



26 Linden Place
Traffic Impact and Parking Study
IMEG # 24000584.00



Prepared for:
JS Barstow LLC
Village of Great Neck Plaza

Prepared by:
Cameron Engineering, an IMEG company
June 2023 / Revised April 2024

TABLE OF CONTENTS

1. BACKGROUND	4
1.1 PURPOSE OF REPORT AND REVISIONS	4
1.2 STUDY METHODOLOGY	5
2. EXISTING CONDITIONS	6
2.1 EXISTING LAND USE	6
2.2 ROADWAY DESCRIPTIONS	6
2.3 KEY INTERSECTIONS	7
2.4 TRAFFIC VOLUMES	7
2.5 EXISTING LEVELS OF SERVICE	8
2.6 TRANSIT	9
2.7 FACILITIES FOR NON-VEHICULAR TRAFFIC / COMPLETE STREETS	10
2.8 GRADES AND SIGHT DISTANCE	10
2.9 EMERGENCY SERVICES	11
2.10 SCHOOLS	11
2.11 ACCIDENT HISTORY	11
3. FUTURE CONDITIONS WITHOUT THE PROJECT – THE NO BUILD SCENARIO	16
3.1 AMBIENT GROWTH	16
3.2 OTHER PLANNED DEVELOPMENTS	16
4. FUTURE CONDITIONS WITH THE PROJECT – THE BUILD SCENARIO	20
4.1 PROPOSED SITE PLAN AND SITE ACCESS	20
4.2 PARKING	21
4.3 TRIP GENERATION	22
4.3.1 Trips via Transit	24
4.4 DISTRIBUTION AND ASSIGNMENT OF SITE-GENERATED TRAFFIC	25
5. ASSESSING IMPACT: NO BUILD VS. BUILD LEVELS OF SERVICE	33
5.1 SITE DRIVEWAY MANEUVERS	36
6. SUMMARY AND CONCLUSIONS	40

LIST OF TABLES

Table 1: Existing Levels of Service	8
Table 2: Provided Parking Summary	21
Table 3: ACS Great Neck Plaza Zip Code 11021 Commuting	24
Table 4: Site-Generated Peak Hour Trips	25
Table 5: Trip Distribution and Assignment	26
Table 6: Level of Service Summary Tables	33

LIST OF FIGURES

(Figures are found at the end of each chapter)

- Figure 1: Project Location Map
- Figure 2: Study Intersections
- Figure 3: Close-up of NICE Route Map
- Figure 4: Existing AM Peak Hour Volumes
- Figure 5: Existing PM Peak Hour Volumes
- Figure 6: Existing Saturday Peak Hour Volumes
- Figure 7: AM Peak Hour No Build Volumes
- Figure 8: PM Peak Hour No Build Volumes
- Figure 9: Saturday Peak Hour No Build Volumes
- Figure 10: C3D Architecture Plan Excerpts (not to scale)
- Figure 11: Barstow Road On-Street Parking Exhibit (not to scale)
- Figure 12: Nearest On-Street Parking
- Figure 13: Distribution of Site-generated Traffic
- Figure 14: AM, PM, and Saturday Peak Hour Generated Traffic
- Figure 15: Weekday AM Peak Hour Build Volumes
- Figure 16: Weekday PM Peak Hour Build Volumes
- Figure 17: Saturday Peak Hour Build Volumes
- Figure 18: Linden Place Maneuvers
- Figure 19: Barstow Road Apron Maneuvers
- Figure 20: Canterbury Road Apron Maneuvers

APPENDICES

- Appendix A: Level of Service Descriptions
- Appendix B: Existing Level of Service Worksheets
- Appendix C: No Build Level of Service Worksheets
- Appendix D: Build Level of Service Worksheets

1. Background

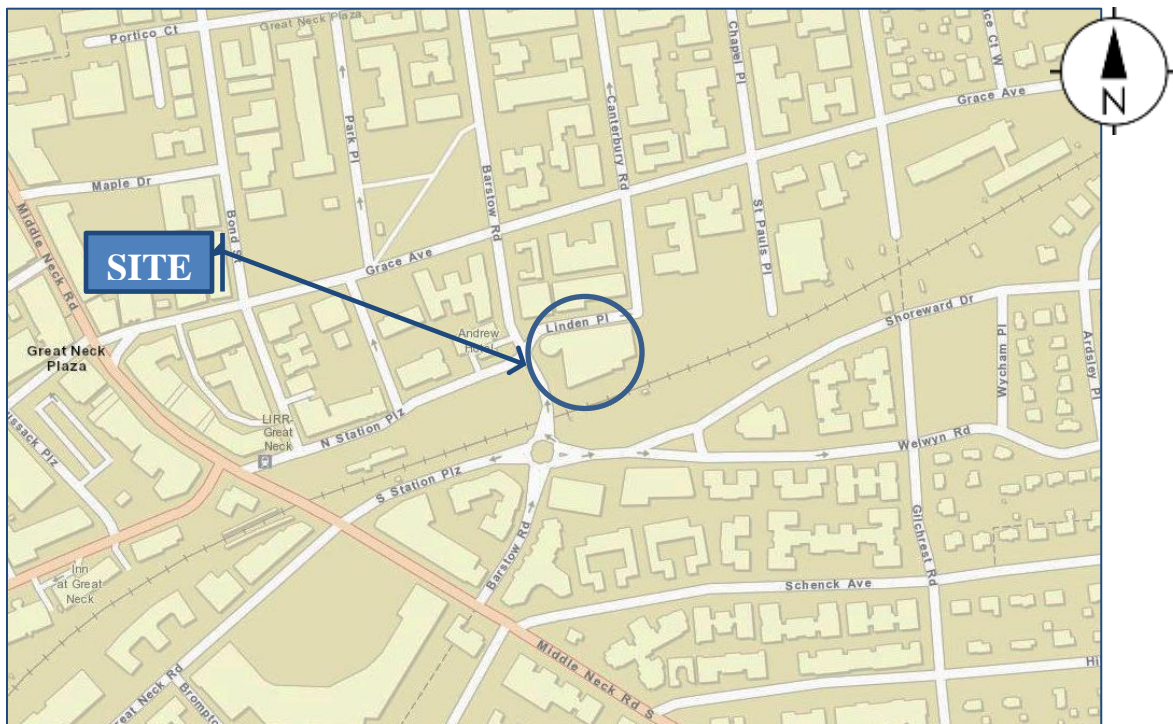
1.1 Purpose of Report and Revisions

This is a revised traffic study of the proposed redevelopment of 15 Barstow Road/26 Linden Place in the Village of Great Neck Plaza. The June 2023 study assessed potential traffic impacts of the JS Barstow LLC proposal for a 57-unit mixed-use building, with 3,813 s.f. of ground floor retail space. This revised study assesses the current plan, which is a 69-unit apartment building with no retail square footage, and references the updated 6th Edition of the Institute of Transportation Engineers (ITE) standard *Parking Generation Manual*.

The property is located at the southeast corner of Barstow Road and Linden Place in the incorporated Village of Great Neck Plaza, shown in Figure 1 below.

Cameron Engineering, an IMEG company, has performed a detailed investigation of the proposed development's potential traffic impacts on the adjacent street system. This study reviews existing roadway characteristics and traffic conditions (traffic volumes, traffic flow quality, and geometry), determines future conditions if this project is not constructed by 2025, estimates the project's expected peak-period trip generation, and assesses the effect of this additional traffic on the surrounding roads.

Figure 1: Project Location Map



1.2 Study Methodology

A. Review the Existing Conditions on the subject property and the surrounding area

- Examine the site plan and other project-related material (e.g., local ordinances).
- Determine the Average Annual Daily Traffic [AADT] volumes near the property using New York State Department of Transportation [NYSDOT] 24-hour data.
- Visit the site to observe prevailing traffic conditions and nearby physical features, and to identify “key intersections” that this proposal might impact.
- Perform traffic and pedestrian counts at those key intersections during weekday AM (7:00-9:00 am), PM (4:00-7:00 pm), and Saturday midday (11:00 am-2:00 pm) peak traffic periods to establish the existing peak hour volumes at the times this facility would be its most active.
- Assess the availability of nearby services and trip generators such as schools, commuter routes, shopping, banking, and emergency facilities.
- Request the latest available three-year accident history at the study intersections.
- Determine the existing levels of service (LOS) at the study intersections, using *Synchro* version 11, a software package that complies with the guidelines of the *Highway Capacity Manual Sixth Edition (HCM 6)*.

B. Determine the “No Build” Scenario: Future Conditions if the project is not constructed.

- Obtain the area’s ambient growth rate from the New York State Department of Transportation (NYSDOT); this rate accounts for general population growth.
- Correspond with Village representatives to determine if there are any other projects being planned nearby. Traffic from any such projects has the potential to affect volumes through the key intersections within the timeframe analyzed in this study.
- These features provide the expected future traffic volumes in two years if the project is not constructed (the “No Build” scenario).
- Use *Synchro* to determine future No Build levels of service.

C. Determine the “Build” Scenario: Future Conditions with the project in place.

- Discuss the site plan yield, layout, and site access.
- Determine the number of parking spaces required by the Village, and determine if parking needs on the site will be met, using data in the Institute of Transportation Engineers (ITE) *Parking Generation Manual (6th Edition)*.

- Distribute site-generated traffic to specific movements at the key intersections. Adding the site traffic to the No Build volumes yields the expected future traffic volumes if the project is constructed (the “Build” scenario).
- Use *Synchro* to determine the future Build levels of service.

D. Determine the traffic impact (if any) of the proposed project.

- Compare the “No Build” and “Build” levels of service. Any differences between the two scenarios indicate identifiable impacts on traffic conditions.
- Address any impacts by proposing mitigation. Any scenario that includes a mitigation measure is labeled the “Mitigated Build” condition.
- The comparison between the “No Build” and either the “Build” or “Mitigated Build” scenarios, indicates the viability of the proposed redevelopment with respect to traffic conditions.

2. Existing Conditions

2.1 Existing Land Use

The site is currently zoned Business B, and is situated on the southeast corner of Barstow Road and Linden Place. Linden Place is a one-way eastbound street; Canterbury Road runs north from the bend where Linden Place ends. Grace Avenue runs east-west, one block to the north of the site. The majority of the surrounding properties are Business or Residential.

2.2 Roadway Descriptions

Barstow Road is a north-south Village road with one through lane in each direction and on-street parking on both sides of the street. Its Average Annual Daily Traffic (AADT) volume is approximately 6,800 vehicles per day (“vpd”) between Grace Avenue to the north and North Station Plaza to the south.

Linden Place is a one-way eastbound Village road that connects Barstow Road and another business lot. There is on-street parking delineated by “box” pavement markings on the north side of the street, with a short segment at the east end of the street wide enough to accommodate left turns next to through traffic.

Canterbury Road begins at Linden place and runs north. It is a one-way northbound Village road with parking allowed on the east side of the street, except for Tuesdays when parking is only allowed on the west side of the street. The intersection of Linden Place/Canterbury Road provides access to a parking lot shared by 15 Barstow Road and adjacent businesses.

2.3 Key Intersections

Based on site visits, there were two key intersections identified for this study. The intersections, traffic control, and lane designations/widths are listed below.

1. Barstow Road and Linden Place
2. Linden Place and Canterbury Road

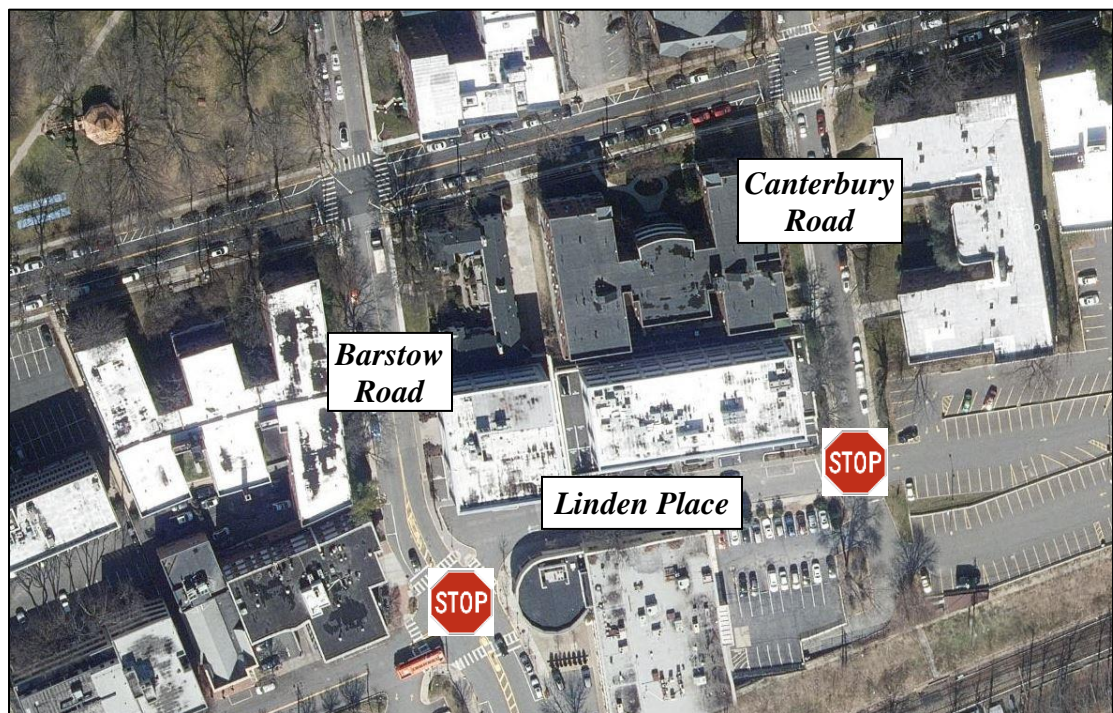
1. Barstow Road and Linden Place: All-way Stop sign control

- Northbound: 1 lane (12 feet wide)
- Eastbound: 1 lane (12 feet wide), one-way
- Southbound: 1 lane (14 feet wide)

2. Linden Place and Canterbury Road: All-way Stop sign control

- Eastbound: 1 wide lane, one-way (29 feet wide: wide enough for separate left and right turns)
- Northbound: 1 lane, one-way (13 feet wide)
- Westbound: 1 lane (12 feet wide)

Figure 2: Study Intersections



2.4 Traffic Volumes

The study intersection traffic and pedestrian volumes were counted on Saturday, June 10, 2023, from 11:00 a.m.-2:00 p.m. and Tuesday, June 12, 2023 from 7:00-9:00 a.m. and 4:00-7:00 p.m. K-12 schools were in session and weather conditions were favorable during these

count periods. The existing volumes, shown in Figures 2-3 to 2-5 at the end of this section, were used to determine the current level of service conditions at the key intersections.

2.5 Existing Levels of Service

An intersection’s Level of Service (LOS) describes its quality of traffic flow, and ranges in grade from LOS “A” (relatively congestion-free) to LOS “F” (congested). LOS grades are based on average delay, measured in “seconds per vehicle”, and the threshold delays for each grade depend on whether the intersection is controlled by a signal or a stop sign. Detailed LOS descriptions are in Appendix A. Existing LOS analyses were performed using Synchro 11, a software package that complies with the guidelines of the *Highway Capacity Manual Sixth Edition (HCM 6)*. Synchro software incorporates features such as:

- Counted/adjusted traffic volumes, in 15-minute intervals
- The numbers and widths of lanes (turn lanes, through lanes) in each direction
- Turn lane storage (where applicable)
- Whether an intersection has a signal or stop sign
- If there is a signal, the amount of green, yellow, and red time for each movement
- The use of left turn arrows or right turn arrows at signalized intersections
- The relative locations of adjacent intersections
- Pedestrians in the crosswalk

Existing levels of service are summarized in Table 1, and the analysis worksheets are in Appendix B. Congestion is not an issue during peak hours.

Table 1: Existing Levels of Service
Intersection 1: Barstow Road and Linden Place

Movement	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS
Eastbound Left-Through-Right	9.3	A	9.9	A	8.3	A
Northbound Left-Through-Right	10.0	A	10.8	B	8.6	A
Southbound Left-Through-Right	10.3	B	10.9	B	8.7	A
<i>INTERSECTION</i>	<i>10.0</i>	<i>A</i>	<i>10.7</i>	<i>B</i>	<i>8.6</i>	<i>A</i>

Intersection 2: Linden Place and Canterbury Road

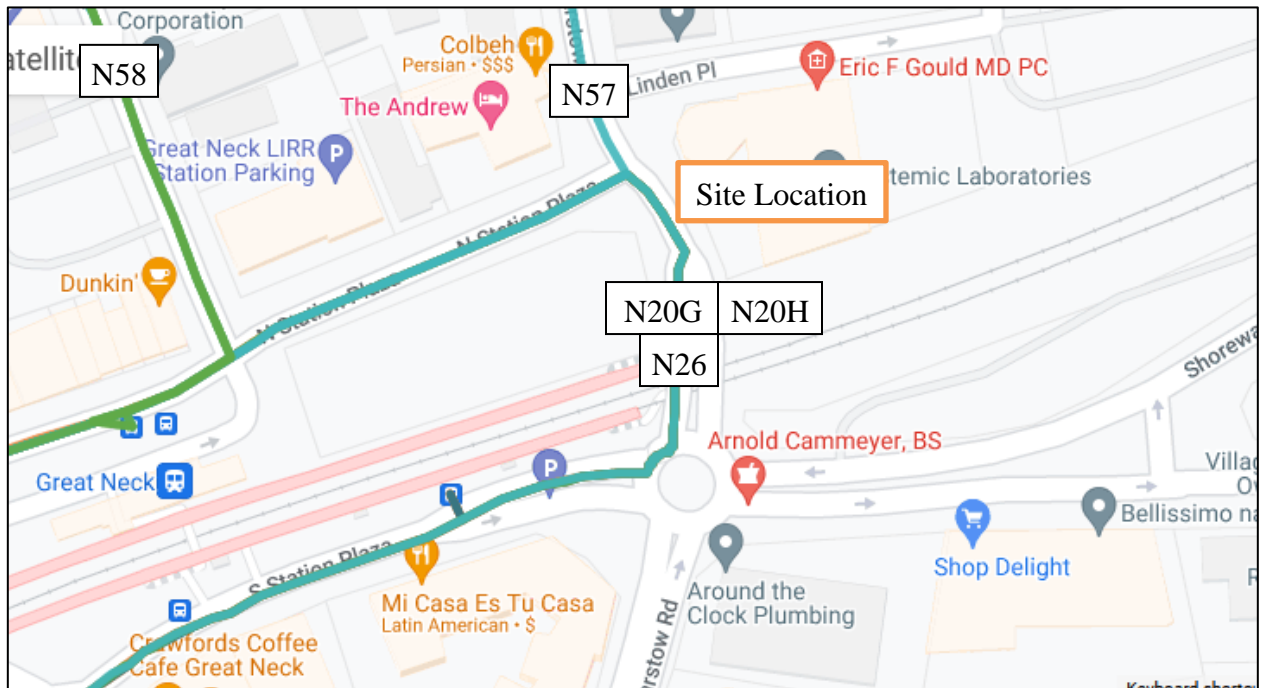
Movement	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
	Delay	LOS	Delay	Delay	LOS	Delay
Eastbound Left	8.1	A	8.3	A	8.1	A
Through-Right	7.7	A	7.8	A	7.3	A
Westbound Left-Right	6.6	A	6.7	A	6.5	A
Northbound Through-Right	7.3	A	7.4	A	7.1	A
<i>INTERSECTION</i>	7.8	A	7.7	A	7.7	A

2.6 Transit

The Long Island Rail Road (LIRR) Great Neck station is less than a 1,000-foot walk from the site, which takes less than 5 minutes at a leisurely pace. Trains to/from Great Neck go directly to Penn Station or Grand Central and do not involve transfers in Jamaica. The waiting room is open 5:00 a.m.-6:00 p.m. on weekdays, 6:00 a.m.-2:00 p.m. on weekends.

