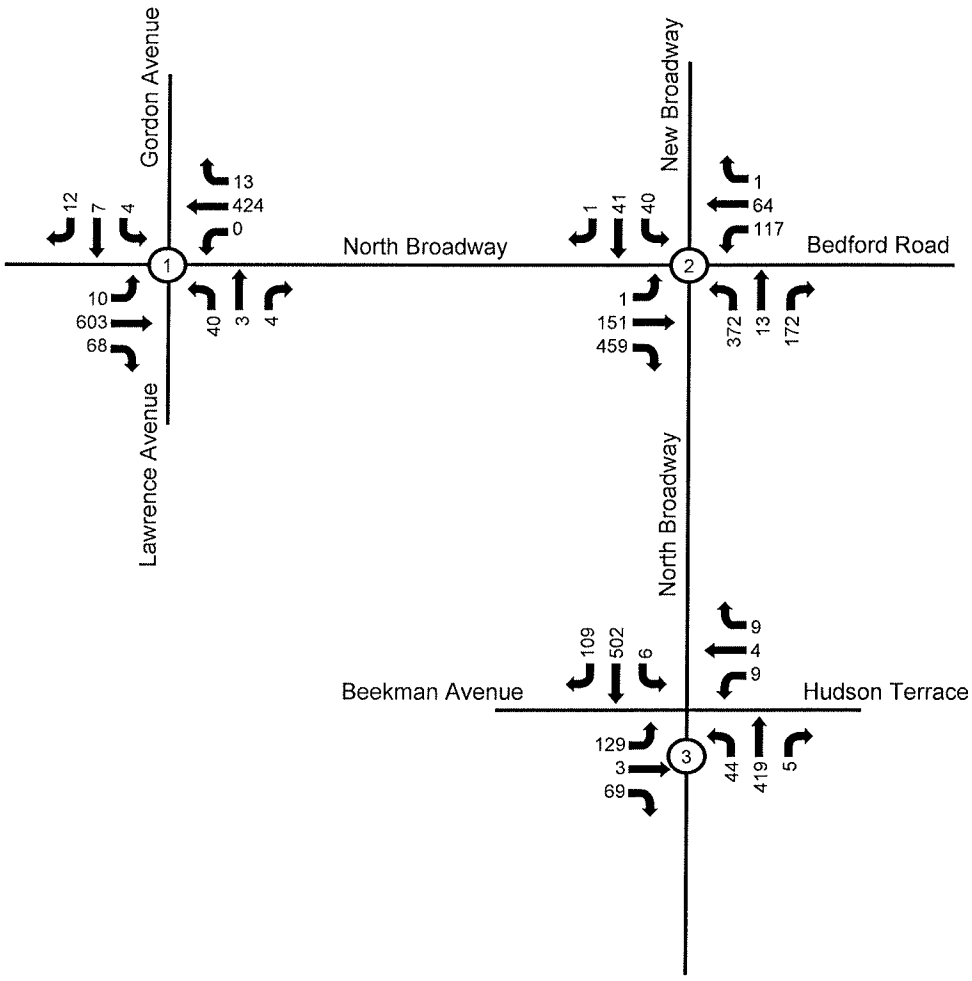
The collected traffic volumes were reviewed to verify their validity and were balanced. The resulting "Existing" Traffic Volumes from November, 2011 are shown graphically

in Figure 5 and Figure 6, while the traffic volume data collected in March, 2012 are depicted in Figure 7 and Figure 8.

K. Capacity Analyses Procedures

Traffic impacts are measured by intersection capacity analyses, computed in accordance with procedures outlined in the 2000 Highway Capacity Manual, published by the Transportation Research Board. In general, analyses' results are a measure of the ability of an intersection to process vehicles. This is evaluated for each approach to the intersection as well as for the entire intersection. The analyses' results are identified as Levels-of-Service (LOS) which range from "A" through "F", with LOS "A" representing the least delays and LOS "F" representing longer delays or capacity deficient operations.

According to generally accepted practice, Levels-of-Service "A", "B" and "C" reflect clearly acceptable conditions, Level-of-Service "D" reflects the existence of delays within a generally tolerable range, Level-of-Service "E" is generally tolerated on minor



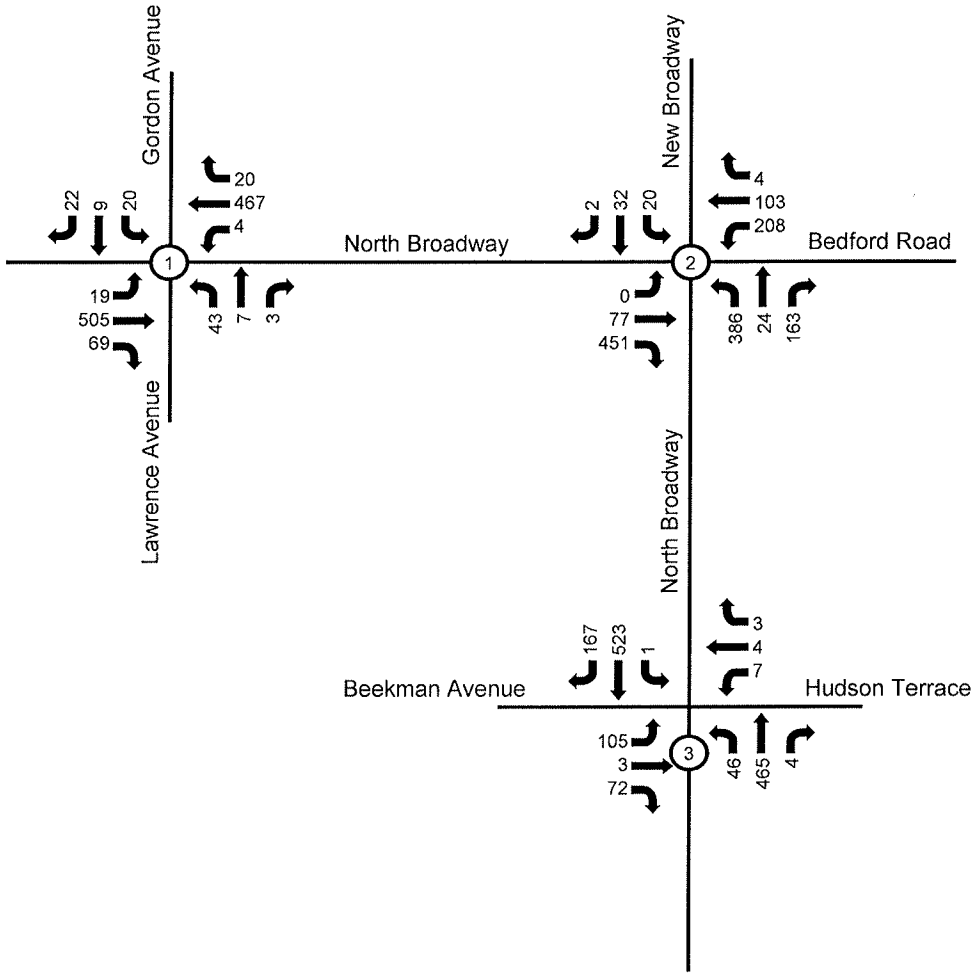
Legend
AM. Peak Hour Volume

Project:
Open Door
Sleepy Hollow, NY

Prepared By:
Adler Consulting, White Plains, NY
Transportation Planning & Traffic Engineering, PLLC

Title:
AM Peak Highway Hour Traffic Volumes (November 2011)

FIGURE 5

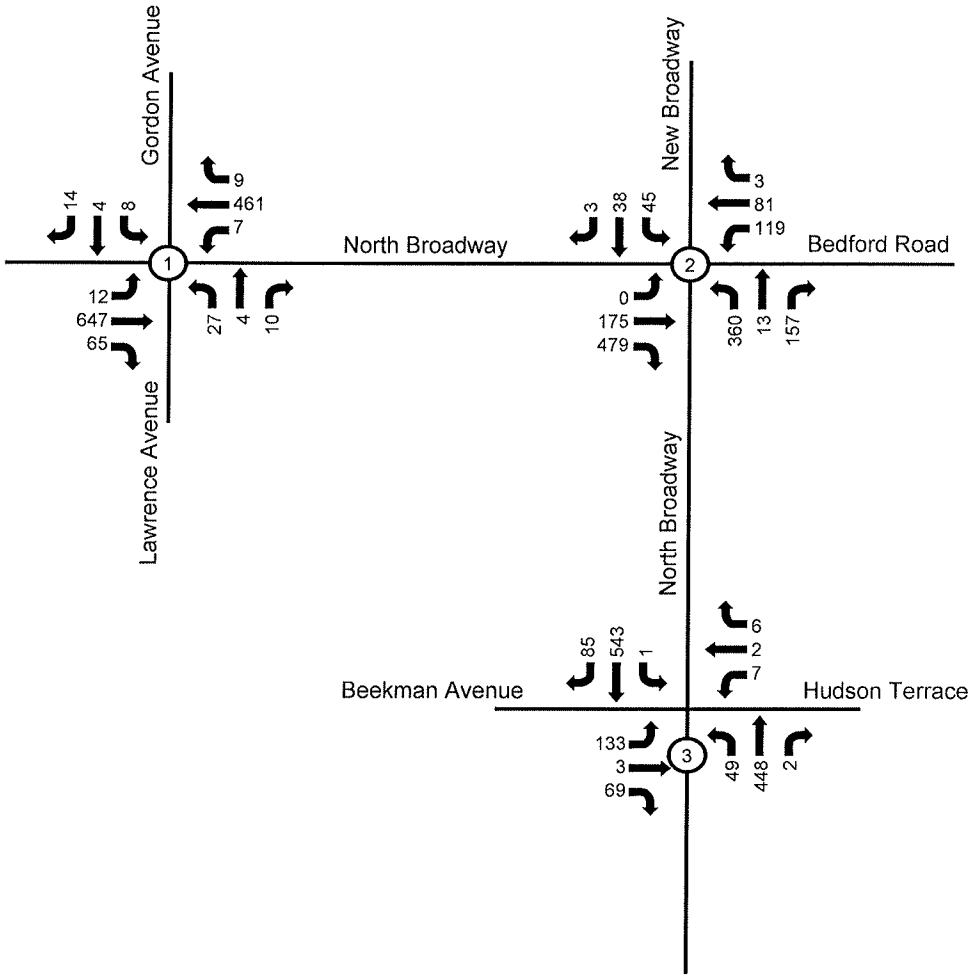


Project:
Open Door
Sleepy Hollow, NY

Title:
PM Peak Highway Hour Traffic Volumes (November 2011)

Prepared By:
Adler Consulting, White Plains, NY
Transportation Planning & Traffic Engineering, PLLC

FIGURE 6



Project:

Open Door

Sleepy Hollow, NY

Prepared By:

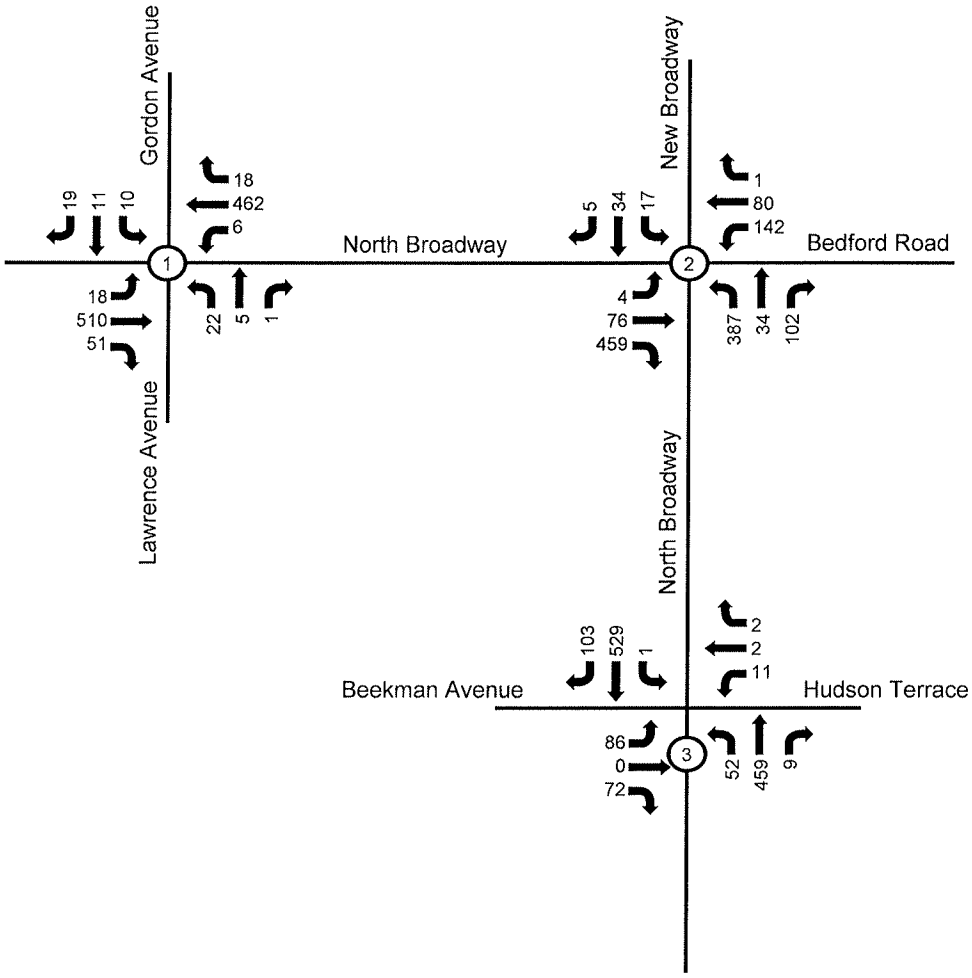
Adler Consulting, White Plains, NY

Transportation Planning & Traffic Engineering, PLLC

Title:

AM Peak Highway Hour Traffic Volumes (March 2012)

FIGURE 7



N
W
E
S
Not to Scale

Legend
PM. Peak Hour Volume

Project:
Open Door
Sleepy Hollow, NY

Title:
PM Peak Highway Hour Traffic Volumes (March 2012)

Prepared By:
Adler Consulting, White Plains, NY
Transportation Planning & Traffic Engineering, PLLC

FIGURE 8

movements and Level-of-Service "F" indicates typically undesirable delays often associated with breakdown conditions.

The parameters considered in the calculations include: the type of intersection control, the volumes on each approach, the distribution of vehicles by direction (left, through and right) and other factors including vehicle types, pedestrian movements and parking constraints. Roadway parameters relate to the geometry of the intersection, specifically, the number of lanes and lane-use considerations.

The computed Level-of-Service is defined in terms of the average control delay per vehicle **for the peak 15-minute period within the peak one-hour period**. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections, capital letters are used to indicate the Levels-of-Service. The range of delay within each Level-of-Service category are:

LEVEL-OF-SERVICE	STOPPED DELAY PER VEHICLE (Seconds)
A	Less than 10.00
B	Between 10.01 and 20.00
C	Between 20.01 and 35.00
D	Between 35.01 and 55.00
E	Between 55.01 and 80.00
F	Greater than 80.00

For unsignalized intersections, Levels-of-Service and delay are reported for the individual lane groups, in that they provide a more meaningful representation of operating conditions than the overall intersection Level-of-Service and delay. Lower case letters are used to show that the Level-of-Service refers to unsignalized intersections. The ranges of delay within each Level-of-Service category are as follows:

LEVEL-OF-SERVICE	STOPPED DELAY PER VEHICLE (Seconds)
a	Less than 10.00
b	Between 10.01 and 15.00
c	Between 15.01 and 25.00
d	Between 25.01 and 35.00
e	Between 35.01 and 50.00
f	Greater than 50.00

These delay ranges for the Unsignalized Level-of-Service categories are less than those at signalized intersections because it is assumed that motorists will tolerate longer delays at a signalized intersection in exchange for guaranteed entry into the intersection in a definite period of time.

L. Existing Traffic Operating Conditions

The Existing traffic volumes were compared with current roadway capacities using the Synchro, Version 7 analyses software. Detailed capacity analysis work sheets are included in the Appendix of this report. As can be seen from the Table 1, overall Level-of-Service "C" or better operating conditions are currently provided at the signalized intersections of North Broadway with New Broadway/Bedford Road and North Broadway with Beekman Avenue/Hudson Terrace for both the AM and PM Peak Highway Hours. At the unsignalized intersection of North Broadway with Lawrence Avenue/Gordon Avenue, Level-of-Service "a" operating conditions are provided for the major street approaches of North Broadway and Level-of-Service "c" operating conditions are provided for the westbound Gordon Avenue approach and

Level-of-Service "f" for the eastbound Lawrence Avenue approach for both the AM and PM Peak Highway Hours.

