



March 24, 2022

Ref: 20908.00

Mr. Dusan Peric
Paramount Development, LLC
2 N. Tamiami Trail, 800
Sarasota, FL 34236

Re: Traffic Impact Evaluation, Wilton Mall Re-development, Town of Wilton, NY

Dear Mr. Peric:

VHB Engineering, Surveying, Landscape Architecture and Geology, PC (VHB) has conducted a traffic impact evaluation to assess the potential traffic impacts associated with the re-development of retail space on the Wilton Mall property with residential units located in the Town of Wilton, New York. The proposed Concept Plan, prepared by The LA Group, P.C. is included as Attachment A.

This letter includes an evaluation of the existing traffic operations and future conditions with and without construction of the proposed project. As detailed herein, the proposed project is expected to have minimal impact on local traffic operations.

Site Location and Proposed Development

The 14.5±-acre project site, as shown in Figure 1, is located on the easterly side of the Wilton Mall property, south of NY Route 50 in the Town of Wilton, New York. The proposed project includes demolition of the currently vacant Bon Ton department store at the east end of the Wilton Mall and construction of four apartment buildings containing 296 apartment units and 86 townhouse units and includes reconfiguration of parking and access to parking at the east end of the mall property. Phase one proposes the construction of the four buildings consisting of 296 apartment units and Phase two consists of the 86 townhouse units. The project is anticipated to be fully constructed in 2024. General access to the site will be provided via the existing driveways to Wilton Mall. Direct access to the residential units is proposed via the existing Wilton Mall ring road with the four full movement access driveways operating under stop control. Two driveways will provide access to the 296-unit apartment buildings on the west side of Wilton Mall Road and two driveways will provide access to the 86 townhouse units on the east side of Wilton Mall Road. This study evaluates the potential impacts for full construction of the project.

Existing Conditions

Based on a review of the study area and magnitude of traffic generated by the project and consultation with the Town of Wilton, the traffic study includes an evaluation of the NY Route 50 at South Wilton Mall Driveway/The Shoppes at Wilton Driveway, NY Route 50 at North Wilton Mall Driveway/Lowes Drive and Loudon Road at Wilton Mall Driveway, as shown in Figure 1. The following section provides a description of the existing study area roadway and intersection characteristics.



NY Route 50

NY Route 50 is classified as an urban minor arterial that generally provides north-south travel throughout Saratoga County. At the project site, the roadway travels in northeast-southwest direction. For the purposes of this study, NY Route 50 is identified as an east-west roadway. Near the project location, NY Route 50 generally provides a 12-foot wide travel lane in each direction with turn lanes at intersections and eight to ten-foot wide paved shoulders on both sides of the roadway. NY Route 50 has a posted speed limit of 40-mph near the project site. There are no sidewalks on NY Route 50 in the vicinity of the project, so pedestrians use the shoulders and bicyclists use the shoulders and/or share the roadway with motorized vehicles. Land use on NY Route 50 near the project site is primarily commercial.

Louden Road

Louden Road is classified as local Town of Wilton roadway that generally provides east-west travel between NY Route 50 to the west and NY Route 29 to the east. Near the project site, Loudon Road provides an 11-foot wide travel lane in each direction with two to three-foot wide paved shoulders on both sides of the roadway. Loudon Road has a posted speed limit of 45-mph near the project site and is posted with an eight-ton weight limit. There are no sidewalks on Loudon Road near the project, so pedestrians use the shoulders and bicyclists use the shoulders and/or share the roadway with motorized vehicles. Land use on Loudon Road near the project site is primarily commercial or undeveloped.

Wilton Mall Road

Wilton Mall Road surrounds the Wilton Mall and provides access to parking for the Wilton Mall and the out parcels. Wilton Mall Road provides one 12-foot wide travel lane in the clockwise direction and two 12-foot wide travel lanes in the counter-clockwise direction. The posted speed limit is 15-mph. There are no sidewalks on Wilton Mall Road but there is a multi-use path from Loudon Road to the south side of the proposed project on the east side of Wilton Mall Road. Land use at the Wilton Mall is a mix of retail, restaurant, office, and health and fitness.

NY Route 50 at South Wilton Mall Driveway/The Shoppes at Wilton Driveway

The NY Route 50 at South Wilton Mall Driveway/The Shoppes at Wilton Driveway intersection is a four-leg signalized intersection. The NY Route 50 eastbound approach provides a left-turn lane, a through lane, and a right-turn lane. The NY Route 50 westbound approach provides a left-turn lane and a shared through/right-turn lane. The South Wilton Mall Driveway northbound approach is a divided roadway providing a shared left-turn/through lane and a right-turn lane. The Shoppes at Wilton Driveway southbound approach provides a left-turn lane and a shared through/right-turn lane. Marked crosswalks and pedestrian countdown timers, signals, and pushbuttons are provided on the westbound and northbound approaches.

NY Route 50 at North Wilton Mall Driveway/Lowes Drive

The NY Route 50 at North Wilton Mall Driveway/Lowes Drive intersection is a four-leg signalized intersection. The NY Route 50 eastbound approach provides a left-turn lane and a shared through/right-turn lane. The NY Route 50 westbound approach provides a left-turn lane, a through lane, and a right-turn lane. The North Wilton Mall Driveway northbound approach is a divided roadway that provides a left-turn lane and a shared through/right-turn lane. The Lowes Drive southbound approach provides a left-turn lane and a shared through/right-turn lane. Marked



crosswalks and pedestrian countdown timers, signals, and pushbuttons are provided on the eastbound and northbound approaches.

Louden Road at Wilton Mall Driveway

The Loudon Road at Wilton Mall Driveway intersection is a three-leg unsignalized intersection with the southbound Wilton Mall driveway approach operating under stop control. The Loudon Road eastbound approach provides a left-turn lane and a through lane. The Loudon Road westbound approach provides single lane for shared travel movements. The southbound Wilton Mall Driveway approach provides a left-turn lane and a right-turn lane. No marked crosswalks or additional pedestrian accommodations are provided at the intersection.

Traffic Volumes

Automatic Traffic Recorder (ATR) data collected by the New York State Department of Transportation (NYSDOT) in October 2018 illustrates general traffic volumes in the study area and is summarized in Table 1. The NYSDOT data can be referenced online on the NYSDOT Traffic Data Viewer.

Table 1 Existing Traffic Volume Summary

Location	Daily Volume ^a	Weekday AM Peak Hour			Weekday PM Peak Hour		
		Vol ^b	K Factor ^c	Dir. Dist.	Vol	K Factor	Dir. Dist.
NY Route 50 ^d	12,472	641	5.1%	68% WB	1,194	9.6%	63% EB

Source: NYSDOT data dated October 2018.

a Daily traffic expressed in vehicles per day (vpd).

b Peak hour volumes expressed in vehicles per hour.

c Percent of daily traffic which occurs during the peak hour.

Table 1 shows that NY Route 50 carries 12,472 vehicles per day (vpd) on a typical weekday, with 5.1 percent of the daily traffic occurring during the weekday AM peak hour and 9.6 percent occurring during the weekday PM peak hour. NY Route 50 traffic is heavier in the westbound direction during the weekday AM peak hour and heavier in the eastbound direction during the weekday PM peak hour. Table 1 also shows that the AM peak hour volume is approximately half of the weekday PM peak hour volume which can be expected given the heavy commercial land use in the project area and that these commercial land uses are not typically operational during the weekday AM peak hour. A review of the NYSDOT ATR data also shows that the Saturday midday peak hour volume is lower than the weekday PM peak hour. The volume review shows that the weekday PM peak hour is the critical peak hour of analysis.

