

Traffic Impact Study
Locust Avenue Parking Structure

New Canaan, Connecticut
August 19, 2016

Prepared for:
Mr. Joe Zagarenski
Senior Engineer
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77 Main Street
New Canaan, Connecticut 06840

MMI #2626-06-01

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**RE: Traffic Impact Study
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Dear Mr. Zagarenski:

At your request, we have conducted a traffic study in connection with the proposed Locust Avenue parking structure to be located above the existing Locust Avenue municipal parking lot in the town of New Canaan. The existing parking lot of 153 parking spaces is to be decked with a second level of parking. The preliminary design of the parking structure will include two separate vehicle driveways, one at the existing Locust Avenue driveway location and a second new driveway location at Heritage Hill Road for the new upper level of parking, with a total of 242 parking spaces but no internal ramp between the two levels of parking. Figure 1 shows the site location. The scope of work consisted of a number of tasks, including field reconnaissance, review of existing conditions data, estimation of site-generated traffic, pedestrian circulation associated with the proposed parking deck, and analysis of future intersection traffic operations at and near the site.

Site Environs

The site is located north of Main Street between Heritage Hill Road to the west and Locust Avenue to the east in the town of New Canaan.

Main Street is classified as an urban principal arterial east of Locust Avenue and as an urban minor arterial west of Heritage Hill Road by the Connecticut Department of Transportation (CTDOT). This roadway runs northwest-southeast and is characterized by one travel lane in each direction with dedicated turn lanes at major intersections. On-street parking is allowed east of Locust Avenue, with sidewalks present on both sides of Main Street in the vicinity of the site. The posted speed limit on Main Street is 25 miles per hour (mph). Land use along this roadway is mostly offices and restaurants east of Locust Avenue and residential west of Heritage Hill Road.

Locust Avenue is classified as an urban principal arterial between Main Street and Forest Street and as an urban collector east of Forest Street by CTDOT. Locust Avenue is a two-lane roadway (one lane in each direction) with a posted speed limit of 25 mph. On-street parking is allowed on the south side of the roadway. Land use on Locust Avenue includes a municipal parking lot, restaurants, shops, and a future post office (currently under construction).

Heritage Hill Road is a town-maintained local roadway. Heritage Hill Road has one travel lane in each direction with a posted speed limit of 30 mph. Land use along Heritage Hill Road is mostly residential.

For the purpose of this traffic study, the following intersections were included in the study area:

- Main Street at Heritage Hill Road/Locust Avenue (signalized)
- Locust Avenue at the existing Locust Avenue parking lot driveway (stop sign controlled)
- Heritage Road at the proposed Locust Avenue parking deck driveway (stop sign controlled)

Existing Traffic Volumes

Average Daily Traffic (ADT) data at the nearest CTDOT traffic monitoring stations was obtained during this study. Table 1 summarizes two-way ADT at these locations near the study area from 2008 to 2014. The data indicates that there was a slight increase in traffic volumes on Main Street (Route 124) northwest of Heritage Hill Road from 9,100 daily vehicles in 2008 to 10,100 daily vehicles in 2014. The traffic volumes on Main Street northwest of Route 106 decreased from 7,900 vehicles per day in 2008 to 6,400 vehicles per day in 2014. The traffic volumes on Locust Avenue west of Forest Street remain consistent between 2008 and 2014. The ADT data from CTDOT is enclosed in Appendix A of this report.

**TABLE 1
 CTDOT Two-Way ADT Volumes**

LOCATION	CTDOT STATION NO.	YEAR	AVERAGE DAILY TRAFFIC (NUMBER OF VEHICLES)
Route 124, Northwest of Heritage Hill Road	45	2014	10100
		2011	9000
		2008	9100
Route 124, Northwest of Route 106	43	2014	6400
		2011	6100
		2008	7900
Locust Avenue, West of Forest Street	2044	2014	5000
		2011	5600
		2008	5000

To supplement the data obtained from CTDOT, manual turning movement counts were conducted on Thursday, April 28, 2016, from 7:00 a.m. to 8:00 p.m. at the intersections of Main Street at Heritage Hill Road/Locust Avenue and Locust Avenue at the existing Locust Avenue parking lot driveway. Pedestrians and bicyclists were counted at the intersection of Main Street at Heritage Hill Road and Locust Avenue at the same time. The weekday morning peak hour occurred from 8:15 a.m. to 9:15 a.m. while the weekday afternoon peak hour occurred from 5:00 p.m. to 6:00 p.m. The turning movement counts collected by Milone & MacBroom, Inc. (MMI) were compared with the latest CTDOT data and determined to be consistent with each other during peak periods. These counts are provided in Appendix B of this report.