Table 1. Level-of-Service Summary, Existing Conditions

Intersection	Approach[1]	AM		PM	
		LOS[2]	Average Delay[3] (Sec./Veh.)	LOS	Average Delay (Sec./Veh.)
North Broadway at Lawrence Ave./Gordon Ave.	EB l/t/r	f	50.3	f	74.5
	WB l/t/r	c	18.8	c	23.1
	NB l/t/r	a	0.0	a	0.1
	SB l/t/r	a	0.4	a	0.8
North Broadway at New Broadway/Bedford Road	WB l	E	63.7	E	69.5
	WB r	E	57.7	E	56.1
	NB t/r	A	3.1	A	2.4
	SB l/t	D	42.1	C	34.6
	SE l/t/r	E	70.9	E	70.1
	Overall	C	31.1	C	29.9
North Broadway at Beekman Ave./Hudson Ter.	EB l/t	E	65.4	E	65.0
	EB r	C	24.6	B	16.8
	WB l/t/r	D	42.1	D	53.3
	NB l/t/r	C	33.3	D	40.1
	SB l/t	A	2.4	A	2.1
	Overall	C	21.6	C	22.2

Note:
1. EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, l = Left, t = Thru and r = Right.
2. Uppercase letters represent Levels-of-Service for signalized intersections, while lowercase letters represent those of unsignalized intersections.
3. Delays are the average for each lane group in seconds per vehicle. For signalized intersections, the average delay per vehicle for the entire intersection is also included. For unsignalized intersections, the value represents the average delay per vehicle for the lane group experiencing the greatest delays.

M. VICINITY DEVELOPMENTS

Discussions with the planning consultants for the Village of Sleepy Hollow indicated that there are two potential developments in the vicinity of the Site that are expected to generate traffic through the Study area. These vicinity developments are as follows:

- RIVERS EDGE

A proposed 60-unit residential project consisting of 32 one-bedroom units, 24 two-bedroom units and four (4) three-bedroom units. These condominium units are to be located on the west side of River Street on the former Castle Oil site and are currently being reviewed by the Village of Sleepy Hollow Planning Board for site plan approval.

- GM PROJECT (LIGHTHOUSE LANDING)

There is a proposal currently being reviewed to develop a total of 1,177-residential units; 135,000 sf of retail space; 35,000 sf of Office area; and a 140-room Hotel to be located on the former GM Plant.

Traffic volumes anticipated to be generated by these developments were determined from information contained in the Institute of Transportation Engineers (ITE) publication, *Trip Generation,* 8th Edition, or from available traffic studies, and was added to the surrounding roadway network.

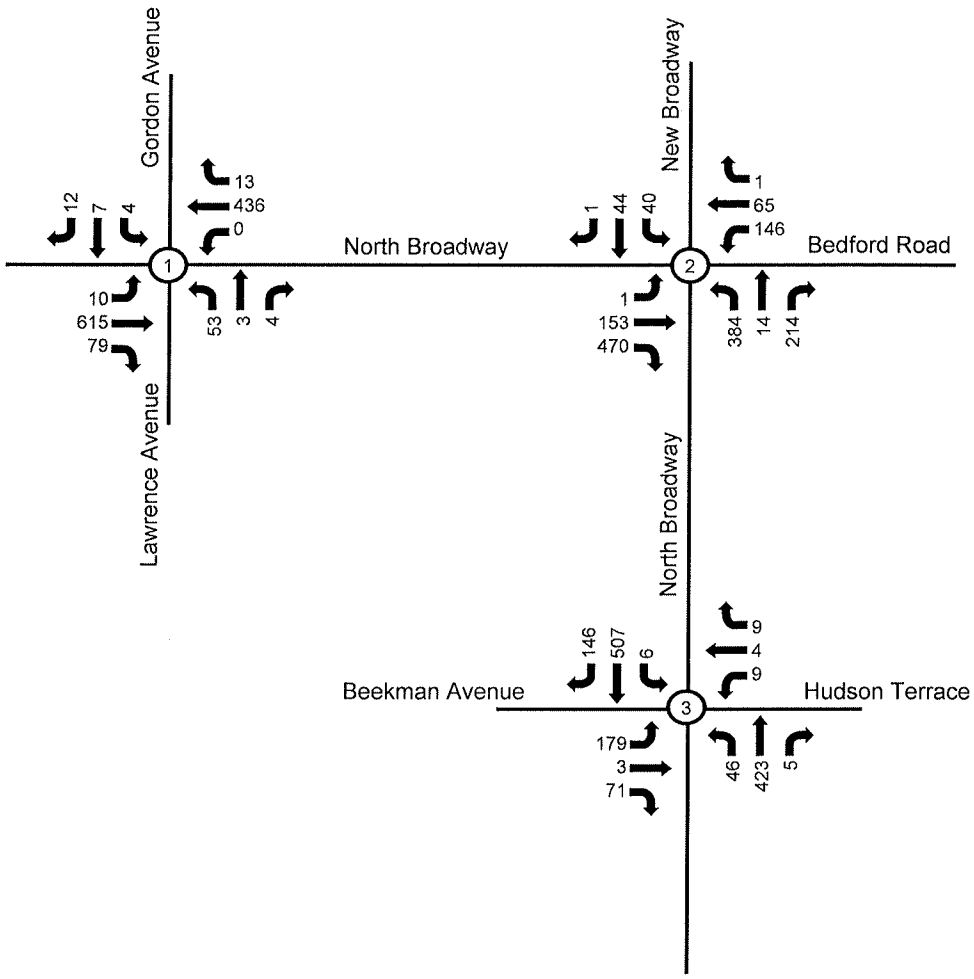
N. No-Build Traffic Volumes

The "No-Build" traffic volumes are the resultant sum of the Horizon Year traffic volumes and the vicinity development volumes. The Horizon Year traffic volumes are determined by multiplying the Existing traffic volumes by a factor representative of area-wide growth. Based on the increase in the traffic volume, it is expected that additional area-wide background traffic growth will not be significant by the Project's year of completion (2013). Hence, in this application, a one-half of one percent per year growth factor was used to represent the non-development-specific increase in traffic volumes on the road system in the area. It is expected that the Project will be completed by 2013; therefore, the existing traffic volumes were increased by one-half of one percent (½) per year for two (2) years, resulting in a total increase of one (1) percent. The No-Build traffic volumes are the sum of the Horizon Year and the

vicinity development traffic volumes. No-Build traffic volumes are shown graphically in Figures 9 and 10. These traffic volumes represent the number of vehicles, projected to be on the adjacent roadway system during the peak highway hours, without the Project in 2013.

O. No-Build Capacity Analysis Results

The No-Build traffic volumes were compared with current roadway capacities using Synchro, Version 7 analyses software.

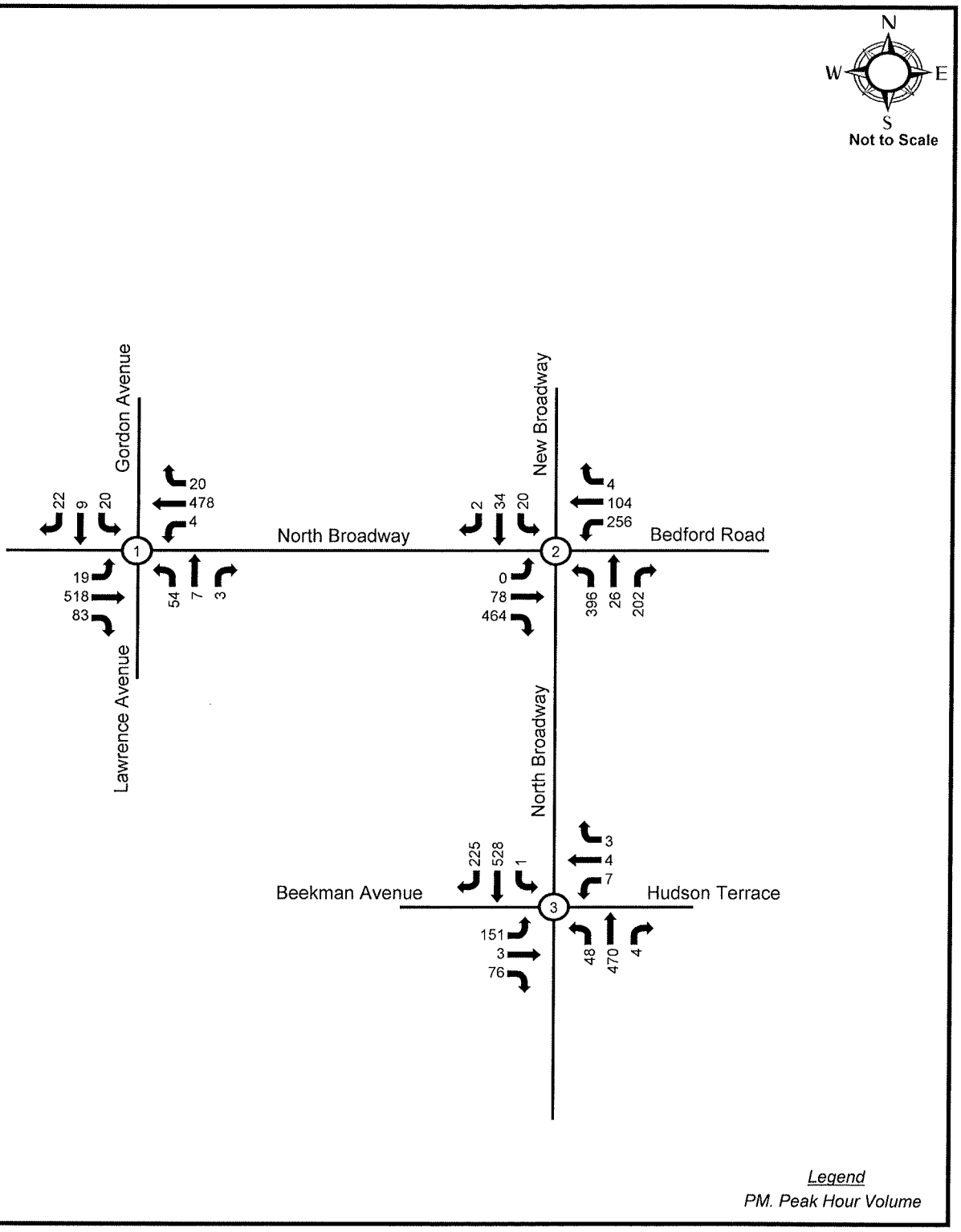


Project:
Open Door
Sleepy Hollow, NY

Title:
No-Build AM
Peak Highway Hour
Traffic Volumes

Prepared By:
Adler Consulting, White Plains, NY
Transportation Planning & Traffic Engineering, PLLC

FIGURE 9



Project:
Open Door
Sleepy Hollow, NY

Title:
No-Build PM
Peak Highway Hour
Traffic Volumes

Prepared By:
Adler Consulting, White Plains, NY
Transportation Planning & Traffic Engineering, PLLC

FIGURE 10

Table 2. Level-of-Service Summary, No-Build Conditions

Intersection	Approach[1]	AM		PM	
		LOS[2]	Average Delay[3] (Sec./Veh.)	LOS	Average Delay (Sec./Veh.)
North Broadway at Lawrence Ave./Gordon Ave.	EB l/t/r	f	67.8	f	111.6
	WB l/t/r	c	19.6	c	24.3
	NB l/t/r	a	0.0	a	0.1
	SB l/t/r	a	0.4	a	0.8
North Broadway at New Broadway/Bedford Road	WB l	E	67.3	F	85.9
	WB r	E	57.1	E	56.9
	NB t/r	A	4.6	A	3.4
	SB l/t	E	56.3	D	40.9
	SE l/t/r	E	73.8	E	72.2
	Overall	D	37.7	D	35.6
North Broadway at Beekman Ave./Hudson Ter.	EB l/t	E	73.1	E	70.2
	EB r	C	33.6	C	26.5
	WB l/t/r	D	42.9	D	54.0
	NB l/t/r	D	37.4	D	47.3
	SB l/t	A	2.8	A	3.0
	Overall	C	25.7	C	26.6

Note:
1. EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, l = Left, t = Thru and r = Right.
2. Uppercase letters represent Levels-of-Service for signalized intersections, while lowercase letters represent those of unsignalized intersections.
3. Delays are the average for each lane group in seconds per vehicle. For signalized intersections, the average delay per vehicle for the entire intersection is also included. For unsignalized intersections, the value represents the average delay per vehicle for the lane group experiencing the greatest delays.

As can be seen from the Table 2, it is anticipated that the overall Level-of-Service at the signalized intersection of North Broadway with New Broadway/Bedford Road would transition to "D" for both the morning and evening Peak Highway Hours and overall Level-of-Service "C" operating condition are expected at the intersection of North Broadway with Beekman Avenue/Hudson Terrace for both morning and

evening Peak Highway Hours. At the intersection of North Broadway with Lawrence Avenue/Gordon Avenue, Level-of-Service "a" conditions are projected for the major street approaches, along with Level-of-Service "f" for the eastbound Lawrence Avenue approach for both the AM and PM Peak Highway Hours.

P. Proposed Project Generated Traffic

Surveys were conducted at the existing Open Door medical offices at 80 Beekman Avenue on Monday, November 28, 2011, between 8:00 a.m. and 7:00 p.m. to determine the trips generated and the travel mode of its patrons. Surveyors noted the arrival time of each person, briefly interviewed them concerning how they arrived (automobile, taxi, bus, or walk). For those who stated that they arrived by automobile, they were also asked whether they had been dropped off by others or had parked their vehicle. Surveyors also interviewed all people leaving the Site and recorded their time of departure and the mode they used, whether they walked to a parked car, picked up by others (in a private car or taxi), boarded a bus or by walking.

The data was categorized to identify existing parking demand attributed to the staff and the visitors at the current Open Door medical offices. The data were also used to project the anticipated parking needs for the proposed medical offices. There were a total of 324 surveys conducted during the day including 297 patients/visitors and 27 staff. The survey data indicated that the vast majority 70 percent of the patients and visitors walked to the medical offices while just over one quarter of the patients, 27 percent, drove to the medical offices. Approximately two (2) percent of the patients used public transportation while approximately one (1) percent of patients either used taxi or were dropped off.

The survey data also indicated that 78 percent of the staff drove their own automobiles to work, four (4) of the staff (15 percent) traveled by bus and two (2) of the staff (7 percent) walked.

The AM Peak Highway Hour for the roadway network occurred between 7:45 a.m. and 8:45 a.m. However, the Open Door facility opens at 8:30 a.m when the surveyed trips generated due to the facility during this Peak Highway Hour would be much lower. To be conservative, therefore, the higher peak generator hour trips were used

to forecast the future trip generation and were superimposed on the morning Peak Highway Hour. The traffic survey data revealed that there were eleven (11) entering and five (5) exiting trips generated during the AM Peak Highway Hour and five (5) entering and six (6) exiting trips generated during the PM Peak Highway Hour.

The number of trips expected to be generated by the new medical offices were projected by growing the number of vehicle trips generated by the existing Site on a proportional bases to reflect the increased size of the proposed medical offices. Therefore, the proposed 12,389 sf medical offices are projected to proportionately generate a total of 39 trips (27 entering and twelve [12] exiting trips) during the AM Peak Highway Hour and a total of 27 trips (twelve [12] entering and 15 exiting trips) during the PM Peak Highway Hour.

It is proposed that a shuttle bus service would transport medical office staff from the Phelps Memorial Hospital to the Site and would add an additional two (2) entering and two (2) exiting trips to the roadways during the AM and PM Peak Highway Hours. Therefore, it is conservatively projected that the proposed open Door Medical offices would generate a total of 43 trips (29 entering and 14 exiting trips)

during the AM Peak Highway Hour and a total of 31 trips (14 entering and 17 exiting trips) during the PM Peak Highway Hour.

Again, in that concern was raised that the data was collected between Thanksgiving and Christmas, additional interviews of staff and clients were conducted at the existing Open Door medical offices at 80 Beekman Avenue on Tuesday, February 28, 2012, between 8:00 a.m. and 7:00 p.m. to determine the trips generated and the travel mode of patients and staff. Surveyors noted the arrival time of each person and briefly interviewed them concerning how they arrived (automobile, taxi, bus, or walk). Those who stated that they arrived by automobile were also asked whether they had been dropped off by others or had parked their vehicle. The surveyors also interviewed all people leaving the Site and recorded their time of departure and the mode they used, whether they walked to a parked car, were picked up by others (in a private car or taxi), boarded a bus or walked.