Peak hour turning movement counts (TMCs) were conducted at the NY Route 50 at South Wilton Mall Driveway/The Shoppes at Wilton Driveway, NY Route 50 at North Wilton Mall Driveway/Lowes Drive, and Loudon Road at Wilton Mall Driveway on Thursday, March 3, 2022, during the weekday PM peak period from 4:00 to 6:00 p.m. Based on the collected data, the weekday PM peak hour occurred from 4:15 to 5:15 p.m. at the NY Route 50 intersections and from 4:30 to 5:30 p.m. at the Loudon Road intersection.

Traffic counts were conducted at a time when traffic volumes could be affected by the COVID-19 Pandemic. To account for potential traffic volume changes, hourly traffic volumes were obtained using an ATR on NY Route 50.



The ATR was installed for a four-day period beginning Thursday, March 3, 2022 through Sunday, March 6, 2022, and coincides with data available from the NYSDOT Traffic Data Viewer that are representative of pre-COVID conditions.

A comparison of the March ATR data with the NYSDOT 2018 ATR data and a comparison of the peak period traffic volumes collected at the NY Route 50 at South Wilton Mall Driveway/The Shoppes at Wilton Driveway intersection as compared to the daily traffic volume data collected by NYSDOT in 2018 indicated that the current turning movement count data is higher than the NYSDOT data during the weekday PM peak period. No COVID-19 adjustment factor was applied to the weekday PM peak hour. The traffic volume count data for the weekday PM peak period is provided in Attachment B. The 2022 Existing PM peak hour traffic volumes are illustrated on Figure 2.

Future Conditions

To determine the impacts of the site-generated traffic volumes near the site, future traffic conditions were evaluated with and without the proposed project. The project is expected to be fully built and occupied in 2024.

Traffic growth on area roadways is a function of the expected land development, environmental activity, and changes in demographics. A frequently used procedure is to identify estimated traffic generated by planned developments that would be expected to affect the project study area roadways. An alternative procedure is to estimate an annual percentage increase and apply that increase to study area traffic volumes. For this evaluation, both procedures were used. The following summarizes this traffic forecasting process.

Historic Growth

Information provided by the Capital District Transportation Committee (CDTC) indicates that traffic volumes on NY Route 50, near the study area are increasing by an annual growth rate of 0.52 percent east of the Lowes Drive and 0.39 percent per year west of Lowes Drive. A growth rate of 0.50 percent for two years was used for this project.

Site Specific Growth

Based on information provided by the Town and VHB's knowledge of proposed projects in the study area, trips associated with the following projects were added to the study area intersections as appropriate:

- › Perry Crossing - Retail development including the construction of a ±6,889 square foot (sf) auto parts store, a ±6,113 sf tire retailer, and a ±2,033 sf bank located on the northwest quadrant of the Perry Road at NY Route 50 intersection.
- › Ingersoll Road Conservation Residential Subdivision - a 41-unit single family home residential subdivision located on Ingersoll Road, northeast of the project site.
- › Wendy's - Conversion of an existing Friendly's restaurant to a Wendy's fast food restaurant located on the southwest quadrant of the NY Route 50 at North Wilton Mall Driveway/Lowes Drive intersection.
- › Forest Grove Residential Subdivision - a 321-unit single family residential development on Putnam Lane northeast of the project site.



No-Build Traffic Volumes

The 2024 No-Build traffic volumes were generated with consideration of the general and site-specific growth described above. The resulting 2024 No-Build PM peak hour traffic volumes are provided on Figure 3 and represent future traffic volumes in the study area prior to development of the proposed project.

Site Generated Traffic Volumes

To estimate the site-generated traffic anticipated at the project site, the Institute of Transportation Engineers' (ITE) publication *Trip Generation, 11th Edition*¹ was utilized. The number of vehicle trips generated by the proposed project at full buildout was estimated based on ITE Land Use Code (LUC) 220 – Multifamily Residential (Low-Rise) and LUC 221 Multifamily Residential (Mid-Rise). The trip generation estimate for the proposed project is summarized in Table 2.

Table 2 Trip Generation Summary

Land Use	Peak Hour								
	Weekday AM			Weekday PM			Saturday Midday		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Multifamily (Mid-Rise) ^a	27	92	119	71	45	116	61	58	119
Multifamily (Low-Rise) ^b	12	38	50	36	22	58	18	17	35
Total	39	130	169	107	67	174	79	75	154

a Trip generation estimate based on ITE LUC 221 – Multifamily Residential (Mid-Rise) for 296 units

b Trip generation estimate based on ITE LUC 220 – Multifamily Residential (Low-Rise) for 86 units.

The proposed project is expected to generate 169 new vehicle trips during the weekday AM peak hour (39 entering and 130 exiting), 174 new vehicle trips during the weekday PM peak hour (107 entering and 67 exiting) and 154 new vehicle trips during the Saturday midday peak hour (79 entering and 75 exiting). It is expected that residents of the proposed project will travel to many of the land uses on the Wilton Mall property like the BJ's Wholesale Club or Planet Fitness. The trip generation estimate and following intersection capacity analyses do not account for trips internal to the Wilton Mall property.

While the trip generation for the weekday AM and Saturday midday peak hours is generally comparable to the trip generation for the weekday PM peak hour, given that the weekday PM peak hour is the critical peak hour for analysis for the project since it has a higher existing volume, it represents a worst-case scenario.

The magnitude of site generated trips results in less than the NYSDOT and ITE trip thresholds of the generation of 100 vehicle trips on a single intersection approach for determining the need for detailed off-site intersection analysis. These agency thresholds were developed as a tool to identify locations where the magnitude of traffic generated has the potential to impact operations at off-site intersections and screen out locations that do not meet

¹ ITE Trip Generation Manual, 11th Edition, Institute of Transportation Engineers, Washington D.C., September 2021



the threshold and are therefore unlikely to require mitigation. However, based on the consultation with the Town, the traffic evaluation includes a detailed evaluation of the three study area intersections.

Trip Distribution

The directional distribution of traffic approaching and departing the site is a function of several variables including population densities, existing travel patterns, and the efficiency of the roadways leading to and from the site. Based on a review of the existing travel patterns and population centers in the area it is estimated that 65 percent of the site generated traffic will travel to and from the west on NY Route 50, 30 percent will travel to and from the east on NY Route 50, and five percent will travel to and from the east on Loudon Road. The trip distribution pattern is illustrated on Figure 4.

Build Traffic Volumes

The project-related traffic volumes shown in Table 2 were assigned to the study area roadway network based on the trip distribution and are shown on Figure 5. These assigned volumes were then added to the 2024 No-Build peak hour traffic volumes to develop the 2024 Build peak hour traffic volumes. The 2024 Build traffic volumes are summarized on Figure 6.

Traffic Operations Analysis

Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them. Roadway operating conditions are classified by calculated levels of service (LOS). The evaluation criteria used to analyze the study area intersections is based on the procedures set forth in the latest version of the Highway Capacity Manual (HCM)². LOS is a measure that considers several factors including roadway geometry, speed, and travel delay. Levels of service range from A to F, with LOS A representing short vehicle delays and LOS F representing longer vehicle delays. The level of service designations, which are based on delay and capacity, are reported differently for signalized and unsignalized intersections. The LOS definitions are included in Attachment C.

Intersection Capacity Analysis

Levels of service analyses were conducted for the 2022 Existing, 2024 No-Build, and 2024 Build conditions for the three study area intersections during the weekday PM peak hour. Table 3 summarizes the capacity analysis results for these study area intersections. The capacity analyses worksheets are included in Attachment D.