Figure 2 illustrates the 2016 existing weekday morning and afternoon peak-hour traffic volumes at the study intersections.

Accidents

Information on traffic accidents on Main Street from 100' west of Heritage Hill Road to 100' east of Locust Avenue was obtained from CTDOT for the latest 3-year period, January 1, 2012 through December 31, 2014. The accident data is shown in Table 2, summarized by location, accident severity, and collision type. The data is also enclosed in Appendix C of this report.

**TABLE 2
 Accident Data Summary**

LOCATION: MAIN STREET	ACCIDENT SEVERITY			TYPE OF COLLISION			
	INJURY	PROPERTY DAMAGE	TOTAL	REAR-END	PEDESTRIAN	PARKING	TOTAL
At Heritage Hill Road	0	2	2	2	0	0	2
At Locust Avenue	2	0	2	0	2	0	2
East of Locust Avenue up to 100'	1	2	3	0	1	2	3
TOTAL	3	4	7	2	3	2	7

Source: Connecticut Department of Transportation

In total, seven accidents were reported during the 3-year period (2012 through 2014) on Main Street between Heritage Hill Road and 100' east of Locust Avenue. Two rear-end accidents occurred at the Main Street and Heritage Hill Road intersection. Two pedestrian-related accidents occurred at the Main Street and Locust Avenue intersection. One pedestrian-related accident and two parking-related accidents were reported on Main Street just east of Locust Avenue. All three of the pedestrian-related accidents resulted in injuries. The Town of New Canaan is currently working on traffic signal improvements at the intersection of Main Street at Heritage Hill Road and Locust Avenue via an encroachment permit. New pedestrian signals are to be installed on Locust Avenue and the south leg of Main Street. Pedestrian safety will be significantly improved when the pedestrian signals are in place.

Information on recent traffic accidents for Heritage Hill Road has been requested but not yet received from the Town of New Canaan Police Department. A summary of the accident information will be provided as an addendum once it is provided by the Town of New Canaan.

Proposed Development and Site Access

The proposed development is a parking deck that is to be located above the existing Locust Avenue municipal parking lot in the town of New Canaan. The existing Locust Avenue parking lot contains approximately 153 parking spaces. Motorists who park at this lot must either have a parking permit or pay at a metered parking machine near the parking lot entrance. The existing Locust Avenue parking lot has one access off Locust Avenue, approximately 120' east of the Main Street intersection.

The proposed parking deck will be a second level of parking. There will be no internal ramps between the two levels of parking. The access to the new parking deck will be off Heritage Hill Road north of the Main Street intersection.

The stopping sight distances (SSD) and intersection sight distances (ISD) were reviewed from the location of the site driveway at Heritage Hill Road. Turning speed of 15 mph (based on the default value of the *Synchro* program) has been assumed for vehicles turning from Main Street and Locust Avenue traveling northbound onto Heritage Hill Road while the posted speed limit of 30 mph has been assumed for vehicles traveling southbound on Heritage Hill Road. CTDOT SSD guidelines suggest at least 80' of visibility for the speed of 15 mph (northbound approach) and 200' of visibility for the speed of 30 mph (southbound approach). CTDOT ISD guidelines suggest at least 170' of visibility for the speed of 15 mph (looking left at the driveway location) and 335' of visibility for the speed of 30 mph (looking right at the driveway location). CTDOT ISD for left turns from major roads suggest at least 245' of visibility for the speed of 15 mph (turning left to the site facing northbound traffic on Heritage Hill Road). Based on the above sight distances requirements, the location of the site driveway has been examined and illustrated on Figure 3.

As shown on Figure 3, the Point "A" driveway is the currently proposed location located at the southernmost property right-of-way point. At this location, the available SSD exceeds the CTDOT guidelines for both directions on Heritage Hill Road. The available ISD exceeds the CTDOT guidelines for the speed on Heritage Hill Road looking right (north) onto Heritage Hill Road but is short by 40' looking left (south) onto Heritage Hill Road.

The Point "B" driveway is located on the northernmost end of the site. At this location, the available SSD exceeds the CTDOT guidelines for both directions on Heritage Hill Road. The available ISD exceeds the CTDOT guidelines for the speed on Heritage Hill Road looking left (south) onto Heritage Hill Road but is short by 50' looking right (north) onto Heritage Hill Road.

The Point "C" driveway is located between Point "A" and Point "B," with the ISD looking left (south) to be 175' and the ISD looking right to be 335'. At this location, the available SSD exceeds the CTDOT guidelines for both directions on Heritage Hill Road. The available ISD exceeds the CTDOT guidelines for both directions on Heritage Hill Road as well.

