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Traffic Impact and Access Study

**Extended Stay Hotel
Boston Post Road (Route 1)
Waterford, Connecticut**

Prepared for:

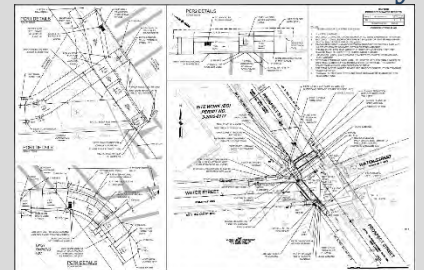
**The Development Manager
Richmond, VA 23226**

August 14, 2023

Quality



Accuracy



Integrity



Traffic Impact and Access Study

To: Ms. Renita Sommers, Principal
The Development Manager
PO Box 8721
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Reg: Extended Stay Hotel
Boston Post Road (Route 1)
Waterford, CT

From: Shaun P. Kelly, Sr. Project Manager

Date: August 14, 2023
Project #: 23026

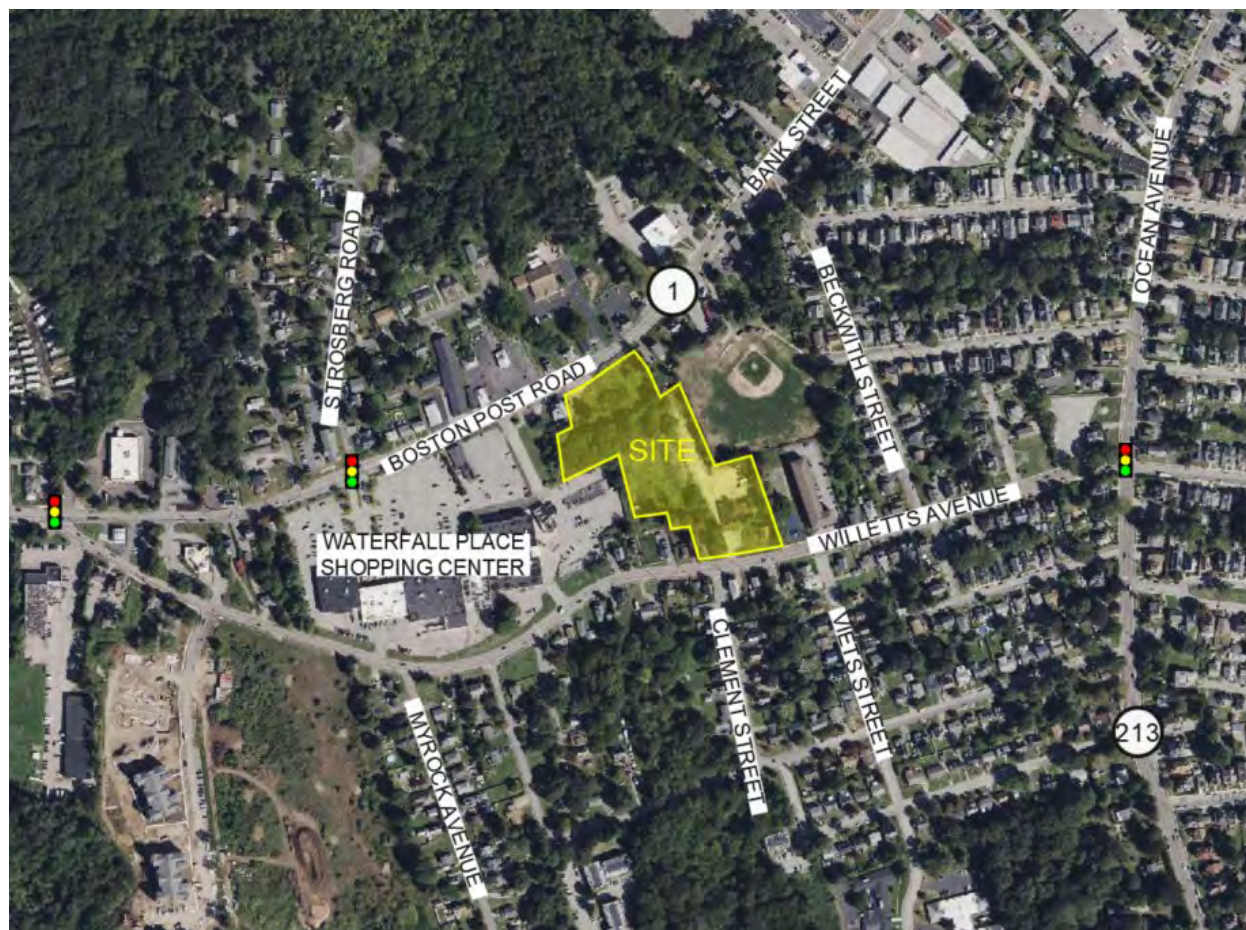
INTRODUCTION

Chappell Engineering Associates, LLC (CEA) has conducted this Traffic Impact and Access Study to evaluate the traffic impacts associated with the development of a proposed 121-room extended stay hotel, to be located at 295 and 313 Willetts Avenue in Waterford, Connecticut. The proposed parking lot would provide a total of 131 parking spaces, including five handicap accessible parking spaces, and three loading spaces. The project site is generally bounded by Boston Post Road (Route 1) to the north, Willetts Avenue to the south, and private properties to the east and west. Access to the site is proposed via two new driveways, a primary access drive onto Boston Post Road, and a secondary access driveway onto Willetts Avenue, that is intended to primarily serve local traffic, and will be restricted to passenger vehicles only. The site location is shown on Figure 1.

This study was conducted in accordance with Connecticut Department of Transportation (ConnDOT) guidelines for preparation of traffic assessments, and in consultation with the Town of Waterford. This study provides an estimate of the expected traffic generation and distribution characteristics of the project, evaluates the impact of that traffic on the adjacent roadways and intersections, and determines the necessity for improvements to the area roadway system.

As documented in this report, project-related traffic increases are expected to result in minimal impacts to area traffic operations, with only minor increases in vehicle delays and associated queuing predicted. Furthermore, adequate sight distances are provided at the proposed site driveway intersections with both Boston Post Road and Willetts Avenue to allow for safe operation.

Figure 1
Site Location Map



EXISTING CONDITIONS

Study Area

Evaluation of the traffic impacts associated with the project requires an evaluation of existing and projected traffic volumes, the volume of traffic expected to be generated by the project, and the impact that this traffic will have on the adjacent streets. In preparing this study, the following intersections were analyzed:

- Boston Post Road at Willetts Avenue and Dollar General driveway
- Boston Post Road at Strosberg Road and Waterfall Place driveway
- Willetts Avenue at Clement Street and site driveway (proposed)
- Boston Post Road at site driveway (proposed)

The study area intersections and roadways are described in detail below.

Boston Post Road (Route 1) is classified as principal arterial under ConnDOT jurisdiction. The corridor is labeled as a north-south route by ConnDOT, but travels in a general east/west orientation within the study area, providing connections to the Interstate 95(I-95) and Interstate 295 (I-295) corridors to the west, and the City of New London to the east. Within the study area, ConnDOT generally provides two lanes of travel in each direction, west of Willetts Avenue, and a single lane of travel in each direction, east of Willetts Avenue, separated by a double-yellow centerline. Sidewalk is provided along both sides of Boston Post Road, west of Willetts Avenue, and along the northern side of the corridor, east of Willetts Avenue. Formal bicycle facilities are not provided along the corridor in the vicinity of the project site. The posted speed limit on Boston Post Road, in the vicinity of the project site is 30 miles per hour. Parking along the corridor is prohibited within the study area. Land use along Boston Post Road, within the study area, is primarily commercial or residential in nature.