² Highway Capacity Manual, 6th Edition, Transportation Research Board, Washington D.C., 2016



Table 3 Intersection Levels of Service Summary – Weekday PM Peak Hour

Location/Movement	2022 Existing		2024 No-Build		2024 Build	
	LOS ^a	Delay ^b	LOS	Delay	LOS	Delay
NY Route 50 at South Wilton Mall Driveway/The Shoppes at Wilton Driveway (Signalized)						
NY Route 50 EB L	A	6	A	8	A	9
T	A	5	A	7	A	7
R	A	3	A	4	A	5
NY Route 50 WB L	A	6	A	8	A	9
TR	A	4	A	5	A	6
South Wilton Mall NB LT	D	41	D	40	D	40
R	D	35	C	33	C	32
Shoppes at Wilton SB L	D	46	D	46	D	46
TR	D	35	C	33	C	32
Overall	B	10	B	11	B	12
NY Route 50 at North Wilton Mall Driveway/Lowes Drive (Signalized)						
NY Route 50 EB L	C	31	C	26	C	23
TR	C	29	C	24	C	21
NY Route 50 WB L	D	42	D	41	D	40
T	C	25	C	20	B	18
R	C	21	B	17	B	15
North Wilton Mall NB L	C	34	C	33	C	34
TR	C	30	C	29	C	30
Lowes Drive SB L	D	42	D	44	D	49
TR	C	30	C	28	C	28
Overall	C	31	C	28	C	27
Louden Road at Wilton Mall Driveway (Unsignalized)						
Louden Road EB L	A	8	A	8	A	8
Wilton Mall SB L	C	16	C	17	C	19
R	A	10	A	10	A	10

^a Level of service

^b Average total delay in seconds per vehicle (rounded to nearest whole number)

Average delays are rounded to the nearest whole number so a single delay value may be represented by two LOS.

The analyses show that the NY Route 50 and Wilton Mall Driveways will operate at acceptable overall LOS (LOS B and LOS C) for the weekday PM peak hour for each of the Existing, No-Build, and Build conditions, with all movements operating at LOS D or better. Table 3 shows that there are some instances where the average delay for a movement is higher during the Existing condition than during the Build condition. This is because the traffic signal will work within the parameters of the traffic signal timing settings and automatically reallocate the amount of green time for a movement based on the traffic volume for critical movements. The Loudon Road at Wilton Mall



Driveway intersection movements will operate at LOS C or better with no changes between the No-Build and Build conditions. No improvements are necessary to accommodate the trips associated with the proposed project.

Conclusions

VHB has conducted a traffic impact evaluation to assess the potential traffic impacts associated with the re-development of retail space on the Wilton Mall property with residential units located south of NY Route 50 in the Town of Wilton, New York. Access to the residential units is proposed via the existing Wilton Mall Road. Two full access driveways will serve the 296-unit apartment buildings on the west side of Wilton Mall Road and two full access driveways will serve the 86 townhouse units on the east side of Wilton Mall Road. The analysis prepared was based upon full-build out with the project anticipated to be fully constructed by 2024.

- Based on consultation with the Town, the traffic evaluation focused on the critical weekday PM peak hour at the following intersections:
 - US Route 50 at South Wilton Mall Driveway/The Shoppes at Wilton Driveway
 - US Route 50 at North Wilton Mall Driveway/Lowes Drive
 - Loudon Road/Wilton Mall Driveway
- The proposed project is expected to generate 169 new vehicle trips during the weekday AM peak hour (39 entering and 130 exiting), 174 new vehicle trips during the weekday PM peak hour (107 entering and 67 exiting) and 154 new vehicle trips during the Saturday midday peak hour (79 entering and 75 exiting).
- The capacity analysis shows that with construction of the proposed project, the NY Route 50 at Wilton Mall Driveway intersections maintain the same overall LOS between the 2024 No-Build and Build conditions, with the overall LOS at LOS B for the NY Route 50 at South Wilton Mall Driveway/The Shoppes at Wilton Driveway intersection and LOS C for the NY Route 50 at North Wilton Mall Driveway/Lowes Drive.
- The Loudon Road at Wilton Mall Driveway shows the same LOS during the Build condition as the No-Build condition with all movements operating at LOS C or better.

The proposed development will be adequately serviced by the existing intersections and roadway network and no off-site mitigation is recommended as a result of the proposed project.

Please call with questions regarding the above evaluation.

Sincerely,

VHB

A handwritten signature in blue ink, appearing to read "Alanna Moran".

Alanna Moran, PE
Project Manager

A handwritten signature in blue ink, appearing to read "John Donnan".