Additionally, Nassau Inter-County Express (NICE) Bus runs multiple bus routes that stop at the Great Neck LIRR station. Figure 3 below depicts routes that travel past the property, though there are no bus stops along the site frontage.

Figure 3: Close-up of NICE Route Map



- The N20G runs between the Great Neck LIRR station and Flushing.
- The N20H runs between the Great Neck LIRR station and the Hicksville LIRR station.

- The N21 runs between the Great Neck LIRR station and Glen Cove.
- The N25 runs between the Great Neck LIRR station and the Lynbrook LIRR station.
- The N26 runs between the Great Neck LIRR station and the Jamaica bus terminal.
- The N57 runs a loop around the Great Neck area, including the Great Neck LIRR station.
- The N58 runs between the Great Neck LIRR and Kings Point Road.

2.7 Facilities for Non-Vehicular Traffic / Complete Streets

This area of the Village is pedestrian-friendly. Facilities for pedestrians consist of:

- A 10-foot-wide sidewalk is provided along Barstow Road adjacent to the site, with pedestrian ramps and crosswalks at each corner of the intersection with Linden Place. Crosswalks are the continental type, eight feet wide, clearly visible on the date of the field visit.
- There are 8-foot tall pedestrian-friendly street lamps at Barstow Road/Linden Place.
- Pedestrian signals with hand/man walk/don't walk symbols, countdown timers, and audible push buttons are provided at the nearby signalized intersections on Grace Avenue (at Barstow Road and at Canterbury Road) with selected approaches signed "No Turn on Red", which is safer and minimizes conflict with crossing pedestrians.

2.8 Grades and Sight Distance

People exiting the site will need to see bypassing traffic to know when to leave, and motorists on the main roads need to see activity at the driveway. The required sight distance (i.e., the farthest away a motorist can be and still see/be seen by another driver) depends on the main road's prevailing "85th percentile" speed, the speed faster than 85% of motorists. Based on observed traffic flows, realistic 85th percentile speeds are 20-25 mph on Barstow Road: southbound traffic is proceeding from a stopped position at N. Station Plaza/Linden Place, and northbound traffic is approaching from a roundabout towards a stop sign at N. Station Plaza/Linden Place. There is no through traffic past the proposed east site access.

Required sight lines are listed in the AASHTO/American Association of State Highway and Transportation Officials text, *A Policy on Geometric Design of Highways and Streets*. The required right-turn view to exit north is 195'-240'; the required left-turn view to exit heading south is 225'-280', and the required view is 165'-205' for through traffic. The proposed Barstow Road driveway is in the same location as the existing apron, ±130' south of an all-way stop controlled intersection and ±200' north of a roundabout. Views to the left and right extend to the adjacent intersections as shown in the photos below, before pulling up in front of the parking lane. There is no apparent sight line concern.

Photo 1: Looking left (south) from existing Barstow Road driveway



Photo 2: Looking right (north) from existing Barstow Road driveway



2.9 Emergency Services

Great Neck Plaza is served by the Nassau County Police Department 3rd Precinct (located in Williston Park) and the Great Neck Vigilant Fire Department. The police and fire departments provide emergency medical services. North Shore University Hospital at Manhasset is the nearest hospital, roughly 2.1 miles away on Community Drive.

2.10 Schools

This site is in the Great Neck School District. The nearest elementary school is the Elizabeth Baker Elementary School, located approximately 1.4 miles north of the site.

2.11 Accident History

The latest available accident data was obtained from the Nassau County Police Department for the two street segments fronting this property:

- Barstow Road from Linden Place to Grace Avenue, and
- Linden Place from Barstow Road to Canterbury Road

The data covers nearly 55 months (over 4½ years) from January 1, 2019 to July 20, 2023.

In total, there were 20 incidents at or within 50' of the intersection of Grace Road at Barstow Road; 1 incident at the intersection of Barstow Road and Linden Place; and 1 incident on Barstow Road, roughly halfway between Grace Avenue and Linden Place.

The signalized intersection of Barstow Road at Grace Avenue had an average of just over 4 collisions per year, which is not enough to indicate a “high accident location”. High accident locations are those which experience 5 or more incidents of a particular type of collision in 12 months, typically with the pattern recurring year over year.

Over the 4½-year period, the predominant collision types were rear ends (6 incidents), sideswipes with parked cars entering the travel lanes and impacting vehicles going in the same direction (5 incidents), and accidents involving pedestrians (6 incidents). It should be noted that traffic signals often increase rear-end type incidents, though the incidents tend not to be severe.

Overall, 7 of the 22 reported collisions involved an injury, and nearly all of the injury accidents involved a pedestrian. Of the 6 pedestrian-involved incidents, 3 pedestrians were crossing the street with the light; 2 pedestrians were crossing in a crosswalk without a traffic signal; and 1 was walking in the roadway, with traffic. The cited causative factors were as follows – and note, some incidents had more than one reported underlying factor:

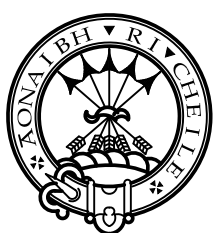
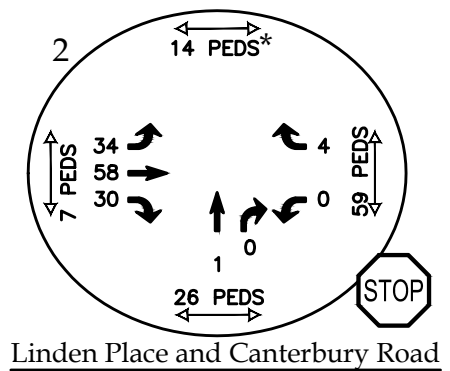
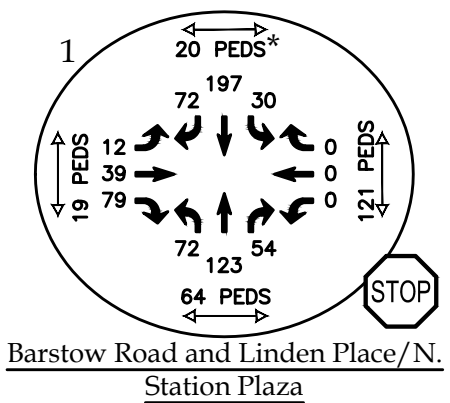
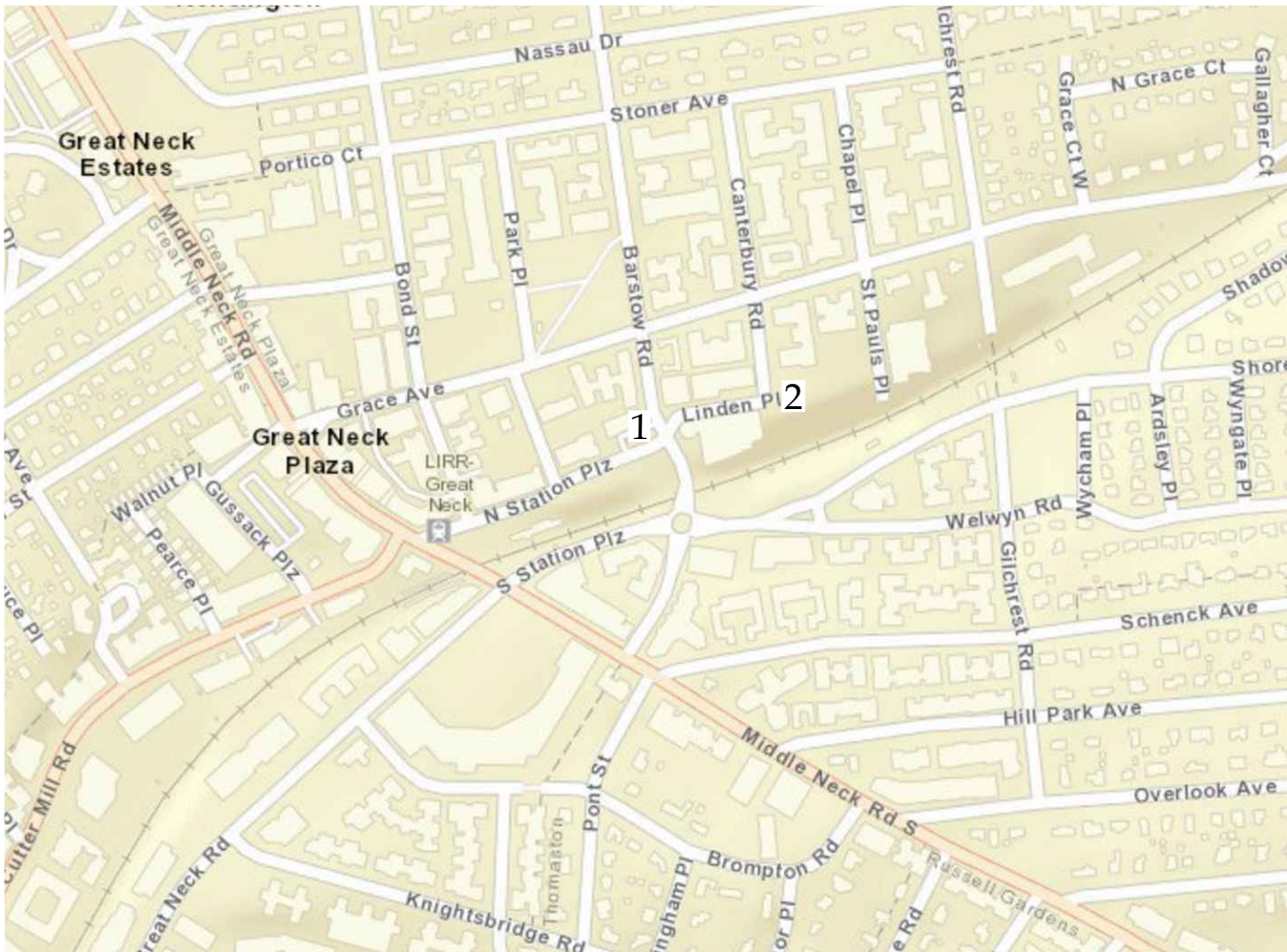
- 5 incidents: driver failed to yield right of way
- 1 incident: driver turned improperly
- 1 incident: pedestrian error/confusion
- 1 incident: glare

The underlying factors are driver-related, not related to the physical environment (which could be addressed with mitigation).

Next, 14% of the reported incidents occurred on wet pavement, far less than the 30% that is typically found in these analyses.

38% of the incidents occurred at night at the Barstow Road/Grace Avenue intersection, which is already lit with street lights.

There were no other discernible patterns identified. Based upon the information obtained, the local road network does not have adverse physical issues which need to be corrected. The proposed Barstow Building development will not diminish the safety of the local streets.



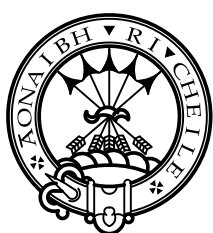
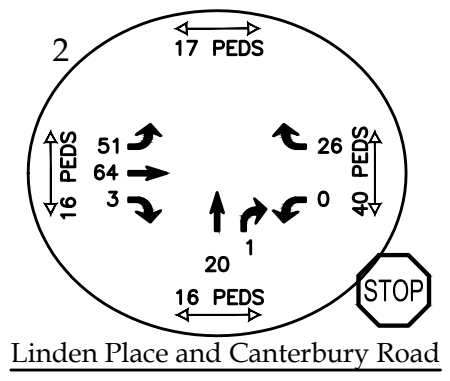
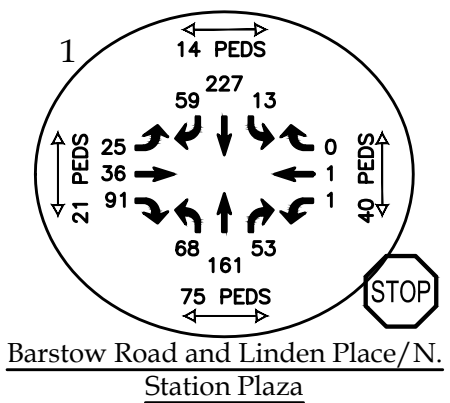
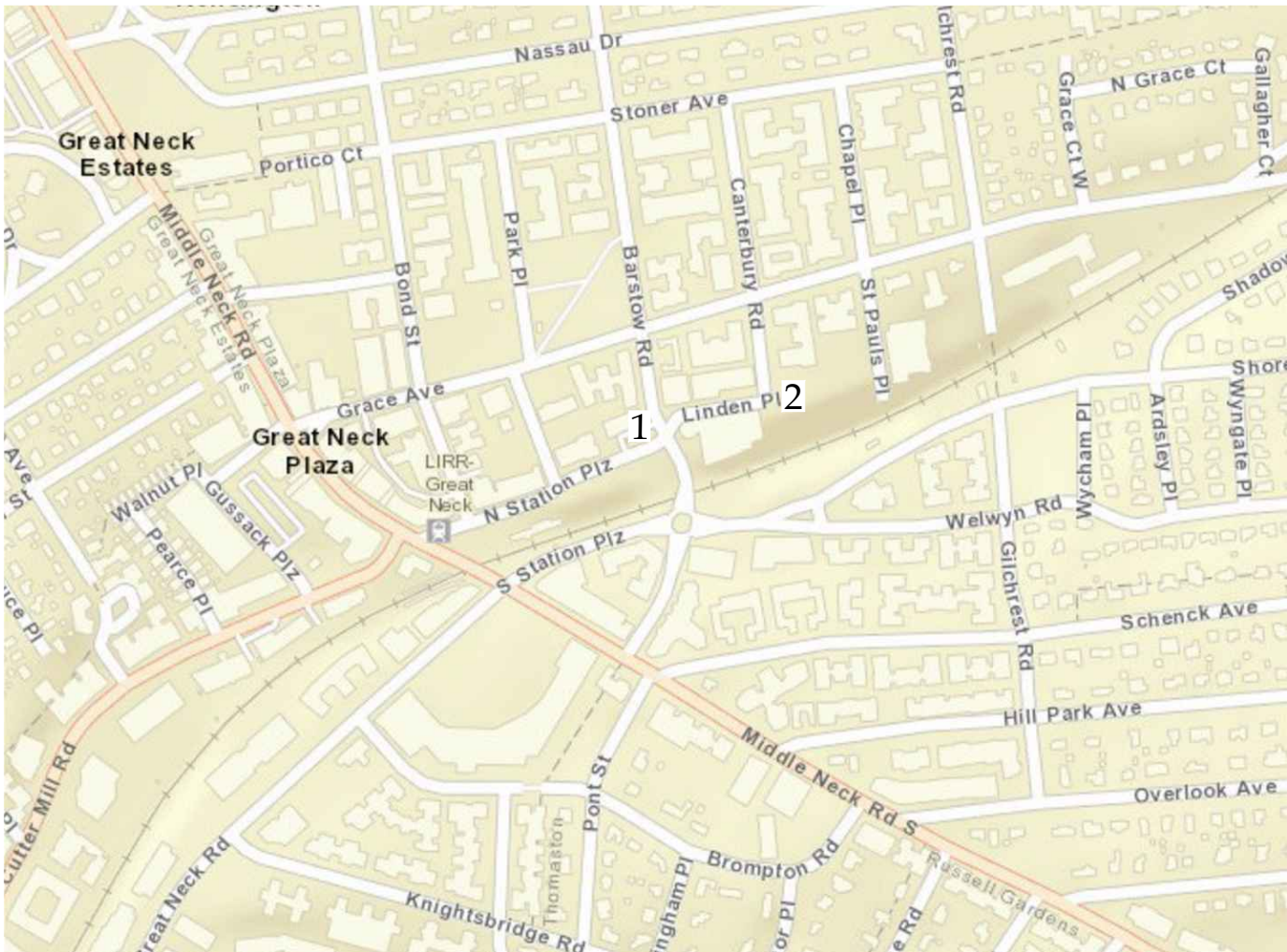
CAMERON ENGINEERING

an IMEG company
 177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
www.cameronengineering.com, www.imegcorp.com

Existing AM Peak Hour Volumes
 *PEDS = Pedestrians per hour in each crosswalk

T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300
 COPYRIGHT

Figure No. 4



CAMERON ENGINEERING

an IMEG company

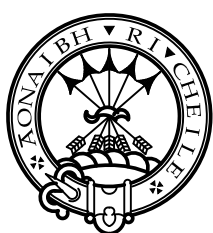
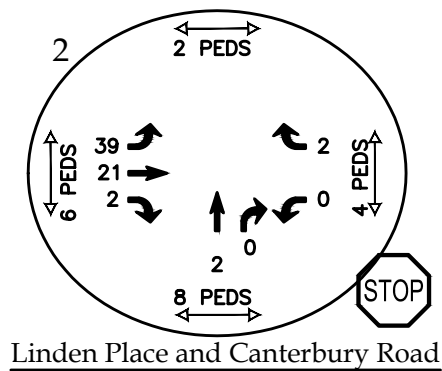
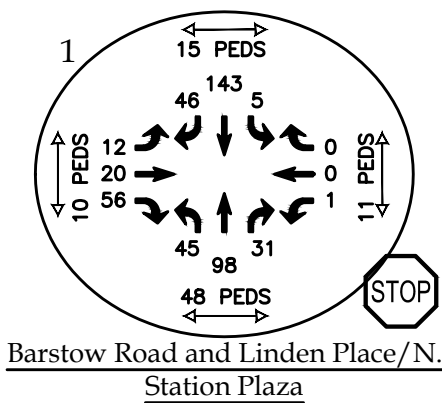
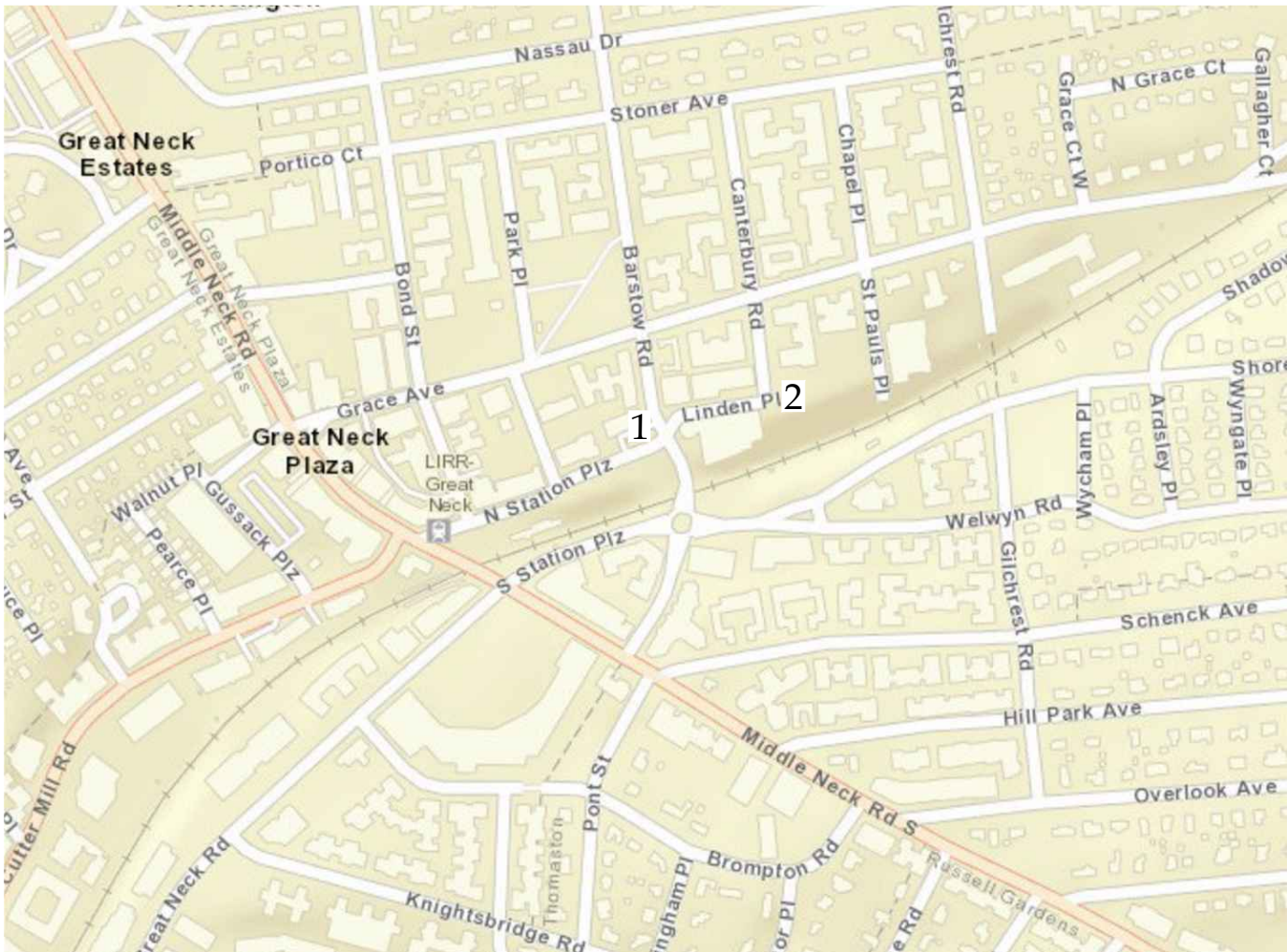
177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
 www.cameronengineering.com, www.imegcorp.com

T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

COPYRIGHT

Existing PM Peak Hour Volumes

Figure No. 5



CAMERON ENGINEERING

an **IMEG** company

177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
www.cameronengineering.com, www.imegcorp.com

Existing Saturday Peak Hour Volumes

T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

COPYRIGHT

Figure No. 6

3. Future Conditions Without the Project – The No Build Scenario

Traffic conditions near the site will change even if the proposed project is not constructed. The future “No Build” condition comes about from the following two types of changes:

- ◆ **Ambient growth** from general population increases and minor development in the area.
- ◆ **Other planned developments** close to the site which have the potential to affect traffic patterns at the study intersections in this report.