Willetts Avenue is classified as a major collector roadway and traverses the study area in a general east/west orientation between its western terminus at Boston Post Road, and eastern terminus at Shaw Street in the city of New London. Willetts Avenue provides a single lane of travel in each direction, separated by a painted double-yellow centerline. Sidewalk is provided along the southern side of the corridor in the vicinity of the project site. Formal bicycle facilities are not provided along the corridor. The posted speed limit on Willetts Avenue is 30 mph in the vicinity of the site access and reduces to 25 mph east of the study area. Land use along Willetts Avenue is primarily commercial in the vicinity of Boston Post Road, and residential further east along the corridor.

Boston Post Road intersects Willetts Road and the Dollar General driveway to form a four-way intersection that operates under traffic signal control. The Boston Post Road eastbound approach provides a shared left-turn/through lane and an exclusive right-turn lane. The Boston Post Road westbound approach provides two general purpose travel lanes. The Willetts Avenue northbound approach provides a single general purpose travel lane. The Dollar General driveway southbound approach provides an exclusive left-turn lane and a shared through/right-turn lane. Sidewalk is provided along the northern side of Boston Post Road and along the southern side of Boston Post Road, west of Willetts Avenue. A painted crosswalk is provided across the Boston Post Road eastbound approach to the intersection. The traffic signal at this location operates under a four-phase signal sequence, with split phasing provided for northbound and southbound traffic on the Dollar General driveway and Willetts Avenue, and an exclusive pedestrian phase provided via push button activation. Land use in the vicinity of this intersection is primarily commercial in nature, including the Dollar General store, a gas station, and an automotive service center.

Boston Post Road intersects the Waterfall Place driveway and Strosberg Road to form a four-way intersection that operates under traffic signal control. The Boston Post Road eastbound approach provides a shared left-turn/through lane and an exclusive right-turn lane. The Boston Post Road westbound approach provides an exclusive left-turn lane and a shared through/right-turn lane. The Waterfall Place driveway northbound approach provides a shared left-turn/through lane and an exclusive right-turn lane. The Strosberg Road southbound approach provides a single general purpose travel lane. Sidewalk is provided along the northern side of Boston Post Road at this location. The traffic signal at this location operates under a two-phase signal sequence. Land use in the vicinity of this intersection is primarily commercial, including the Waterfall Place shopping center.

Willetts Avenue intersects Clements Street to form a three-way intersection that operates under STOP-sign control. All three intersection approaches provide a single general purpose travel lane. The Clements Street northbound approach operates under STOP-sign control. Sidewalk is provided along the southern side of Willetts Avenue at this location. Land use in the vicinity of this intersection is predominantly residential in nature.

Traffic Volumes

Base traffic conditions within the study area were developed by conducting manual turning movement and vehicle classification counts (TMC's) at the study intersections in May 2023. The TMC's were conducted during the weekday AM peak period (7:00 to 9:00 AM) and weekday PM peak period (4:00 to 6:00 PM). These time periods were chosen as they typically represent the peak time periods for adjacent roadway traffic. Collected traffic count data are provided in the Appendix. The count data indicate that the weekday AM peak hour generally occurs from 7:45 to 8:45 AM, with the weekday PM peak hour generally occurring between 4:00 to 5:00 PM.

Based on consultation with the Town of Waterford Planning Department, it was noted that traffic volumes along Willetts Avenue are often higher during the hour between 3:00 and 4:00 PM than during the typical weekday PM commuter hours due to employee shift patterns along this corridor that typically run earlier in the afternoon. As such, collected volumes were compared to 3:00 to 4:00 PM traffic volume data, provided in support of the Waterford Central residential development, and were adjusted accordingly to represent peak conditions.

To determine if the count data needed to be adjusted to represent peak month conditions consistent with ConnDOT guidelines for traffic impact assessments, expansion factors provided by the department were reviewed. Based on a review of these data, May traffic volumes are approximately 3 percent lower than peak month conditions. As such, collected traffic volumes were adjusted upwards by 3 percent, as well as the adjustments to reflect the higher 3:00 to 4:00 PM traffic patterns. The ConnDOT expansion factor data are provided in the Appendix.

Table 1 summarizes the 2023 Existing peak hour traffic volumes on the study area roadways, with the peak hour traffic flow networks provided on Figure 2.

Table 1
Existing Traffic Volume Summary

Location/Time Period	Peak Hour Volume ^a		Directional Distribution ^b
Boston Post Road, west of proposed site driveway:	AM:	654	51% EB
	PM:	1,096	52% WB
Willetts Avenue, west of proposed site driveway:	AM:	731	51% EB
	PM:	936	53% WB

^a In vehicles per hour.

^b EB = eastbound, WB = westbound.

Crash History

Crash data for the study intersections were obtained from the Town of Waterford Police Department for the five-year period between 2018 and 2022. The data were reviewed and summarized by severity, crash type, and roadway surface under which the crash occurred, as summarized in Table 2.

Table 2
Crash Summary

Location	Number of Accidents		Severity ^a		Accident Type ^b						% During Wet/Icy Conditions
	Total	Avg./Year	PD	PI	CM	RE	SS	HO	SV	U	
Boston Post Road at Willetts Avenue	25	5.0	19	6	5	13	4	1	2	0	16%
Boston Post Road at Strosberg Road	6	1.2	4	2	0	5	0	0	1	0	0%
Willetts Avenue at Clement Street	1	0.2	1	0	0	0	0	0	1	0	0%

Source: Town of Waterford Police Department – 2018 through 2022 data.

^a PD = property damage only; PI = personal injury; NR = Not Reported.

^b CM = cross movement/angle; RE = rear end; SS = sideswipe; HO = head-on; SV= single vehicle; U= unknown.

Weekday AM Peak Hour



As summarized in Table 2, the intersection of Boston Post Road with Willetts Avenue experienced a total of twenty-five crashes over the five-year period, averaging approximately 5 motor vehicle collisions per year. Of the twenty-five reported collisions, the majority involved property damage only (19 of 25 crashes), with no fatalities reported over the five-year review period. The majority of crashes were either angle or rear-end type collisions. Approximately 16 percent of reported crashes occurred during wet/icy conditions.

The intersection of Boston Post Road with Strosberg Road and the Waterfall Place driveway experienced a total of six motor vehicles per year, or approximately one motor vehicle collision per year on average. The majority of collisions (4 out of 6) involved property damage only, with no fatalities reported over the five-year review period.

A single collision was reported at the intersection of Willetts Avenue with Clements Street over the five-year review period, involving a single car crash that resulted in property damage only.

Vehicle Speeds

Vehicle speed measurements were conducted along Boston Post Road and Willetts Avenue, at the proposed site access driveway locations, through the use of radar detection during off-peak hours. The results of the speed measurements are summarized in Table 3.

Table 3
Observed Travel Speeds ^a

Location/Direction	Posted Speed Limit	Average Speed	85 th Percentile Speed ^b
Boston Post Road:			
Eastbound	30	34	38
Westbound	30	33	36
Willetts Avenue:			
Eastbound	30	30	33
Westbound	30	31	35

^a In miles per hour (mph).

^b Speed at, or below which 85 percent of all observed vehicles travel.