The data was categorized to identify existing parking demand attributed to the staff and the visitors at the current Open Door medical offices. There were a total of 237 surveys conducted during the day including 214 patients/visitors and 23 staff. The

survey data indicate that the vast majority of the patients and visitors (69 percent) walk to the medical offices, while one quarter of the patients (25 percent) drive to the medical offices. Approximately two (2) percent of the patients use public transportation while approximately four (4) percent of patients either used taxi service or are dropped off. The patient/visitor travel mode percentages are almost identical to those calculated using the November 2011 survey data wherein 70 percent of the patients/visitors also arrived at and left the medical offices by walking and approximately one quarter of the patients drove. It is projected that a proportionate increase in the number of patients who walked to the medical offices would result in an estimated 82 and 64 patient/visitors that would walk to the medical offices, during the AM and PM Peak Highway Hours, respectively.

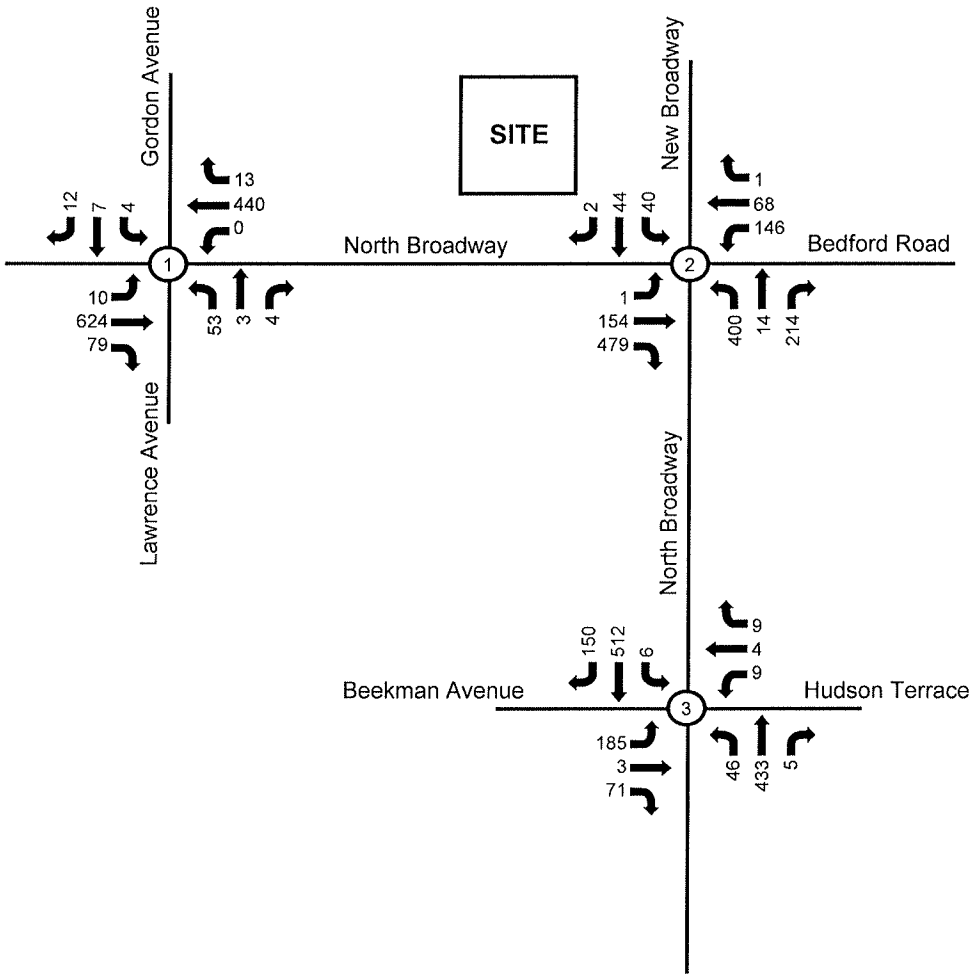
The staff travel mode percentages determined using the February 2012 survey resulted in higher vehicle usage than was survey on the November 2011 data (87 percent versus 78 percent) and lower bus usage (15 percent usage in November 2011 versus nine (9) percent in February 2012). However, the two sets of survey data are consistent and indicate the majority of the staff drive to the medical offices while most of the patients/visitors (approximately 70 percent) arrive at and leave the medical offices by walking. While Open Door's policy is that all staff will park at a

remote location, and will, therefore, not generate traffic volumes at the Site, the following Site-generated traffic volumes were projected as a conservative value representing a worst-case scenario. The project-generated vehicle trips are summarized in Table 3.

Table 3. Project-Generated Peak Hour Vehicular Trip Summary

Open Door	AM			PM		
	In	Out	Total	In	Out	Total
Future	27	12	39	12	15	27
Additional Trips (Shuttle Bus)	2	2	4	2	2	4
Total Projected	29	14	43	14	17	31

The arrival and departure patterns for the Project-generated traffic were developed based on a review of the surveyed volumes at the study intersections. The Project-generated trips were added to the No-Build traffic volumes to obtain the Build traffic volumes. The resultant Build traffic volumes are shown in Figures 11 and 12, which represent the future projected traffic volumes upon completion of the Project.



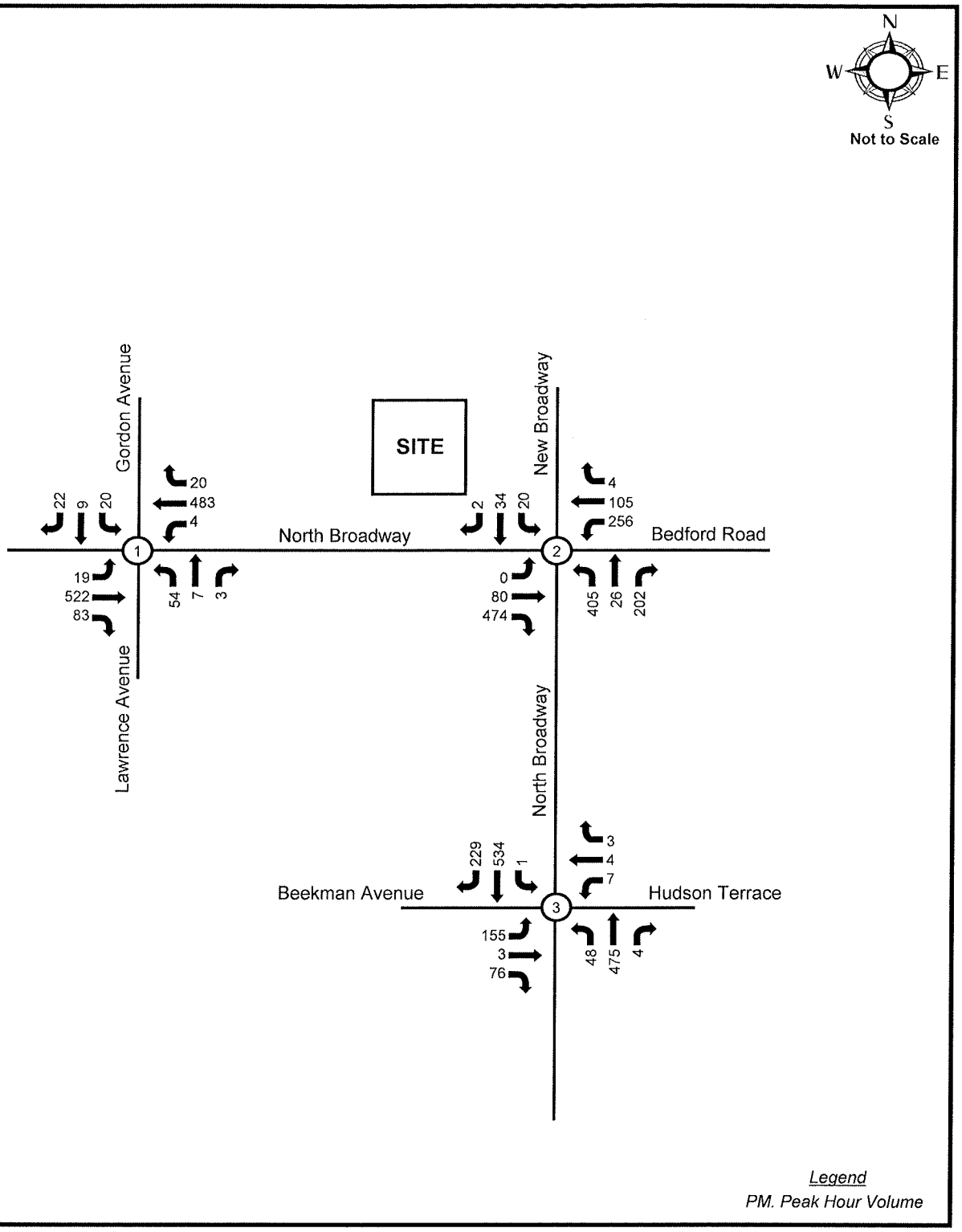
Legend
AM. Peak Hour Volume

Project:
Open Door
Sleepy Hollow, NY

Title:
Build AM
Peak Highway Hour
Traffic Volume

Prepared By:
Adler Consulting, White Plains, NY
Transportation Planning & Traffic Engineering, PLLC

FIGURE 11



Project:

Open Door

Sleepy Hollow, NY

Title:

Build PM
Peak Highway Hour
Traffic Volume

Prepared By:

Adler Consulting, White Plains, NY

Transportation Planning & Traffic Engineering, PLLC

FIGURE 12

Q. FUTURE TRAFFIC OPERATING CONDITIONS

The anticipated Build traffic volumes were compared with current roadway capacities using Synchro, Version 7 analyses software. Detailed capacity analysis work sheets are included in the Appendix of this report. Level-of-Service "D" operating conditions continue to be projected at the intersection of North Broadway with New Broadway/Bedford Road with an overall increase in delay of 2.2 seconds and 0.6 seconds for the AM and PM Peak Highway Hours respectively. At the intersection of North Broadway with Beekman Avenue/Hudson Terrace Level-of-Service "C" conditions are anticipated with an increase in delay of less than 1.0 seconds in the AM and PM Peak Highway Hours. At the intersection of North Broadway with Lawrence Avenue/Gordon Avenue, Level-of-Service "a" operating conditions are anticipated on North Broadway approaches and Level-of-Service "f" operating conditions continue to be projected for the eastbound Lawrence Avenue approach for both the AM and PM Peak Highway Hours.

A summary of the analysis results for the Build conditions along with a summary of the analysis results for the Existing and No-Build projected traffic operating conditions is depicted in Table 4.

Table 4. Level-of-Service Comparison

Intersection	App.[1]	AM Existing	AM No-Build	AM Build	PM Existing	PM No-Build	PM Build
North Broadway	EB l/t/r	f (50.3)	f (67.8)	f (70.0)	f (74.5)	f (111.6)	f (119.0)
	WB l/t/r	c (18.8)	c (19.6)	c (19.8)	c (23.1)	c (24.3)	c (24.7)
at	NB l/t/r	a (0.0)	a (0.0)	a (0.0)	a (0.1)	a (0.1)	a (0.1)
Lawrence Ave./Gordon Ave.	SB l/t/r	a (0.4)	a (0.4)	a (0.4)	a (0.8)	a (0.8)	a (0.8)
	WB l	E (63.7)	E (67.3)	E (67.0)	E (69.5)	F (85.9)	F (86.2)
North Broadway	WB r	E (57.7)	E (57.1)	E (57.4)	E (56.1)	E (56.9)	E (57.1)
	NB t/r	A (3.1)	A (4.6)	A (4.9)	A (2.4)	A (3.4)	A (3.7)
at	SB l/t	D (42.1)	E (56.3)	E (61.9)	C (34.6)	D (40.9)	D (42.6)
New Broadway/Bedford Road	SE l/t/r	E (70.9)	E (73.8)	E (73.6)	E (70.1)	E (72.2)	E (72.3)
	Overall	C (31.1)	D (37.7)	D (39.9)	C (29.9)	D (35.6)	D (36.2)
	EB l/t	E (65.4)	E (73.1)	E (74.1)	E (65.0)	E (70.2)	E (71.0)
North Broadway	EB r	C (24.6)	C (33.6)	C (30.6)	B (16.8)	C (26.5)	C (27.1)
	WB l/t/r	D (42.1)	D (42.9)	D (42.8)	D (53.3)	D (54.0)	D (53.9)
at	NB l/t/r	C (33.3)	D (37.4)	D (38.2)	D (40.1)	D (47.3)	D (48.8)
Beekman Ave./Hudson Ter.	SB l/t	A (2.4)	A (2.8)	A (3.0)	A (2.1)	A (3.0)	A (3.1)
	Overall	C (21.6)	C (25.7)	C (26.2)	C (22.2)	C (26.6)	C (27.4)

Note:
1. EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, l = Left, t = Thru, and r = Right
2. Uppercase letters represent Levels-of-Service for signalized intersection, while lowercase letters represent those of unsignalized intersections.
3. Delays are the average for each lane group in seconds per vehicle. For signalized intersections, the average delay per vehicle for the entire intersection is also included. For unsignalized intersections, the value represents the average delay per vehicle for the lane group experiencing the greatest delays.

As can be seen from Table 4, The proposed action is not expected to precipitate changes in Levels-of-Service at the studied intersections.

Pedestrians coming from the Inner Village may cross to the north side of Beekman Avenue using the crosswalks at intersections prior to reaching the North Broadway at Beekman Avenue intersection. These pedestrians then are likely to continue walking along the west side of North Broadway before crossing North Broadway to the medical offices at the New Broadway intersection.

Test intersection capacity analyses were completed to see what effect increasing the number of pedestrians would have on the intersection's operating conditions. The number of conflicting pedestrians with right-turning vehicles was increased to 200 pedestrians per hour on each leg of the intersection in both the Build AM and PM Peak Highway Hour capacity analyses. The 200 pedestrians per hour entered into the analyses is well over the number of conflicting pedestrians observed during the Peak Hours analyzed. The test analyses indicate that there was little change in the way the intersection operated. The increase of the conflicting pedestrians with right-turning vehicles to 200 pedestrians per hour resulted in only a three (3.0) second increase in the overall intersection delay during the weekday AM Highway Peak Hour and a 1.9 second delay increase during the weekday PM Highway Peak Hour. The Synchro printouts are located in the Appendix.

R. PARKING DATA COLLECTION

The Village of Sleepy Hollow Zoning code requires that one (1) parking space be provided for every 300 square feet (sf) of gross floor area. Therefore, approximately 42 parking spaces should be provided for the proposed medical offices. The Site Plan depicts ten (10) parking spaces indicating that there is a deficit of 32 parking spaces.

For the purposes of this study, it is anticipated that all staff would park at the Phelps Memorial Hospital Garage and would be shuttled to the medical offices in the future.

To determine sufficient on-street parking would be available to meet the requirements for the medical offices, supply and demand data were collected. On-street parking data were collected in the near vicinity of the Open Door medical offices to assess parking needs of the patients and visitors parking supply and demand data for the staff needs were collected at the Phelps Memorial Hospital parking garage.

1) ON-STREET PARKING DATA COLLECTION FOR PATIENTS/VISITORS

To determine the number of available on-street parking spaces, **Adler Consulting** reconnoitered within approximately one-quarter mile of the proposed Site including

sections of New Broadway, Pine Close, Hudson Terrace, Beekman Avenue, Lawrence Avenue, North Washington Street and the municipal parking lot located on Beekman Avenue west of North Broadway.

On-street parking data were collected every half hour on a busy day for the medical offices. The parking data were collected on Monday, November 28, 2011, between 8:00 a.m. and 7:00 p.m. The on-street parking supply and demand is summarized in Table 5.

The parking inventory indicated that there are a total of 242 parking spaces including 56 metered spaces and seven (7) handicapped spaces available in the immediate vicinity of the Site.

On Lawrence Avenue there were 34 parking spaces of which 21 spaces were located on the east side and 13 spaces were located on the west side. On New Broadway, there were a total of 44 parking spaces distributed equally on both the sides of the roadway. On Pine Close, there were nine (9) parking spaces located on the north side of the street.

Vehicles were also parked on the south side of Pine Close though parking is not permitted. These vehicles were included in the parking demand calculations.

On Pine Street, there were a total of nine (9) parking spaces on the east side. On Hudson Terrace, there were a total of 40 parking spaces of which seven (7) spaces were located on the east side and 16 spaces were located on the west side. For the section of Hudson Terrace that operates in an east-west direction seven (7) spaces were located on the north side and ten (10) spaces were located on the south side. Parking is not permitted along the east side and north side of Hudson Terrace except on Tuesday and Thursday, when parking is permitted between 9:00 a.m. and 12:00 p.m. Therefore, the 14 parking spaces provided on those section of street were not available for potential parkers most of the time and were not included in the calculations of available parking supply.