3.1 Ambient Growth

According to the NYSDOT, the annual ambient growth rate in this part of Nassau County is 0.5% per year. The factor was applied to the counted traffic volumes for two years to project the June 2023 traffic counts to the year 2025.

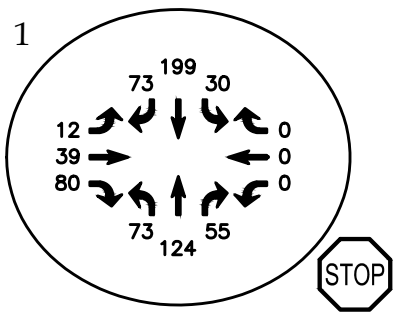
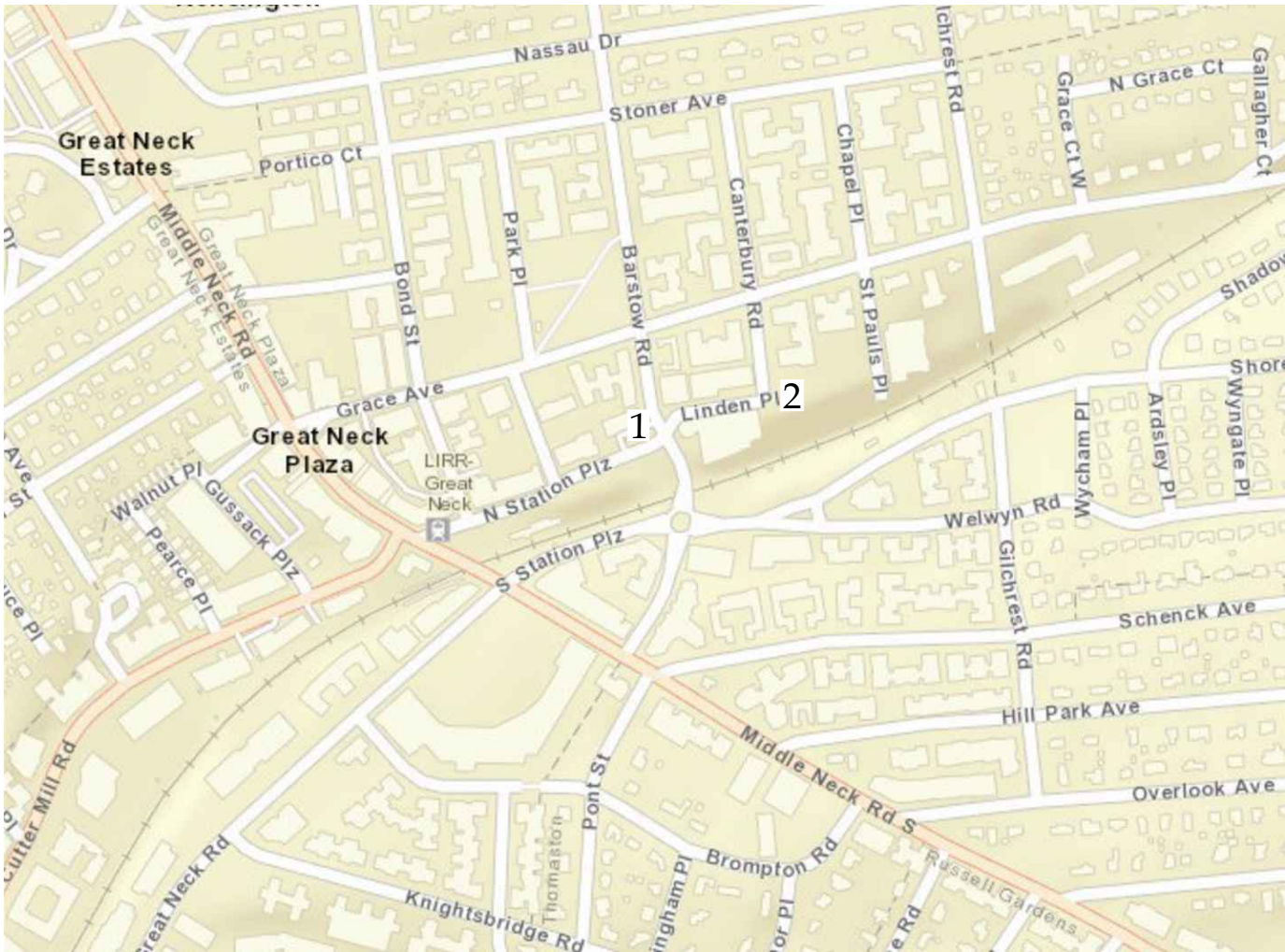
Because the growth rate is small, this study will not have different results if the Build year is 2026 instead of 2025. The change in background traffic volumes would be negligible, less than 1-2 vehicle per hours for any lane group (left turns, throughs, or right turns in each direction).

3.2 Other Planned Developments

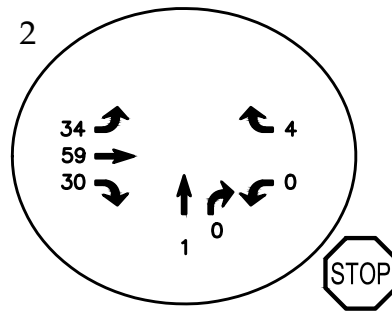
“Other planned developments” are projects planned in the general area and progressed to the point where they may generate traffic through at least one key intersection in the upcoming months, but whose traffic was not present during the field counts.

Cameron Engineering requested information on other planned developments from the Village Building Department, and was not notified of any such projects. Therefore, the No Build traffic volumes in this study are based on the ambient growth, a conservative approach because it does not account for different commercial tenants in the existing building.

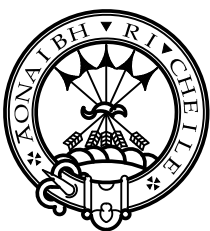
The projected No Build volumes are depicted in Figure 7 through Figure 9. The No Build level of service worksheets are in Appendix C, and the data are summarized together with the Build levels of service in Section 5 of this report.



1
 Barstow Road and Linden Place/N.
 Station Plaza



2
 Linden Place and Canterbury Road



CAMERON ENGINEERING

an **IMEG** company

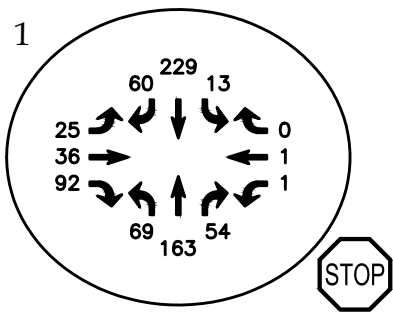
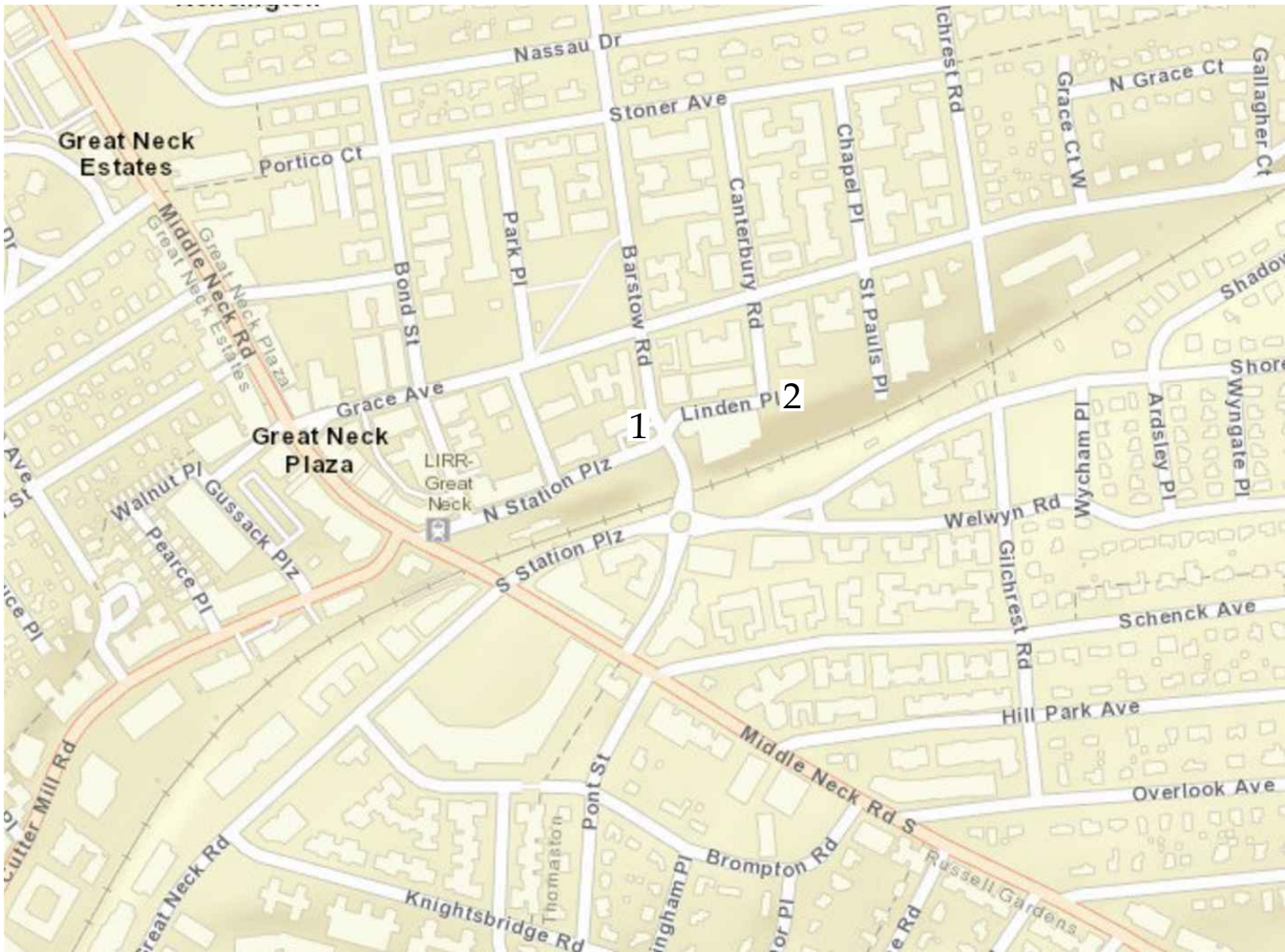
177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
www.cameronengineering.com, www.imegcorp.com

T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

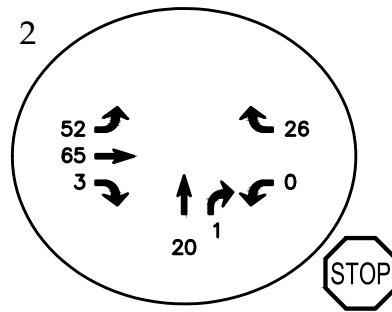
COPYRIGHT

AM Peak Hour No Build Volumes

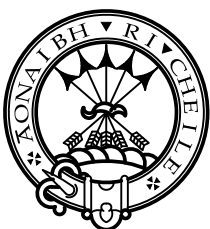
Figure No. 7



Barstow Road and Linden Place/N. Station Plaza



Linden Place and Canterbury Road



CAMERON ENGINEERING

an **IMEG** company

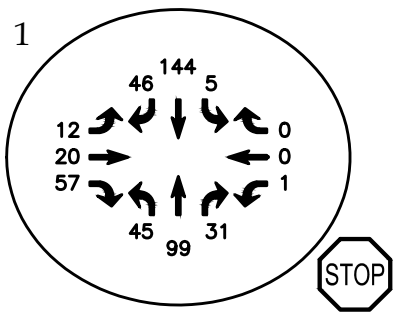
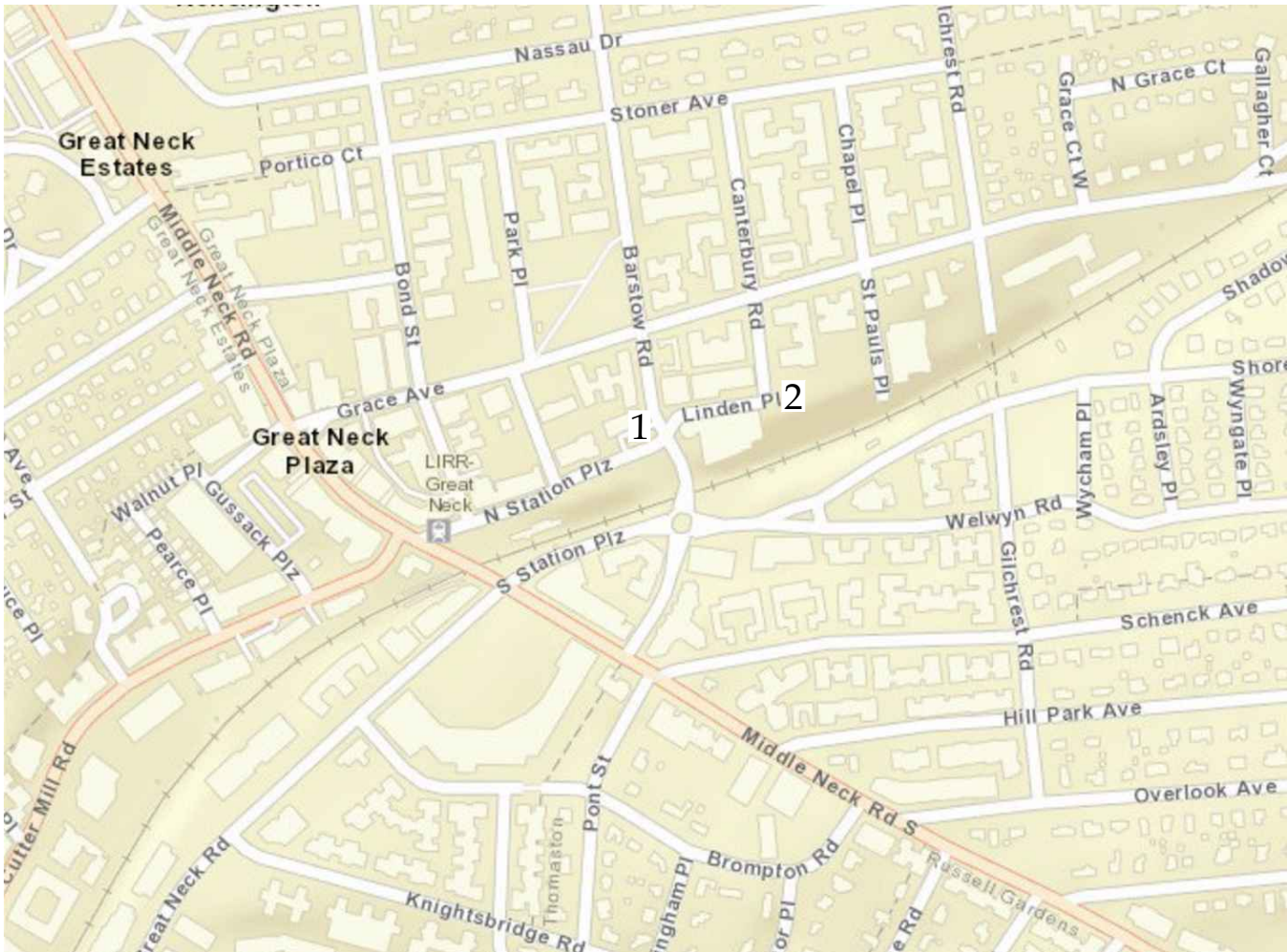
177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
www.cameronengineering.com, www.imegcorp.com

T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

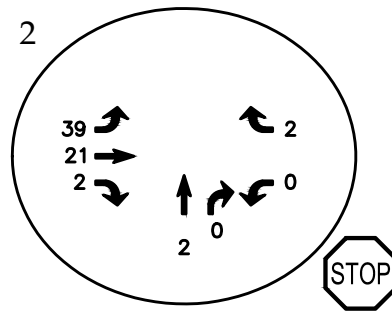
COPYRIGHT

PM Peak Hour No Build Volumes

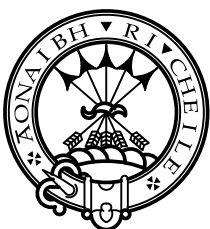
Figure No. 8



1
 Barstow Road and Linden Place/N.
 Station Plaza



2
 Linden Place and Canterbury Road



CAMERON ENGINEERING

an **IMEG** company

177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
 www.cameronengineering.com, www.imegcorp.com

T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

COPYRIGHT

Saturday Peak Hour No Build Volumes

Figure No. 9

4. Future Conditions With the Project – The Build Scenario

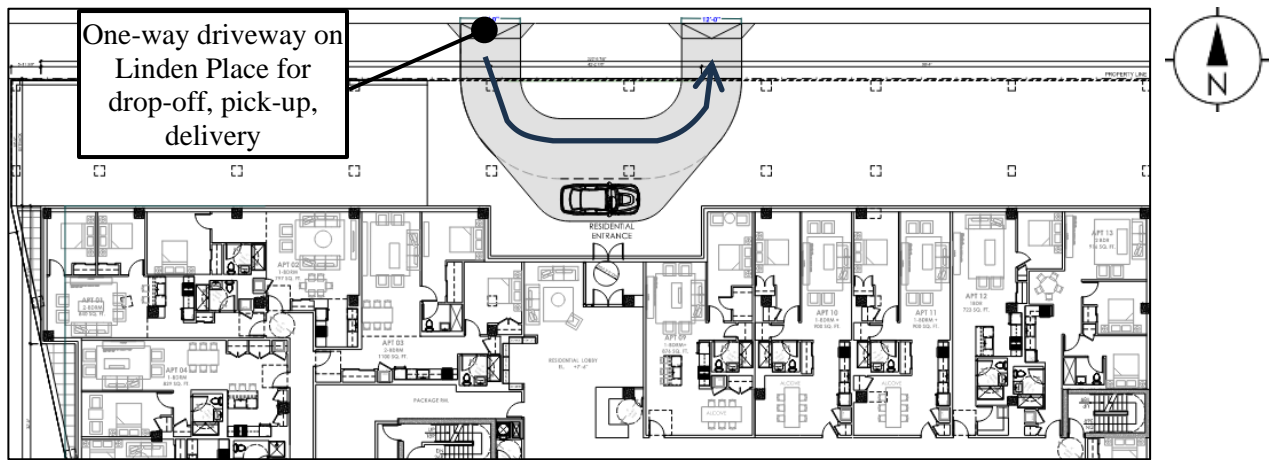
4.1 Proposed Site Plan and Site Access

The new building will have 69 apartments (5 studios, 29 one-bedroom units, and 35 two-bedroom units) plus 2 levels of parking shown on the C3D Architecture March 27, 2024 plans.