As shown in Table 3, average travel speeds along Boston Post Road, adjacent to the site, are higher than the posted speed limit of 30 mph, with vehicles on average traveling 34 mph in the eastbound direction and 33 mph in the westbound direction. The calculated 85th percentile travel speeds were determined to be 38 mph speeds in the eastbound direction and 36 mph in the westbound direction.

The average travel speed on Willetts Avenue, adjacent to the site, was determined to be 30 mph in the eastbound direction and 31 mph in the westbound direction, equal to or slightly higher than the posted 30 mph speed limit. The 85th percentile operating speed was determined to be 33 mph in the eastbound direction and 35 mph in the westbound direction.

Accordingly, the 85th percentile travel speeds were used in the calculation of minimum sight distance requirements for both roadways, as discussed below.

Sight Distance

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveway intersections with Boston Post Road and Willetts Avenue, to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).¹ AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. ConnDOT requires the use of AASHTO sight distance standards when preparing traffic impact assessments and studies, as stated in their guidelines for traffic impact assessments.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream.

¹A *Policy on Geometric Design of Highways and Streets*, 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018.

However, the ISD must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *“If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road.”* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available intersection sight distances at the proposed site driveway locations with Boston Post Road and Willetts Avenue were measured and compared to minimum requirements as established by AASHTO. The reported distances reflect the removal of overgrown vegetation within the sight triangles at each driveway location. Since the requirements are based on the adjacent street speed of traffic, the observed 85th percentile speeds were used to calculate the minimum sight distance requirements. The required minimum sight distances for these speeds are compared to the available distances, as shown in Table 4.

Table 4
Sight Distance Summary

Location/Direction	Sight Distance (feet)		
	Measured	Minimum Required (SSD) ^a	Desirable (ISD) ^b
Boston Post Road at Site Driveway			
East of intersection ^c	485	265	335
West of intersection ^c	600+	285	290
Willetts Avenue at Site Driveway			
East of intersection ^c	283	250	290
West of intersection	438	230	335

^a Values based on AASHTO SSD requirements for observed 85th percentile speeds of 38 mph traveling eastbound and 36 mph traveling westbound on Boston Post Road, and 33 mph traveling eastbound and 35 mph traveling westbound on Willetts Avenue.

^b Values based on AASHTO ISD requirements for a posted speed limit of 30 mph on both Boston Post Road and Willetts Avenue.

^c Measured distances reflect the removal of overgrown vegetation at the proposed driveway locations.

As shown in Table 4, following the removal of overgrown vegetation at the proposed site driveway locations, sight distances exceed the minimum required SSD in both directions at both the Boston Post Road and Willetts Avenue driveway locations. The Boston Post Road driveway meets the desirable ISD in both the eastbound and westbound directions. The Willetts Avenue driveway

location meets the desirable ISD to the west, and is just short of the desirable ISD to the east. It is noted however, that ISD only reflects an acceptable speed reduction to oncoming traffic and is not the minimum requirement. It is recommended that sight triangles be shown on the site plan to identify areas where existing vegetation is to be trimmed or removed and proposed landscaping or signs should be kept low (maximum 2 feet in height from street level) or set back outside the sight triangles (as defined by AASHTO) so as not to impede the available sight distances.

FUTURE CONDITIONS

Traffic Growth

Future traffic conditions were projected to the year 2025, representing the anticipated opening year for the project, consistent with state requirements for traffic impact analyses. To project traffic conditions within this design horizon, two components of traffic growth were included. First, an annual average traffic growth rate was determined to account for general population growth and smaller development projects (such as residential developments) that may impact traffic along roadways in the site vicinity.

In order to account for background growth, existing traffic volumes were adjusted upwards by 1 percent per year over the two-year planning horizon. This background growth rate is consistent with the background growth rate utilized for other recent area traffic studies that have been reviewed and approved by ConnDOT.

Second, any planned or approved specific developments in the area that would generate a significant volume of traffic on study area roadways within the next seven years were included. The Town of Waterford and City of New London Planning Departments were contacted to determine whether there are any planned development projects expected to influence future traffic operations within the study area. The City of New London indicated no specific developments are proposed proximate to the project that would impact future traffic volumes. The Town of Waterford identified the following background development project, which was included in the analysis of future traffic operations:

- ***Proposed Waterford Central Residential Development - 386 & 394 Willetts Avenue/61 & 61A Myrock Avenue, Waterford, CT*** – this development project entails the final phase of a proposed residential development, consisting of 216 units of residential housing, with 305 parking spaces provided. Access to the project will be provided via an existing access driveway onto Willetts Avenue, east of Boston Post Road. Additional traffic associated with this project were obtained from the traffic assessment² prepared for this development and have been included in the analysis of future traffic operations. As discussed in

² *Traffic Volume Data – Step 1, Proposed Waterford Central Residential Development, 386 & 394 Willetts Avenue/61 & 61A Myrock Avenue, Waterford, Connecticut; VHB, April 21, 2023.*

subsequent sections of this report, in conjunction with this project, roadway geometric enhancements are proposed for the intersection of Boston Post Road with Willetts Avenue, including the widening of Willetts Avenue to provide a second approach lane to Boston Post Road.

No-Build Conditions

The 2025 No-Build networks were accordingly developed by applying a compounded 1.0 percent annual growth rate to the existing adjacent street volumes and by adding the traffic associated with the aforementioned background development project. The 2025 No-Build peak-hour traffic-flow networks are shown on Figure 3.

Proposed Roadway Improvements

As mitigation for the proposed Waterford Central residential development, both roadway geometric and traffic signal improvements are proposed at the intersection of Boston Post Road with Willetts Avenue. Proposed improvements include the widening of the Willetts Avenue northbound approach to provide additional capacity and queue storage, as well as the optimization of the future signal timing at this location. Future year traffic analyses reflect the proposed improvements at this intersection.

Project-Related Traffic Generation

In order to develop the trip generation characteristics of the project, trip generation data published by the Institute of Transportation Engineers (ITE) as part of the *Trip Generation Manual*³ were reviewed. The ITE publishes trip generation for a number of Land Use Codes (LUCs) including LUC 311 – All Suites Hotel, the most appropriate category for the proposed development. The trip generation for the project is summarized in Table 5.

³ *Trip Generation Manual, 11th Edition*; Institute of Transportation Engineers; Washington, DC; 2021.