Site-Generated Traffic

Vehicle trips that may be generated by the proposed development were estimated based on information provided by the Town of New Canaan regarding potential users of the proposed parking deck. The estimation of vehicle trips entering and exiting the site from all types of users is summarized in Table 3. As shown on Table 3, the potential users of the proposed parking deck will include eight town vehicles, 12 town employees, 69 commuters, and 23 business permit holders. The arrival and departure times of all these users is summarized in Table 3. It is estimated that approximately 37 trips will enter the site and eight trips will exit the site during a typical weekday morning peak hour. During the afternoon peak hour, eight trips will enter the site and 37 trips will exit the site. Note that these are considered conservative estimates since arrival and departure times for mostly all of these trips falls outside of the calculated peak hour.

**TABLE 3
 Estimated Site Traffic**

Parking Deck Vehicle Users	Number of Vehicles	Vehicle/User Activities	PEAK-HOUR TRIPS					
			Weekday A.M. (8:15 a.m. to 9:15 a.m.)			Weekday P.M. (5:00 p.m. to 6:00 p.m.)		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Town Vehicles	8	Assume all depart in a.m. peak hour and return in p.m. peak hour	0	8	8	8	0	8
Town Employees	12	Assume half arrive in a.m. peak hour and depart in p.m. peak hour	6	0	6	0	6	6
Commuters	69	Assume one third arrive in a.m. peak hour and depart in p.m. peak hour	23	0	23	0	23	23
Business Permit	23	Assume a quarter arrive in a.m. peak hour and depart in p.m. peak hour	8	0	8	0	8	8
TOTAL	112		37	8	45	8	37	45

The distribution of this peak-hour site traffic through the study area was estimated based on a review of the latest available Census Journey-to-Work (JTW) data as well as the existing traffic network. In general, it is anticipated that 30 percent of the site traffic will be oriented to and from the east via Main Street, 35 percent of the site traffic will be oriented to and from the west via Main Street, 10 percent of the site traffic will be oriented to and from the north via Heritage Hill Road, with the remaining 25 percent of site traffic oriented to and from the northeast via Locust Avenue. Figure 4 shows the site distribution through the study area. Figure 5 shows the anticipated site traffic volumes for the weekday morning and afternoon peak hours, respectively, based on this distribution.

Future Traffic Volumes

Future roadway traffic estimates along the study area were developed without and with the site traffic volumes, background and combined, respectively. Background (no-build) traffic is reflective of roadway conditions prior to the proposed development. Year 2018 is assumed to be the project opening year for

the purpose of this study. The CTDOT Bureau of Policy and Planning was consulted and advised us that an ambient growth rate of 0.5 percent per year should be used to estimate the volume increase between 2016 and 2018. Additionally, it is our understanding that the Town of New Canaan proposed post office is a development that would add to traffic volumes in the vicinity of the site. Vehicle trips that are anticipated to be generated by the proposed post office have been added to develop the background traffic volumes. The background traffic volumes are shown on Figure 6 for the weekday morning and afternoon peak hours, respectively.

The estimated site-generated traffic volumes were then added to the 2018 background traffic to form the future combined (build) traffic volumes. Combined volumes are reflective of roadway traffic conditions with the proposed development in place. Figure 7 depicts the 2018 combined traffic volumes.

Future pedestrian volumes at the intersection of Main Street at Heritage Hill Road and Locust Avenue were also estimated for the combined (build) conditions. As mentioned previously, pedestrian and bicyclist counts were collected on Thursday, April 28, 2016, from 7:00 a.m. to 8:00 p.m. at the intersection of Main Street at Heritage Hill Road and Locust Avenue. It is shown that a total of eight pedestrians crossed this intersection during the weekday morning peak hour (8:15 a.m. to 9:15 a.m.). During the weekday afternoon peak hour (5:00 p.m. to 6:00 p.m.), a total of 22 pedestrians crossed this intersection. The new pedestrian volumes to be generated by the proposed parking deck were estimated based on the site-generated vehicle trips. As discussed in the previous section of the report, the site will generate approximately 37 vehicle trips entering the site during the weekday morning peak hour and eight vehicle trips entering the site during the weekday afternoon peak hour, respectively. As the majority of the proposed parking deck users will be town vehicles, town employees, commuters, and a few business permit holders, we are assuming that all of the drivers who enter the site during the weekday morning or afternoon peak hour will walk out of the site and cross the intersection of Main Street at Heritage Hill Road and Locust Avenue to their destinations. It is also assumed that there will be one pedestrian per vehicle for our analysis. In such a case, the site will generate a total of 37 pedestrian trips during the weekday morning peak hour and eight pedestrian trips during the weekday afternoon peak hour. The estimated site-generated pedestrian volumes were added to the 2016 existing pedestrian volumes to form the future combined (build) pedestrian volumes.