John Donnan, IE
Project Engineer

Attachments



Legend

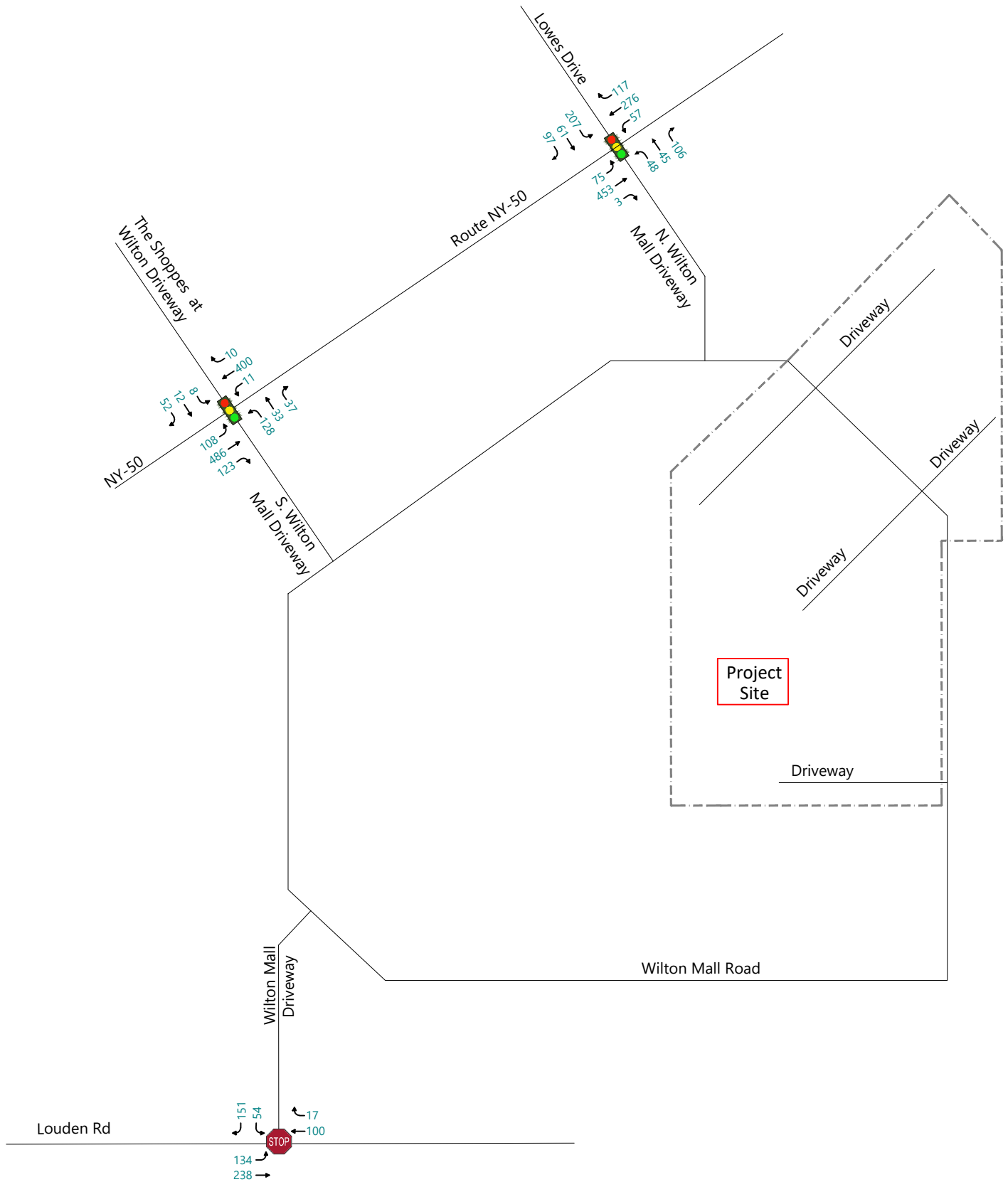


Study Intersection



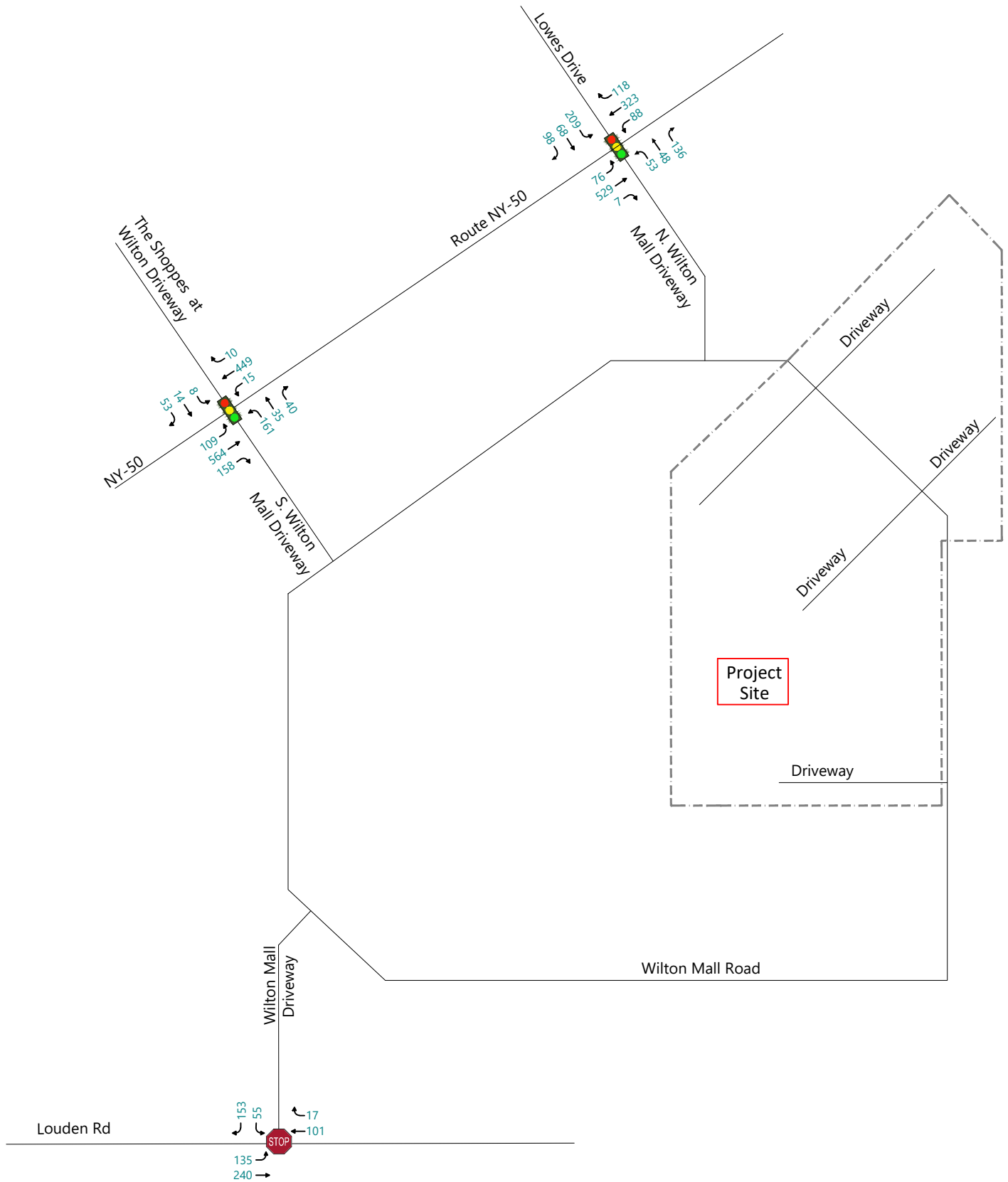
Project Location Map
Wilton Mall Re-Development
Town of Wilton, NY

Figure 1



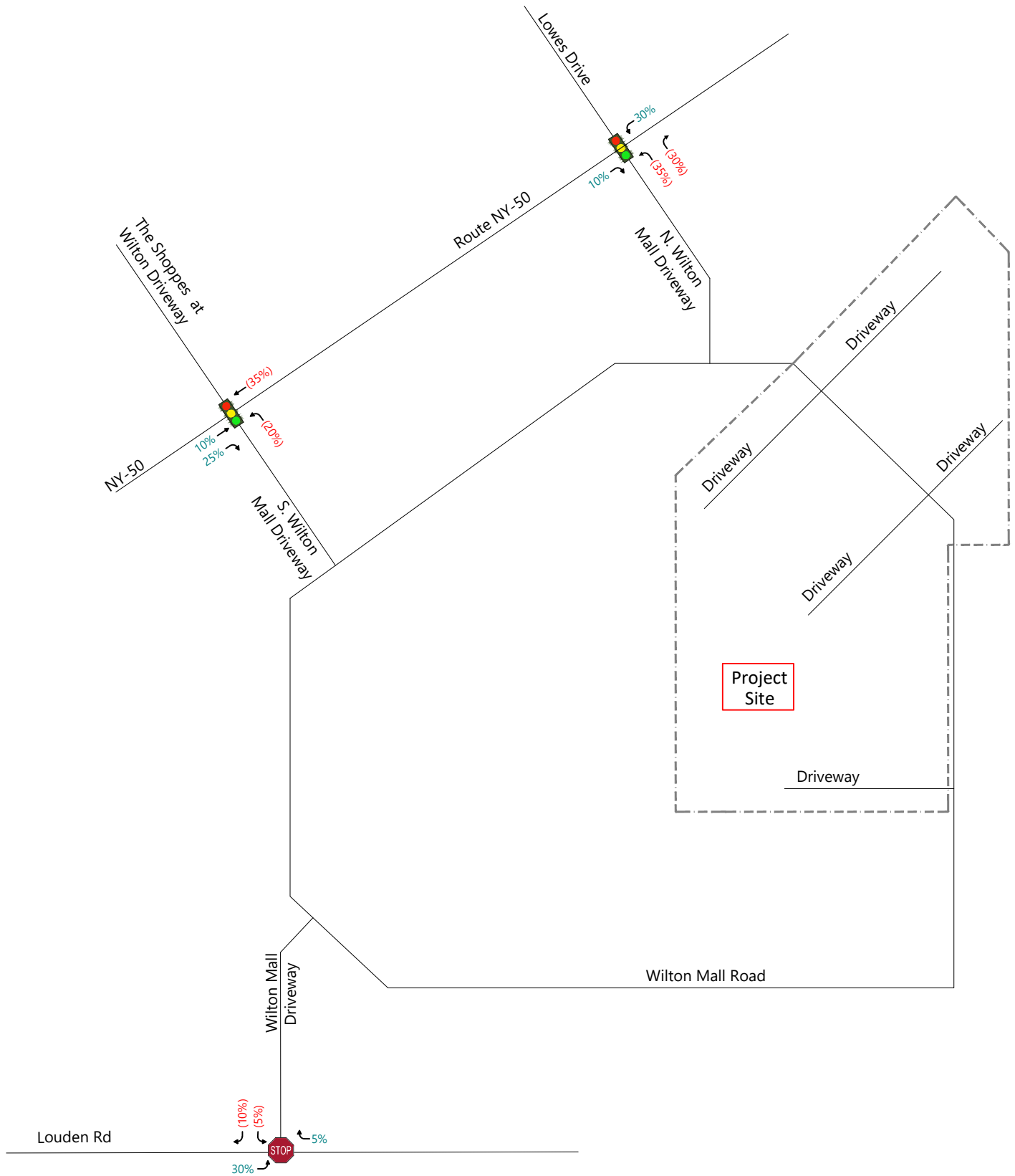
2022 Existing PM Peak Hour
Traffic Volumes
Wilton Mall Re-Development
Town of Wilton, NY