Figure 3
2025 No Build Peak Month
Peak Hour Traffic Volumes

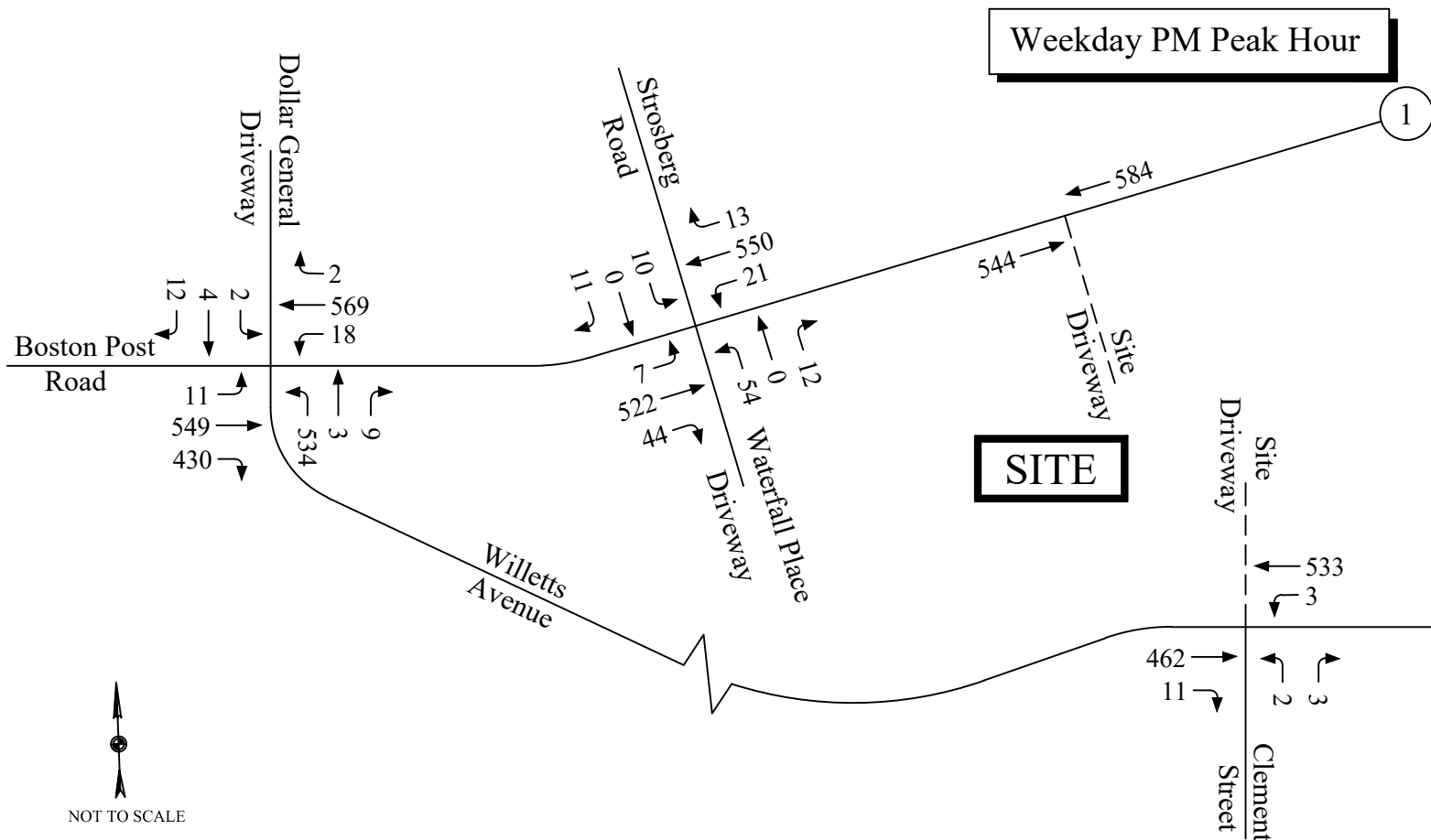
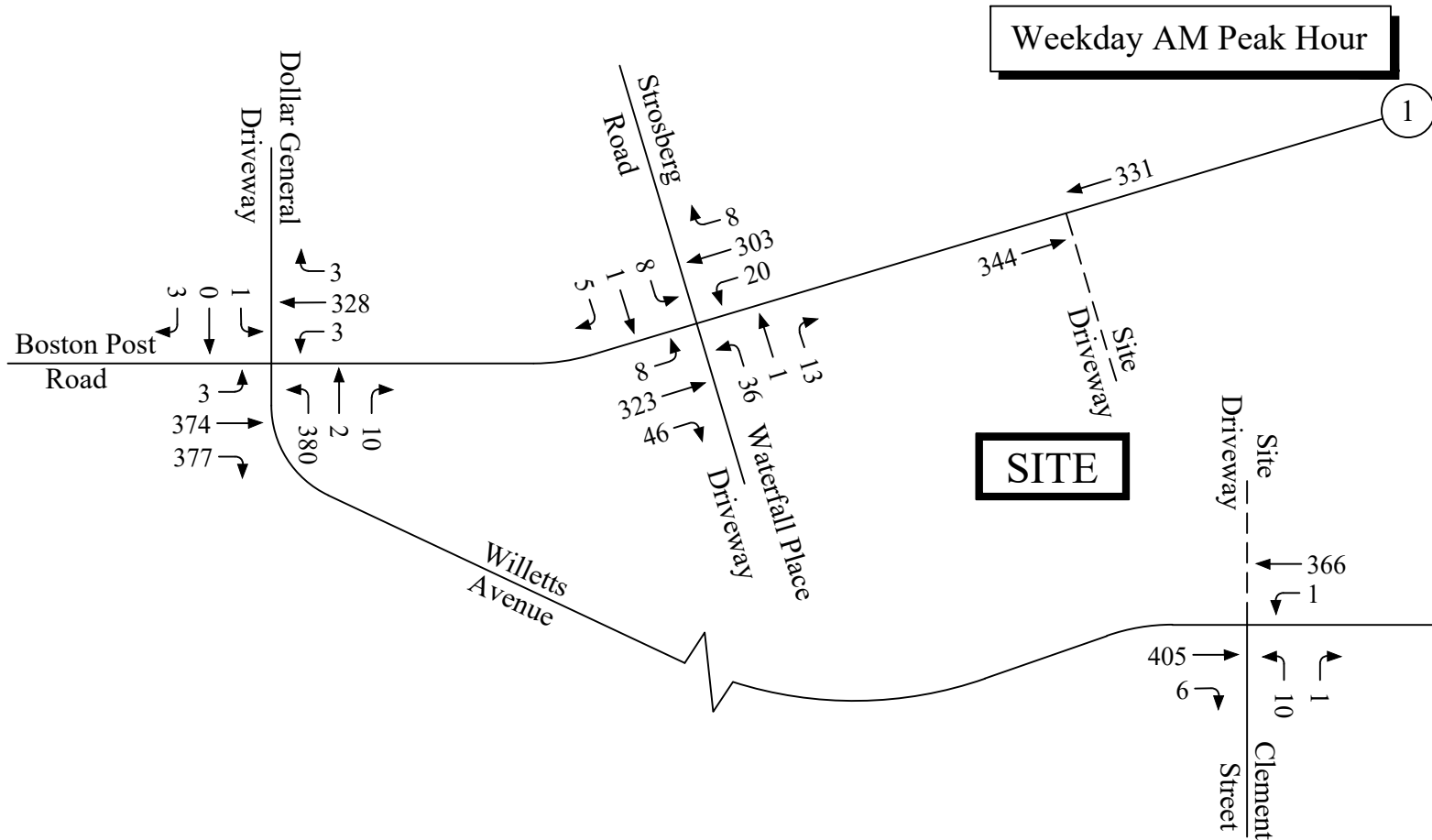


Table 5
Trip Generation Summary

Time Period	Vehicle Trips ^a
Weekday Daily	540
Weekday AM Peak Hour	
Enter	22
<u>Exit</u>	<u>19</u>
Total	41
Weekday PM Peak Hour	
Enter	22
<u>Exit</u>	<u>22</u>
Total	44

^a ITE LUC 311 (All Suites Hotel), 122 rooms.

As summarized in Table 5, the proposed extended stay hotel is expected to generate 540 vehicle trips (270 entering and 270 exiting) on a typical weekday, including 41 vehicle trips (22 entering and 19 exiting) during the weekday AM peak hour, and 44 vehicle trips (22 entering and 22 exiting) during the weekday PM peak hour.