On Beekman Avenue, there were a total of 50 metered parking spaces including two (2) metered spaces designated for the use of handicapped drivers distributed equally on both sides of the roadway. On Washington Street, there were a total of 19 parking spaces. The municipal parking lot has a total of 58 parking spaces of which 22 parking spaces are provided for permit holders and nine (9) spaces are reserved for Municipal use. These

31 reserved parking spaces are not available for medical office customers, and were not included in the calculations.

As shown in the Table 5, 116 vehicles were observed to be parked in the study area between 9:45 a.m. and 10:45 a.m. With 242 parking spaces in the area, there were at least 126 additional parking spaces available for potential patients or visitors during this period. The data also indicate that during the afternoon period a total of 114 parking spaces would be available between 2:30 pm. and 3:00 p.m.. Similarly, during the evening period when on-street parking demand was the highest there were at least 76 parking spaces available.

The Site Plans for the Open Door medical offices indicate that ten (10) parking spaces are provided on-Site. In analyzing the anticipated parking conditions, no credit was taken for the ten (10) on-Site parking spaces, nor for providing shuttle service from Phelps Memorial Hospital Garage for the staff resulting in a very conservative approach. There would be at least 76 parking spaces available for the use of the patients and staff of the Open Door medical offices during the evening peak hour, when on-street parking demand is at its highest.

Table 5. On-Street Parking Supply and Demand (Monday, November 28, 2011)

Time		Lawrence Avenue		New Broadway		Pine Close		Pine Street	Hudson Terrace				Beekman Avenue		Washington Street		Municipal Lot			Official	Total 242 spaces	Available
		E	W	E	W	N	S	E	E	W	N	S	N	S	E	W	R		HC			
# of Spaces		*21*	*13*	*22*	*22*	*9*	*0*	*9*	*7*	*16*	*7*	*10*			*12*	*7*	*24*				*179*	
Metered													*24*	*24*	*4*	*4*					*56*	
HC spaces			*1*										*1*	*1*	*1*				*3*		*7*	
Permit																		*22*		*9*	*31*	
8:00	8:30	17	12	19	4	4	0	8		15		5	19	3	10	1	11	6	2	8	**130**	112
8:30	9:00	17	11	18	0	5	0	9		15		7	12	6	6	2	13	11	2	8	**123**	119
9:00	9:30	15	11	16	0	6	0	10		16		7	11	6	5	2	12	12	1	10	**118**	124
9:30	10:00	17	10	17	1	5	0	8		15		7	8	3	11	4	7	14	2	9	**115**	127
10:00	10:30	16	8	17	0	5	0	7		12		7	8	6	11	6	10	14	3	9	**116**	126
10:30	11:00	16	7	14	0	4	0	6		12		7	11	9	9	7	6	14	1	9	**109**	133
11:00	11:30	15	7	14	0	6	0	5		10		6	12	7	6	7	10	14	1	9	**106**	136
11:30	12:00	16	7	16	1	6	0	5		6		7	14	11	8	8	10	14	2	9	**117**	125
12:00	12:30	15	7	16	1	6	1	6		7		6	9	11	8	8	9	13	1	9	**111**	131
12:30	1:00	14	8	16	0	7	0	6		8		4	9	14	9	8	5	12	1	9	**109**	133
1:00	1:30	15	7	16	2	7	0	6		11		4	14	12	9	9	9	11	0	9	**121**	121
1:30	2:00	15	8	15	1	7	0	6		11		5	8	10	10	8	12	10	1	8	**117**	125
2:00	2:30	15	9	14	1	8	0	6		13		7	11	8	10	9	9	10	1	8	**121**	121
2:30	3:00	17	9	14	1	8	0	6		13		6	15	8	8	10	12	11	1	7	**128**	114
3:00	3:30	15	7	15	0	8	0	7		10		5	20	16	11	9	22	11	3	7	**148**	94
3:30	4:00	18	12	14	3	9	0	8		7		4	15	14	11	10	23	14	1	8	**149**	93
4:00	4:30	18	16	14	7	8	0	7		10		6	15	18	13	10	21	13	3	9	**166**	76
4:30	5:00	19	16	14	13	7	0	7		11		7	20	17	16	10	23	9	3	8	**183**	59
5:00	5:30	19	15	11	15	8	0	6		12		5	18	19	12	11	18	7	3	7	**172**	70
5:30	6:00	16	16	10	13	9	1	8		14		5	16	20	11	9	19	6	2	7	**169**	73
6:00	6:30	18	17	9	16	13	1	10		14		5	16	20	15	10	16	4	0	6	**180**	62
6:30	7:00	20	17	11	17	13	1	11		16		6	20	20	16	11	14	3	1	6	**194**	48

Similar to Site data collection and vehicle turning movement data upon which there were concerns raised about the period between Thanksgiving and Christmas, additional on-street parking data were collected every half-hour on Tuesday, February 28, 2012, and are summarized in Table 6.

Table 6. On-Street Parking Supply and Demand (Tuesday, February 28, 2012)

Time		Lawrence Avenue		New Broadway		Pine Close		Pine Street	Hudson Terrace				Beekman Avenue		Washington Street		Municipal Lot			Official	Total 242 spaces	Available
		E	W	E	W	N	S	E	E	W	N	S	N	S	E	W	R		HC			
# of Spaces		*21*	*13*	*22*	*22*	*9*	*0*	*9*	*7*	*16*	*7*	*10*			*12*	*7*	*24*				*179*	
Metered													*24*	*24*	*4*	*4*					*56*	
HC spaces			*1*										*1*	*1*	*1*				*3*		*7*	
Permit																		*22*		*9*	*31*	
8:00	8:30	8	16	0	13	5	0	9	3	4	0	5	5	11	7	13	19	9	1	9	**119**	123
8:30	9:00	8	15	1	11	5	0	10	5	4	0	2	9	13	6	12	17	10	1	10	**119**	123
9:00	9:30	5	15	0	11	5	0	9	9	0	2	0	7	12	9	9	17	13	1	10	**111**	131
9:30	10:00	3	16	0	14	4	0	10	6	0	1	0	9	16	10	9	17	14	2	10	**117**	125
10:00	10:30	1	17	0	15	3	1	8	9	0	1	0	8	14	6	9	16	13	1	10	**109**	133
10:30	11:00	4	16	0	13	3	1	7	7	0	3	0	10	13	8	9	19	14	1	10	**114**	128
11:00	11:30	2	16	0	14	4	1	7	6	1	4	0	15	16	12	10	16	15	1	10	**125**	117
11:30	12:00	3	16	0	13	4	1	9	7	0	2	0	12	18	15	10	16	15	2	10	**128**	114
12:00	12:30	4	17	0	11	4	1	10	6	2	1	0	13	25	13	9	17	14	1	10	**134**	108
12:30	1:00	8	17	1	12	4	2	7	0	9	1	1	16	20	10	9	15	11	0	10	**132**	110
1:00	1:30	13	16	0	13	4	1	9	0	10	0	1	9	19	9	9	11	14	0	11	**124**	118
1:30	2:00	12	16	0	9	5	1	9	0	11	0	3	10	16	9	10	18	14	0	11	**129**	113
2:00	2:30	11	15	0	13	6	1	8	0	13	0	3	11	14	12	8	16	12	0	11	**131**	111
2:30	3:00	12	15	2	13	5	1	9	0	12	0	2	13	12	12	9	12	11	1	11	**130**	112
3:00	3:30	14	14	0	13	5	1	7	0	12	0	2	20	11	8	8	11	9	0	11	**126**	116
3:30	4:00	10	14	3	13	6	0	7	0	8	1	2	15	12	11	10	15	10	0	12	**127**	115
4:00	4:30	11	16	3	10	6	0	6	0	11	0	2	14	13	8	9	13	11	0	10	**122**	120
4:30	5:00	15	16	5	10	6	0	7	0	12	1	2	16	18	12	9	11	9	0	12	**140**	102
5:00	5:30	15	15	8	12	7	0	7	1	12	0	5	18	17	11	12	12	8	0	12	**152**	90
5:30	6:00	16	12	11	13	8	0	8	0	12	0	7	19	17	11	10	13	5	2	11	**159**	83
6:00	6:30	19	16	11	13	10	0	9	0	14	0	7	21	22	10	9	14	4	0	11	**175**	67
6:30	7:00	18	15	13	14	10	1	9	0	17	0	8	25	25	18	9	15	6	0	11	**197**	45

As shown in Table 6, 117 vehicles are observed to be parked in the study area between 9:30 a.m. and 10:00 a.m. With 242 parking spaces within the area of the relocated medical offices, there are at least 125 additional parking spaces available for potential patients or visitors during this period. The data also indicate that during the evening 4:30 p.m. to 5:00 p.m. period (the last half-hour before local residents return to the area from work), there are at least 102 on-street parking spaces available. From 5:00 p.m. to the hour when the medical offices close (7:00 p.m.), it was observed at half-hour intervals that 90 spaces, 83 spaces, 67 spaces, and 45 on-street parking spaces, respectively, would be available in the study area.

The parking data collected in February is very similar to what was collected initially three months earlier around the Thanksgiving holiday. The November 2011 parking data revealed 115 vehicles parking in the study area between 9:30 a.m. and 10:00 a.m., leaving at least 127 available parking spaces for potential patients or visitors during this period. The previous data collected also indicated that from 5:00 p.m. to 7:00 p.m., the time when the medical offices close, it was observed at half-hour intervals that 70 spaces, 73 spaces, 62 spaces, and 48 on-street parking spaces, respectively, would be available in the study area.

The Site Plan for the Open Door medical offices indicates that ten (10) parking spaces are provided on-Site. In analyzing the anticipated parking conditions, no credit was taken for the ten (10) on-Site parking spaces, nor for providing shuttle service from Phelps Memorial Hospital Garage for the staff resulting in a very conservative approach. It can be seen from Table 6 that there would be at least 45 on-street parking spaces available (similar to the minimum of 48 on-street parking spaces available based on the November 2011 data) for the use of the patients and staff of the Open Door medical offices during a typical weekday. Based on both sets of parking data, it is, therefore, the considered opinion of **Adler Consulting** that there is still sufficient on-street parking available to accommodate the anticipated parking needs at the Open Door medical offices.

2) Parking Garage Data Collection

To determine the availability of parking for the medical office staff at the Phelps Memorial Hospital parking garage, supply and demand data were collected every half hour on a Thursday and were considered to be representative of a typical day. Hence, parking data were collected on Thursday, January 19, 2012, between 7:00 a.m. and 6:00 p.m. The existing parking supply and demand at the Phelps Memorial Hospital is summarized in Table 7. The parking inventory indicated that there are a total of 743 parking spaces in

the garage including 62 reserved spaces, 621 lined spaces, 38 spaces assigned for patients and 22 handicapped accessible spaces available which are distributed over five (5) level garage.

As shown in the Table 7, the Ground Level (Level 1) of the parking garage has 109 parking spaces, Level 2 has 170 parking spaces, Level 3 has 174 parking spaces, Level 4 has 170 parking spaces, and the rooftop level of the parking garage has 120 parking spaces.

In summary, there were more than 300 parking spaces available at the Phelps Memorial Hospital parking garage with the majority of the open spaces centered on Level 4 and the roof of the garage. Therefore, it is considered opinion of **Adler Consulting** that there are sufficient parking spaces available at the Phelps Memorial Hospital garage to accommodate the anticipated parking needs of the staff of the Open Door Medical offices. The staff of the Medical offices are expected to drive to the Phelps Memorial Hospital garage and then use the shuttle bus to travel to the medical offices.

Table 7. Parking Demand at Phelps Memorial Hospital Garage

Time	Ground Level-1		Level-2		Level-3		Level-4		Rooftop	
	Total	109	Total	170	Total	174	Total	170	Total	120
	Occupied	Vacant	Occupied	Vacant	Occupied	Vacant	Occupied	Vacant	Occupied	Vacant
7:30 a.m.	32	77	130	40	43	131	8	162	0	120
8:00 a.m.	53	56	117	53	49	125	8	162	0	120
8:30 a.m.	61	48	103	67	104	70	13	157	0	120
9:00 a.m.	71	38	89	81	128	46	17	153	0	120
9:30 a.m	72	37	55	115	140	34	19	151	0	120
10:00 a.m.	79	30	25	145	153	21	20	150	1	119
10:30 a.m.	86	23	21	149	152	22	19	151	1	119
11:00 a.m.	89	20	14	156	155	19	24	146	1	119
11:30 a.m.	88	21	6	164	154	20	26	144	2	118
12:00 p.m.	85	24	10	160	156	18	31	139	2	118
12:30 p.m.	84	25	10	160	157	17	30	140	2	118
1:00 p.m.	86	23	7	163	155	19	31	139	1	119
1:30 p.m.	87	22	8	162	157	17	32	138	0	120
2:00 p.m.	86	23	11	159	155	19	31	139	0	120
2:30 p.m.	82	27	16	154	156	18	30	140	0	120
3:00 p.m.	81	28	13	157	153	21	29	141	0	120
3:30 p.m	82	27	10	160	134	40	26	144	0	120
4:00 p.m.	81	28	9	161	117	57	25	145	0	120
4:30 p.m.	77	32	20	150	95	79	25	145	0	120
5:00 p.m.	71	38	41	129	73	101	21	149	0	120
5:30 p.m.	60	49	67	103	36	138	19	151	0	120
6:00 p.m.	62	47	82	88	26	148	17	153	0	120

S. DROP-OFFS AT THE SITE

At the February 16, 2012 Public Hearing, it was suggested that motorists (especially taxis) would drop off visitors to the Open Door facility on New Broadway. From a traffic engineering perspective, this suggestion appears to be less likely in that:

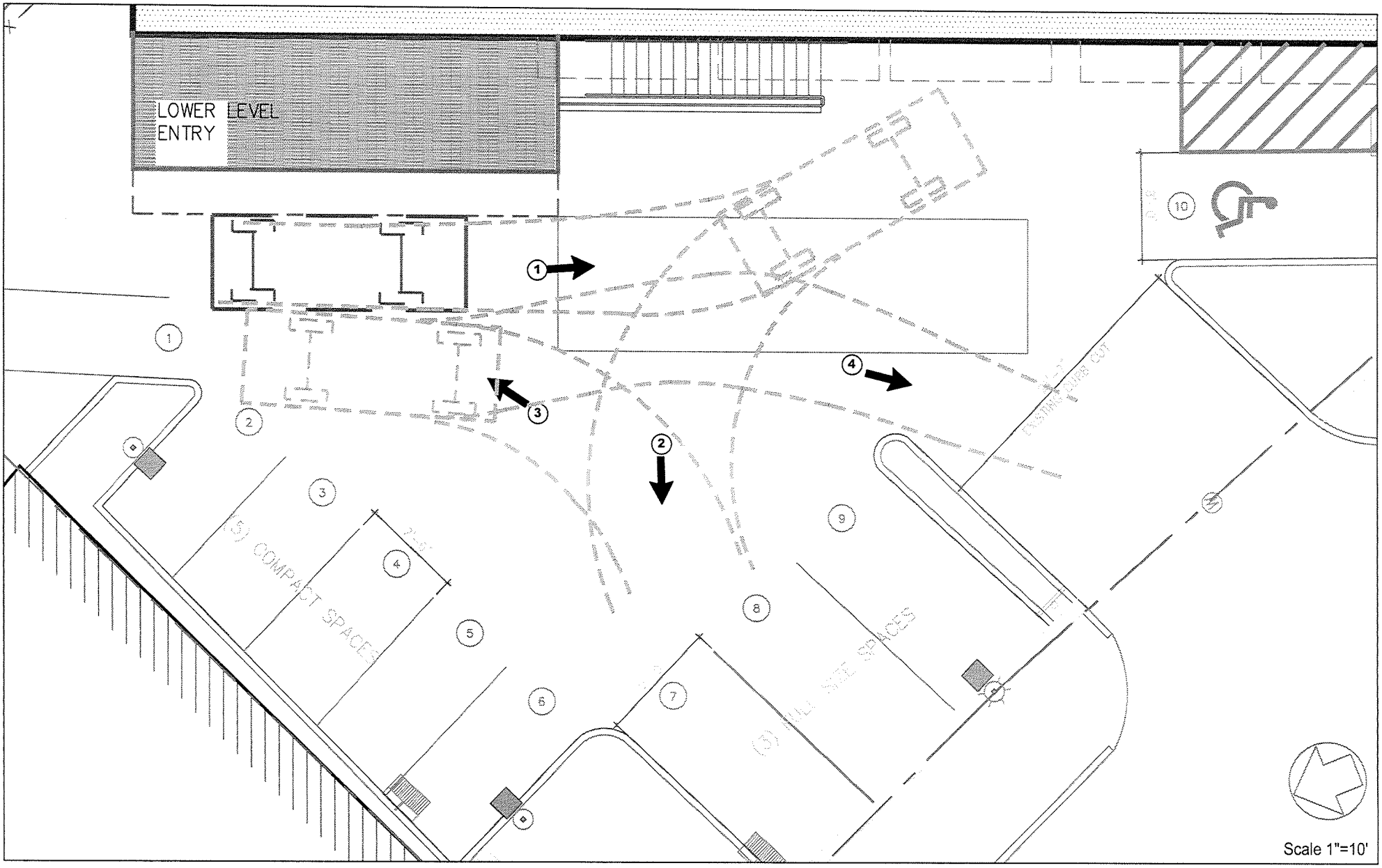
- The address of the facility will be 300 North Broadway clearly identifying access on North Broadway and not New Broadway;
- There are no building entry portals on New Broadway making it less convenient for a visitor to enter the building if dropped off on New Broadway;
- There is a driveway with a convenient location for a taxi driver to stop allowing a passenger to disembark in the parking lot off North Broadway;
- Upon exiting, a motorist can easily turn right out of the driveway onto northbound North Broadway and turn left onto Lawrence Street to return to Beekman Avenue;

- Most clients and the taxi stations are located to the west on Beekman Avenue making it more convenient and logical to use the North Broadway parking lot instead of driving on a clearly residential street and looking to make a u-turn or drive through other residential streets to return to Beekman Avenue.