Figure 10: C3D Architecture Plan Excerpts (not to scale)



Figure 10 (continued)



Site access will be designed to split this building’s traffic among multiple driveways:

- 1) The lower parking level, called the cellar level, has access on Barstow Road, roughly 26’ north of the existing Barstow Road apron.
- 2) The upper parking level, called the basement level, will access Canterbury Road at the southeast corner of the building.
- 3) The next floor up is the building’s first floor that will have a dedicated one-way circular drop-off/pick-up/delivery driveway on the north side of the building, along Linden Place.

4.2 Parking

The Village requires 113 on-site parking spaces per Great Neck Plaza Zoning Code §225-86:

- 1.5 spaces space per studio (5) and 1-bedroom (29) x 34 = 51 spaces
- 1.75 spaces per 2-bedroom unit x 35 = 61.25 = 62 spaces
- Total = 51 + 62 = 113 spaces required

The March 2024 site plan drawings depict 147 spaces, 5 of which are handicapped accessible. This is a 34-space surplus above Village code and will satisfy the 5 handicapped parking spaces required by the Americans with Disabilities Act (ADA). Table 2 summarizes the provided parking per level for each type of parking space.

Table 2: Provided Parking Summary

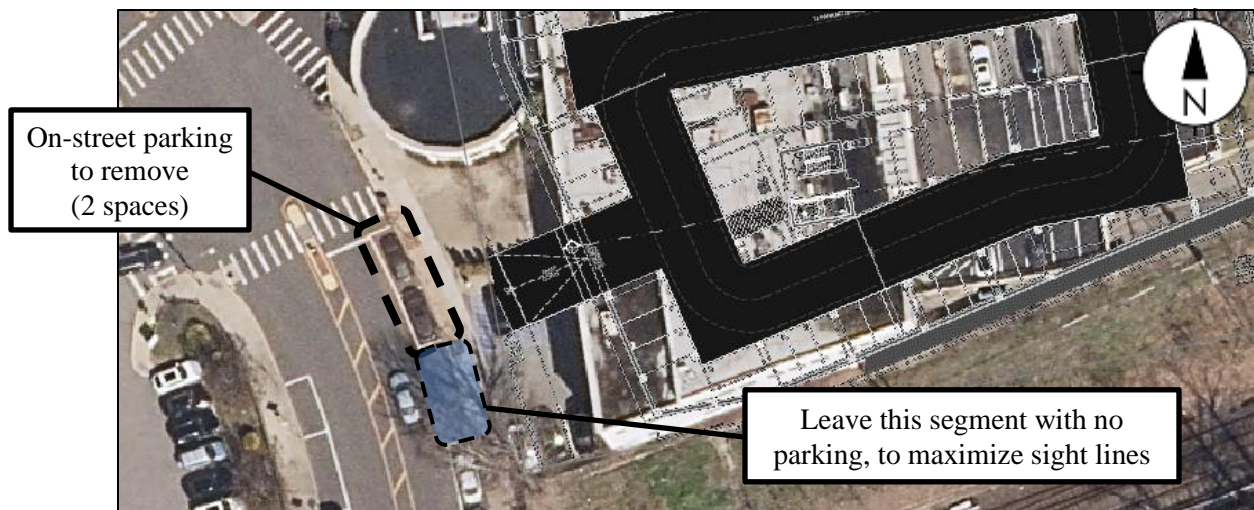
	ADA	Tandem*	Standard Size	Compact	Total
Basement (upper) Level	4	2	52	15	73
Cellar (lower) Level	1	2	56	15	74
Total Provided	5	4	108	30	147

* 2 tandem spaces mean 1 pair of two spaces

The table shows that 30 compact spaces will be provided, which satisfies the 20% limit (equal to 30 spaces) set in Village code §225-89D. Similarly, there will be 4 tandem spaces (referring to two sets of tandem couplets) which satisfies the limit established in Village code §225-89F: “document that the number of tandem spaces does not exceed the expected number of two-car households”. The building will have 35 two-bedroom units, and we expect far more than 2 out of these units to be two-car households.

The intent for the on-site parking surplus, as requested by the Village, is for residents of nearby, under-parked buildings so they do not have to park on the street, a benefit for the surrounding area. By code, there is a 34-space surplus on-site; these spaces will be provided to the Village to be part of the Village Residential Parking Permit program. The net surplus will be 32 spaces, since two on-street spaces will be removed from the east side of Barstow Road to accommodate the new driveway; please see Figure 11 below.

Figure 11: Barstow Road On-Street Parking Exhibit (not to scale)



Also as shown in Figure 11, we would not recommend striping new on-street spaces. Leaving the segment un-parked would maximize the driver’s line of sight looking south (to the left as one exits the building) and for northbound drivers on Barstow Road.

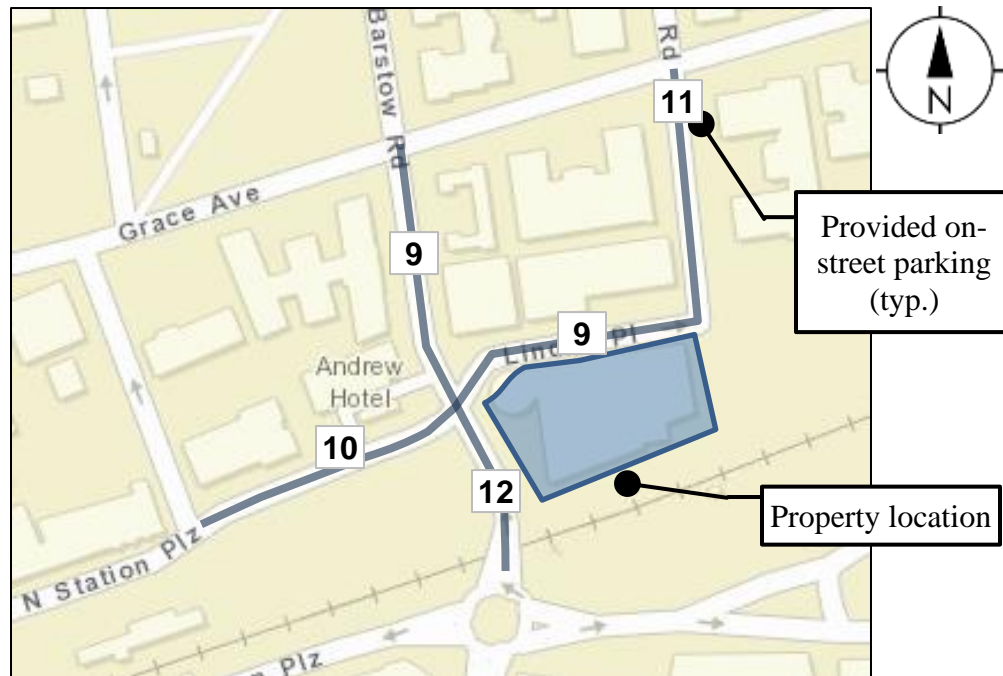
4.3 Trip Generation

The future Build volumes were determined by adding the site-generated traffic to the No Build volumes. First, trip generation information for the proposed apartments was referenced from the 11th Edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual* land use code 221 (mid-rise apartment building). This study considers peak site-generated traffic coinciding with the peak AM, PM, and Saturday travel periods on the surrounding roads.

Next, accommodating up to 34 residents of nearby buildings will bring additional traffic in and out of the parking levels, even though these trips will not be newly generated at the study intersections. The surplus parking space assignments are not yet established. For the purposes of this study, we consider that the drivers who would park in the surplus spaces are currently parking within a one-block walk from the site, the segments shown in Figure 12 below. The figure labels over 50 on-street parking spaces within one block of the property.¹

Since the surplus parking would be used by people who already live and drive in the immediate area, the associated cars will divert from nearby intersections or on-street parking spaces, and will only be “new” traffic at the driveways, calculated separately.

Figure 12: Nearest On-Street Parking



There is no established ITE procedure to calculate the traffic associated with using surplus parking. This report calculates the added driveway traffic by pro-rating the new building’s ITE trip generation by the relative numbers of parking spaces. The arrival and departure patterns should be similar because each driver lives in an apartment building in the area.

$$\text{Trips associated with 34 surplus parking spaces} = \text{Trips associated with 113 spaces for the proposed apartments} \times \frac{34}{113}$$

¹ 12 spaces on Barstow south of N. Station Plaza/Linden Place + 9 spaces on Barstow up to Grace Avenue + 10 spaces on N. Station Plaza + 11 spaces on Canterbury Road + 9 spaces on Linden Place = 51 spaces within 1 block.

4.3.1 Trips via Transit

Multifamily residential units near rail and bus stations typically have noticeable levels of commuting via public transit instead of in single-occupant vehicles. Baseline ITE study sites reflect apartments that are not necessarily convenient to transit, and therefore nearly every trip or all trips are in a private vehicle. This property, in contrast, is what the ITE labels “transit friendly” because the Great Neck LIRR station and multiple bus stops are less than a 5-minute walk away (discussed in Section 2.6-Transit). The total number of anticipated peak hour trips is unchanged; what can change is a component of trips by public transit.

A site-specific local analysis was done to research the latest available five-year American Community Survey (ACS) census data for “Means of Transportation to Work” for the Village of Great Neck Plaza’s zip code 11021. According to the census data, more than 1/3 of commuters in the 11021 zip code who work outside the home take public transit.

Table 3: ACS Great Neck Plaza Zip Code 11021 Commuting
Workers 16 years and over who did not work from home

Car, truck, or van - - drove alone	Car, truck, or van -- carpooled	Public transportation (excluding taxicab)	TOTAL
4,128	432	2,916	7,476
55%	6%	39%	

Given this information, it would be acceptable to incorporate a “transit credit” for weekday AM and PM peak hour residential trips associated with this application. Instead of 100% of trips made by auto, up to 39% of future trips would be by transit, which does not require a private vehicle because the train and bus stops are within walking distance.

If this building was situated far from a railroad station, its highest directional trip generation would be 20 vehicles exiting during the AM peak hour, with 26-27 total hourly trips, shown in the “Trips as Analyzed” column in Table 4 below. The genuinely anticipated traffic is 16-17 trips per hour during the week; Saturday commuter traffic is negligible.

Realistically, a transit trip could mean the residents walk to the LIRR station or bus stop, or it could mean one resident is dropped off and picked up in a vehicle driven by a family member. This study takes the conservative approach and analyzes the entire building as if it was a standalone building, with all trips made by private vehicle. The intent is for the reader to understand that this approach is expected to overestimate the number of vehicles entering and leaving this property. Additionally, this study considers 5 hourly vehicles using the drop-off/pick-up lane on the north side of the building during each peak hour period. The resulting peak hour trip generation numbers are as follows:

Table 4: Site-Generated Peak Hour Trips

Tph = trips per hour

Proposed Apartments - Genuine Projected Trip Generation (with a transit credit) – not analyzed		
AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Enter: 4 tph	Enter: 10 tph	Enter: 14 tph
<u>Exit: 12 tph</u>	<u>Exit: 7 tph</u>	<u>Exit: 13 tph</u>
Total: 16 tph	Total: 17 tph	Total: 27 tph
Proposed Apartments – As Analyzed (without a transit credit)		
AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Enter: 6 tph	Enter: 16 tph	Enter: 14 tph
<u>Exit: 20 tph</u>	<u>Exit: 11 tph</u>	<u>Exit: 13 tph</u>
Total: 26 tph	Total: 27 tph	Total: 27 tph
Surplus Parking		
AM Peak Hour	PM Peak Hour	Saturday Peak Hour
$26 \times 34 / 113 = 8$	$27 \times 34 / 113 = 8$	$27 \times 34 / 113 = 8$
Enter: 2 tph	Enter: 5 tph	Enter: 4 tph
<u>Exit: 6 tph</u>	<u>Exit: 3 tph</u>	<u>Exit: 4 tph</u>
Total: 8 tph	Total: 8 tph	Total: 8 tph
Linden Place Drop-off/Pick-up Lane		
This report considers 5 entering and exiting vehicles using this lane each hour (deliveries)		

4.4 Distribution and Assignment of Site-Generated Traffic

The next step of this study was to determine the peak volumes of traffic this project would generate in each direction at each study intersection. This was done by performing a directional distribution analysis, resulting in, for example, “35% of entering trips will make the northbound right turn into the Barstow Road driveway...”

Based on the parking spaces accessible from each driveway, 50% of trips were assigned to the apron on Barstow Road and 50% of trips were assigned to the apron on Canterbury Road. Trip assignments follow the one-way directions for eastbound Linden Place and northbound Canterbury Road. This applies to the building residents and the non-building residents who use the surplus parking spaces via the Village Residential Parking Permit program.

Table 5 illustrates the existing, No Build, and Build volumes, with the precise trip distribution percentages and generated traffic volumes. Figure 13 and Figure 14 follow and depict the distribution of site-generated traffic and the generated volumes during each study period. These generated volumes were added to the No Build volumes to determine the Build volumes, which are shown in Figure 15 through Figure 17.

Table 5: Existing, No Build, Generated, and Build Traffic Volumes

Growth Factor: 0.5% for 2 years, to 2025
 2-year growth: 1.010

**Counts X 1.01
 for 2 years ambient
 growth & trips from
 other projects**

	69 apartments		
	AM	PM	SAT
Enter	6	16	14
Exit	20	11	13
Total	26	27	27

	Surplus Parking		
	AM	PM	SAT
Enter	2	5	4
Exit	6	3	4
Total	8	8	8

AM	PM	SAT	Dir.	Mvmt.	2023 Existing Volumes			% Heavy Vehicles			2025 No Build Volumes			Distribution		Generated Traffic			Distribution		Generated Traffic			Total Site Generated			2025 Build Volumes		
					AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	%In	%Out	AM	PM	SAT	%In	%Out	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Barstow Road and Linden Place																													
Peak Hours start:			NB	Left	72	68	45				73	69	45		6%	1	1	1		6%	0	0	0	2	1	1	74	70	46
800 1645 1145				Thr	123	161	98	5%	2%	0%	124	163	99		9%	2	1	1		9%	1	0	0	2	1	2	127	164	101
				Right	54	53	31				55	54	31			---	---	---			---	---	---	0	0	0	55	54	31
			SB	Left	30	13	5				30	13	5	40%		2	6	6	40%		1	2	2	3	8	7	33	21	12
				Thr	197	227	143	1%	1%	2%	199	229	144	9%		1	1	1	9%		0	0	0	1	2	2	200	231	146
				Right	72	59	46				73	60	46			---	---	---			---	---	---	0	0	0	73	60	46
			EB	Left	12	25	12				12	25	12			---	---	---			---	---	---	0	0	0	12	25	12
				Thr	39	36	20	14%	13%	13%	39	36	20	10%		1	2	1	10%		0	0	0	1	2	2	40	38	22
				Right	79	91	56				80	92	57	6%		0	1	1	6%		0	0	0	0	1	1	80	93	58
Hourly Peak Hour Factors (PHFs)			WB	Left	0	1	1				0	1	1			---	---	---			---	---	---	0	0	0	0	1	1
				Thr	0	1	0	0%	0%	0%	0	1	0			---	---	---			---	---	---	0	0	0	0	1	0
				Right	0	0	0				0	0	0			---	---	---			---	---	---	0	0	0	0	0	0
					0.95	0.92	0.91																						
Canterbury Road and Linden Place																													
Peak Hours start:			NB	Thr	1	20	2	0%	0%	0%	1	20	2		50%	10	6	7		50%	3	2	2	13	7	8	14	27	10
745 1800 1145				Right	0	1	0				0	1	0			---	---	---			---	---	---	0	0	0	0	1	0
			EB	Left	34	51	39				34	52	39	consider 5		5	5	5			---	---	---	5	5	5	39	57	44
				Thr	58	64	21	2%	0%	0%	59	65	21			---	---	---			---	---	---	0	0	0	59	65	21
				Right	30	3	2				30	3	2	50%		3	8	7	50%		1	2	2	4	10	9	34	13	11
Hourly Peak Hour Factors (PHFs)			WB	Left	0	0	0				0	0	0			---	---	---			---	---	---	0	0	0	0	0	0
				Right	4	26	2	0%	0%	0%	4	26	2			---	---	---			---	---	---	0	0	0	4	26	2
					0.77	0.83	0.83																						
Barstow Road/West Cellar Level Access																													
			NB	Left	0	0	0				0	0	0			---	---	---			---	---	---	0	0	0	0	0	0
				Thr	249	282	174	5%	2%	0%	251	285	176			---	---	---			---	---	---	0	0	0	251	285	176
				Right	0	0	0				0	0	0	35%		2	6	5	35%		1	2	1	3	7	6	3	7	6
			SB	Left	0	0	0				0	0	0	15%		1	2	2	15%		0	1	1	1	3	3	1	3	3
				Thr	276	319	200	1%	1%	2%	279	322	202			---	---	---			---	---	---	0	0	0	279	322	202
				Right	0	0	0				0	0	0			---	---	---			---	---	---	0	0	0	0	0	0
			WB	Left	0	0	0				0	0	0		35%	7	4	5	35%		2	1	1	9	5	6	9	5	6
				Right	0	0	0				0	0	0	15%		3	2	2	15%		1	0	1	4	2	3	4	2	3

Table 5: Existing, No Build, Generated, and Build Traffic Volumes

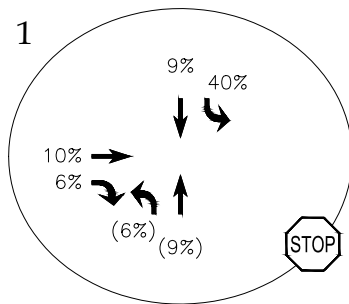
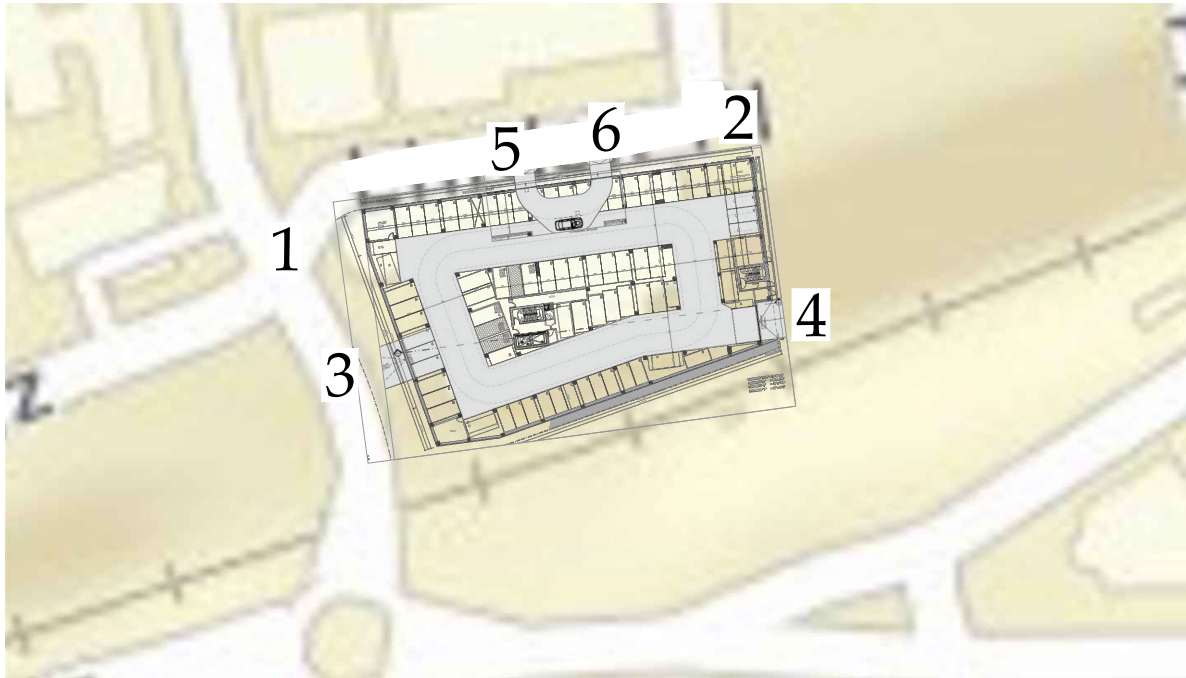
Growth Factor: 0.5% for 2 years, to 2025
 2-year growth: 1.010