Trip Distribution

Trip distribution patterns for the project were determined based on a review of traffic patterns along area roadways serving the site. Primary access to the project will be provided via a new driveway onto Boston Post Road, with secondary access provided via a rear access driveway onto Willetts Avenue, opposite Clements Street. Specifically, 70 percent of project-generated traffic is expected to arrive and depart via Boston Post Road, with 35 percent oriented to and from the east, and 35 percent oriented to and from the west. The remaining 30 percent is expected to arrive and depart via Willetts Avenue, including 15 percent to and from the east, and 15 percent to and from the west.

Build Conditions

Based on the traffic generation and distribution estimates for this project, additional traffic expected to be generated by the project were assigned to the roadway network as shown on Figure 4, with the 2025 Build peak hour traffic volumes graphically depicted on Figure 5.

Figure 4
Project Generated Traffic
Peak Hour Traffic Volumes

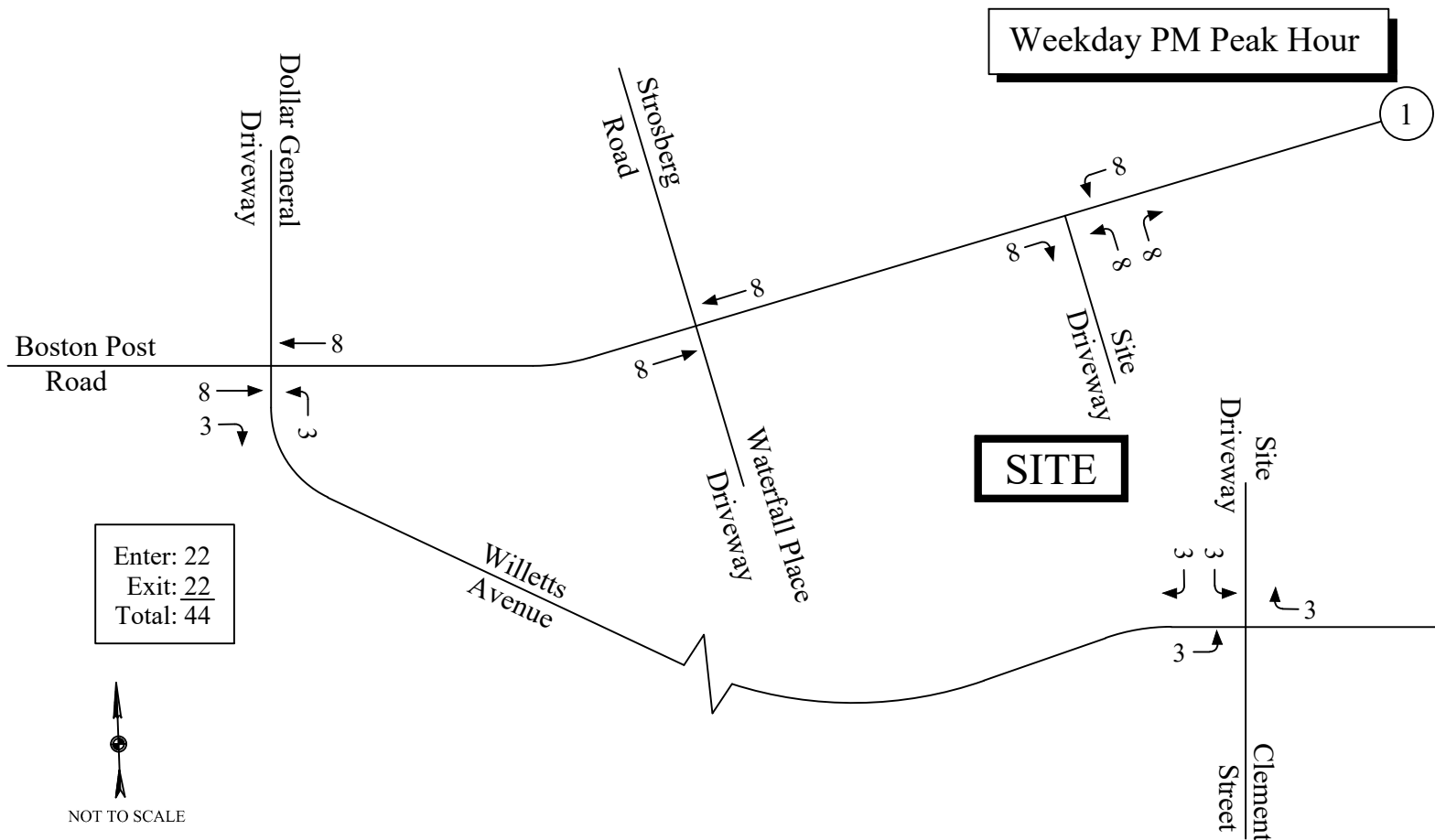
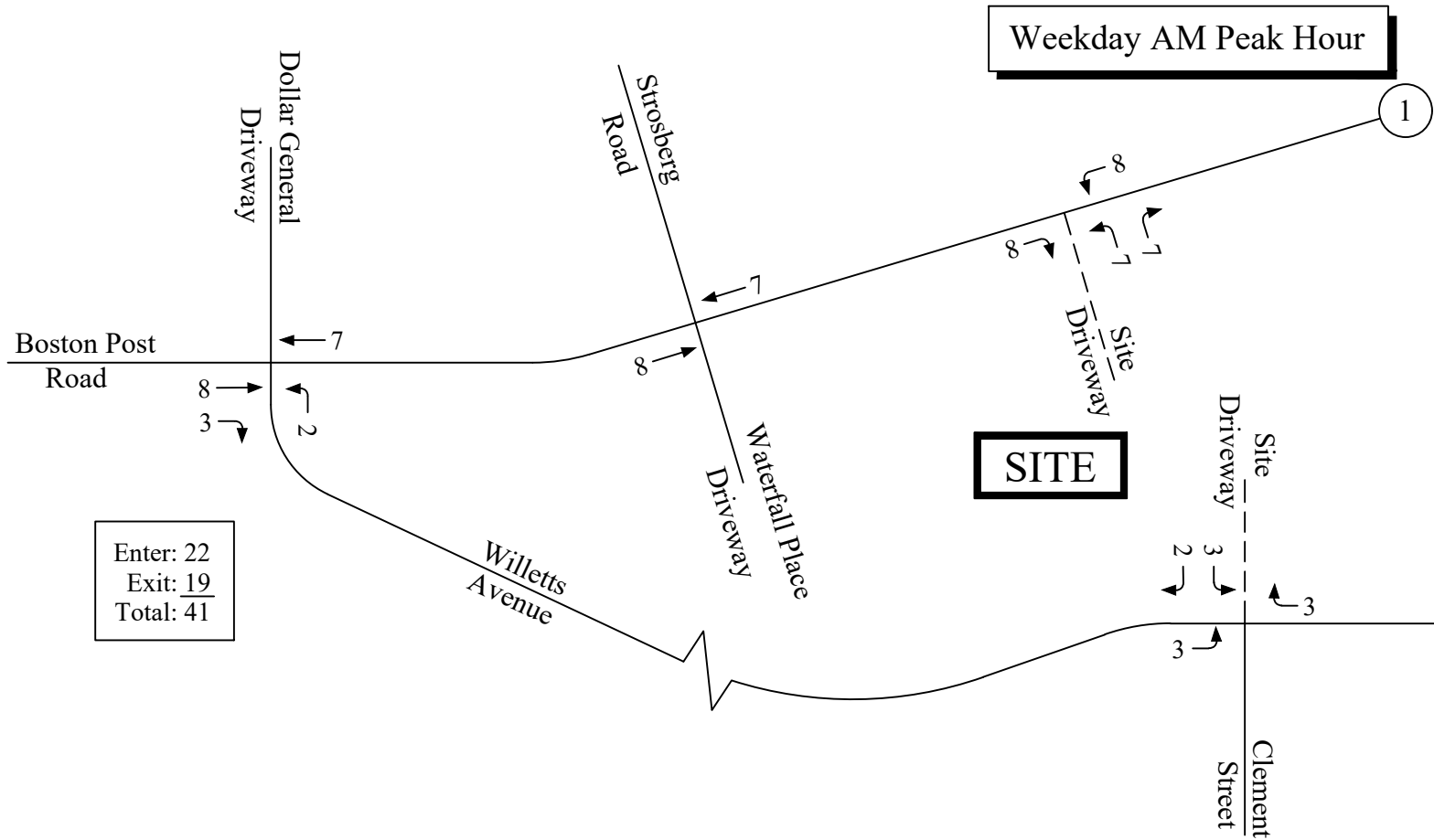
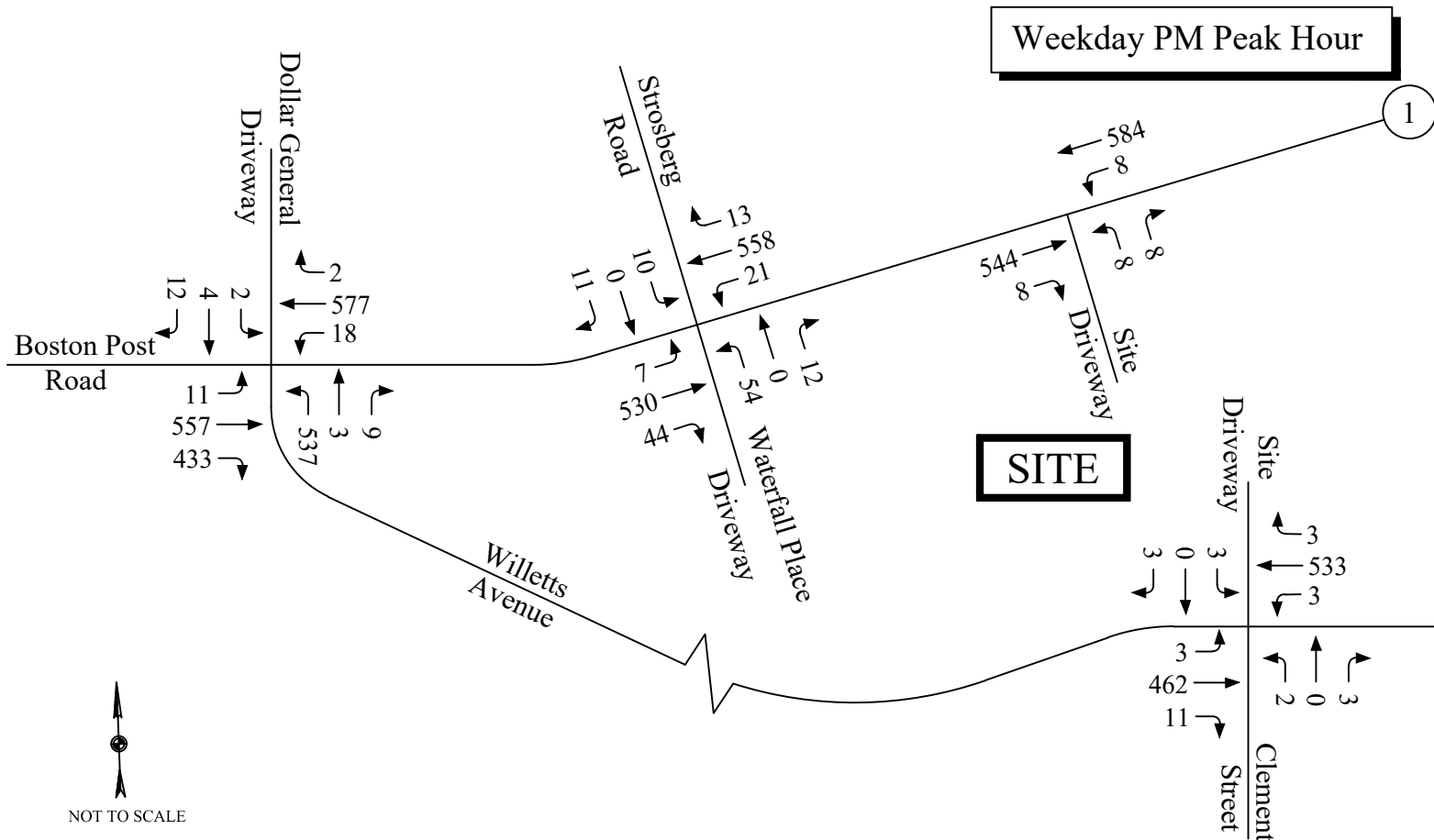
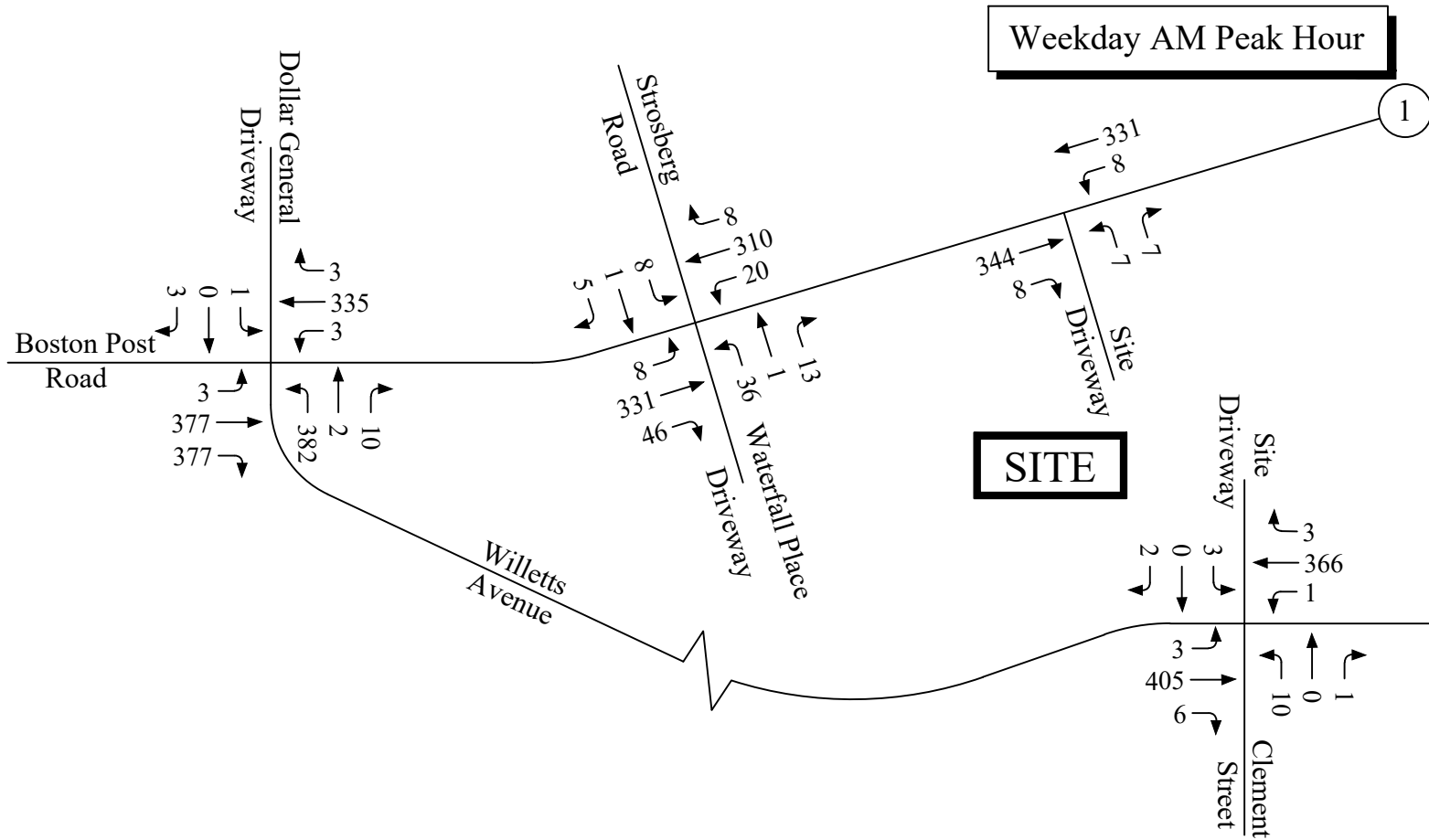