Figure 13 depicts the turning maneuvers that a private vehicle or taxi would take within the parking lot after picking up a passenger and then exiting the Site by turning right onto northbound North Broadway.

T. Traffic-Related Safety Issues in the Webber Park Neighborhood

A number of concerns were expressed in a memorandum to the Village, dated December 23, 2008 by The Residents of Webber Park through its liaison, Ms. Jennifer Lobato-Church, regarding vehicular traffic and safety issues. Neighbors' concerns included the number of vehicles that did not stay on US Route 9 but traveled on New Broadway into the Webber Park neighborhood and the speeds of the wayward vehicles. Since that



Project:
Open Door
Sleepy Hollow, NY

Prepared By:
Adler Consulting, White Plains, NY
Transportation Planning & Traffic Engineering, PLLC

Title:
Vehicle Drop-off/Pick-up
Turn-around in Parking Lot

Figure 13

time, NYSDOT and the Village of Sleepy Hollow have installed several mitigating measures to reduce the number of drivers who errantly enter the Webber Park Neighborhood, including the construction of an island at the entrance to New Broadway, the installation of a sign announcing the Webber Park Neighborhood, the installation of additional roadway placards with arrows directing motorists to bear to the left to stay on US Route 9, the installation of "No Truck" signs at the entrance to New Broadway, and the installation of neighborhood Speed Limit signs, at 25 miles per hour, on New Broadway.

U. ACCIDENT DATA

Accident records were obtained by **Adler Consulting** for the five-year period from January 1, 2007 to December 31, 2011. The accident records contained descriptions of the accidents that occurred on North Broadway between the BP Gas Station Driveway west of Gordon Avenue/Lawrence Avenue and Depeyster Street (High School entrance) in the vicinity of the proposed site of the relocated Open Door medical offices.

The accident record descriptions were reviewed and categorized by year and location. It was determined that, out of the 200 total accident records obtained for the five-year analysis period, 102 accidents occurred outside the immediate study area. The remaining 98 accidents that did occur on North Broadway within the immediate study area are summarized below in Table 8 by year and location.

Table 8. Accident History

Location	Accidents Per Year					5-Year Total
	2007	2008	2009	2010	2011	
North Broadway at BP Gas Driveway west of Lawrence Avenue	0	0	2	1	0	3
North Broadway at Gordon Avenue / Lawrence Avenue	3	5	5	5	3	21
North Broadway between Lawrence Avenue and New Broadway	0	0	2	1	0	3
North Broadway at New Broadway	0	1	3	1	2	7
North Broadway at Bedford Road	4	4	6	2	5	21
North Broadway between Bedford Road and Beekman Avenue / Hudson Terrace	0	1	1	0	1	3
North Broadway at Beekman Avenue / Hudson Terrace	3	8	8	9	12	40
Total	**10**	**19**	**27**	**19**	**23**	**98**

A review of the data indicates that 40 accidents occurred at the North Broadway/Beekman Avenue/Hudson Terrace intersection, or an average of approximately eight (8) accidents per year. Twenty-one accidents occurred at the

North Broadway/Bedford Road intersection, an average of just over four (4) accidents per year. At the intersection of North Broadway/Gordon Avenue/Lawrence Avenue, a total of 21 accidents were reported. A total of seven (7) accidents occurred at the North Broadway/New Broadway intersection.

The accident reports revealed that the majority of the accidents resulted in property damage only. Collectively, there were 85 accidents which resulted in property damage only and 13 accidents that resulted in injuries.

The accident records were also categorized by accident type which revealed that during the five-year study period, there were 30 rear-end collisions, 28 overtaking collisions, 13 right-angle collisions, seven (7) collisions involving a vehicle backing up, five (5) collisions involving a parked vehicle, four (4) collisions involving a fixed object, three (3) sideswipe collisions, two (2) collisions involving a bicyclist, two (2) left-turn collisions, and four (4) collisions of unknown types. Driver inattention was the significant contributing factor in most of the rear-end collisions. The majority of the 28 overtaking accidents occurred on the section of North Broadway between Bedford Road and Beekman Avenue/Hudson Terrace where the two southbound travel lanes merge

into one lane, and where the one northbound travel lane divides into two separate through lanes. Many of the overtaking accidents were attributed to one vehicle sideswiping another vehicle while changing lanes in the merge or diverge transitional areas on North Broadway or to improper lane usage.

V. Accident Analyses

The determination of safety of a particular location is based on its risk exposure. Specifically, as more vehicles pass through an intersection or travel along a roadway segment, the more likely it is that an accident will occur. Therefore, to evaluate the relative level of safety at a location, the accident rate at that location is calculated in units of Million Entering Vehicles (MEV) for intersections or Million Vehicle Miles (MVM) traveled for roadway segments.

The historical accident rate was then compared to the Critical Accident Rate, which is a value determined from the corresponding Statewide Average Accident rate for similar locations. This evaluation is known as the Rate Quality Control Method. Using the Rate Quality Control Method, when the actual accident rate for the intersection or

roadway segment exceeds the Critical Accident Rate, the location is eligible for additional study.

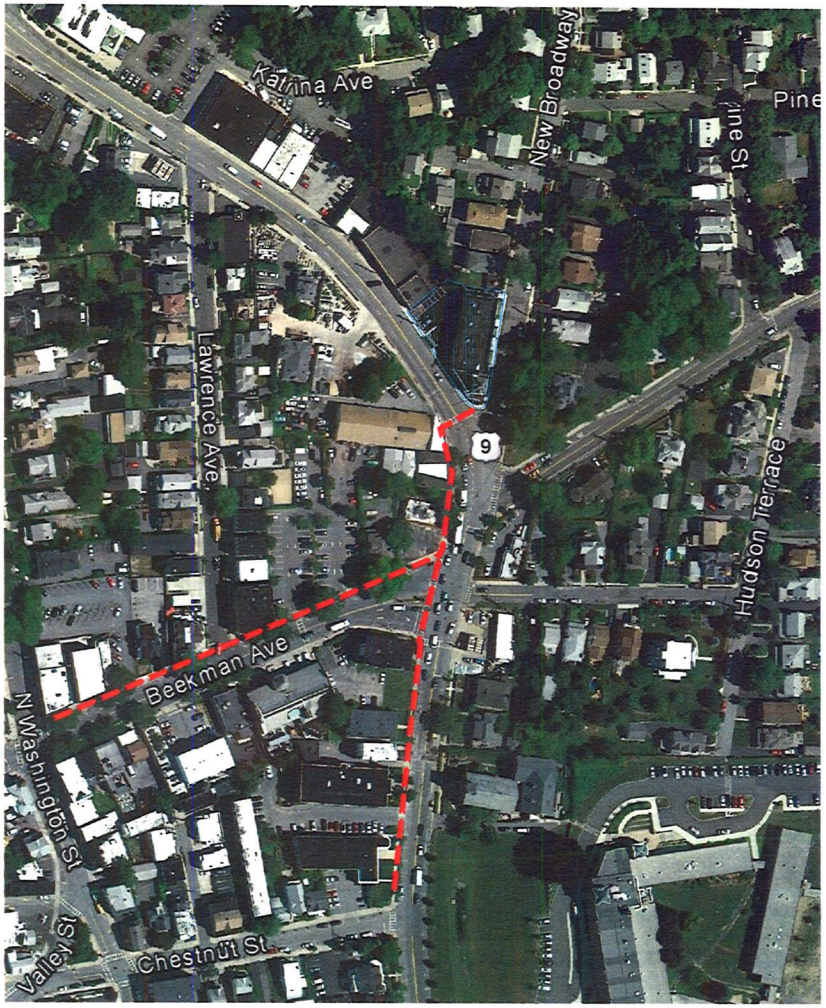
The accident rates for the study intersections and roadway segments are contained in Table 9, Accident Rates. Table 9 also includes Statewide Average Accident rates for specific intersection types, based on a location in either urban or rural areas and intersection control using traffic signals or STOP signs. The Statewide Average Accident rates for the roadway segments are also identified.

Table 9. Accident Rates

Location	5-year Accident Total	5-year volume per Million Vehicles	Segment Length (miles)	MEV/ MVM	State Avg	Acc Rate	CAR
North Broadway at BP Gas Driveway west of Lawrence Avenue	3	N/A	N/A	N/A	N/A	N/A	N/A
North Broadway at Gordon Avenue / Lawrence Avenue	21	25.51	1	25.51	0.15	0.82	0.30
North Broadway between Lawrence Avenue and New Broadway	3	22.19	0.11	2.44	2.70	1.23	4.73
North Broadway at New Broadway	7	24.07	1	24.07	0.15	0.29	0.31
North Broadway at Bedford Road	21	31.11	1	31.11	0.15	0.68	0.28
North Broadway between Bedford Road and Beekman Avenue / Hudson Terrace	3	26.17	0.03	0.78	2.70	3.82	6.70
North Broadway at Beekman Avenue / Hudson Terrace	40	29.07	1	29.07	0.26	1.38	0.44
Total	**98**						

A review of the data contained in Table 9 indicate that the accident rate for the intersection of North Broadway with New Broadway, the location of the new Open Door Medical offices, does not exceed the Critical Accident Rate. The data also indicate that, for the North Broadway intersections with Beekman Avenue, Bedford Road and Lawrence Avenue, the accident rates are greater than the respective Critical Accident Rates.

It is noted that as part of the directions to the new facility at 300 North Broadway, ambulatory patients will be advised to walk along the west side of North Broadway until they reach the signalized intersection opposite the Site and walk in the pedestrian-controlled crosswalk which includes pedestrian signal displays (Walk/Don't Walk) and allows for the safe crossing of North Broadway. (See Figure prepared by Arconics Architecture, P.C. on the following page which depicts the suggested pedestrian route.) Further, the Open Door Medical Offices has offered to reimburse the Village for the costs of a crossing guard to aid pedestrians at the intersection of North Broadway with New Broadway.



SUGGESTED PEDESTRIAN
ROUTE MAP

NORTH BROADWAY CROSSWALK AT
NEW BROADWAY - LOOKING EAST

NORTH BROADWAY CROSSWALK AT
NEW BROADWAY - LOOKING WEST

15 MAY 2012

OPEN DOOR FAMILY MEDICAL CENTER

300 NORTH BROADWAY, SLEEPY HOLLOW, NY

ARCONICS
ARCHITECTURE, P.C.

W. CONCLUSIONS

Based on the findings contained herein, it is the considered professional opinion of **Adler Consulting** that the operation of the proposed Open Door medical offices in the Village of Sleepy Hollow will not have a significant impact on area wide traffic operating conditions.

Based on the analysis of the on-street parking, there would be sufficient number of spaces available to accommodate the anticipated needs of the Open Door facility for patients. Analyses also indicate that there would be sufficient parking spaces available at the Phelps Memorial Hospital garage for use by the Open Door staff. Therefore, it is considered professional opinion of **Adler Consulting** that there are sufficient parking spaces available to accommodate the anticipated needs of the Open Door medical offices.

Because of the low volume of cars expected to be generated by the Open Door medical offices, it is anticipated that the relocation of the existing Open Door medical offices to 300 North Broadway will not have a significant impact on the accident rate for the

intersections and roadway segments that were studied. Further, a safe crossing of North Broadway is provided directly opposite the new facility.

APPENDIX A

INTERSECTION CAPACITY ANALYSES

Existing AM
1: Lawrence Avenue & North Broadway

Project # 111229

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	3	4	4	7	12	0	424	13	10	603	68
Sign Control		Stop			Stop			Free			Free	
Grade		-5%			-2%			-4%			3%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	44	3	4	4	8	13	0	466	14	11	663	75
Pedestrians		5			2						6	
Lane Width (ft)		8.0			12.0						10.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								678				
pX, platoon unblocked	0.88	0.88		0.88	0.88	0.88				0.88		
vC, conflicting volume	1223	1209	374	834	1239	481	742			482		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1186	1170	374	745	1204	344	742			345		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	63	98	99	98	95	98	100			99		
cM capacity (veh/h)	118	167	622	258	159	571	858			1065		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	52	25	480	342	406
Volume Left	44	4	0	11	0
Volume Right	4	13	14	0	75
cSH	129	285	858	1065	1700
Volume to Capacity	0.40	0.09	0.00	0.01	0.24
Queue Length 95th (ft)	43	7	0	1	0
Control Delay (s)	50.3	18.8	0.0	0.4	0.0
Lane LOS	F	C		A	
Approach Delay (s)	50.3	18.8	0.0	0.2	
Approach LOS	F	C			

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	53	3	4	4	7	12	0	436	13	10	615	79
Sign Control		Stop			Stop			Free			Free	
Grade		-5%			-2%			-4%			3%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	58	3	4	4	8	13	0	479	14	11	676	87
Pedestrians		5			2						6	
Lane Width (ft)		8.0			12.0						10.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								678				
pX, platoon unblocked	0.88	0.88		0.88	0.88	0.88				0.88		
vC, conflicting volume	1256	1242	386	854	1278	494	768			495		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1224	1208	386	770	1249	363	768			364		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	47	98	99	98	95	98	100			99		
cM capacity (veh/h)	111	159	611	248	150	557	840			1052		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	66	25	493	349	425
Volume Left	58	4	0	11	0
Volume Right	4	13	14	0	87
cSH	119	273	840	1052	1700
Volume to Capacity	0.55	0.09	0.00	0.01	0.25
Queue Length 95th (ft)	67	8	0	1	0
Control Delay (s)	67.8	19.6	0.0	0.4	0.0
Lane LOS	F	C		A	
Approach Delay (s)	67.8	19.6	0.0	0.2	
Approach LOS	F	C			

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

Build AM

1: Lawrence Avenue & North Broadway

Project # 111229

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	53	3	4	4	7	12	0	440	13	10	624	79
Sign Control		Stop			Stop			Free			Free	
Grade		-5%			2%			-4%			3%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	58	3	4	4	8	13	0	484	14	11	686	87
Pedestrians		5			2						6	
Lane Width (ft)		8.0			12.0						10.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								678				
pX, platoon unblocked	0.90	0.90		0.90	0.90	0.90				0.90		
vC, conflicting volume	1270	1256	391	864	1292	499	778			500		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1244	1229	391	793	1269	387	778			389		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	46	98	99	98	95	98	100			99		
cM capacity (veh/h)	108	157	606	243	148	547	832			1048		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	66	25	498	354	430
Volume Left	58	4	0	11	0
Volume Right	4	13	14	0	87
cSH	117	269	832	1048	1700
Volume to Capacity	0.57	0.09	0.00	0.01	0.25
Queue Length 95th (ft)	68	8	0	1	0
Control Delay (s)	70.0	19.8	0.0	0.4	0.0
Lane LOS	F	C		A	
Approach Delay (s)	70.0	19.8	0.0	0.2	
Approach LOS	F	C			

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

Existing PM
1: Lawrence Avenue & North Broadway

Project # 111229

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	43	7	3	20	9	22	4	467	20	19	505	69
Sign Control		Stop			Stop			Free			Free	
Grade		-5%			-2%			-4%			3%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	50	8	3	23	10	26	5	543	23	22	587	80
Pedestrians		6						1			2	
Lane Width (ft)		8.0						16.0			10.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								678				
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	1274	1253	341	910	1282	557	673			566		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1234	1209	341	806	1243	389	673			401		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	49	95	99	89	93	95	99			98		
cM capacity (veh/h)	99	150	653	216	143	517	910			981		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	62	59	571	316	374
Volume Left	50	23	5	22	0
Volume Right	3	26	23	0	80
cSH	109	257	910	981	1700
Volume to Capacity	0.57	0.23	0.01	0.02	0.22
Queue Length 95th (ft)	67	22	0	2	0
Control Delay (s)	74.5	23.1	0.1	0.8	0.0
Lane LOS	F	C	A	A	
Approach Delay (s)	74.5	23.1	0.1	0.4	
Approach LOS	F	C			