Figure 2



2024 No-Build PM Peak Hour
Traffic Volumes
Wilton Mall Re-Development
Town of Wilton, NY

Figure 3



Key: Entering %, (Exiting %)

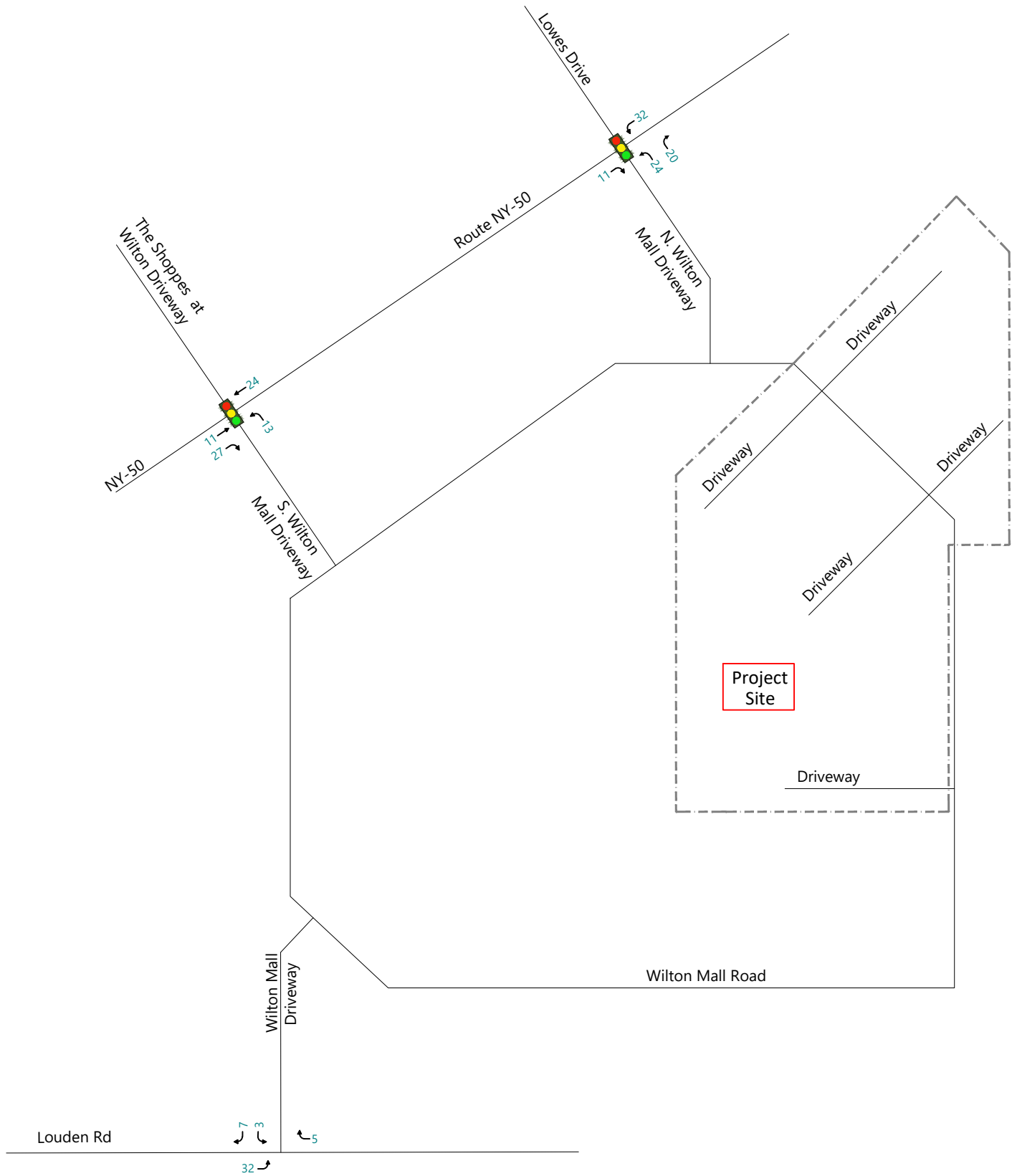


Not to Scale



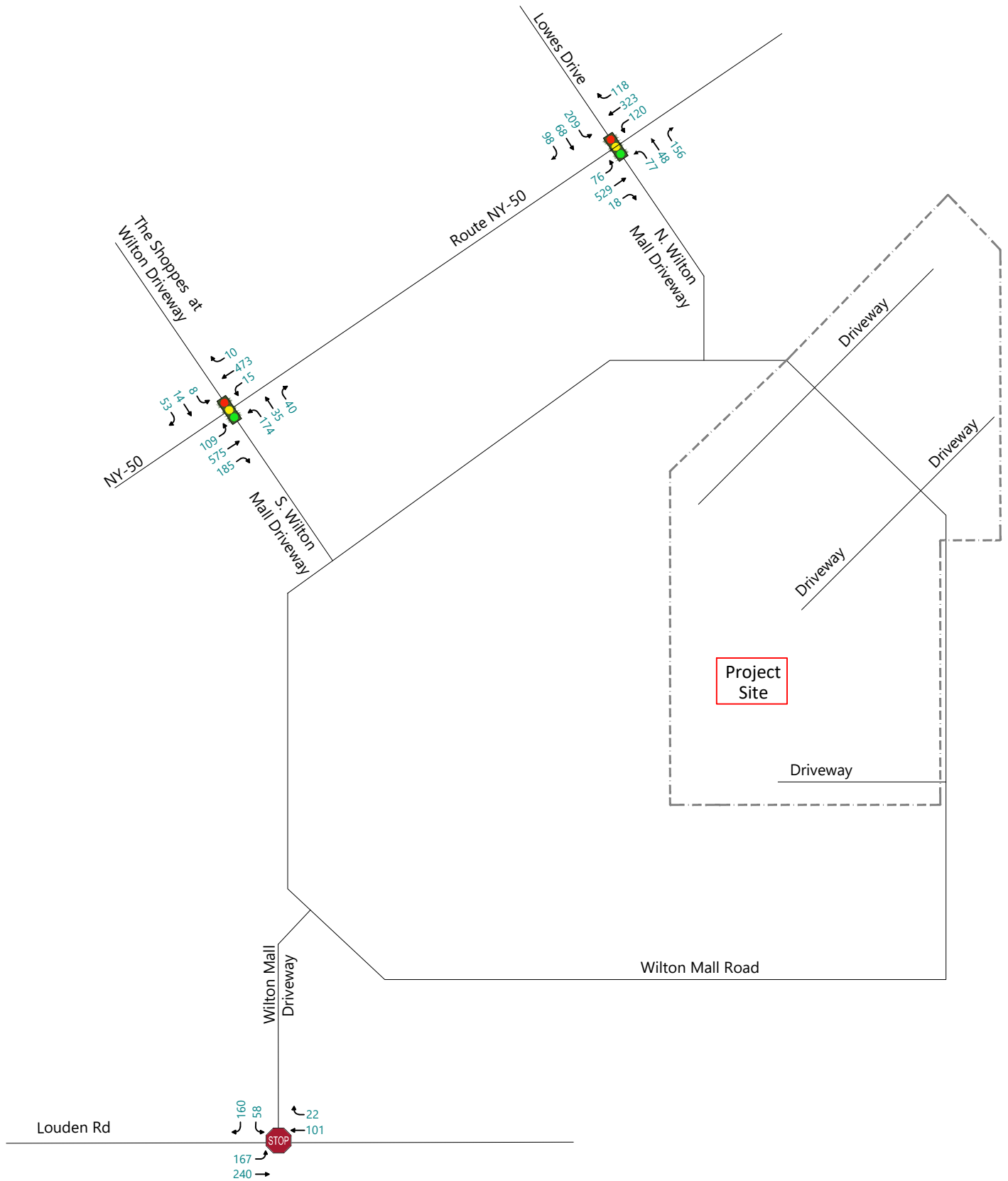
Primary Trip Distribution
Wilton Mall Re-Development
Town of Wilton, NY

Figure 4