Figure 5
2025 Build Peak Month
Peak Hour Traffic Volumes



Traffic Increases

The greatest increases in traffic are expected to occur along segments of Boston Post Road, west of Willetts Avenue. During peak hours of roadway traffic, total increases are projected to amount to 20 to 22 new vehicle trips per hour, or approximately one new vehicle trip every three minutes. This level of traffic represents an approximate 1 to 2 percent increase in traffic as compared to future No-Build conditions, which is not expected to result in a notable impact to area traffic operations.

Site Access, Circulation and Parking

Access to the project is proposed via two new driveways. The primary access driveway will intersect the southern side of Boston Post Road, with secondary access via a new driveway onto Willetts Avenue, opposite Clements Street. It is recommended that both driveways provide a minimum of 24-feet in width to provide a 12-foot entering and 12-foot exiting lane. A painted double-yellow centerline should be installed to separate inbound and outbound traffic flows, with a STOP-sign (MUTCD R1-1) and painted stop line provided at the termini of both driveways. Corner radii at the proposed driveways should be 30-feet, or the minimum required to accommodate both delivery and emergency vehicle access to the project.

The project proposes to provide a total of 131 parking spaces to serve the project. Based on parking demand data published by the ITE for LUC 311 – All Suites Hotel, the weekday peak demand for the project amounts to 94 spaces, with the peak weekend demand, which would occur on a Saturday, amounting to 111 spaces. As such, the proposed parking supply is sufficient to accommodate the peak demand for the proposed hotel. It is noted that the parking demand projections represent full occupancy at the hotel. During periods when there are vacancies the associated demand would be lower.

CAPACITY ANALYSIS

Level-of-service (LOS) analyses were conducted at the study area intersections under existing and projected volume conditions to determine the effect that the additional site-generated traffic will have on traffic operations. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual*⁴ (HCM) and is described in the Appendix. For signalized intersections, the maximum back of queue during an average signal cycle and a 95th percentile signal cycle was calculated for each lane group during the peak periods studied. The back of queue is the length of a backup of vehicles from the stop line of a signalized intersection to the last car in the queue that is required to stop, regardless of the signal indication. The length of this queue depends on a number of factors including signal timing, vehicle arrival patterns, and

⁴ *Highway Capacity Manual 2010*; Transportation Research Board; Washington, DC; 2010.

the saturation flow rate. For unsignalized intersections, the 95th percentile queue represents the length of queue of the critical minor-street movement that is not expected to be exceeded 95 percent of the time during the analysis period (typically one hour). The queue length is a function of the capacity of the movement and the movement's degree of saturation.

The Synchro analysis program was used for all capacity analyses. Existing parameters were obtained from observations made in the field during peak times. The level-of-service and queue results for signalized and unsignalized intersections are presented in Tables 6 and 7, respectively and are discussed below. All analysis worksheets are provided in the Appendix.

Table 6
Signalized Intersection Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2023 Existing					2025 No-Build					2025 Build ^f				
	V/C ^a	Delay ^b	LOS ^c	50 Q ^d	95 Q ^e	V/C	Delay	LOS	50 Q	95 Q	V/C	Delay	LOS	50 Q	95 Q
Boston Post Road at Willetts Avenue and Dollar General Driveway															
<i>Weekday AM Peak Hour</i>															
EB Left/Thru	0.53	14.7	B	59	216	0.51	12.9	B	50	205	0.52	13.1	B	52	210
EB Right	0.25	0.5	A	0	9	0.27	0.6	A	0	9	0.27	0.6	A	0	9
WB All	0.29	10.7	B	27	87	0.28	9.4	A	23	83	0.29	9.4	A	24	85
NB All	0.52	15.2	B	58	223	--	--	--	--	--	--	--	--	--	--
NB Left	--	--	--	--	--	0.36	14.6	B	31	133	0.36	14.6	B	32	134
NB Thru/Right	--	--	--	--	--	0.33	13.3	B	29	127	0.33	13.3	B	29	128
SB Left	0.01	27.0	C	0	4	0.01	24.0	C	0	4	0.01	24.0	C	0	4
SB Thru/Right	0.01	0.0	A	0	0	0.01	0.0	A	0	0	0.01	0.0	A	0	0
Overall	--	10.3	B	--	--	--	9.3	A	--	--	--	9.3	A	--	--
<i>Weekday PM Peak Hour</i>															
EB Left/Thru	0.77	26.1	C	188	447	0.71	21.6	C	130	462	0.72	22.1	C	133	471
EB Right	0.30	0.7	A	0	11	0.32	0.8	A	0	11	0.32	0.8	A	0	11
WB All	0.44	15.2	B	88	164	0.41	13.0	B	61	170	0.42	13.2	B	62	173
NB All	0.75	26.9	C	175	408	--	--	--	--	--	--	--	--	--	--
NB Left	--	--	--	--	--	0.52	21.4	C	84	188	0.52	21.4	C	85	188
NB Thru/Right	--	--	--	--	--	0.49	20.0	B	82	183	0.50	20.0	B	82	184
SB Left	0.01	32.0	C	1	8	0.02	30.8	C	2	11	0.01	31.0	C	2	11
SB Thru/Right	0.10	19.9	B	2	18	0.09	19.6	B	2	18	0.09	19.8	B	2	18
Overall	--	18.2	B	--	--	--	14.8	B	--	--	--	15.0	B	--	--

^a Volume-to-capacity ratio.

^b Average control delay in seconds per vehicle.

^c Level of service.

^d 50th percentile queue in feet, assuming 25 feet per vehicle.

^e 95th percentile queue in feet, assuming 25 feet per vehicle.