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	54	7	3	20	9	22	4	478	20	19	518	83
Sign Control		Stop			Stop			Free			Free	
Grade		-5%			-2%			-4%			3%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	63	8	3	23	10	26	5	556	23	22	602	97
Pedestrians		6						1			2	
Lane Width (ft)		8.0						16.0			10.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								678				
pX, platoon unblocked	0.84	0.84		0.84	0.84	0.84				0.84		
vC, conflicting volume	1310	1289	356	931	1326	569	705			579		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1273	1248	356	820	1292	388	705			399		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	31	94	99	89	92	95	99			98		
cM capacity (veh/h)	90	140	637	207	131	510	886			967		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	74	59	584	323	398
Volume Left	63	23	5	22	0
Volume Right	3	26	23	0	97
cSH	98	245	886	967	1700
Volume to Capacity	0.76	0.24	0.01	0.02	0.23
Queue Length 95th (ft)	100	23	0	2	0
Control Delay (s)	111.6	24.3	0.1	0.8	0.0
Lane LOS	F	C	A	A	
Approach Delay (s)	111.6	24.3	0.1	0.4	
Approach LOS	F	C			

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

Build PM
1: Lawrence Avenue & North Broadway

Project # 111229

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	54	7	3	20	9	22	4	483	20	19	522	83
Sign Control		Stop			Stop			Free			Free	
Grade		-5%			-2%			-4%			3%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	63	8	3	23	10	26	5	562	23	22	607	97
Pedestrians		6						1			2	
Lane Width (ft)		8.0						16.0			10.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								678				
pX, platoon unblocked	0.83	0.83		0.83	0.83	0.83				0.83		
vC, conflicting volume	1321	1300	359	939	1336	575	709			585		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1283	1258	359	821	1302	381	709			393		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	28	94	99	89	92	95	99			98		
cM capacity (veh/h)	88	136	635	204	128	509	882			961		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	74	59	590	326	400
Volume Left	63	23	5	22	0
Volume Right	3	26	23	0	97
cSH	95	241	882	961	1700
Volume to Capacity	0.78	0.25	0.01	0.02	0.24
Queue Length 95th (ft)	103	23	0	2	0
Control Delay (s)	119.0	24.7	0.1	0.8	0.0
Lane LOS	F	C	A	A	
Approach Delay (s)	119.0	24.7	0.1	0.4	
Approach LOS	F	C			

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

Existing AM
2: Bedford Road & North Broadway

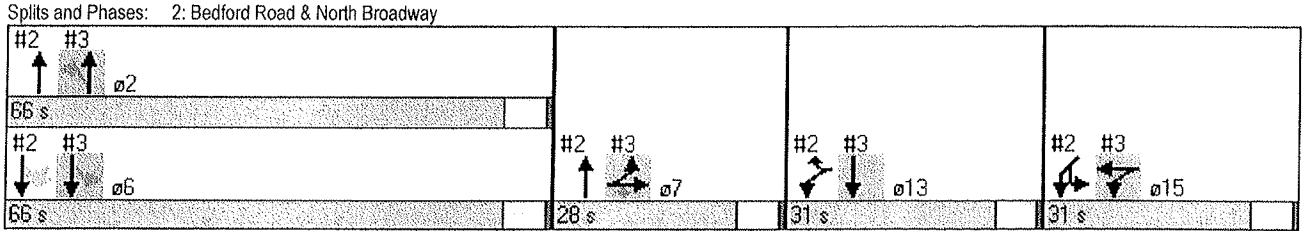
Project # 111229

Lane Group	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations												
Volume (vph)	117	64	1	372	13	172	1	151	459	40	41	1
Satd. Flow (prot)	1753	1561	0	1702	0	0	0	0	3075	0	1919	0
Flt Permitted	0.950								0.586		0.953	
Satd. Flow (perm)	1742	1561	0	1702	0	0	0	0	1824	0	1871	0
Satd. Flow (RTOR)				24								
Confl. Peds. (#/hr)	3					8		8		8		15
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	5%	2%	2%	5%	2%	5%	2%	5%	5%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	131	73	0	626	0	0	0	0	687	0	92	0
Turn Type		Prot					Perm	Perm		Split		
Protected Phases	13	13		2 7					6	15	15	
Permitted Phases							6	6	6			
Total Split (s)	31.0	31.0	0.0	94.0	0.0	0.0	66.0	66.0	66.0	31.0	31.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0
Act Effct Green (s)	17.5	17.5		83.7					60.6		11.7	
Actuated g/C Ratio	0.13	0.13		0.64					0.46		0.09	
v/c Ratio	0.56	0.35		0.57					0.82		0.53	
Control Delay	63.7	57.7		2.8					42.1		70.9	
Queue Delay	0.0	0.0		0.3					0.0		0.0	
Total Delay	63.7	57.7		3.1					42.1		70.9	
LOS	E	E		A					D		E	
Approach Delay	61.6			3.1					42.1		70.9	
Approach LOS	E			A					D		E	
Queue Length 50th (ft)	106	57		17					265		77	
Queue Length 95th (ft)	182	111		28					#453		142	
Internal Link Dist (ft)	384			71					598		497	
Turn Bay Length (ft)		155										
Base Capacity (vph)	337	300		1160					842		369	
Starvation Cap Reductn	0	0		138					0		0	
Spillback Cap Reductn	0	0		0					0		0	
Storage Cap Reductn	0	0		0					0		0	
Reduced v/c Ratio	0.39	0.24		0.61					0.82		0.25	

Intersection Summary

Cycle Length: 156
Actuated Cycle Length: 131.2
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 31.1 — Intersection LOS: C
Intersection Capacity Utilization 83.0% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Bedford Road & North Broadway

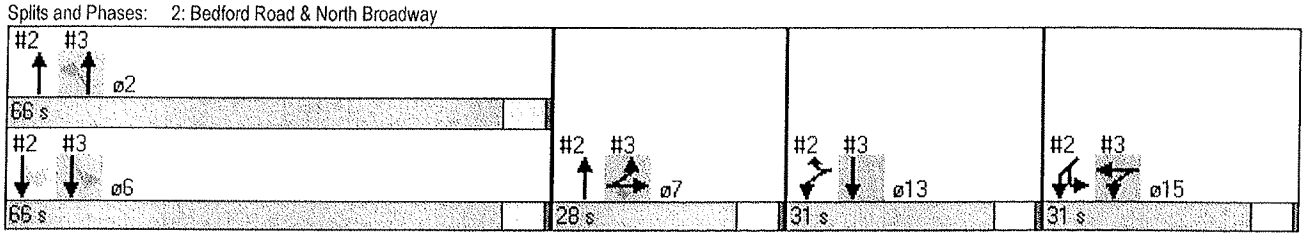


Lane Group	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations												
Volume (vph)	146	65	1	384	14	214	1	153	470	40	44	1
Satd. Flow (prot)	1753	1561	0	1690	0	0	0	0	3075	0	1919	0
Flt Permitted	0.950								0.553		0.953	
Satd. Flow (perm)	1742	1561	0	1690	0	0	0	0	1721	0	1871	0
Satd. Flow (RTOR)				28								
Confl. Peds. (#/hr)	3					8		8		8		15
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	5%	2%	2%	5%	2%	5%	2%	5%	5%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	74	0	687	0	0	0	0	701	0	95	0
Turn Type		Prot					Perm	Perm		Split		
Protected Phases	13	13		2 7					6	15	15	
Permitted Phases							6	6	6			
Total Split (s)	31.0	31.0	0.0	94.0	0.0	0.0	66.0	66.0	66.0	31.0	31.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0
Act Effct Green (s)	20.1	20.1		86.4					60.4		12.2	
Actuated g/C Ratio	0.15	0.15		0.63					0.44		0.09	
v/c Ratio	0.64	0.32		0.64					1.01dl		0.56	
Control Delay	67.3	57.1		4.1					56.3		73.8	
Queue Delay	0.0	0.0		0.5					0.0		0.0	
Total Delay	67.3	57.1		4.6					56.3		73.8	
LOS	E	E		A					E		E	
Approach Delay	64.1			4.6					56.3		73.8	
Approach LOS	E			A					E		E	
Queue Length 50th (ft)	141	61		20					321		85	
Queue Length 95th (ft)	225	114		60					#492		147	
Internal Link Dist (ft)	384			71					598		497	
Turn Bay Length (ft)		155										
Base Capacity (vph)	323	287		1104					760		353	
Starvation Cap Reductn	0	0		133					0		0	
Spillback Cap Reductn	0	0		0					0		0	
Storage Cap Reductn	0	0		0					0		0	
Reduced v/c Ratio	0.51	0.26		0.71					0.92		0.27	

Intersection Summary

Cycle Length: 156
Actuated Cycle Length: 136.8
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 37.7 Intersection LOS: D
Intersection Capacity Utilization 88.3% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Bedford Road & North Broadway

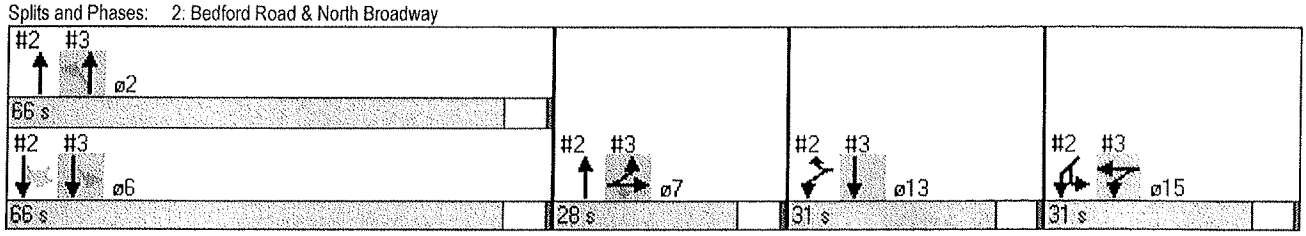


Lane Group	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations												
Volume (vph)	146	68	1	400	14	214	1	154	479	40	44	2
Satd. Flow (prot)	1753	1561	0	1692	0	0	0	0	3075	0	1904	0
Flt Permitted	0.950								0.546		0.953	
Satd. Flow (perm)	1742	1561	0	1692	0	0	0	0	1700	0	1857	0
Satd. Flow (RTOR)				27							1	
Confl. Peds. (#/hr)	3	82				8		8		8		97
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	5%	2%	2%	5%	2%	5%	2%	5%	5%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	77	0	705	0	0	0	0	712	0	96	0
Turn Type		Prot					Perm	Perm		Split		
Protected Phases	13	13		2 7					6	15	15	
Permitted Phases							6	6	6			
Total Split (s)	31.0	31.0	0.0	94.0	0.0	0.0	66.0	66.0	66.0	31.0	31.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0
Act Effct Green (s)	20.4	20.4		86.6					60.3		12.2	
Actuated g/C Ratio	0.15	0.15		0.63					0.44		0.09	
v/c Ratio	0.63	0.33		0.65					1.09dl		0.56	
Control Delay	67.0	57.4		4.3					61.9		73.6	
Queue Delay	0.0	0.0		0.6					0.0		0.0	
Total Delay	67.0	57.4		4.9					61.9		73.6	
LOS	E	E		A					E		E	
Approach Delay	63.9			4.9					61.9		73.6	
Approach LOS	E			A					E		E	
Queue Length 50th (ft)	141	63		21					332		85	
Queue Length 95th (ft)	226	117		62					#508		147	
Internal Link Dist (ft)	384			71					598		497	
Turn Bay Length (ft)		155										
Base Capacity (vph)	321	286		1100					747		349	
Starvation Cap Reductn	0	0		129					0		0	
Spillback Cap Reductn	0	0		0					0		0	
Storage Cap Reductn	0	0		0					0		0	
Reduced v/c Ratio	0.51	0.27		0.73					0.95		0.28	

Intersection Summary

Cycle Length: 156
Actuated Cycle Length: 137.3
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 39.9 Intersection LOS: D
Intersection Capacity Utilization 103.7% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Bedford Road & North Broadway



Existing PM
2: Bedford Road & North Broadway

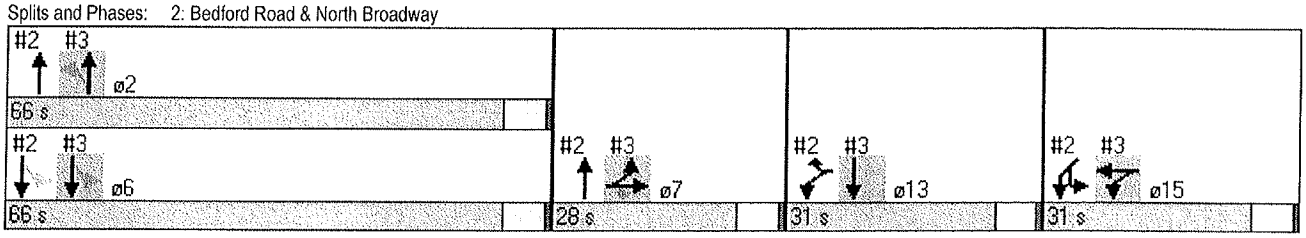
Project # 111229

Lane Group	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL	SBT	SWL2	SWL	SWR	ø2
Lane Configurations												
Volume (vph)	208	103	4	386	24	163	77	451	20	32	2	
Satd. Flow (prot)	1753	1561	0	1732	0	0	0	3091	0	1916	0	
Flt Permitted	0.950							0.636		0.954		
Satd. Flow (perm)	1746	1561	0	1732	0	0	0	1980	0	1905	0	
Satd. Flow (RTOR)				21						1		
Confl. Peds. (#/hr)	2								2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	5%	2%	2%	5%	2%	5%	5%	5%	2%	2%	2%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	231	118	0	637	0	0	0	587	0	60	0	
Turn Type		Prot					Perm		Split			
Protected Phases	13	13		2 7				6	15	15		2
Permitted Phases							6	6				
Total Split (s)	31.0	31.0	0.0	94.0	0.0	0.0	66.0	66.0	31.0	31.0	0.0	66.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	4.0	4.0	6.0	6.0	6.0	6.0	4.0	
Act Effct Green (s)	23.4	23.4		82.6				60.3		9.6		
Actuated g/C Ratio	0.18	0.18		0.62				0.45		0.07		
v/c Ratio	0.75	0.43		0.59				0.66		0.43		
Control Delay	69.5	56.1		1.9				34.6		70.1		
Queue Delay	0.0	0.0		0.5				0.0		0.0		
Total Delay	69.5	56.1		2.4				34.6		70.1		
LOS	E	E		A				C		E		
Approach Delay	65.0			2.4				34.6		70.1		
Approach LOS	E			A				C		E		
Queue Length 50th (ft)	193	93		1				212		51		
Queue Length 95th (ft)	#328	166		0				315		102		
Internal Link Dist (ft)	384			71				598		497		
Turn Bay Length (ft)		155										
Base Capacity (vph)	329	293		1152				893		361		
Starvation Cap Reductn	0	0		196				0		0		
Spillback Cap Reductn	0	0		0				0		0		
Storage Cap Reductn	0	0		0				0		0		
Reduced v/c Ratio	0.70	0.40		0.67				0.66		0.17		

Intersection Summary

Cycle Length: 156
Actuated Cycle Length: 133.7
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 29.9 — Intersection LOS: C
Intersection Capacity Utilization 82.9% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Bedford Road & North Broadway