Primary Trip Assignment
PM Peak Hour
Wilton Mall Re-Development
Town of Wilton, NY

Figure 5



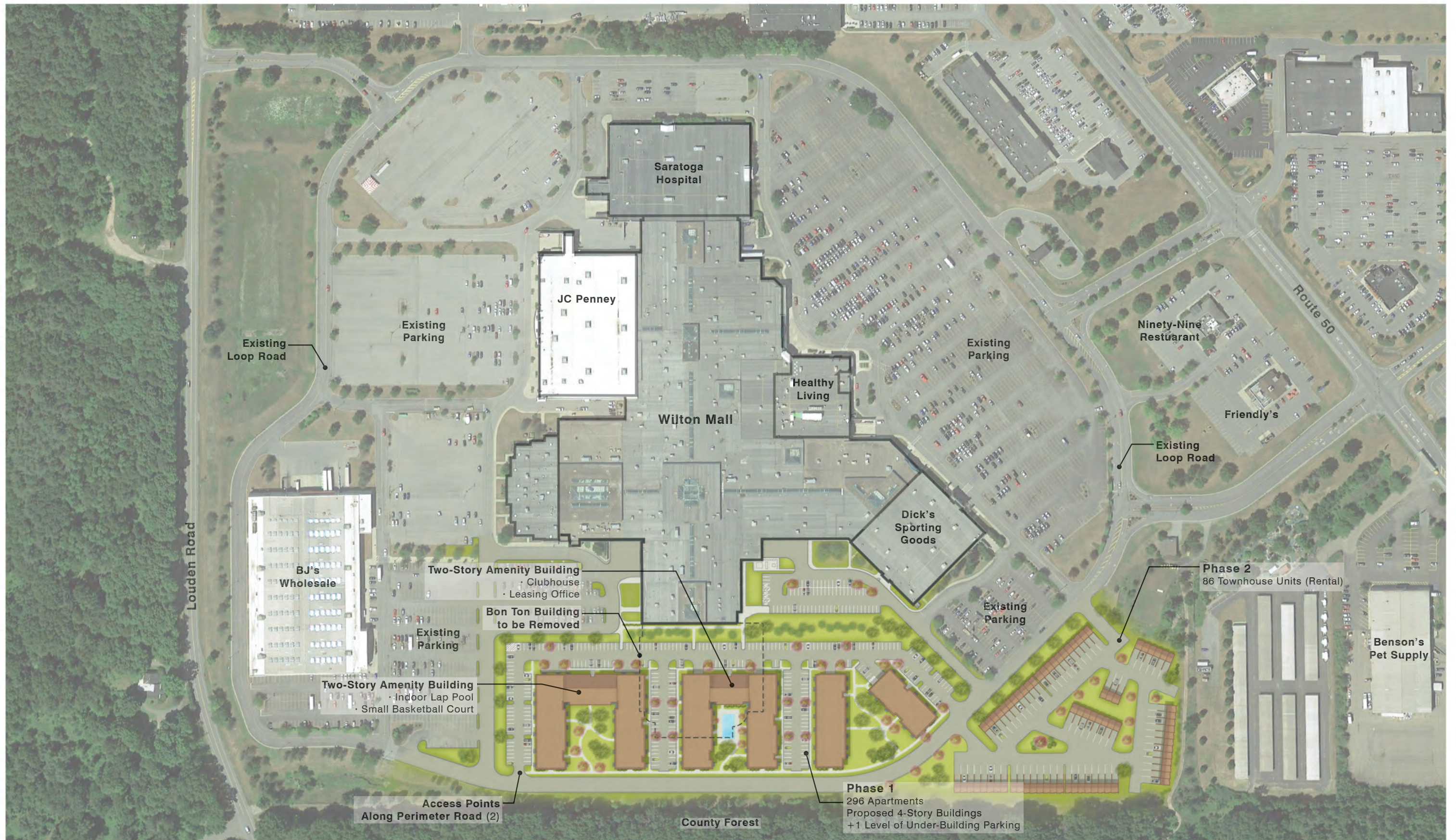
2024 Build PM Peak
Traffic Volumes
Wilton Mall Re-Development
Town of Wilton, NY

Figure 6

Attachments

- A. Concept Plan
- B. Turning Movement Count Data
- C. LOS Definitions
- D. Capacity Analysis Worksheets