Counts X 1.01 for 2 years ambient growth & trips from other projects

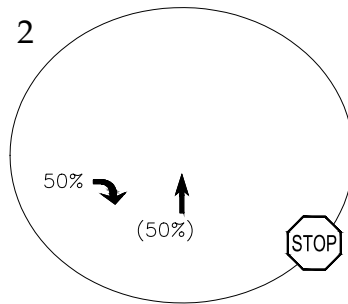
	69 apartments		
	AM	PM	SAT
Enter	6	16	14
Exit	20	11	13
Total	26	27	27

	Surplus Parking		
	AM	PM	SAT
Enter	2	5	4
Exit	6	3	4
Total	8	8	8

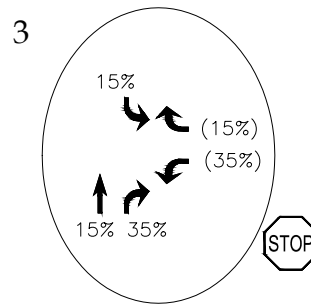
AM	PM	SAT	Dir.	Mvmt.	2023 Existing Volumes			% Heavy Vehicles			2025 No Build Volumes			Distribution		Generated Traffic			Distribution		Generated Traffic			Total Site Generated			2025 Build Volumes		
					AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	%In	%Out	AM	PM	SAT	%In	%Out	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Canterbury Road/Basement Level Access (SE corner of the building)																													
			NB	Left	0	0	0				0	0	0			---	---	---			---	---	---	0	0	0	0	0	0
				Thr	1	21	2	12%	3%	3%	1	21	2			---	---	---			---	---	---	0	0	0	1	21	2
			SB	Thr	30	3	2	2%	0%	0%	30	3	2			---	---	---			---	---	---	0	0	0	30	3	2
				Right	0	0	0				0	0	0	50%		3	8	7	50%		1	2	2	4	10	9	4	10	9
			EB	Left	0	0	0				0	0	0		50%	10	6	7	50%		3	2	2	13	7	8	13	7	8
Drop-off Lane Entry																													
			EB	Thr	123	118	62	2%	0%	0%	124	119	63	50%		3	8	7	50%		1	2	2	4	10	9	128	130	72
				Right	0	0	0				0	0	0	consider 5		5	5	5			---	---	---	5	5	5	5	5	5
Drop-off Lane Exit																													
			NB	Right	0	0	0				0	0	0	consider 5		5	5	5			---	---	---	5	5	5	5	5	5
			EB	Thr	123	118	62	2%	0%	0%	124	119	63	50%		3	8	7	50%		1	2	2	4	10	9	128	130	72



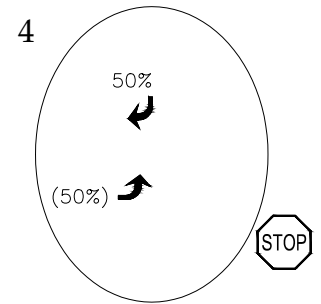
Barstow Road and Linden Place/N. Station Plaza



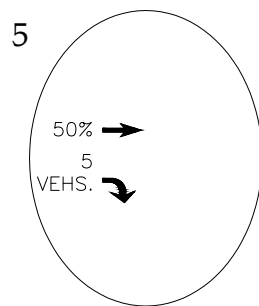
Linden Place and Canterbury Road



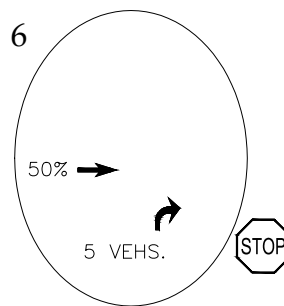
Barstow Road Cellar Access



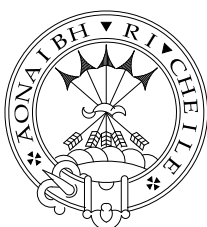
Canterbury Road Basement Access



Linden Place Drop-off Lane Entry



Linden Place Drop-off Lane Exit



CAMERON ENGINEERING

an IMEG company

177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
www.cameronengineering.com, www.imegcorp.com

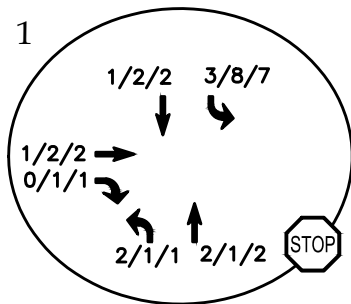
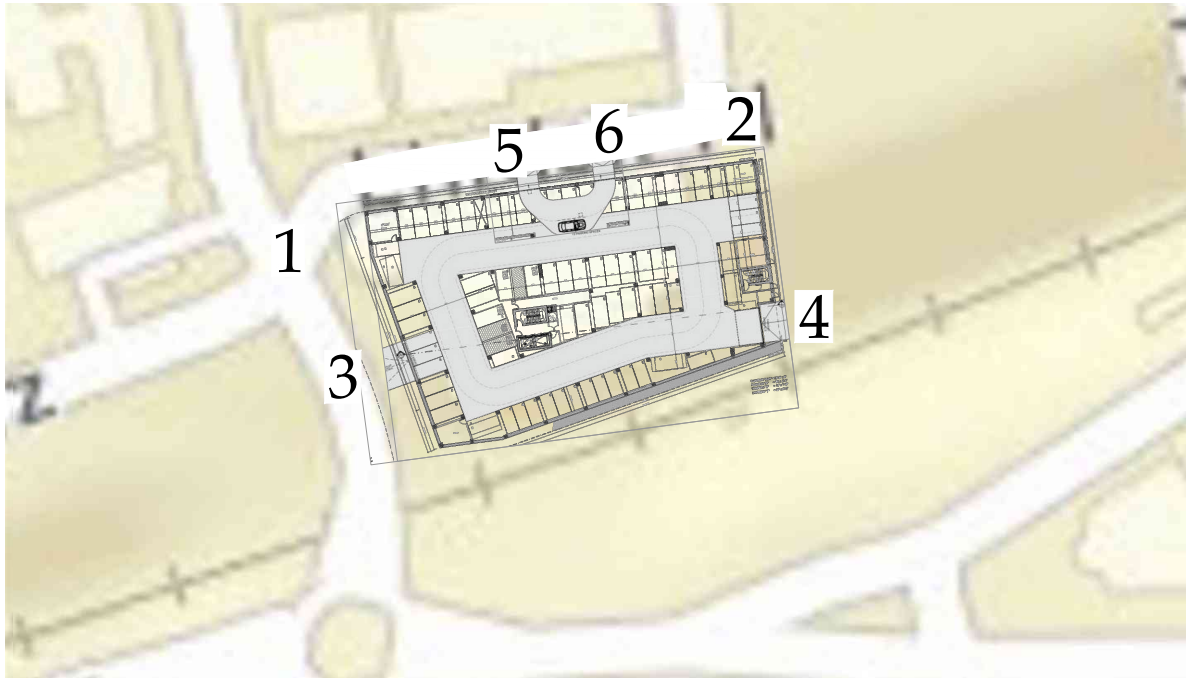
T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

COPYRIGHT

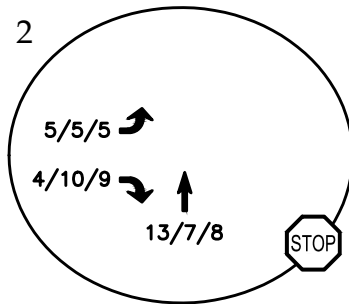
Distribution of Site-generated Traffic

Key: Entering Traffic / (Exiting Traffic)

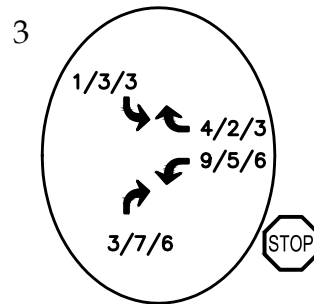
Figure No. 13



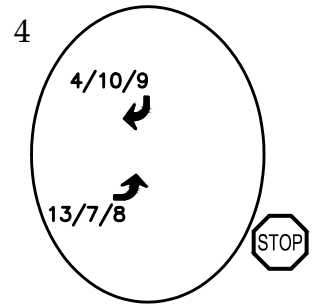
Barstow Road and Linden Place/N. Station Plaza



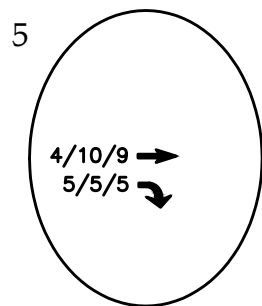
Linden Place and Canterbury Road



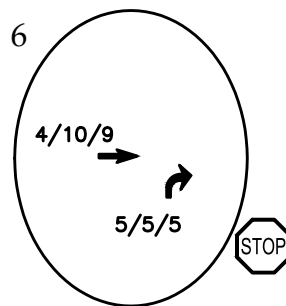
Barstow Road Cellar Access



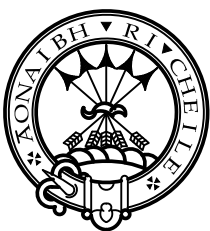
Canterbury Road Basement Access



Linden Place Drop-off Lane Entry



Linden Place Drop-off Lane Exit



CAMERON ENGINEERING

an **IMEG** company

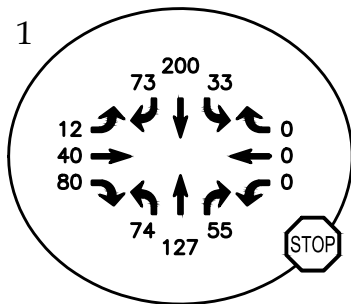
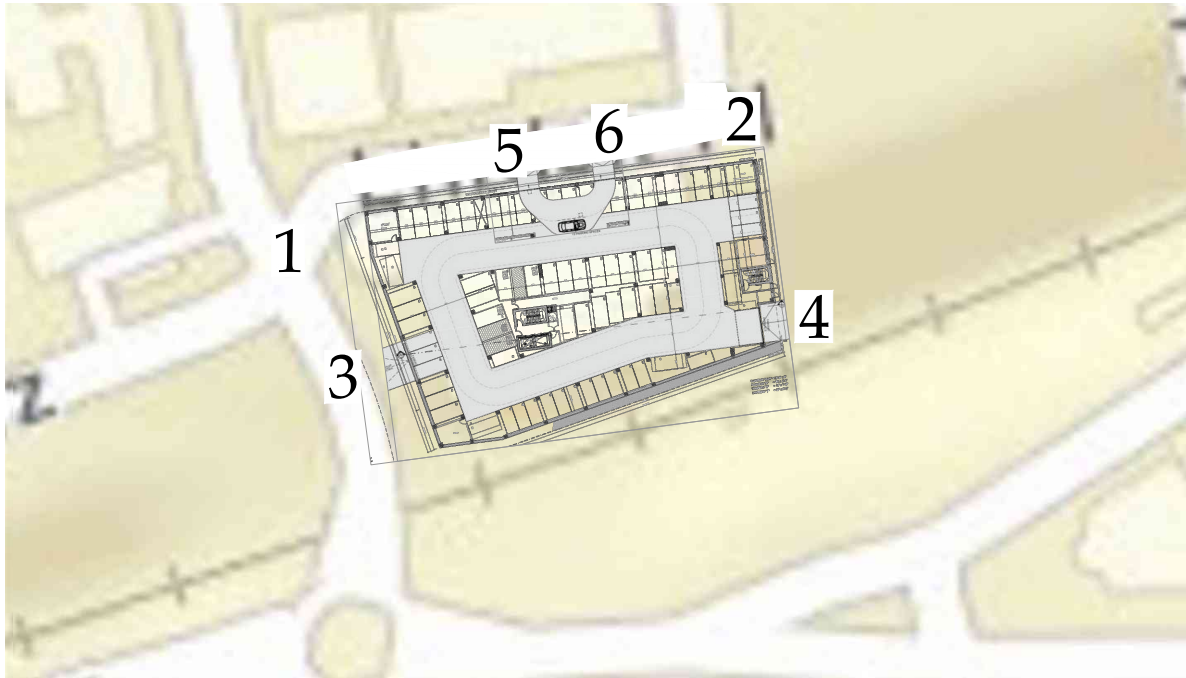
177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
 www.cameronengineering.com, www.imegcorp.com

T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

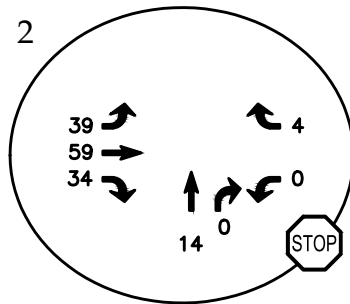
COPYRIGHT

AM, PM, and Saturday Peak Hour
 Generated Traffic

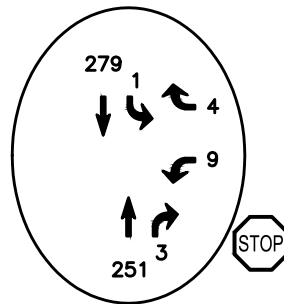
Figure No. 14



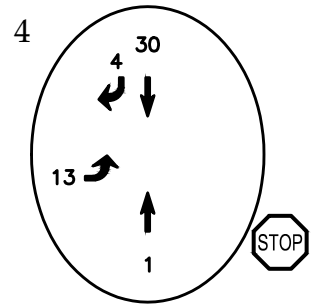
Barstow Road and Linden Place/N. Station Plaza



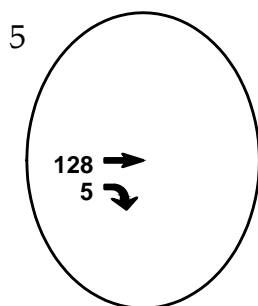
Linden Place and Canterbury Road



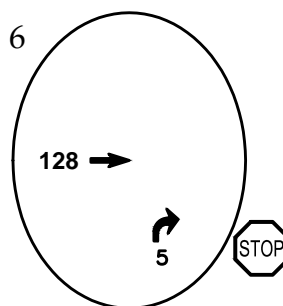
Barstow Road Cellar Access



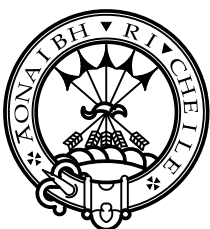
Canterbury Road Basement Access



Linden Place Drop-off Lane Entry



Linden Place Drop-off Lane Exit



CAMERON ENGINEERING

an **IMEG** company

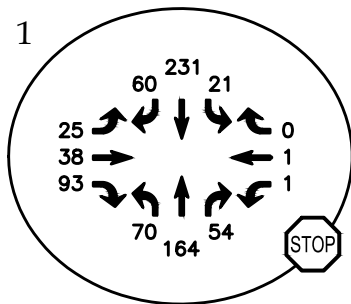
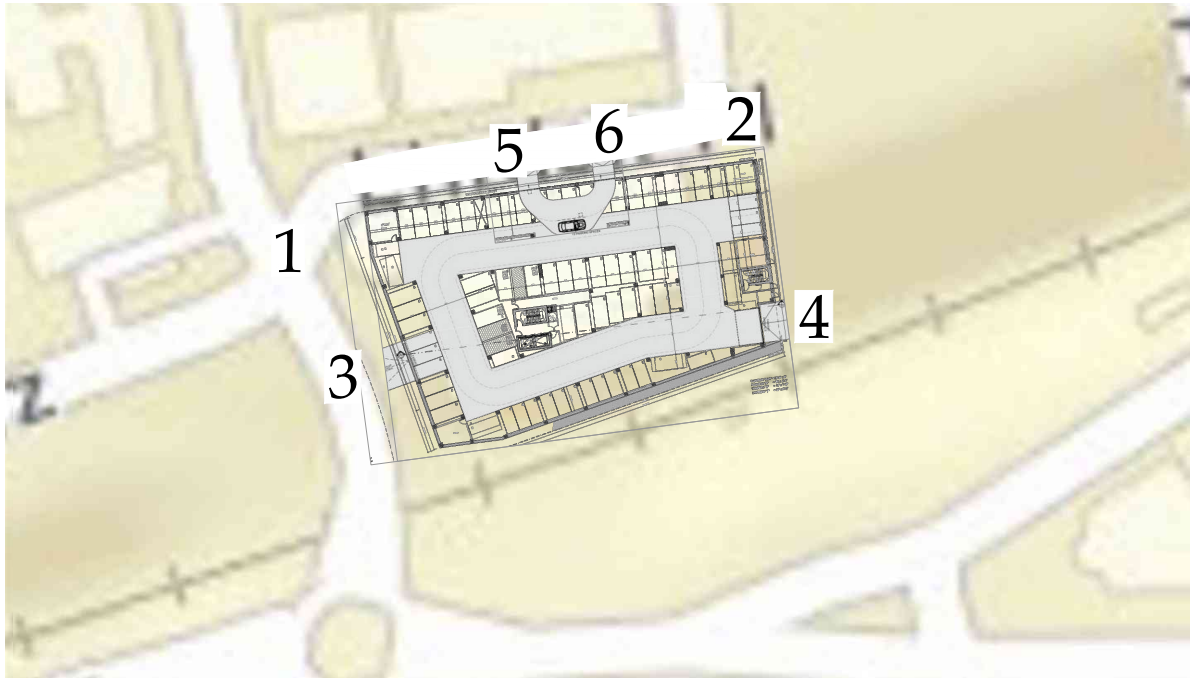
177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
 www.cameronengineering.com, www.imegcorp.com

Weekday AM Peak Hour Build Volumes

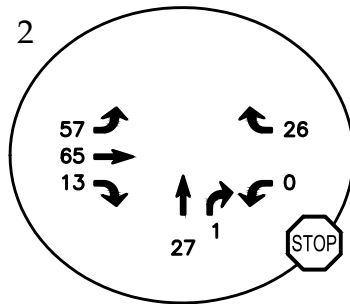
T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

COPYRIGHT

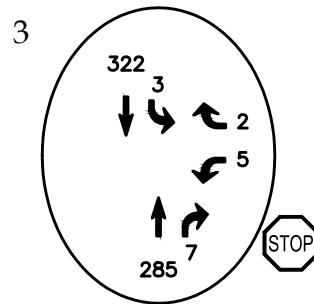
Figure No. 15



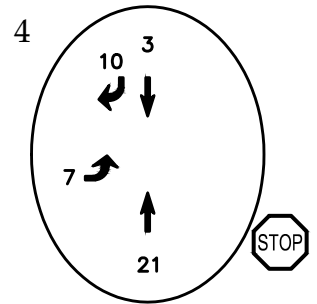
Barstow Road and Linden Place/N. Station Plaza