Table 6 (Continued)
Signalized Intersection Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2023 Existing					2025 No-Build					2025 Build				
	V/C ^a	Delay ^b	LOS ^c	50 Q ^d	95 Q ^e	V/C	Delay	LOS	50 Q	95 Q	V/C	Delay	LOS	50 Q	95 Q
Boston Post Road at Strosberg Road and Waterfall Place Driveway															
<i>Weekday AM Peak Hour</i>															
EB Left/Thru	0.26	3.1	A	0	54	0.27	3.2	A	0	57	0.28	3.2	A	0	59
EB Right	0.04	1.5	A	0	6	0.04	1.5	A	0	6	0.04	1.5	A	0	6
WB Left	0.03	3.0	A	0	6	0.03	3.0	A	0	6	0.03	3.0	A	0	6
WB Thru/Right	0.22	2.9	A	0	50	0.23	2.9	A	0	52	0.24	2.9	A	0	54
NB Left/Thru	0.10	9.8	A	5	17	0.10	9.9	A	5	17	0.10	10.1	A	5	18
NB Right	0.04	5.4	A	0	6	0.04	5.5	A	0	6	0.04	5.5	A	0	6
SB All	0.08	8.2	A	2	6	0.08	8.4	A	2	6	0.08	8.4	A	2	6
Overall	--	3.5	A	--	--	--	3.5	A	--	--	--	3.5	A	--	--
<i>Weekday PM Peak Hour</i>															
EB Left/Thru	0.44	4.6	A	54	114	0.44	4.6	A	54	114	0.45	4.7	A	55	122
EB Right	0.04	1.3	A	0	6	0.04	1.3	A	0	6	0.04	1.3	A	0	6
WB Left	0.4	3.3	A	1	7	0.04	3.3	A	1	7	0.04	3.2	A	2	7
WB Thru/Right	0.43	4.5	A	55	120	0.43	4.5	A	55	120	0.45	4.6	A	60	130
NB Left/Thru	0.19	15.4	B	13	36	0.19	15.4	B	13	36	0.20	16.2	B	13	38
NB Right	0.04	7.2	A	0	9	0.04	7.2	A	0	9	0.04	7.5	A	0	9
SB All	0.13	10.5	B	4	10	0.13	10.5	B	4	10	0.13	11.0	B	4	11
Overall	--	5.1	A	--	--	--	5.1	A	--	--	--	5.1	A	--	--

^a Volume-to-capacity ratio.

^b Average control delay in seconds per vehicle.

^c Level of service.

^d 50th percentile queue in feet, assuming 25 feet per vehicle.

^e 95th percentile queue in feet, assuming 25 feet per vehicle.

Table 7
Unsignalized Intersection Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2023 Existing				2025 No-Build				2025 Build			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Willetts Avenue at Clements Street and Site Drive												
<i>Weekday AM Peak Hour</i>												
EB All	0.00	0.0	A	0	0.00	0.0	A	0	0.00	0.0	A	0
WB All	0.00	0.0	A	0	0.00	0.0	A	0	0.00	0.0	A	0
NB All	0.04	15.2	C	0	0.05	16.1	C	0	0.06	18.5	C	0
SB All	--	--	--	--	--	--	--	--	0.02	15.4	C	0
<i>Weekday PM Peak Hour</i>												
EB All	0.00	0.0	A	0	0.00	0.0	A	0	0.00	0.0	A	0
WB All	0.00	0.0	A	0	0.00	0.0	A	0	0.00	0.0	A	0
NB All	0.03	14.3	B	0	0.03	15.1	C	0	0.04	16.9	C	0
SB All	--	--	--	--	--	--	--	--	0.02	18.6	C	0
Boston Post Road at Site Drive												
<i>Weekday AM Peak Hour</i>												
WB All	-	-	-	-	-	-	-	-	0.01	0.20	A	0
NB All	-	-	-	-	-	-	-	-	0.03	12.8	B	0
<i>Weekday PM Peak Hour</i>												
WB All	-	-	-	-	-	-	-	-	0.01	0.10	A	0
NB All	-	-	-	-	-	-	-	-	0.06	19.0	C	0

^a Volume-to-capacity ratio.

^b Average control delay in seconds per vehicle.

^c Level of service.

^d 95th percentile queue in feet, assuming 25 feet per vehicle.

As shown in Table 6, under 2023 Existing conditions, the signalized intersection of Boston Post Road with Willetts Avenue currently operates at an overall LOS B during the weekday AM and weekday PM peak hours. Under 2025 No-Build conditions, following the implementation of roadway geometric and traffic signal improvements by others, reductions in vehicle delay are noted at this location with operations at an overall LOS A to B during the weekday AM and PM peak hours, respectively. Under 2025 Build conditions, this location is projected to continue to operate at an overall LOS A to B, with overall delays increasing by less than one second as compared to future No-Build conditions.

Under 2023 Existing conditions the intersection of Boston Post Road with Strosberg Road and the Waterfall Place driveway currently operates at LOS A, and is projected to continue to operate at

LOS A under future 2025 No-Build and Build conditions, with project-related traffic resulting in no notable change to traffic operations.

As summarized in Table 7, under 2023 Existing conditions, northbound traffic on Clements Street, at its intersection with Willetts Avenue currently operates at LOS C during both the weekday AM and weekday PM peak hours, with mainline traffic on Willetts Avenue operating at LOS A. Under future 2025 No-Build conditions, northbound traffic on Clements Street is projected to continue to operate at LOS C during both peak periods, with mainline traffic volumes continuing to operate at LOS A. Under future 2025 Build conditions, both the Clements Street northbound approach and proposed site driveway southbound approach are projected to operate at LOS C during both the weekday AM and weekday PM peak hours, with mainline traffic on Willet Avenue continuing to operate at LOS A. Queuing on both minor street approaches is projected to be minimal, amounting to less than one vehicle on average.

Under 2025 Build conditions, the proposed site drive approach to Boston Post Road is projected to operate at LOS C or better during both the weekday AM and weekday PM peak hours, with mainline traffic volumes along Boston Post Road operating at LOS A during both peak periods.

CONCLUSIONS

Existing and future conditions at the study area intersections have been described and analyzed with respect to traffic operations and the impact of the proposed project. Conclusions of this effort and recommendations are presented below.

- The project entails the development of a 122-room hotel, that will provide a total of 131 on-site parking spaces.
- Access to the facility is proposed by way of two new unsignalized driveways, a primary driveway onto Boston Post Road, with secondary local access provided via Willetts Avenue.
- The proposed parking supply is adequate to meet the peak parking demand for the facility on both a weekday and weekend.
- The proposed hotel is expected to generate 540 vehicle trips (270 entering and 270 exiting) on a typical weekday, including 41 vehicle trips (22 entering and 19 exiting) during the weekday AM peak hour, and 44 vehicle trips (22 entering and 22 exiting) during the weekday PM peak hour.
- In general, it is expected that 70 percent of project-related traffic will arrive and depart via Boston Post Road, with the remaining 30 percent utilizing the Willetts Avenue driveway. Approximately half of the entering and exiting traffic at each driveway location are expected to travel east and west along Route 1 and Willetts Avenue, respectively.

- Traffic increases are expected to be greatest along the segment of Boston Post Road, west of Willetts Avenue, where increases are expected to amount to approximately 1 new vehicle trip every three minutes.
- Under future 2025 Build conditions, following implementation of roadway improvements by others, all signalized study area locations are projected to operate at acceptable LOS B or better conditions, with project-related traffic increases resulting in minimal impacts to traffic operations or vehicle queuing.
- Following the removal of existing vegetation, the proposed site access driveways onto both Boston Post Road and Willetts Avenue will provide sight lines that well exceed the minimum required SSD in both the eastbound and westbound directions.
- It is recommended that any proposed landscaping or signs in the vicinity of the driveways be kept low to the ground (less than 2 feet above street level) or set back sufficiently so as not to impede sight distances for drivers exiting the site.

With implementation of the recommended mitigation measures, safe and efficient access will be provided to the proposed extended stay hotel, with minimal impact expected to area traffic operations.