Traffic Capacity Analysis

The study intersections were evaluated by means of capacity analysis techniques comparing the background and combined traffic volume conditions. Levels of Service (LOS) were determined, which are qualitative measures of the efficiency of operations in terms of delay and inconvenience to motorists. A description of the various LOS designations, A through F, is given in Appendix D of the report. LOS A describes operations with very low average control delay per vehicle while LOS F describes operations with long average delays. LOS D is generally considered acceptable in most urban communities. The analysis worksheets are enclosed in Appendix E of the report. Table 4 summarizes the findings of future LOS at the study intersections without (background conditions) and with (combined conditions) the estimated site traffic generated by the proposed development. Based on the analysis, the addition of the new trips generated by the proposed development is expected to have a minimal impact on the study intersections. All movements operate at a peak hour LOS D or

better during both time periods under existing conditions and are expected to remain as such under future conditions with the exception of the signalized southbound right-turn movement from Heritage Hill Road and the southwest shared left/right movement on Locust Avenue during the morning peak hour. However, a minor timing adjustment of reallocating 1 second from phase 2 (Main Street eastbound/westbound movements) to phase 4 (Heritage Hill Road southbound movements) could make these two movements maintain LOS D as they do today.

TABLE 4
Capacity Analysis Summary

MOVEMENTS	WEEKDAY MORNING PEAK HOUR		WEEKDAY AFTERNOON PEAK HOUR	
	BACKGROUND	COMBINED	BACKGROUND	COMBINED
SIGNALIZED				
Main Street (EB/WB) at Heritage Hill Road (NB/SB) and Locust Avenue (NE/SW)				
Eastbound Left	C	D	C	C
Eastbound Through	C	C	B	B
Westbound Through	C	D	C	C
Westbound Right	A	A	A	A
Southbound Left	C	D	D	D
Southbound Right	D	E (D)	D	D
Southwest Left/Right	D	E (D)	D	D
OVERALL	C	D	C	C
UNSIGNALIZED				
Locust Avenue (EB/WB) at Existing Site Driveway (NB/SB)				
Eastbound Left	A	A	A	A
Southbound Left	B	B	B	B
Heritage Hill Road (NB/SB) at Proposed Site Driveway (EB/WB)				
Westbound Left	--	B	--	B
Southbound Left	--	A	--	A

() with minor timing adjustment

Pedestrian Circulation Analysis

The proposed parking deck is located in the central area within the town of New Canaan. As mentioned previously, the majority of the potential users of the parking deck will be walking to and from the town hall, train station, local offices, and shops, which are all within a quarter mile walking distance from the proposed parking deck.

Sidewalks are present on Main Street, Heritage Hill Road, and Locust Avenue in the vicinity of the site. Pedestrian signals and crosswalks are present on Heritage Hill Road and the north leg of Main Street. Crosswalks were recently installed on Locust Avenue and the south leg of Main Street. New pedestrian signals are to be installed on Locust Avenue and the south leg of Main Street. The existing hand/man pedestrian signals will be replaced with new countdown pedestrian signals. The existing pedestrian pushbuttons and sign housings will also be replaced by the regulatory CTDOT sign #31-0845 to reflect

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the countdown timings. All of these signal improvements will help facilitate pedestrian crossings and improve pedestrian safety at the intersection.

In addition, to comply with Americans with Disabilities Act (ADA) standards, audible pedestrian pushbuttons are to be installed on Locust Avenue and the south leg of Main Street. The audible WALK indication provides a clear cue to the beginning of the pedestrian phase. Pedestrians who are blind or who have low vision will be able to listen for the WALK indication.

Summary and Conclusion

Based on this study, we have found that the proposed development can be accommodated from a traffic standpoint. The addition of the new trips generated by the proposed parking deck is expected to have a minimal impact on the study intersections. Minor signal timing adjustment could be suggested to CTDOT at the intersection of Main Street at Heritage Hill Road and Locust Avenue in the morning after the new parking deck is opened and operational. SSD and ISD at the proposed site driveway on Heritage Hill Road were reviewed, and it was found that Point "C" (illustrated on Figure 3 – approximately midway along the Heritage Hill Road frontage) meets all of the CTDOT sight distance requirements for the anticipated traveling speeds. Pedestrian signals and audible pedestrian pushbuttons are being installed on Locust Avenue and the south leg of Main Street by the Town of New Canaan in order to better facilitate pedestrian crossing and improve pedestrian safety.

We hope this report is useful to you and the Town of New Canaan in assessing the traffic aspects of this development. If you have any questions or need any further information, please do not hesitate to contact either of the undersigned.

Very truly yours,

MILONE & MACBROOM, INC.

David G. Sullivan, P.E., Associate
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Enclosures

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