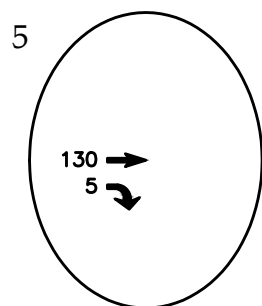
Linden Place and Canterbury Road



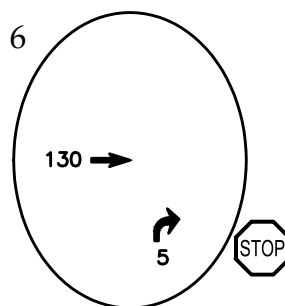
Barstow Road Cellar Access



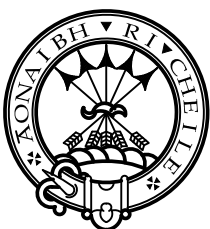
Canterbury Road Basement Access



Linden Place Drop-off Lane Entry



Linden Place Drop-off Lane Exit



CAMERON ENGINEERING

an **IMEG** company

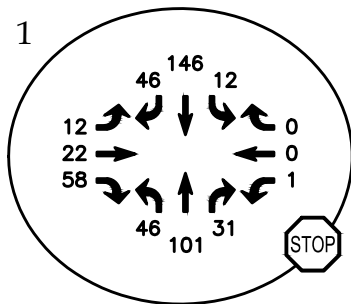
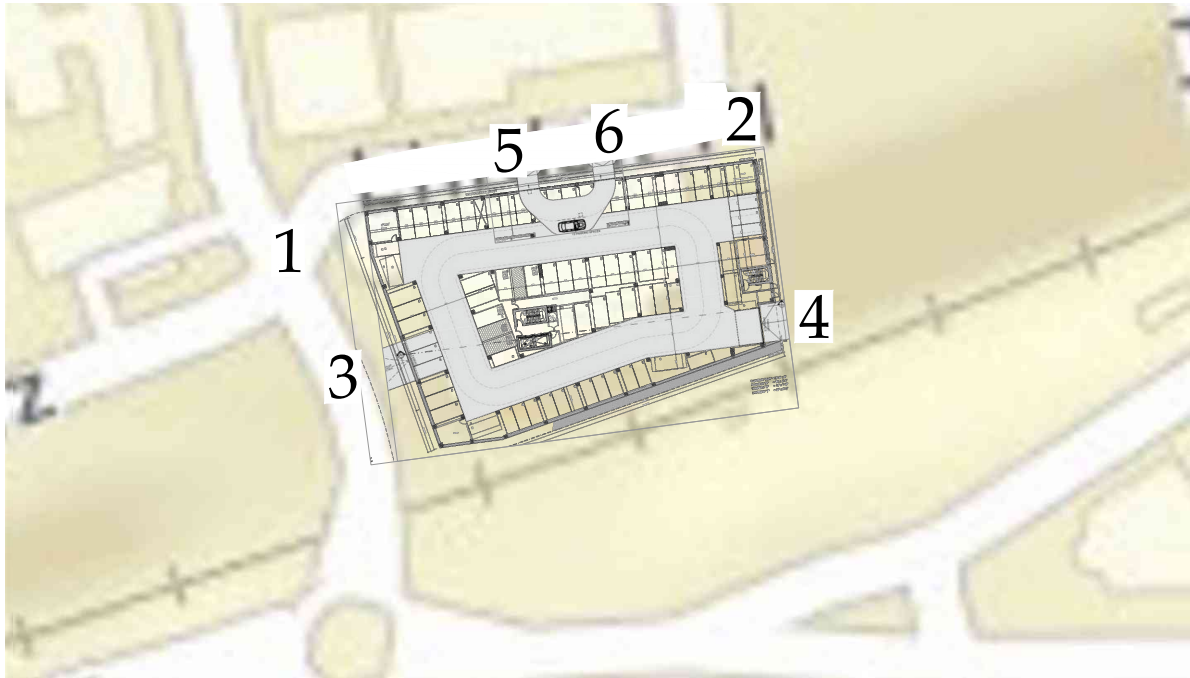
177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
 www.cameronengineering.com, www.imegcorp.com

T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

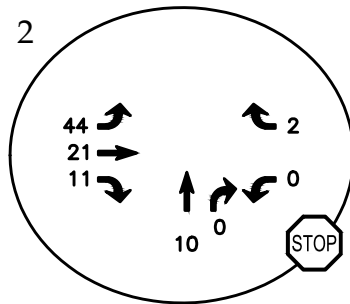
COPYRIGHT

Weekday PM Peak Hour Build Volumes

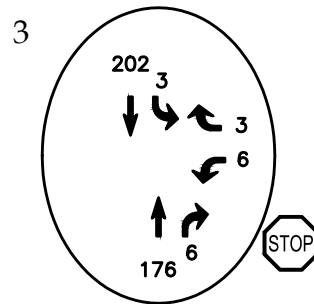
Figure No. 16



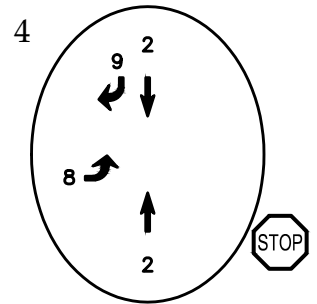
Barstow Road and Linden Place/N. Station Plaza



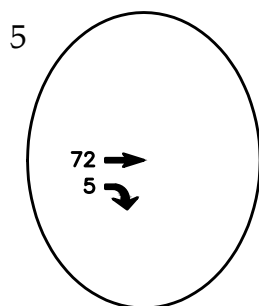
Linden Place and Canterbury Road



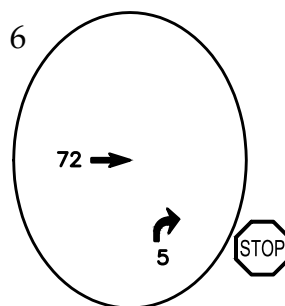
Barstow Road Cellar Access



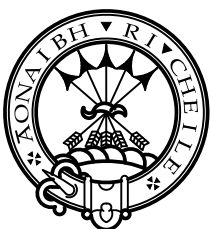
Canterbury Road Basement Access



Linden Place Drop-off Lane Entry



Linden Place Drop-off Lane Exit



CAMERON ENGINEERING

an **IMEG** company

177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
 www.cameronengineering.com, www.imegcorp.com

T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

COPYRIGHT

Saturday Peak Hour Build Volumes

Figure No. 17

5. Assessing Impact: No Build vs. Build Levels of Service

The next step of this report was to determine the Build condition levels of service. Any traffic impacts are gauged by the genuine differences between the No Build and Build levels of service. Table 6 follows with the future level of service summaries.

Table 6: Level of Service Summary Tables
Barstow Road and Linden Place

2025 No Build Volumes			2025 Build Volumes	
AM Peak Hour	Delay	LOS	Delay	LOS
Eastbound Left-Through-Right	9.4	A	9.4	A
Northbound Left-Through-Right	10.4	B	10.1	B
Southbound Left-Through-Right	10.0	A	10.5	B
Intersection	10.1	B	10.1	B
PM Peak Hour	Delay	LOS	Delay	LOS
Eastbound Left-Through-Right	10.0	A	10.1	B
Northbound Left-Through-Right	10.9	B	11.0	B
Southbound Left-Through-Right	11.0	B	11.3	B
Intersection	10.8	B	10.9	B
Saturday Peak Hour	Delay	LOS	Delay	LOS
Eastbound Left-Through-Right	8.3	A	8.4	A
Northbound Left-Through-Right	8.6	A	8.7	A
Southbound Left-Through-Right	8.7	A	8.8	A
Intersection	8.6	A	8.7	A

Linden Place and Canterbury Road

2025 No Build Volumes			2025 Build Volumes	
AM Peak Hour	Delay	LOS	Delay	LOS
Northbound Through-Right	7.3	A	7.4	A
Eastbound Left Through-Right	8.1 7.7	A A	8.2 7.8	A A
Westbound Left-Right	6.6	A	6.6	A
Intersection	7.8	A	7.8	A
PM Peak Hour	Delay	LOS	Delay	LOS
Northbound Through-Right	7.4	A	7.5	A
Eastbound Left Through-Right	8.3 7.8	A A	8.3 7.8	A A
Westbound Left-Right	6.7	A	6.8	A
Intersection	7.7	A	7.8	A

Saturday Peak Hour	Delay	LOS
Northbound Through-Right	7.1	A
Eastbound Left	8.1	A
Through-Right	7.3	A
Westbound Left-Right	6.5	A
Intersection	7.7	A

Delay	LOS
7.2	A
8.1	A
7.2	A
6.5	A
7.6	A

Site Driveways - 2025 Build Volumes only

Barstow Road/West Cellar Level Access

AM Peak Hour	Delay	LOS
Westbound Left-Right	17.1	C
Northbound Through-Right	0.0	A
Southbound Left-Through	8.5	A
Intersection	0.4	A
PM Peak Hour	Delay	LOS
Westbound Left-Right	14.2	B
Northbound Through-Right	0.0	A
Southbound Left-Through	8.1	A
Intersection	0.2	A
Saturday Peak Hour	Delay	LOS
Westbound Left-Right	10.9	B
Northbound Through-Right	0.0	A
Southbound Left-Through	7.7	A
Intersection	0.3	A

Canterbury Road/Basement Level Access

AM Peak Hour	Delay	LOS
Northbound Left-Through	0.0	A
Eastbound Left	8.9	A
Intersection	2.4	A
PM Peak Hour	Delay	LOS
Northbound Left-Through	0.0	A
Eastbound Left	9.0	A
Intersection	1.4	A
Saturday Peak Hour	Delay	LOS
Northbound Left-Through	0.0	A
Eastbound Left	8.7	A
Intersection	3.1	A

Drop-off Lane Entry: No Delay

Drop-off Lane Exit

AM Peak Hour	Delay	LOS
Northbound Right	9.2	A
Intersection	0.3	A
PM Peak Hour	Delay	LOS
Northbound Right	9.2	A
Intersection	0.3	A
Saturday Peak Hour	Delay	LOS
Northbound Right	8.9	A
Intersection	0.6	A

As shown above and as summarized below, this application does not warrant mitigation. There will be adequate gaps in traffic for vehicles to enter and exit onto Barstow Road and Linden Place.

Barstow Road and Linden Place: Every lane group will maintain its No Build level of service, with the exception of the southbound movements in the AM and the eastbound movement in the PM peak hour. The levels of service change from LOS A to B, with actual delay increasing by ½ a second per vehicle or less. The increases in delay are insignificant, and will not affect any motorists traversing this intersection. No mitigation is required.

Linden Place and Canterbury Road: Every approach to this intersection will have the same LOS (LOS A) in the No Build and Build conditions. For the movements with an increase in delay, the highest calculated increase is one tenth of a second, which is too small for drivers to notice. No mitigation is required.

Site Driveways: Each of the driveway analyses reflects a conservative approach, with no credit taken for residents walking to the LIRR station or a bus stop.

Barstow Road/West Cellar Level Access: The Barstow Road approaches will operate at LOS A, and the exit from the parking area will operate at LOS B or LOS C. The delay for exiting traffic will be less than 20 seconds, which is not a significant delay or an adverse condition. The only off-site change required is associated with eliminating two existing on-street parking spaces to accommodate the proposed driveway. The line of sight looking at, and looking from, the proposed driveway will be better with this application in place, because of the removal of two on-site parking spaces that will be replaced by the 34-space parking surplus in the building. No traffic mitigation is warranted.

Canterbury Road/Basement Level Access: Each lane group at this intersection will have level of service A during all three time periods analyzed. The largest delay will be 9 seconds for the eastbound left turn in the PM peak hour. This access will not require mitigation.

Drop-off Lane Entry: The entry into the drop-off lane has no delay because every vehicle is continuing straight past the driveway, or turning right with no opposing traffic.

Drop-off Lane Exit: The exit from this drop-off lane has minimal delay of 9.2 seconds or less, which corresponds to LOS A during each of the three peak hour periods. No further enhancement is warranted to accommodate site traffic.

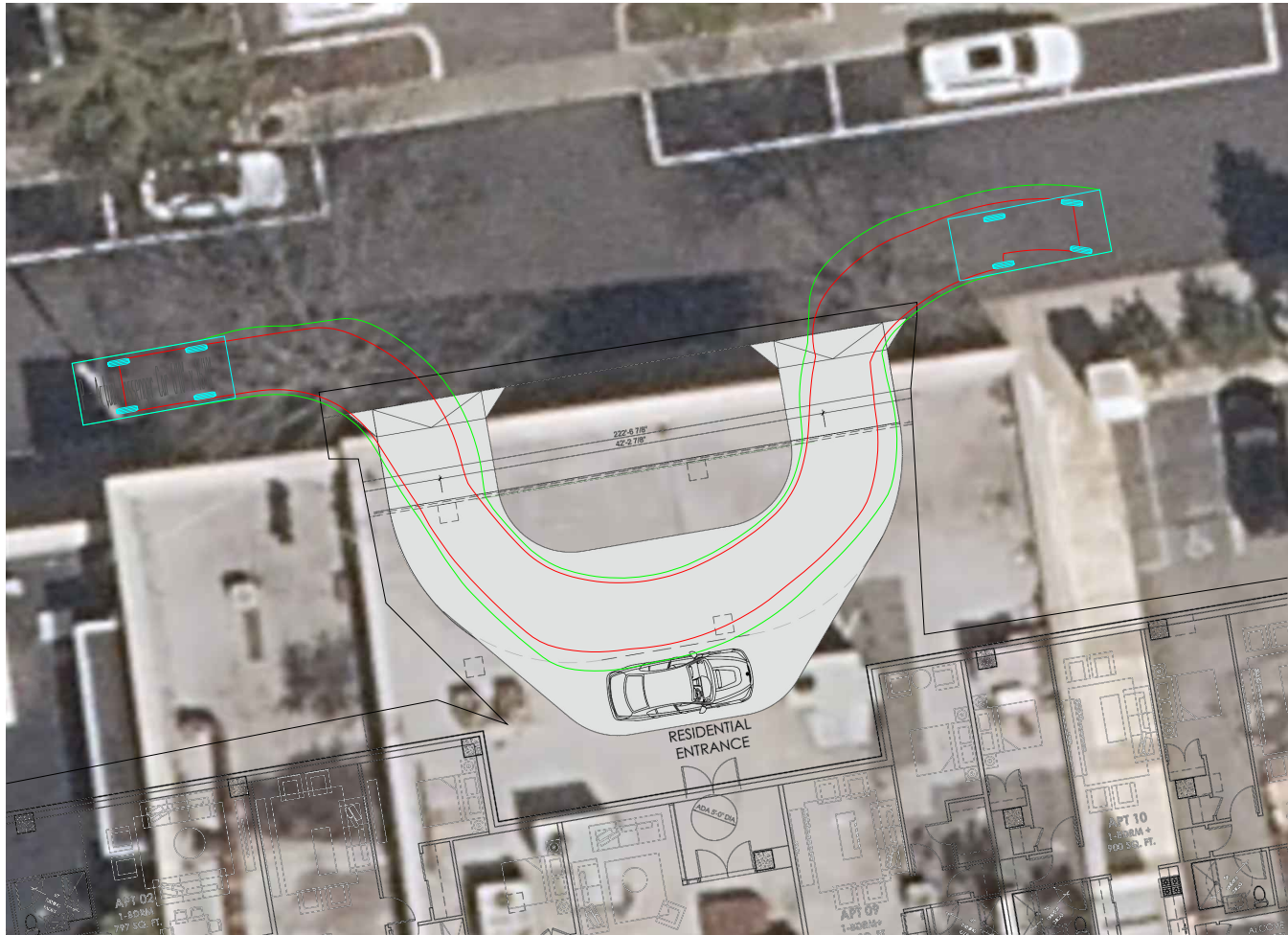
5.1 Site Driveway Maneuvers

As a supplemental assessment of the proposed driveways, this report includes “vehicle turning diagrams” to depict the entry and exit maneuvers.

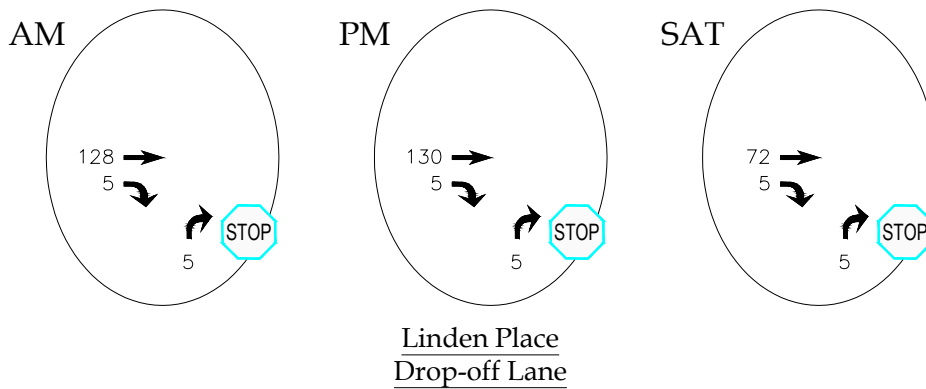
The diagrams are based on typical car/SUV dimensions and illustrate the following:

- The Linden Place drop off lane is maneuverable without 3-point turns, and
- The Barstow Road and Canterbury Road aprons accommodate incoming and outgoing traffic at the same time. We recommend a stop line inside the garage at the Canterbury apron as shown.

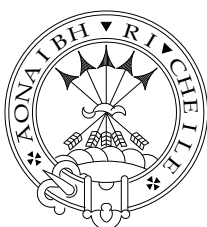
The maneuvers are depicted in Figures 18, 19, and 20.



Peak Hour Driveway Volumes



P - Passenger Car/SUV Actual Size	16.830ft
Overall Length	6.830ft
Overall Width	6.3ft (SUV)
Overall Body Height	4.3ft (Car), 6.3ft (SUV)
Min. Body Ground Clearance	1.135ft
Track Width	5.800ft
Lock-to-lock time	3.00s
Curb to Curb Turning Radius	19.000ft



CAMERON
ENGINEERING

an IMEG company

177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
www.cameronengineering.com, www.imegcorp.com

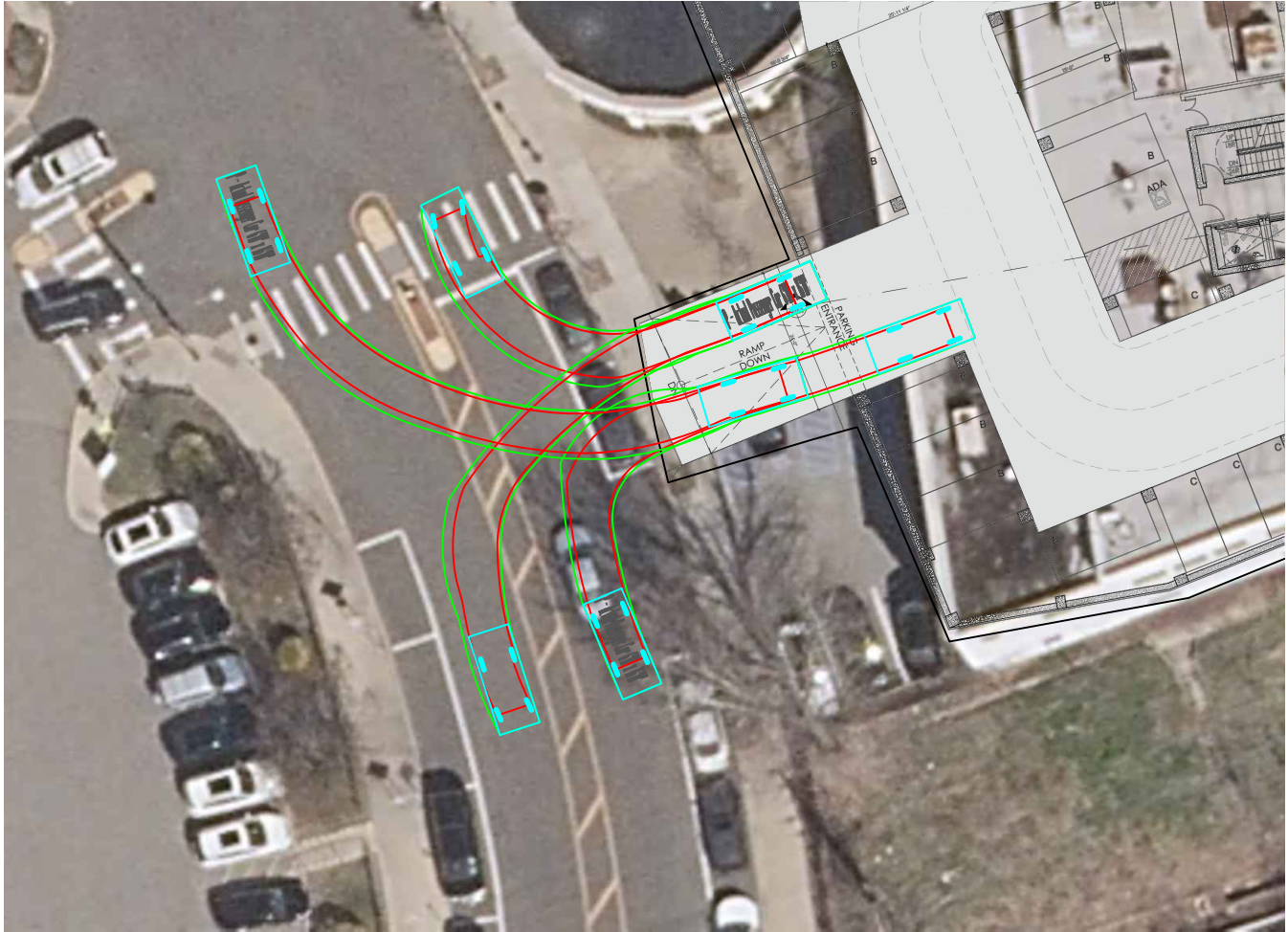
T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