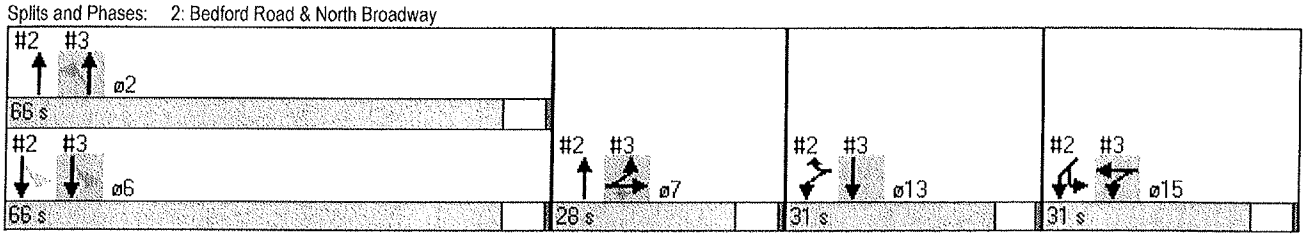


Lane Group	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL	SBT	SWL2	SWL	SWR	ø2
Lane Configurations												
Volume (vph)	256	104	4	396	26	202	78	464	20	34	2	
Satd. Flow (prot)	1753	1561	0	1723	0	0	0	3091	0	1916	0	
Flt Permitted	0.950							0.595		0.954		
Satd. Flow (perm)	1746	1561	0	1723	0	0	0	1852	0	1905	0	
Satd. Flow (RTOR)				25						1		
Confl. Peds. (#/hr)	2								2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	5%	2%	2%	5%	2%	5%	5%	5%	2%	2%	2%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	284	120	0	693	0	0	0	603	0	62	0	
Turn Type		Prot					Perm		Split			
Protected Phases	13	13		2 7				6	15	15		2
Permitted Phases							6	6				
Total Split (s)	31.0	31.0	0.0	94.0	0.0	0.0	66.0	66.0	31.0	31.0	0.0	66.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	4.0	4.0	6.0	6.0	6.0	6.0	4.0	
Act Effct Green (s)	25.0	25.0		85.6				60.1		9.8		
Actuated g/C Ratio	0.18	0.18		0.62				0.43		0.07		
v/c Ratio	0.90	0.43		0.64				0.75		0.46		
Control Delay	85.9	56.9		2.3				40.9		72.2		
Queue Delay	0.0	0.0		1.1				0.0		0.0		
Total Delay	85.9	56.9		3.4				40.9		72.2		
LOS	F	E		A				D		E		
Approach Delay	77.3			3.4				40.9		72.2		
Approach LOS	E			A				D		E		
Queue Length 50th (ft)	258	99		2				244		55		
Queue Length 95th (ft)	#446	170		0				342		104		
Internal Link Dist (ft)	384			71				598		497		
Turn Bay Length (ft)		155										
Base Capacity (vph)	317	282		1106				804		347		
Starvation Cap Reductn	0	0		205				0		0		
Spillback Cap Reductn	0	0		0				0		0		
Storage Cap Reductn	0	0		0				0		0		
Reduced v/c Ratio	0.90	0.43		0.77				0.75		0.18		

Intersection Summary

Cycle Length: 156
Actuated Cycle Length: 138.4
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 35.6 Intersection LOS: D
Intersection Capacity Utilization 89.0% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Bedford Road & North Broadway

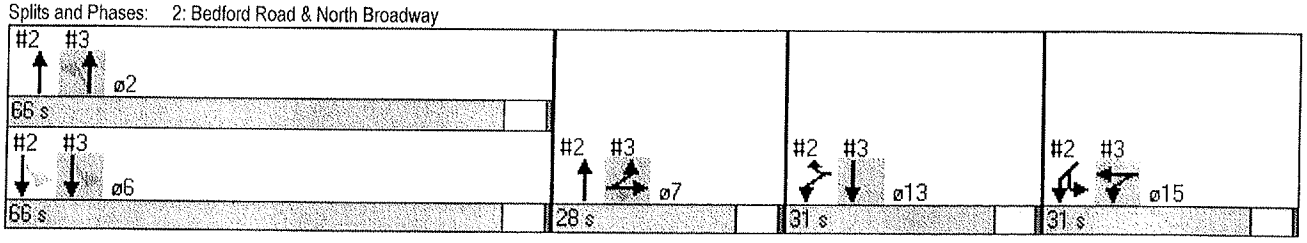


Lane Group	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL	SBT	SWL2	SWL	SWR	ø2
Lane Configurations												
Volume (vph)	256	105	4	405	26	202	80	474	20	34	2	
Satd. Flow (prot)	1753	1561	0	1723	0	0	0	3091	0	1903	0	
Flt Permitted	0.950							0.587		0.954		
Satd. Flow (perm)	1746	1561	0	1723	0	0	0	1827	0	1891	0	
Satd. Flow (RTOR)				25						1		
Confl. Peds. (#/hr)	2	64							2		64	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	5%	2%	2%	5%	2%	5%	5%	5%	2%	2%	2%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	284	121	0	703	0	0	0	616	0	62	0	
Turn Type		Prot					Perm		Split			
Protected Phases	13	13		2 7				6	15	15		2
Permitted Phases							6	6				
Total Split (s)	31.0	31.0	0.0	94.0	0.0	0.0	66.0	66.0	31.0	31.0	0.0	66.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	4.0	4.0	6.0	6.0	6.0	6.0	4.0	
Act Effct Green (s)	25.0	25.0		85.7				60.1		9.8		
Actuated g/C Ratio	0.18	0.18		0.62				0.43		0.07		
v/c Ratio	0.90	0.43		0.65				0.78		0.46		
Control Delay	86.2	57.1		2.4				42.6		72.3		
Queue Delay	0.0	0.0		1.3				0.0		0.0		
Total Delay	86.2	57.1		3.7				42.6		72.3		
LOS	F	E		A				D		E		
Approach Delay	77.5			3.7				42.6		72.3		
Approach LOS	E			A				D		E		
Queue Length 50th (ft)	259	100		3				254		55		
Queue Length 95th (ft)	#446	171		0				355		104		
Internal Link Dist (ft)	384			71				598		497		
Turn Bay Length (ft)		155										
Base Capacity (vph)	317	282		1105				792		345		
Starvation Cap Reductn	0	0		209				0		0		
Spillback Cap Reductn	0	0		0				0		0		
Storage Cap Reductn	0	0		0				0		0		
Reduced v/c Ratio	0.90	0.43		0.78				0.78		0.18		

Intersection Summary

Cycle Length: 156
Actuated Cycle Length: 138.6
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 36.2 — Intersection LOS: D
Intersection Capacity Utilization 100.8% — ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Bedford Road & North Broadway



Existing AM
3: Beekman Avenue & North Broadway

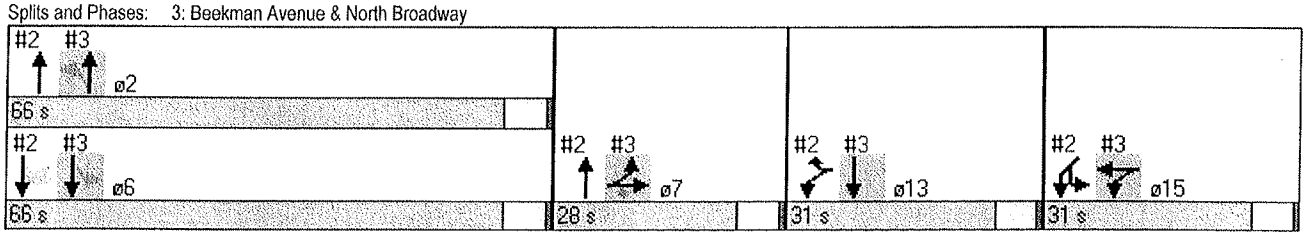
Project # 111229

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	129	3	69	9	4	9	44	419	5	6	502	109
Satd. Flow (prot)	0	1798	1350	0	1757	0	0	1903	0	0	3344	0
Flt Permitted		0.953			0.980			0.891			0.951	
Satd. Flow (perm)	0	1737	952	0	1610	0	0	1703	0	0	3181	0
Satd. Flow (RTOR)			59		9						25	
Confl. Peds. (#/hr)	10		79	79		10	5		25	25		5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Parking (#/hr)			0						0			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	71	0	22	0	0	482	0	0	636	0
Turn Type	Split		Perm	Split			Perm			custom		
Protected Phases	7	7		15	15			2			6 13	
Permitted Phases			7				2			6		
Total Split (s)	28.0	28.0	28.0	31.0	31.0	0.0	66.0	66.0	0.0	66.0	97.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)		17.1	17.1		11.7			60.6			78.1	
Actuated g/C Ratio		0.13	0.13		0.09			0.46			0.60	
v/c Ratio		0.58	0.41		0.13			0.61			0.33	
Control Delay		65.4	24.6		42.1			33.3			1.9	
Queue Delay		0.0	0.0		0.0			0.0			0.6	
Total Delay		65.4	24.6		42.1			33.3			2.4	
LOS		E	C		D			C			A	
Approach Delay		51.4			42.1			33.3			2.4	
Approach LOS		D			D			C			A	
Queue Length 50th (ft)		110	9		10			308			20	
Queue Length 95th (ft)		196	60		40			519			26	
Internal Link Dist (ft)		289			328			376			71	
Turn Bay Length (ft)			80									
Base Capacity (vph)		304	210		345			786			2089	
Starvation Cap Reductn		0	0		0			0			986	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.45	0.34		0.06			0.61			0.58	

Intersection Summary

Cycle Length: 156
Actuated Cycle Length: 131.2
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 21.6 — Intersection LOS: C
Intersection Capacity Utilization 72.1% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: Beekman Avenue & North Broadway



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	179	3	71	9	4	9	46	423	5	6	507	146
Satd. Flow (prot)	0	1798	1350	0	1757	0	0	1903	0	0	3319	0
Flt Permitted		0.953			0.980			0.878			0.951	
Satd. Flow (perm)	0	1737	952	0	1621	0	0	1679	0	0	3156	0
Satd. Flow (RTOR)			44		9						37	
Confl. Peds. (#/hr)	10		79	79		10	5		25	25		5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Parking (#/hr)			0						0			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	188	73	0	22	0	0	488	0	0	680	0
Turn Type	Split		Perm	Split			Perm			custom		
Protected Phases	7	7		15	15			2			6 13	
Permitted Phases			7				2			6		
Total Split (s)	28.0	28.0	28.0	31.0	31.0	0.0	66.0	66.0	0.0	66.0	97.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)		19.9	19.9		12.2			60.4			80.5	
Actuated g/C Ratio		0.15	0.15		0.09			0.44			0.59	
v/c Ratio		0.72	0.41		0.13			0.66			0.36	
Control Delay		73.1	33.6		42.8			37.4			1.9	
Queue Delay		0.0	0.0		0.1			0.0			1.0	
Total Delay		73.1	33.6		42.9			37.4			2.8	
LOS		E	C		D			D			A	
Approach Delay		62.0			42.9			37.4			2.8	
Approach LOS		E			D			D			A	
Queue Length 50th (ft)		164	23		11			355			22	
Queue Length 95th (ft)		#266	79		40			533			m25	
Internal Link Dist (ft)		289			328			376			71	
Turn Bay Length (ft)			80									
Base Capacity (vph)		291	191		331			741			1988	
Starvation Cap Reductn		0	0		0			0			983	
Spillback Cap Reductn		0	0		70			3			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.65	0.38		0.08			0.66			0.68	

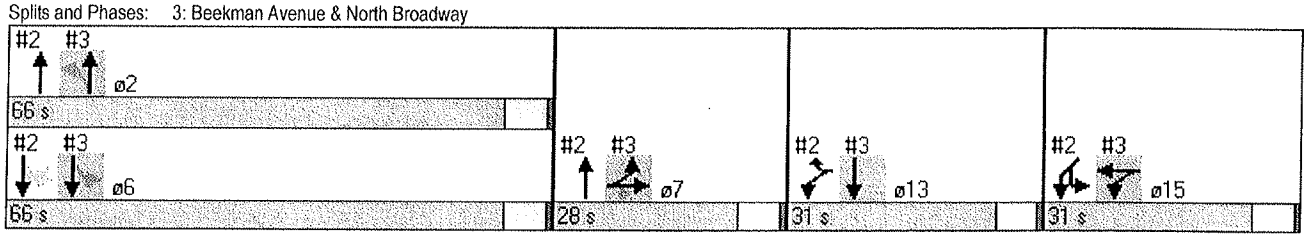
Intersection Summary

Cycle Length: 156
Actuated Cycle Length: 136.8
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 25.7 — Intersection LOS: C
Intersection Capacity Utilization 75.8% — ICU Level of Service D
Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Beekman Avenue & North Broadway



Build AM

3: Beekman Avenue & North Broadway

Project # 111229

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	185	3	71	9	4	9	46	433	5	6	512	150
Satd. Flow (prot)	0	1798	1350	0	1794	0	0	1905	0	0	3344	0
Flt Permitted		0.953			0.980			0.879			0.951	
Satd. Flow (perm)	0	1798	1350	0	1794	0	0	1683	0	0	3180	0
Satd. Flow (RTOR)			42		9						38	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Parking (#/hr)			0						0			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	194	73	0	22	0	0	498	0	0	689	0
Turn Type	Split		Perm	Split			Perm			custom		
Protected Phases	7	7		15	15			2			6 13	
Permitted Phases			7				2			6		
Total Split (s)	28.0	28.0	28.0	31.0	31.0	0.0	66.0	66.0	0.0	66.0	97.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)		20.2	20.2		12.2			60.3			80.7	
Actuated g/C Ratio		0.15	0.15		0.09			0.44			0.59	
v/c Ratio		0.73	0.31		0.13			0.67			0.37	
Control Delay		74.1	30.6		42.7			38.2			1.9	
Queue Delay		0.0	0.0		0.1			0.0			1.1	
Total Delay		74.1	30.6		42.8			38.2			3.0	
LOS		E	C		D			D			A	
Approach Delay		62.2			42.8			38.2			3.0	
Approach LOS		E			D			D			A	
Queue Length 50th (ft)		170	25		11			365			21	
Queue Length 95th (ft)		#286	77		40			548			m24	
Internal Link Dist (ft)		289			328			376			71	
Turn Bay Length (ft)			80									
Base Capacity (vph)		290	253		336			740			1994	
Starvation Cap Reductn		0	0		0			0			1002	
Spillback Cap Reductn		0	0		74			3			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.67	0.29		0.08			0.68			0.69	

Intersection Summary

Cycle Length: 156

Actuated Cycle Length: 137.3

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 26.2 Intersection LOS: C

Intersection Capacity Utilization 76.8% ICU Level of Service D

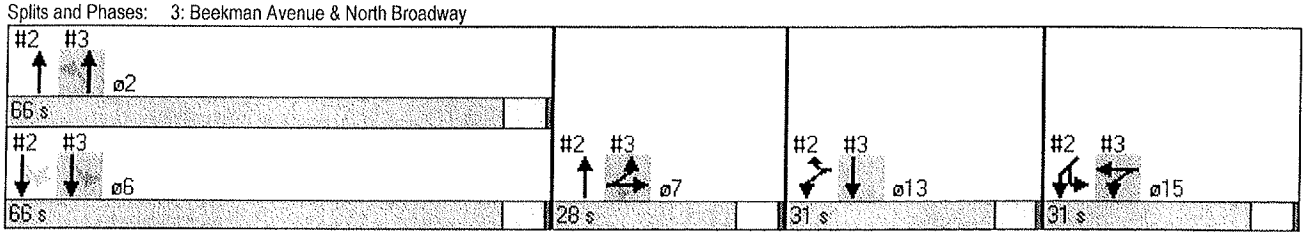
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Beekman Avenue & North Broadway

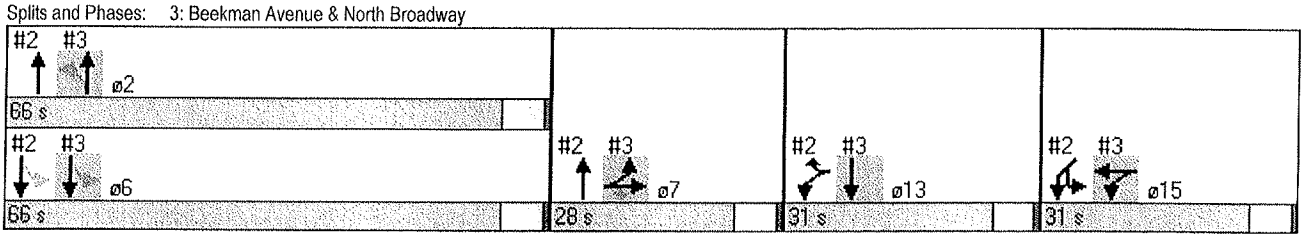


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	3	72	7	4	3	46	465	4	1	523	167
Satd. Flow (prot)	0	1800	1350	0	1826	0	0	1906	0	0	3260	0
Flt Permitted		0.954			0.974			0.870			0.955	
Satd. Flow (perm)	0	1787	1299	0	1813	0	0	1662	0	0	3113	0
Satd. Flow (RTOR)			76		3						43	
Confl. Peds. (#/hr)	2		5	5		2	22		12	12		22
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Parking (#/hr)			0						0			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	118	79	0	15	0	0	566	0	0	760	0
Turn Type	Split		Perm	Split			Perm			custom		
Protected Phases	7	7		15	15			2			6 13	
Permitted Phases			7				2			6		
Total Split (s)	28.0	28.0	28.0	31.0	31.0	0.0	66.0	66.0	0.0	66.0	97.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)		16.3	16.3		9.6			60.3			83.7	
Actuated g/C Ratio		0.12	0.12		0.07			0.45			0.63	
v/c Ratio		0.54	0.35		0.11			0.76			0.39	
Control Delay		65.0	16.8		53.3			40.1			1.5	
Queue Delay		0.0	0.0		0.0			0.0			0.6	
Total Delay		65.0	16.8		53.3			40.1			2.1	
LOS		E	B		D			D			A	
Approach Delay		45.7			53.3			40.1			2.1	
Approach LOS		D			D			D			A	
Queue Length 50th (ft)		99	2		10			415			0	
Queue Length 95th (ft)		168	52		35			635			15	
Internal Link Dist (ft)		289			328			376			71	
Turn Bay Length (ft)			80									
Base Capacity (vph)		298	278		346			749			2004	
Starvation Cap Reductn		0	0		0			0			806	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.40	0.28		0.04			0.76			0.63	