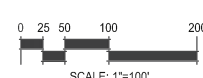
Attachment A – Concept Plan



Proposed Residential Development
Wilton, New York

Concept Plan

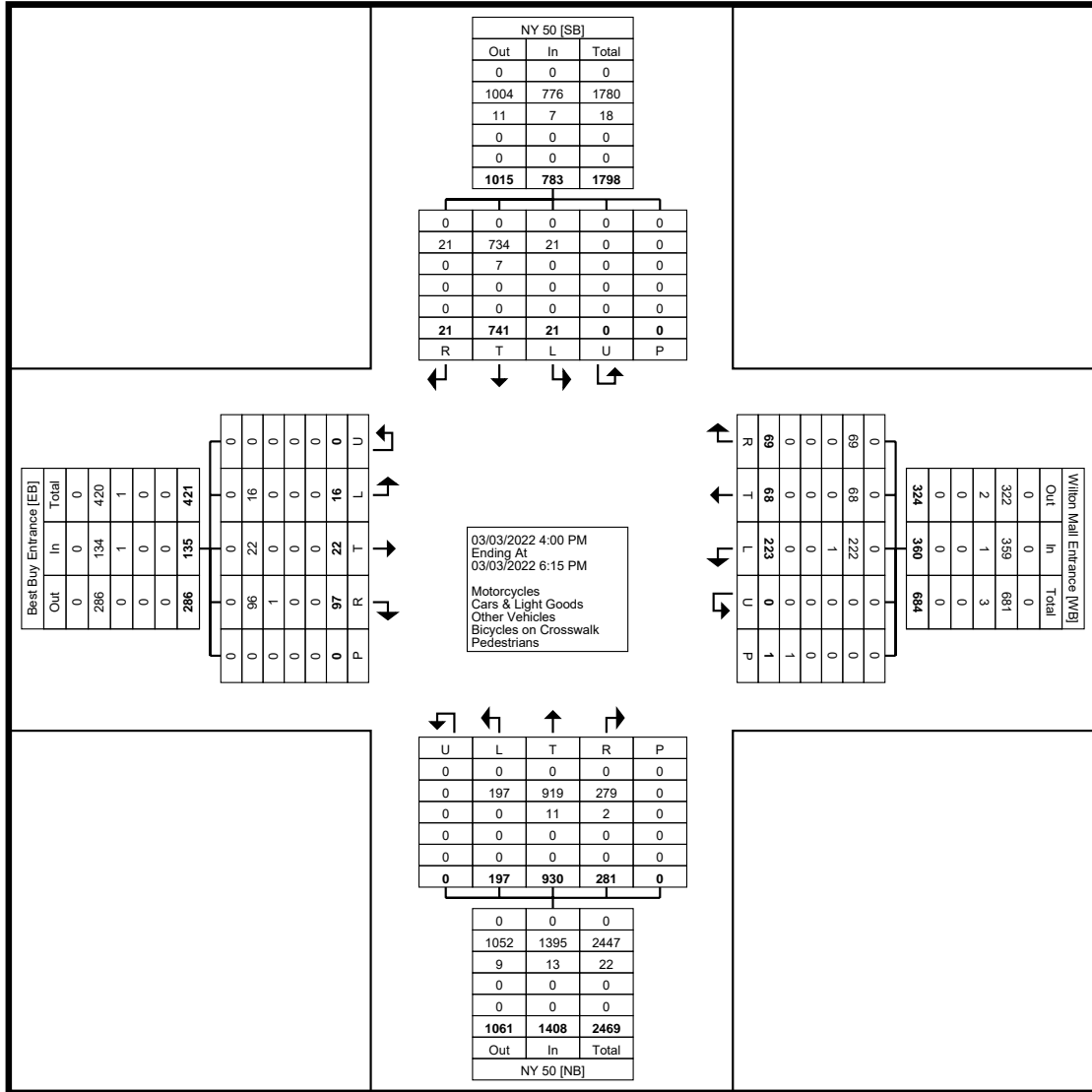
September 2021



The LA GROUP
Landscape Architecture & Engineering P.C.
People. Purpose. Place.