COPYRIGHT

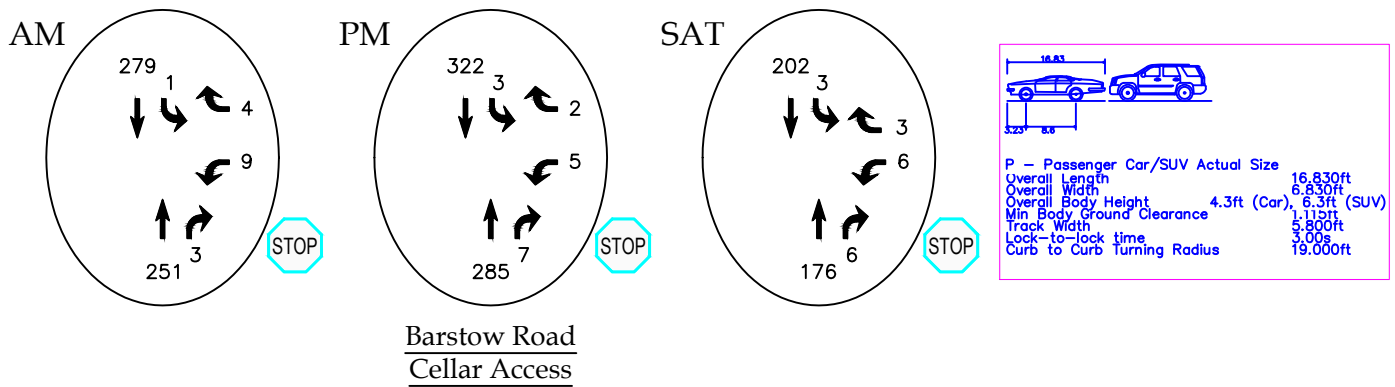
Linden Place Drop-off Lane
Maneuvering

Figure No. 18

Scale: 1" = 20'



Peak Hour Driveway Volumes



CAMERON
ENGINEERING

an IMEG company

177 Crossways Park Drive, Woodbury, NY 11797
1411 Broadway, Suite 610, New York, NY 10018
303 Tarrytown Road, 1st Floor, White Plains, NY 10603
Corporate Seal Initiated 1996 State of New York
www.cameronengineering.com, www.imegcorp.com

T: (516) 827-4900
T: (212) 324-4000
T: (914) 721-8300

COPYRIGHT

Barstow Road Driveway Maneuvering

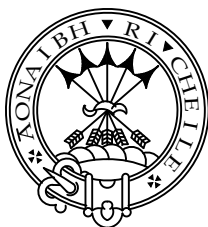
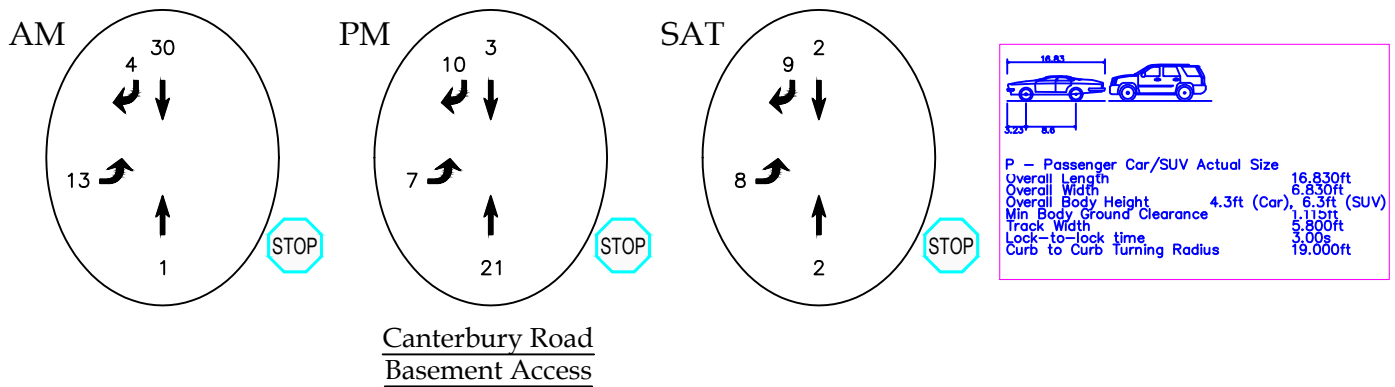
Figure No. 19

Scale: 1" = 30'



Exiting cars should have a stop line here

Peak Hour Driveway Volumes



CAMERON
ENGINEERING

an IMEG company

177 Crossways Park Drive, Woodbury, NY 11797
 1411 Broadway, Suite 610, New York, NY 10018
 303 Tarrytown Road, 1st Floor, White Plains, NY 10603
 Corporate Seal Initiated 1996 State of New York
 www.cameronengineering.com, www.imegcorp.com

T: (516) 827-4900
 T: (212) 324-4000
 T: (914) 721-8300

COPYRIGHT

Canterbury Road Driveway
Maneuvering

Figure No. 20

Scale: 1" = 30'

6. Summary and Conclusions

1. JS Barstow LLC is proposing a 69-unit apartment building at 26 Linden Place in the Village of Great Neck Plaza in Nassau County.
2. The following key intersections were included in this report:

Existing Intersections:	Proposed Site Driveways:
a. Barstow Road and Linden Place	c. Barstow Road/West Cellar Level Access
b. Linden Place and Canterbury Road	d. Canterbury Road/Basement Level Access
	e. Drop-off Lane Entry
	f. Drop-off Lane Exit
3. Existing traffic and pedestrian volumes were counted on Saturday June 10 and Tuesday June 13, 2023 during weekday 7:00-9:00 a.m., 4:00-7:00 p.m., and Saturday 11:00 a.m.-2:00 p.m. peak periods for residential. K-12 schools were in session and weather conditions were favorable during the counts.
4. The No Build scenario includes two years of ambient growth, without considering a new commercial tenant in the existing building, to be conservative. Other planned development information was requested from the Village of Great Neck Plaza and was not received. This study's results will not change if the Build year becomes 2026 instead of 2025.
5. The proposed site plan depicts a 34-space parking code surplus (147 provided spaces, 113 spaces required) and satisfies the 5-space ADA requirement. The surplus on-site parking will be provided to the Village to be part of the Village Residential Parking Permit program, so residents in nearby buildings won't need on-street parking.
6. The building will have stop-sign controlled driveways: the cellar parking level will be accessed from Barstow Road (north of the existing apron) and Canterbury Road (at the northeast corner of the building); the basement parking level will be accessed from Canterbury Road (at the southeast corner of the building); and there will be a drop-off/pick-up lane on the north side of the building about halfway between Barstow Road and Canterbury Road.
7. To accommodate the new Barstow Road access, two on-street parking spaces will be removed.
8. This report is conservative and assesses the entire projected traffic volume (26-27 peak hour trips) with no transit credit, with 5 trips per hour using the drop-off/pick-up lane.
9. The site is in close proximity to shopping and emergency services (fire, police, and hospital).
10. None of the study intersections in the report will be affected by the proposed development. There will be minimal delay changes, with all "Build" conditions at LOS A, LOS B, or LOS C (the three best LOS grades). Any delay increases are less than 1 second per vehicle, which is too small for drivers to notice as a difference, so mitigation will not be necessary.
11. Based on the analyses and the conclusions herein, it is our professional opinion that this site will not create off-site traffic impacts or parking concerns, and will in fact benefit nearby residents. It is requested that the Village approve this project as proposed.

Appendices

- Appendix A: Level of Service Descriptions
- Appendix B: Existing Level of Service Worksheets
- Appendix C: No Build Level of Service Worksheets
- Appendix D: Build Level of Service Worksheets

APPENDIX A: LEVEL OF SERVICE DESCRIPTIONS

Level of service is a measure of traffic flow quality, which denotes the average delays that motorists face as they travel through an intersection. A motorist's delay is caused by several factors, including the presence of a traffic control (i.e., a signal or stop sign), geometry, other vehicles on the road, and incidents.

Total delay is the difference between the actual travel time, and the ideal travel time that would happen if there weren't any traffic controls, geometric delays, incidents, or other vehicles on the road. The HCS program only quantifies the "control delay," the portion of total delay attributed to the signal or stop sign. Control delay includes delays due to initial deceleration, stopped time, queue move-up time, and final acceleration.

The level of service (LOS) at **signalized** intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

The LOS at **two-way stop controlled (TWSC)** intersections depends on the capacity of each minor movement, not for the intersection as a whole. The capacity of a controlled leg is based on the distribution of gaps in the major street traffic flow, driver judgment in selecting a gap through which to move, and the follow-up time required by each driver in a queue.

The LOS at **All-Way stop controlled (AWSC)** intersections is also defined for each minor movement, and depends on the capacity, departure headway, and service time. A movement's delay is a function of the volume-to-capacity (v/c) ratio, service time, and departure headway.

The right of way at an AWSC intersection is controlled by stop signs on every leg of an intersection. Though the driver on the right generally has right of way, actual traffic flow at AWSC intersections generally follows one of two patterns:

1. Vehicles from opposite legs (i.e., northbound and southbound, or eastbound and westbound) arrive close to the same time; this is considered "2-phase" operation.
2. Vehicles from all four legs arrive separately. This is considered "4-phase" operation.

Service time is the time it takes an average vehicle to enter the intersection after stopping, and it depends on the probability that someone is on an opposing leg when a vehicle reaches the stop line. When the opposing legs are empty, a motorist can enter the intersection right after stopping. But if there are one or more vehicles on the opposing legs, the driver must wait for consensus from the other drivers before entering the intersection. The more opposing vehicles there are, the longer the service time will be, although subsequent delay increases get smaller with each additional vehicle. This probability depends on several factors, including the geometry of the intersection, lane configuration, and vehicular volumes.

Levels of service range between LOS A (relatively congestion-free) and LOS F (congested):

Level of Service A indicates very low control delays. This occurs when progression is extremely favorable; most vehicles arrive during the green phase and do not stop at all. Short traffic signal cycles may contribute to low delay.

Level of Service B generally occurs with good progression and/or short signal cycle lengths at signalized intersections. More vehicles stop than for LOS A, causing higher average delays.

**APPENDIX A (continued):
LEVEL OF SERVICE DESCRIPTIONS**

Level of Service C has higher delays than LOS B. This may result from fair progression and/or longer cycle lengths. Individual cycle failures, where motorists wait through an entire signal cycle, may begin to appear. The number of vehicles stopping is significant, though many still pass through without stopping.

Level of Service D has the influence of congestion becoming more noticeable. This may result from some combination of unfavorable progression, long cycle lengths, and high volume-to-capacity (v/c) ratios. The proportion of stopping vehicles increases, and individual cycle failures are noticeable.

Level of Service E is considered the limit of acceptable delay. This LOS generally indicates poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures occur often.

Level of Service F is considered unacceptable to most drivers. The condition occurs with oversaturation (when arrival flow exceeds the intersection’s capacity, denoted by the v/c ratio*) but it may also occur at v/c ratios below 1.0 with many individual cycle failures.

The following conditions are used to determine **Signalized** levels of service:

Average Control Delay (seconds per vehicle)	Level of Service (v/c Ratio)	
	v/c ≤ 1.0	v/c > 1.0
≤ 10.0	Level of Service A	Level of Service F
> 10.0 and ≤ 20.0	Level of Service B	Level of Service F
> 20.0 and ≤ 35.0	Level of Service C	Level of Service F
> 35.0 and ≤ 55.0	Level of Service D	Level of Service F
> 55.0 and ≤ 80.0	Level of Service E	Level of Service F
> 80.0	Level of Service F	Level of Service F

The expectation is that TWSC and AWSC intersections are designed to carry smaller traffic volumes than signalized intersections. Therefore, the delay threshold times are lower for the same LOS grades. The following delays are used to determine **Unsignalized** levels of service:

Average Control Delay (seconds per vehicle)	Level of Service (v/c Ratio)	
	v/c ≤ 1.0	v/c > 1.0
≤ 10.0	Level of Service A	Level of Service F
> 10.0 and ≤ 15.0	Level of Service B	Level of Service F
> 15.0 and ≤ 25.0	Level of Service C	Level of Service F
> 25.0 and ≤ 35.0	Level of Service D	Level of Service F
> 35.0 and ≤ 50.0	Level of Service E	Level of Service F
> 50.0	Level of Service F	Level of Service F

* For individual lane groups (not overall approaches or intersections), HCM 6 automatically defines the signalized level of service as LOS F if the v/c ratio is above 1.0.

APPENDIX B:
EXISTING LEVEL OF SERVICE/CAPACITY WORKSHEETS

1. Barstow Road and Linden Place
2. Linden Place and Canterbury Road

HCM 6th AWSC
 1: Barstow Road & N. Station Plaza/Linden Place

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	12	39	79	0	0	0	72	123	54	30	197	72
Future Vol, veh/h	12	39	79	0	0	0	72	123	54	30	197	72
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	14	14	14	0	0	0	5	5	5	1	1	1
Mvmt Flow	13	41	83	0	0	0	76	129	57	32	207	76
Number of Lanes	0	1	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.3	10	10.3
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	29%	9%	10%
Vol Thru, %	49%	30%	66%
Vol Right, %	22%	61%	24%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	249	130	299
LT Vol	72	12	30
Through Vol	123	39	197
RT Vol	54	79	72
Lane Flow Rate	262	137	315
Geometry Grp	1	1	1
Degree of Util (X)	0.335	0.192	0.388
Departure Headway (Hd)	4.605	5.059	4.438
Convergence, Y/N	Yes	Yes	Yes
Cap	778	706	809
Service Time	2.646	3.114	2.477
HCM Lane V/C Ratio	0.337	0.194	0.389
HCM Control Delay	10	9.3	10.3
HCM Lane LOS	A	A	B
HCM 95th-tile Q	1.5	0.7	1.8

HCM 6th AWSC
2: Canterbury Road & Linden Place

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↔			↗				
Traffic Vol, veh/h	34	58	30	0	0	4	0	1	0	0	0	0
Future Vol, veh/h	34	58	30	0	0	4	0	1	0	0	0	0
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	0	0	0
Mvmt Flow	44	75	39	0	0	5	0	1	0	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	6.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	100%	0%	66%	0%
Vol Right, %	0%	0%	34%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	34	88	4
LT Vol	0	34	0	0
Through Vol	1	0	58	0
RT Vol	0	0	30	4
Lane Flow Rate	1	44	114	5
Geometry Grp	2	7	7	5
Degree of Util (X)	0.002	0.062	0.137	0.005
Departure Headway (Hd)	4.276	5.039	4.3	3.514
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	842	715	839	1011
Service Time	2.276	2.741	2.002	1.56
HCM Lane V/C Ratio	0.001	0.062	0.136	0.005
HCM Control Delay	7.3	8.1	7.7	6.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.5	0

HCM 6th AWSC
 1: Barstow Road & N. Station Plaza/Linden Place

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	25	36	91	1	1	0	68	161	53	13	227	59
Future Vol, veh/h	25	36	91	1	1	0	68	161	53	13	227	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	13	13	13	0	0	0	2	2	2	1	1	1
Mvmt Flow	27	39	99	1	1	0	74	175	58	14	247	64
Number of Lanes	0	1	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.9	10.8	10.9
HCM LOS	A	B	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	24%	16%	4%
Vol Thru, %	57%	24%	76%
Vol Right, %	19%	60%	20%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	282	152	299
LT Vol	68	25	13
Through Vol	161	36	227
RT Vol	53	91	59
Lane Flow Rate	307	165	325
Geometry Grp	1	1	1
Degree of Util (X)	0.398	0.238	0.415
Departure Headway (Hd)	4.67	5.193	4.593
Convergence, Y/N	Yes	Yes	Yes
Cap	766	686	780
Service Time	2.726	3.268	2.648
HCM Lane V/C Ratio	0.401	0.241	0.417
HCM Control Delay	10.8	9.9	10.9
HCM Lane LOS	B	A	B
HCM 95th-tile Q	1.9	0.9	2.1

HCM 6th AWSC
2: Canterbury Road & Linden Place

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷			↕			↷				
Traffic Vol, veh/h	51	64	3	0	0	26	0	20	1	0	0	0
Future Vol, veh/h	51	64	3	0	0	26	0	20	1	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	61	77	4	0	0	31	0	24	1	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8	6.7	7.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	95%	0%	96%	0%
Vol Right, %	5%	0%	4%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	21	51	67	26
LT Vol	0	51	0	0
Through Vol	20	0	64	0
RT Vol	1	0	3	26
Lane Flow Rate	25	61	81	31
Geometry Grp	2	7	7	5
Degree of Util (X)	0.03	0.086	0.102	0.031
Departure Headway (Hd)	4.273	5.059	4.528	3.545
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	843	710	794	998
Service Time	2.273	2.777	2.245	1.608
HCM Lane V/C Ratio	0.03	0.086	0.102	0.031
HCM Control Delay	7.4	8.3	7.8	6.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.3	0.1

HCM 6th AWSC
 1: Barstow Road & N. Station Plaza/Linden Place

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	12	20	56	1	0	0	45	98	31	5	143	46
Future Vol, veh/h	12	20	56	1	0	0	45	98	31	5	143	46
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, %	13	13	13	0	0	0	0	0	0	2	2	2
Mvmt Flow	13	22	62	1	0	0	49	108	34	5	157	51
Number of Lanes	0	1	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.3	8.6	8.7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	26%	14%	3%
Vol Thru, %	56%	23%	74%
Vol Right, %	18%	64%	24%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	174	88	194
LT Vol	45	12	5
Through Vol	98	20	143
RT Vol	31	56	46
Lane Flow Rate	191	97	213
Geometry Grp	1	1	1
Degree of Util (X)	0.228	0.125	0.25
Departure Headway (Hd)	4.295	4.639	4.227
Convergence, Y/N	Yes	Yes	Yes
Cap	837	774	851
Service Time	2.313	2.66	2.245
HCM Lane V/C Ratio	0.228	0.125	0.25
HCM Control Delay	8.6	8.3	8.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.9	0.4	1

HCM 6th AWSC
2: Canterbury Road & Linden Place

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘			↔			↘				
Traffic Vol, veh/h	39	21	2	0	0	2	0	2	0	0	0	0
Future Vol, veh/h	39	21	2	0	0	2	0	2	0	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	47	25	2	0	0	2	0	2	0	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	6.5	7.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	100%	0%	91%	0%
Vol Right, %	0%	0%	9%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	39	23	2
LT Vol	0	39	0	0
Through Vol	2	0	21	0
RT Vol	0	0	2	2
Lane Flow Rate	2	47	28	2
Geometry Grp	2	7	7	5
Degree of Util (X)	0.003	0.065	0.034	0.002
Departure Headway (Hd)	4.031	5.005	4.444	3.458
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	880	720	810	1033
Service Time	2.09	2.707	2.146	1.485
HCM Lane V/C Ratio	0.002	0.065	0.035	0.002
HCM Control Delay	7.1	8.1	7.3	6.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.1	0