Intersection Summary

Cycle Length: 156
Actuated Cycle Length: 133.7
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 22.2 — Intersection LOS: C
Intersection Capacity Utilization 73.4% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Beekman Avenue & North Broadway

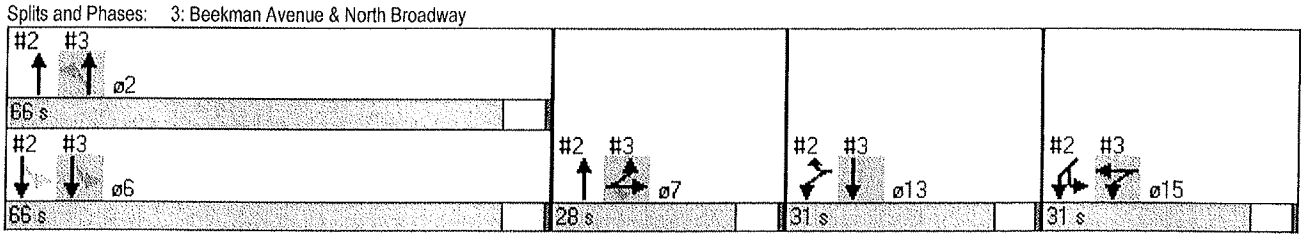


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	151	3	76	7	4	3	48	470	4	1	528	225
Satd. Flow (prot)	0	1798	1350	0	1826	0	0	1904	0	0	3216	0
Flt Permitted		0.953			0.974			0.834			0.955	
Satd. Flow (perm)	0	1785	1299	0	1814	0	0	1594	0	0	3072	0
Satd. Flow (RTOR)			56		3						66	
Confl. Peds. (#/hr)	2		5	5		2	22		12	12		22
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Parking (#/hr)			0						0			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	169	84	0	15	0	0	573	0	0	828	0
Turn Type	Split		Perm	Split			Perm			custom		
Protected Phases	7	7		15	15			2			6 13	
Permitted Phases			7				2			6		
Total Split (s)	28.0	28.0	28.0	31.0	31.0	0.0	66.0	66.0	0.0	66.0	97.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)		19.5	19.5		9.8			60.1			85.1	
Actuated g/C Ratio		0.14	0.14		0.07			0.43			0.61	
v/c Ratio		0.67	0.36		0.11			0.83			0.43	
Control Delay		70.2	26.5		54.0			47.3			1.7	
Queue Delay		0.0	0.0		0.0			0.0			1.2	
Total Delay		70.2	26.5		54.0			47.3			3.0	
LOS		E	C		D			D			A	
Approach Delay		55.7			54.0			47.3			3.0	
Approach LOS		E			D			D			A	
Queue Length 50th (ft)		146	22		11			465			0	
Queue Length 95th (ft)		233	77		35			#707			m18	
Internal Link Dist (ft)		289			328			376			71	
Turn Bay Length (ft)			80									
Base Capacity (vph)		286	254		333			692			1915	
Starvation Cap Reductn		0	0		0			0			811	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.59	0.33		0.05			0.83			0.75	

Intersection Summary

Cycle Length: 156
Actuated Cycle Length: 138.4
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 26.6 — Intersection LOS: C
Intersection Capacity Utilization 80.0% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Beekman Avenue & North Broadway



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	3	76	7	4	3	48	475	4	1	534	229
Satd. Flow (prot)	0	1798	1350	0	1826	0	0	1904	0	0	3216	0
Flt Permitted		0.953			0.974			0.828			0.955	
Satd. Flow (perm)	0	1785	1299	0	1814	0	0	1582	0	0	3071	0
Satd. Flow (RTOR)			55		3						67	
Confl. Peds. (#/hr)	2		5	5		2	22		12	12		22
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Parking (#/hr)			0						0			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	173	84	0	15	0	0	579	0	0	840	0
Turn Type	Split		Perm	Split			Perm			custom		
Protected Phases	7	7		15	15			2			6 13	
Permitted Phases			7				2			6		
Total Split (s)	28.0	28.0	28.0	31.0	31.0	0.0	66.0	66.0	0.0	66.0	97.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)		19.6	19.6		9.8			60.1			85.2	
Actuated g/C Ratio		0.14	0.14		0.07			0.43			0.61	
v/c Ratio		0.68	0.36		0.11			0.84			0.44	
Control Delay		71.0	27.1		53.9			48.8			1.8	
Queue Delay		0.0	0.0		0.0			0.0			1.4	
Total Delay		71.0	27.1		53.9			48.8			3.1	
LOS		E	C		D			D			A	
Approach Delay		56.7			53.9			48.8			3.1	
Approach LOS		E			D			D			A	
Queue Length 50th (ft)		150	23		11			475			0	
Queue Length 95th (ft)		238	78		35			#724			m18	
Internal Link Dist (ft)		289			328			376			71	
Turn Bay Length (ft)			80									
Base Capacity (vph)		286	253		332			686			1913	
Starvation Cap Reductn		0	0		0			0			817	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.60	0.33		0.05			0.84			0.77	

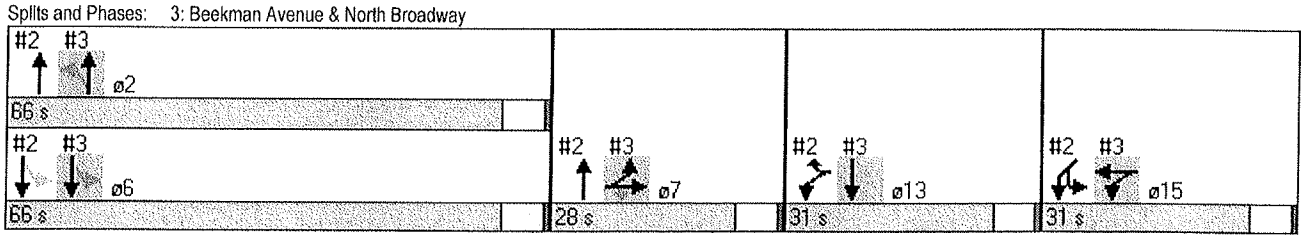
Intersection Summary

Cycle Length: 156
Actuated Cycle Length: 138.6
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 27.4 — Intersection LOS: C
Intersection Capacity Utilization 80.9% — ICU Level of Service D
Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Beekman Avenue & North Broadway



APPENDIX B

INTERSECTION CAPACITY ANALYSES

HIGH PEDESTRIAN VOLUMES

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations												
Volume (vph)	146	68	1	400	14	214	1	154	479	40	44	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	16	12	12	10	10	12	14	12
Grade (%)	-4%			0%					6%		-3%	
Total Lost time (s)	6.0	6.0		6.0					6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00					0.95		1.00	
Frpb, ped/bikes	1.00	1.00		0.98					1.00		0.99	
Flpb, ped/bikes	1.00	1.00		1.00					1.00		1.00	
Frt	1.00	0.85		0.95					1.00		1.00	
Flt Protected	0.95	1.00		1.00					0.99		0.95	
Satd. Flow (prot)	1753	1561		1694					3075		1896	
Flt Permitted	0.95	1.00		1.00					0.55		0.95	
Satd. Flow (perm)	1753	1561		1694					1699		1896	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	164	76	1	449	16	240	1	173	538	45	49	2
RTOR Reduction (vph)	0	0	0	10	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	164	77	0	695	0	0	0	0	712	0	95	0
Confl. Peds. (#/hr)	3	82				8		8		8		97
Heavy Vehicles (%)	5%	2%	2%	5%	2%	5%	2%	5%	5%	2%	2%	2%
Turn Type		Prot					Perm	Perm		Split		
Protected Phases	13	13		2 7					6	15	15	
Permitted Phases							6	6	6			
Actuated Green, G (s)	20.4	20.4		86.6					60.4		12.2	
Effective Green, g (s)	20.4	20.4		86.6					60.4		12.2	
Actuated g/C Ratio	0.15	0.15		0.63					0.44		0.09	
Clearance Time (s)	6.0	6.0							6.0		6.0	
Vehicle Extension (s)	3.0	3.0							3.0		3.0	
Lane Grp Cap (vph)	261	232		1069					748		169	
v/s Ratio Prot	c0.09	0.05		c0.41							c0.05	
v/s Ratio Perm									c0.42			
v/c Ratio	0.63	0.33		0.65					1.09dl		0.56	
Uniform Delay, d1	54.8	52.3		15.8					37.0		59.9	
Progression Factor	1.00	1.00		0.11					1.00		1.00	
Incremental Delay, d2	4.7	0.8		1.1					23.1		4.2	
Delay (s)	59.5	53.1		2.8					60.1		64.2	
Level of Service	E	D		A					E		E	
Approach Delay (s)	57.5			2.8					60.1		64.2	
Approach LOS	E			A					E		E	

Intersection Summary			
HCM Average Control Delay	36.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	137.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations												
Volume (vph)	146	68	1	400	14	214	1	154	479	40	44	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	16	12	12	10	10	12	14	12
Grade (%)	-4%			0%					6%		-3%	
Total Lost time (s)	6.0	6.0		6.0					6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00					0.95		1.00	
Frpb, ped/bikes	1.00	1.00		0.81					1.00		0.99	
Flpb, ped/bikes	1.00	1.00		1.00					1.00		1.00	
Frt	1.00	0.85		0.95					1.00		1.00	
Flt Protected	0.95	1.00		1.00					0.99		0.95	
Satd. Flow (prot)	1753	1561		1388					3075		1892	
Flt Permitted	0.95	1.00		1.00					0.55		0.95	
Satd. Flow (perm)	1753	1561		1388					1698		1892	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	164	76	1	449	16	240	1	173	538	45	49	2
RTOR Reduction (vph)	0	0	0	10	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	164	77	0	695	0	0	0	0	712	0	95	0
Confl. Peds. (#/hr)	3	200				200		200		8		200
Heavy Vehicles (%)	5%	2%	2%	5%	2%	5%	2%	5%	5%	2%	2%	2%
Turn Type		Prot					Perm	Perm		Split		
Protected Phases	13	13		2 7					6	15	15	
Permitted Phases							6	6	6			
Actuated Green, G (s)	20.4	20.4		86.6					60.4		12.3	
Effective Green, g (s)	20.4	20.4		86.6					60.4		12.3	
Actuated g/C Ratio	0.15	0.15		0.63					0.44		0.09	
Clearance Time (s)	6.0	6.0							6.0		6.0	
Vehicle Extension (s)	3.0	3.0							3.0		3.0	
Lane Grp Cap (vph)	260	232		875					747		169	
v/s Ratio Prot	c0.09	0.05		c0.50							c0.05	
v/s Ratio Perm									c0.42			
v/c Ratio	0.63	0.33		0.79					1.09dl		0.56	
Uniform Delay, d1	54.9	52.3		18.8					37.1		59.9	
Progression Factor	1.00	1.00		0.31					1.00		1.00	
Incremental Delay, d2	4.9	0.8		4.0					23.3		4.2	
Delay (s)	59.8	53.2		9.8					60.4		64.2	
Level of Service	E	D		A					E		E	
Approach Delay (s)	57.7			9.8					60.4		64.2	
Approach LOS	E			A					E		E	

Intersection Summary			
HCM Average Control Delay	39.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	137.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	107.2%	ICU Level of Service	G
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	256	105	4	405	26	202	80	474	20	34	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	16	12	10	10	12	14	12
Grade (%)	-4%			0%				6%		-3%	
Total Lost time (s)	6.0	6.0		6.0				6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00				0.95		1.00	
Frpb, ped/bikes	1.00	1.00		1.00				1.00		0.99	
Flpb, ped/bikes	1.00	1.00		1.00				1.00		1.00	
Frt	1.00	0.85		0.95				1.00		1.00	
Flt Protected	0.95	1.00		1.00				0.99		0.95	
Satd. Flow (prot)	1753	1561		1724				3090		1887	
Flt Permitted	0.95	1.00		1.00				0.59		0.95	
Satd. Flow (perm)	1753	1561		1724				1827		1887	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	284	117	4	450	29	224	89	527	22	38	2
RTOR Reduction (vph)	0	0	0	10	0	0	0	0	0	1	0
Lane Group Flow (vph)	284	121	0	693	0	0	0	616	0	61	0
Confl. Peds. (#/hr)	2	64							2		64
Heavy Vehicles (%)	5%	2%	2%	5%	2%	5%	5%	5%	2%	2%	2%
Turn Type		Prot					Perm		Split		
Protected Phases	13	13		2.7				6	15	15	
Permitted Phases							6	6			
Actuated Green, G (s)	25.0	25.0		85.7				60.1		9.8	
Effective Green, g (s)	25.0	25.0		85.7				60.1		9.8	
Actuated g/C Ratio	0.18	0.18		0.62				0.43		0.07	
Clearance Time (s)	6.0	6.0						6.0		6.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	
Lane Grp Cap (vph)	316	282		1067				793		134	
v/s Ratio Prot	c0.16	0.08		c0.40						c0.03	
v/s Ratio Perm								c0.34			
v/c Ratio	0.90	0.43		0.65				0.78		0.46	
Uniform Delay, d1	55.5	50.4		16.8				33.5		61.8	
Progression Factor	1.00	1.00		0.03				1.00		1.00	
Incremental Delay, d2	26.4	1.1		0.8				7.4		2.5	
Delay (s)	81.9	51.5		1.3				40.8		64.2	
Level of Service	F	D		A				D		E	
Approach Delay (s)	72.8			1.3				40.8		64.2	
Approach LOS	E			A				D		E	

Intersection Summary			
HCM Average Control Delay	33.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	138.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	256	105	4	405	26	202	80	474	20	34	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	16	12	10	10	12	14	12
Grade (%)	-4%			0%				6%		-3%	
Total Lost time (s)	6.0	6.0		6.0				6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00				0.95		1.00	
Frpb, ped/bikes	1.00	1.00		0.81				1.00		0.98	
Flpb, ped/bikes	1.00	1.00		1.00				1.00		1.00	
Frt	1.00	0.85		0.95				1.00		1.00	
Flt Protected	0.95	1.00		1.00				0.99		0.95	
Satd. Flow (prot)	1753	1561		1391				3090		1873	
Flt Permitted	0.95	1.00		1.00				0.59		0.95	
Satd. Flow (perm)	1753	1561		1391				1825		1873	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	284	117	4	450	29	224	89	527	22	38	2
RTOR Reduction (vph)	0	0	0	10	0	0	0	0	0	1	0
Lane Group Flow (vph)	284	121	0	693	0	0	0	616	0	61	0
Confl. Peds. (#/hr)	2	200				200	200		2		200
Heavy Vehicles (%)	5%	2%	2%	5%	2%	5%	5%	5%	2%	2%	2%
Turn Type		Prot					Perm		Split		
Protected Phases	13	13		2 7				6	15	15	
Permitted Phases							6	6			
Actuated Green, G (s)	25.0	25.0		85.9				60.1		9.9	
Effective Green, g (s)	25.0	25.0		85.9				60.1		9.9	
Actuated g/C Ratio	0.18	0.18		0.62				0.43		0.07	
Clearance Time (s)	6.0	6.0						6.0		6.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	
Lane Grp Cap (vph)	316	281		861				790		134	
v/s Ratio Prot	c0.16	0.08		c0.50						c0.03	
v/s Ratio Perm								0.34			
v/c Ratio	0.90	0.43		0.81				0.78		0.46	
Uniform Delay, d1	55.7	50.6		20.1				33.7		61.9	
Progression Factor	1.00	1.00		0.11				1.00		1.00	
Incremental Delay, d2	26.4	1.1		3.4				7.5		2.5	
Delay (s)	82.0	51.6		5.6				41.2		64.3	
Level of Service	F	D		A				D		E	
Approach Delay (s)	73.0			5.6				41.2		64.3	
Approach LOS	E			A				D		E	

Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	138.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			