**APPENDIX C:
NO BUILD LEVEL OF SERVICE/CAPACITY WORKSHEETS**

1. Barstow Road and Linden Place
2. Linden Place and Canterbury Road

HCM 6th AWSC
 1: Barstow Road & N. Station Plaza/Linden Place

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	12	39	80	0	0	0	73	124	55	30	199	73
Future Vol, veh/h	12	39	80	0	0	0	73	124	55	30	199	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	14	14	14	0	0	0	5	5	5	1	1	1
Mvmt Flow	13	41	84	0	0	0	77	131	58	32	209	77
Number of Lanes	0	1	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.4	10	10.4
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	29%	9%	10%
Vol Thru, %	49%	30%	66%
Vol Right, %	22%	61%	24%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	252	131	302
LT Vol	73	12	30
Through Vol	124	39	199
RT Vol	55	80	73
Lane Flow Rate	265	138	318
Geometry Grp	1	1	1
Degree of Util (X)	0.34	0.194	0.393
Departure Headway (Hd)	4.612	5.073	4.446
Convergence, Y/N	Yes	Yes	Yes
Cap	777	705	807
Service Time	2.654	3.129	2.485
HCM Lane V/C Ratio	0.341	0.196	0.394
HCM Control Delay	10	9.4	10.4
HCM Lane LOS	A	A	B
HCM 95th-tile Q	1.5	0.7	1.9

HCM 6th AWSC
2: Canterbury Road & Linden Place

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘			↔			↘				
Traffic Vol, veh/h	34	59	30	0	0	4	0	1	0	0	0	0
Future Vol, veh/h	34	59	30	0	0	4	0	1	0	0	0	0
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	0	0	0
Mvmt Flow	44	77	39	0	0	5	0	1	0	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	6.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	100%	0%	66%	0%
Vol Right, %	0%	0%	34%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	34	89	4
LT Vol	0	34	0	0
Through Vol	1	0	59	0
RT Vol	0	0	30	4
Lane Flow Rate	1	44	116	5
Geometry Grp	2	7	7	5
Degree of Util (X)	0.002	0.062	0.138	0.005
Departure Headway (Hd)	4.278	5.039	4.303	3.515
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	842	715	838	1011
Service Time	2.278	2.741	2.005	1.56
HCM Lane V/C Ratio	0.001	0.062	0.138	0.005
HCM Control Delay	7.3	8.1	7.7	6.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.5	0

HCM 6th AWSC
 1: Barstow Road & N. Station Plaza/Linden Place

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	25	36	92	1	1	0	69	163	54	13	229	60
Future Vol, veh/h	25	36	92	1	1	0	69	163	54	13	229	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	13	13	13	0	0	0	2	2	2	1	1	1
Mvmt Flow	27	39	100	1	1	0	75	177	59	14	249	65
Number of Lanes	0	1	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	10	10.9	11
HCM LOS	A	B	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	24%	16%	4%
Vol Thru, %	57%	24%	76%
Vol Right, %	19%	60%	20%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	286	153	302
LT Vol	69	25	13
Through Vol	163	36	229
RT Vol	54	92	60
Lane Flow Rate	311	166	328
Geometry Grp	1	1	1
Degree of Util (X)	0.404	0.241	0.42
Departure Headway (Hd)	4.678	5.208	4.602
Convergence, Y/N	Yes	Yes	Yes
Cap	765	684	778
Service Time	2.737	3.285	2.659
HCM Lane V/C Ratio	0.407	0.243	0.422
HCM Control Delay	10.9	10	11
HCM Lane LOS	B	A	B
HCM 95th-tile Q	2	0.9	2.1

HCM 6th AWSC
2: Canterbury Road & Linden Place

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷			↕			↷				
Traffic Vol, veh/h	52	65	3	0	0	26	0	20	1	0	0	0
Future Vol, veh/h	52	65	3	0	0	26	0	20	1	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	63	78	4	0	0	31	0	24	1	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8	6.7	7.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	95%	0%	96%	0%
Vol Right, %	5%	0%	4%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	21	52	68	26
LT Vol	0	52	0	0
Through Vol	20	0	65	0
RT Vol	1	0	3	26
Lane Flow Rate	25	63	82	31
Geometry Grp	2	7	7	5
Degree of Util (X)	0.03	0.088	0.103	0.031
Departure Headway (Hd)	4.278	5.059	4.528	3.547
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	842	710	793	998
Service Time	2.278	2.777	2.246	1.61
HCM Lane V/C Ratio	0.03	0.089	0.103	0.031
HCM Control Delay	7.4	8.3	7.8	6.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.3	0.1

HCM 6th AWSC

1: Barstow Road & N. Station Plaza/Linden Place

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	12	20	57	1	0	0	45	99	31	5	144	46
Future Vol, veh/h	12	20	57	1	0	0	45	99	31	5	144	46
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, %	13	13	13	0	0	0	0	0	0	2	2	2
Mvmt Flow	13	22	63	1	0	0	49	109	34	5	158	51
Number of Lanes	0	1	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.3	8.6	8.7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	26%	13%	3%
Vol Thru, %	57%	22%	74%
Vol Right, %	18%	64%	24%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	175	89	195
LT Vol	45	12	5
Through Vol	99	20	144
RT Vol	31	57	46
Lane Flow Rate	192	98	214
Geometry Grp	1	1	1
Degree of Util (X)	0.23	0.126	0.252
Departure Headway (Hd)	4.3	4.639	4.233
Convergence, Y/N	Yes	Yes	Yes
Cap	837	774	851
Service Time	2.317	2.664	2.249
HCM Lane V/C Ratio	0.229	0.127	0.251
HCM Control Delay	8.6	8.3	8.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.9	0.4	1

HCM 6th AWSC
2: Canterbury Road & Linden Place

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘			↔			↘				
Traffic Vol, veh/h	39	21	2	0	0	2	0	2	0	0	0	0
Future Vol, veh/h	39	21	2	0	0	2	0	2	0	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	47	25	2	0	0	2	0	2	0	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	6.5	7.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	100%	0%	91%	0%
Vol Right, %	0%	0%	9%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	39	23	2
LT Vol	0	39	0	0
Through Vol	2	0	21	0
RT Vol	0	0	2	2
Lane Flow Rate	2	47	28	2
Geometry Grp	2	7	7	5
Degree of Util (X)	0.003	0.065	0.034	0.002
Departure Headway (Hd)	4.031	5.005	4.444	3.458
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	880	720	810	1033
Service Time	2.09	2.707	2.146	1.485
HCM Lane V/C Ratio	0.002	0.065	0.035	0.002
HCM Control Delay	7.1	8.1	7.3	6.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.1	0

**APPENDIX D:
BUILD LEVEL OF SERVICE/CAPACITY WORKSHEETS**

1. Barstow Road and Linden Place
2. Linden Place and Canterbury Road
3. Barstow Road/West Cellar Level Access
4. Canterbury Road/Basement Level Access
5. Drop-off Lane Exit [Drop-off Lane Entry has no delay]

HCM 6th AWSC
 1: Barstow Road & N. Station Plaza/Linden Place

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	12	40	80	0	0	0	74	127	55	33	200	73
Future Vol, veh/h	12	40	80	0	0	0	74	127	55	33	200	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	14	14	14	0	0	0	5	5	5	1	1	1
Mvmt Flow	13	42	84	0	0	0	78	134	58	35	211	77
Number of Lanes	0	1	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.4	10.1	10.5
HCM LOS	A	B	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	29%	9%	11%
Vol Thru, %	50%	30%	65%
Vol Right, %	21%	61%	24%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	256	132	306
LT Vol	74	12	33
Through Vol	127	40	200
RT Vol	55	80	73
Lane Flow Rate	269	139	322
Geometry Grp	1	1	1
Degree of Util (X)	0.346	0.197	0.399
Departure Headway (Hd)	4.623	5.092	4.458
Convergence, Y/N	Yes	Yes	Yes
Cap	776	700	805
Service Time	2.668	3.152	2.5
HCM Lane V/C Ratio	0.347	0.199	0.4
HCM Control Delay	10.1	9.4	10.5
HCM Lane LOS	B	A	B
HCM 95th-tile Q	1.5	0.7	1.9

HCM 6th AWSC
 2: Canterbury Road & Linden Place

Intersection

Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	59	34	0	0	4	0	14	0	0	0	0
Future Vol, veh/h	39	59	34	0	0	4	0	14	0	0	0	0
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	0	0	0
Mvmt Flow	51	77	44	0	0	5	0	18	0	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.9	6.6	7.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	100%	0%	63%	0%
Vol Right, %	0%	0%	37%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	39	93	4
LT Vol	0	39	0	0
Through Vol	14	0	59	0
RT Vol	0	0	34	4
Lane Flow Rate	18	51	121	5
Geometry Grp	2	7	7	5
Degree of Util (X)	0.022	0.071	0.145	0.005
Departure Headway (Hd)	4.306	5.069	4.312	3.553
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	836	709	835	996
Service Time	2.306	2.781	2.024	1.613
HCM Lane V/C Ratio	0.022	0.072	0.145	0.005
HCM Control Delay	7.4	8.2	7.8	6.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.5	0

HCM 6th TWSC
 3: Barstow Road & West Cellar Access

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Traffic Vol, veh/h	9	4	251	3	1	279
Future Vol, veh/h	9	4	251	3	1	279
Conflicting Peds, #/hr	121	121	0	121	121	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	95	95	95	95
Heavy Vehicles, %	2	2	5	5	1	1
Mvmt Flow	10	4	264	3	1	294

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	804	508	0	0	388	0
Stage 1	387	-	-	-	-	-
Stage 2	417	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209	-
Pot Cap-1 Maneuver	352	565	-	-	1176	-
Stage 1	686	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	275	442	-	-	1040	-
Mov Cap-2 Maneuver	275	-	-	-	-	-
Stage 1	607	-	-	-	-	-
Stage 2	588	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	311	1040
HCM Lane V/C Ratio	-	-	0.045	0.001
HCM Control Delay (s)	-	-	17.1	8.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
 4: Canterbury Road & Basement Access

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖			↗	↗	
Traffic Vol, veh/h	13	0	0	1	30	4
Future Vol, veh/h	13	0	0	1	30	4
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	14	0	0	1	33	4

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	50	- 44	0	-	0
Stage 1	42	- -	-	-	-
Stage 2	8	- -	-	-	-
Critical Hdwy	6.42	- 4.1	-	-	-
Critical Hdwy Stg 1	5.42	- -	-	-	-
Critical Hdwy Stg 2	5.42	- -	-	-	-
Follow-up Hdwy	3.518	- 2.2	-	-	-
Pot Cap-1 Maneuver	959	0 1577	-	-	-
Stage 1	980	0 -	-	-	-
Stage 2	1015	0 -	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	946	- 1566	-	-	-
Mov Cap-2 Maneuver	946	- -	-	-	-
Stage 1	973	- -	-	-	-
Stage 2	1008	- -	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1566	-	946	-	-
HCM Lane V/C Ratio	-	-	0.015	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 6th TWSC
6: Drop-off Exit & Linden Place

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑					↑
Traffic Vol, veh/h	128	0	0	0	0	5
Future Vol, veh/h	128	0	0	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	20	20
Mvmt Flow	139	0	0	0	0	5

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	-	-	139
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.48
Pot Cap-1 Maneuver	-	0	0	863
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	863
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	9.2
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	EBT
Capacity (veh/h)	863	-
HCM Lane V/C Ratio	0.006	-
HCM Control Delay (s)	9.2	-
HCM Lane LOS	A	-
HCM 95th %tile Q(veh)	0	-

HCM 6th AWSC
 1: Barstow Road & N. Station Plaza/Linden Place

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	25	38	93	1	1	0	70	164	54	21	231	60
Future Vol, veh/h	25	38	93	1	1	0	70	164	54	21	231	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	13	13	13	0	0	0	2	2	2	1	1	1
Mvmt Flow	27	41	101	1	1	0	76	178	59	23	251	65
Number of Lanes	0	1	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	10.1	11	11.3
HCM LOS	B	B	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	24%	16%	7%
Vol Thru, %	57%	24%	74%
Vol Right, %	19%	60%	19%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	288	156	312
LT Vol	70	25	21
Through Vol	164	38	231
RT Vol	54	93	60
Lane Flow Rate	313	170	339
Geometry Grp	1	1	1
Degree of Util (X)	0.409	0.247	0.436
Departure Headway (Hd)	4.704	5.242	4.625
Convergence, Y/N	Yes	Yes	Yes
Cap	761	678	773
Service Time	2.766	3.322	2.685
HCM Lane V/C Ratio	0.411	0.251	0.439
HCM Control Delay	11	10.1	11.3
HCM Lane LOS	B	B	B
HCM 95th-tile Q	2	1	2.2

HCM 6th AWSC
 2: Canterbury Road & Linden Place

Intersection

Intersection Delay, s/veh 7.8
 Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	57	65	13	0	0	26	0	27	1	0	0	0
Future Vol, veh/h	57	65	13	0	0	26	0	27	1	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	69	78	16	0	0	31	0	33	1	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8	6.8	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	96%	0%	83%	0%
Vol Right, %	4%	0%	17%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	28	57	78	26
LT Vol	0	57	0	0
Through Vol	27	0	65	0
RT Vol	1	0	13	26
Lane Flow Rate	34	69	94	31
Geometry Grp	2	7	7	5
Degree of Util (X)	0.041	0.097	0.116	0.031
Departure Headway (Hd)	4.323	5.076	4.458	3.575
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	833	707	804	987
Service Time	2.323	2.799	2.182	1.649
HCM Lane V/C Ratio	0.041	0.098	0.117	0.031
HCM Control Delay	7.5	8.3	7.8	6.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.4	0.1

HCM 6th TWSC
 3: Barstow Road & West Cellar Access

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	2	285	7	3	322
Future Vol, veh/h	5	2	285	7	3	322
Conflicting Peds, #/hr	40	40	0	40	40	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	5	2	310	8	3	350

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	750	394	0	0	358
Stage 1	354	-	-	-	-
Stage 2	396	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.11
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.209
Pot Cap-1 Maneuver	379	655	-	-	1206
Stage 1	710	-	-	-	-
Stage 2	680	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	350	606	-	-	1160
Mov Cap-2 Maneuver	350	-	-	-	-
Stage 1	683	-	-	-	-
Stage 2	652	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.2	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	398	1160
HCM Lane V/C Ratio	-	-	0.019	0.003
HCM Control Delay (s)	-	-	14.2	8.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
 4: Canterbury Road & Basement Access

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	7			4	4	
Traffic Vol, veh/h	7	0	0	21	3	10
Future Vol, veh/h	7	0	0	21	3	10
Conflicting Peds, #/hr	16	16	16	0	0	16
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	83	83	83	83
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	8	0	0	25	4	12

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	67	-	32	0	-
Stage 1	26	-	-	-	-
Stage 2	41	-	-	-	-
Critical Hdwy	6.42	-	4.1	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.2	-	-
Pot Cap-1 Maneuver	938	0	1593	-	-
Stage 1	997	0	-	-	-
Stage 2	981	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	910	-	1569	-	-
Mov Cap-2 Maneuver	910	-	-	-	-
Stage 1	982	-	-	-	-
Stage 2	966	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1569	-	910	-	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	0	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 6th TWSC
6: Drop-off Exit & Linden Place

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑					↑
Traffic Vol, veh/h	130	0	0	0	0	5
Future Vol, veh/h	130	0	0	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	20	20
Mvmt Flow	141	0	0	0	0	5

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	-	-	141
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.48
Pot Cap-1 Maneuver	-	0	0	861
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	861
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	9.2
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	EBT
Capacity (veh/h)	861	-
HCM Lane V/C Ratio	0.006	-
HCM Control Delay (s)	9.2	-
HCM Lane LOS	A	-
HCM 95th %tile Q(veh)	0	-

HCM 6th AWSC
 1: Barstow Road & N. Station Plaza/Linden Place

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	12	22	58	1	0	0	46	101	31	12	146	46
Future Vol, veh/h	12	22	58	1	0	0	46	101	31	12	146	46
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, %	13	13	13	0	0	0	0	0	0	2	2	2
Mvmt Flow	13	24	64	1	0	0	51	111	34	13	160	51
Number of Lanes	0	1	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.4	8.7	8.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	26%	13%	6%
Vol Thru, %	57%	24%	72%
Vol Right, %	17%	63%	23%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	178	92	204
LT Vol	46	12	12
Through Vol	101	22	146
RT Vol	31	58	46
Lane Flow Rate	196	101	224
Geometry Grp	1	1	1
Degree of Util (X)	0.235	0.131	0.265
Departure Headway (Hd)	4.324	4.677	4.261
Convergence, Y/N	Yes	Yes	Yes
Cap	831	767	845
Service Time	2.341	2.702	2.277
HCM Lane V/C Ratio	0.236	0.132	0.265
HCM Control Delay	8.7	8.4	8.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.9	0.4	1.1

HCM 6th AWSC
 2: Canterbury Road & Linden Place

Intersection

Intersection Delay, s/veh 7.6
 Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	21	11	0	0	2	0	10	0	0	0	0
Future Vol, veh/h	44	21	11	0	0	2	0	10	0	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	53	25	13	0	0	2	0	12	0	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	6.5	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	100%	0%	66%	0%
Vol Right, %	0%	0%	34%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	44	32	2
LT Vol	0	44	0	0
Through Vol	10	0	21	0
RT Vol	0	0	11	2
Lane Flow Rate	12	53	39	2
Geometry Grp	2	7	7	5
Degree of Util (X)	0.014	0.074	0.046	0.002
Departure Headway (Hd)	4.057	5.023	4.282	3.487
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	872	717	840	1022
Service Time	2.129	2.729	1.988	1.524
HCM Lane V/C Ratio	0.014	0.074	0.046	0.002
HCM Control Delay	7.2	8.1	7.2	6.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.1	0

HCM 6th TWSC
 3: Barstow Road & West Cellar Access

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Traffic Vol, veh/h	6	3	176	6	3	202
Future Vol, veh/h	6	3	176	6	3	202
Conflicting Peds, #/hr	11	11	0	11	11	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	91	91	91	91
Heavy Vehicles, %	2	2	0	0	2	2
Mvmt Flow	7	3	193	7	3	222

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	447	219	0	0	211
Stage 1	208	-	-	-	-
Stage 2	239	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	569	821	-	-	1360
Stage 1	827	-	-	-	-
Stage 2	801	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	556	804	-	-	1346
Mov Cap-2 Maneuver	556	-	-	-	-
Stage 1	819	-	-	-	-
Stage 2	791	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	620	1346
HCM Lane V/C Ratio	-	-	0.016	0.002
HCM Control Delay (s)	-	-	10.9	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 6th TWSC
 4: Canterbury Road & Basement Access

Intersection						
Int Delay, s/veh	3.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	8	0	0	2	2	9
Future Vol, veh/h	8	0	0	2	2	9
Conflicting Peds, #/hr	6	6	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	83	83	83	83
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	9	0	0	2	2	11

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	22	-	19	0	-
Stage 1	14	-	-	-	-
Stage 2	8	-	-	-	-
Critical Hdwy	6.42	-	4.1	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.2	-	-
Pot Cap-1 Maneuver	995	0	1611	-	-
Stage 1	1009	0	-	-	-
Stage 2	1015	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	983	-	1602	-	-
Mov Cap-2 Maneuver	983	-	-	-	-
Stage 1	1003	-	-	-	-
Stage 2	1009	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1602	-	983	-	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	0	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 6th TWSC
6: Drop-off Exit & Linden Place

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑					↑
Traffic Vol, veh/h	72	0	0	0	0	5
Future Vol, veh/h	72	0	0	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	20
Mvmt Flow	78	0	0	0	0	5

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	-	-	78
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.48
Pot Cap-1 Maneuver	-	0	0	935
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	935
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	8.9
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	EBT
Capacity (veh/h)	935	-
HCM Lane V/C Ratio	0.006	-
HCM Control Delay (s)	8.9	-
HCM Lane LOS	A	-
HCM 95th %tile Q(veh)	0	-