Attachment B – Turning Movement Count Data

Tri-State Traffic Data: New York Division
184 Baker Rd

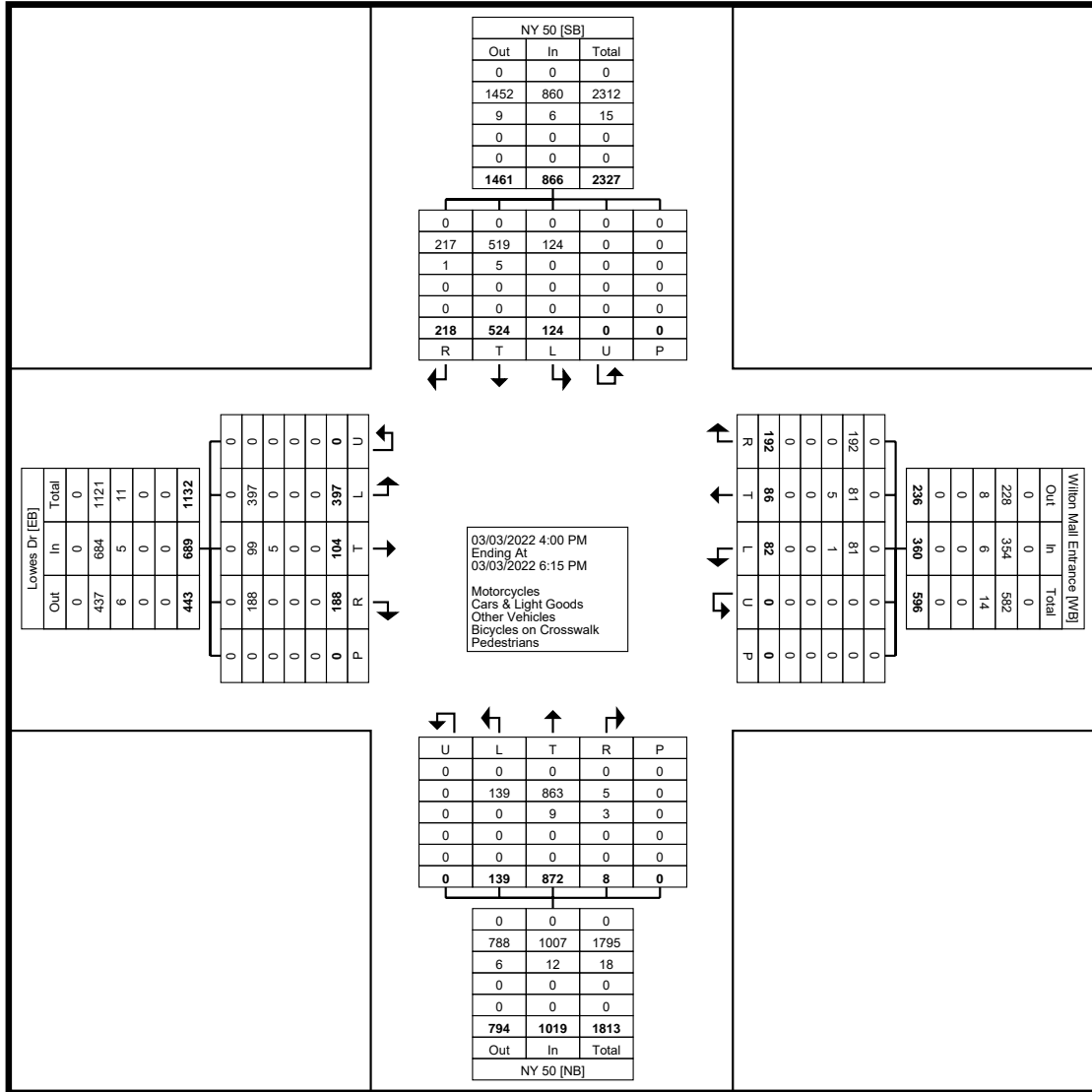


Turning Movement Data Plot

Tri-State Traffic Data: New York Division
184 Baker Rd

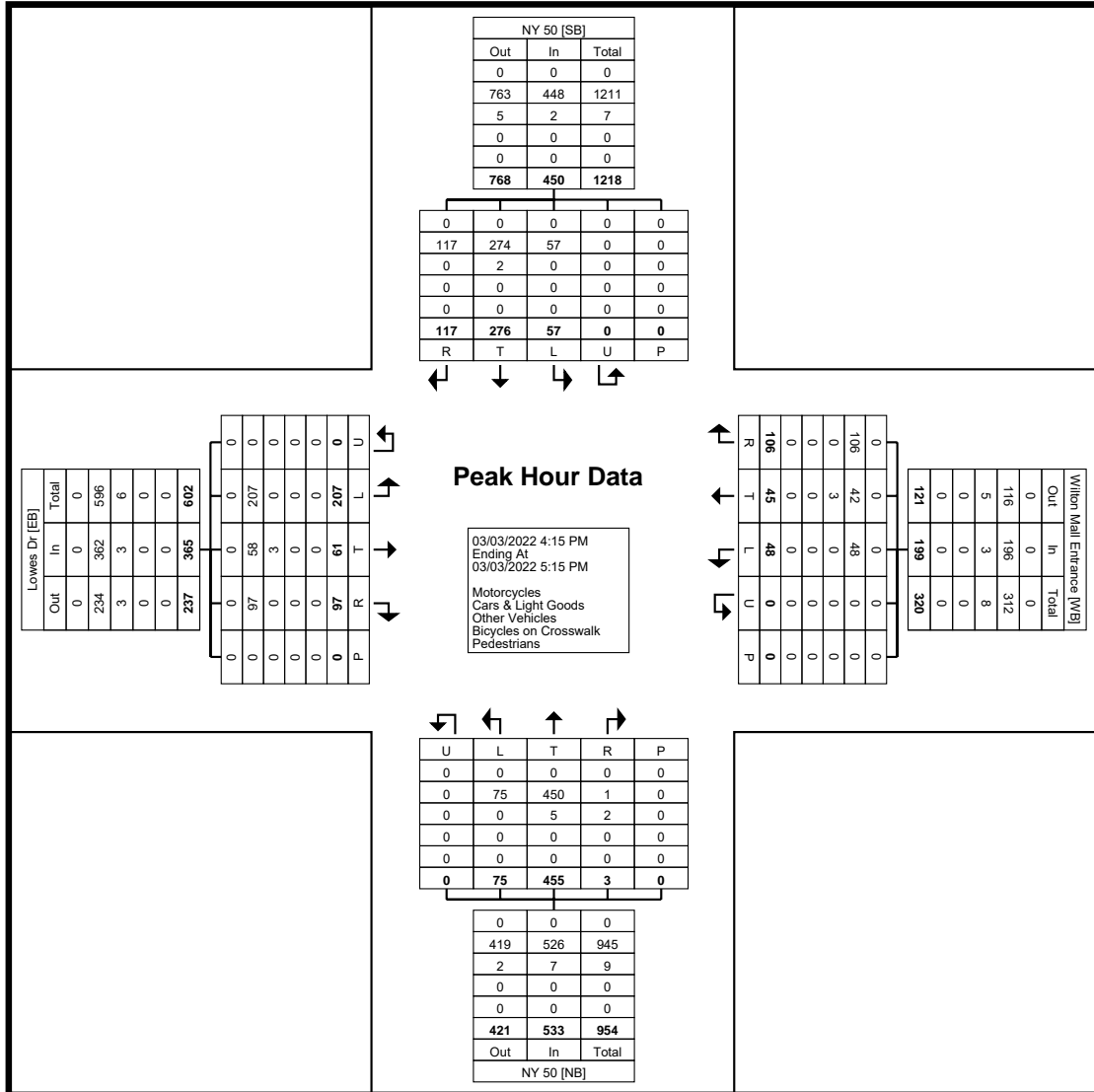
Tri-State Traffic Data: New York Division
184 Baker Rd

Tri-State Traffic Data: New York Division
184 Baker Rd



Turning Movement Data Plot

Tri-State Traffic Data: New York Division
184 Baker Rd



Tri-State Traffic Data: New York Division
184 Baker Rd

Tri-State Traffic Data: New York Division
184 Baker Rd

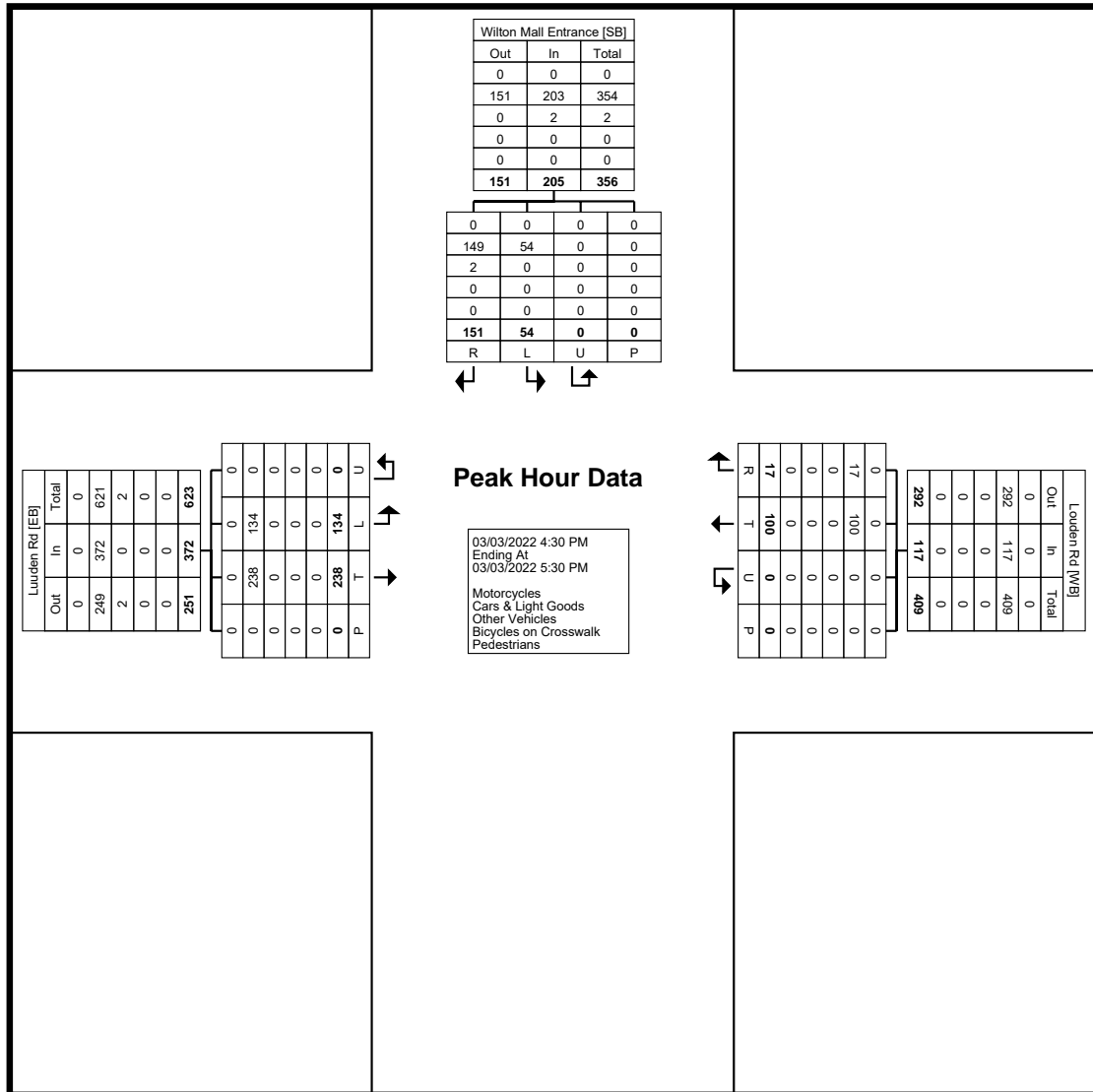
Tri-State Traffic Data: New York Division
184 Baker Rd



Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338 bkarz@tstdata.com

Count Name: Louden Rd /
Wilton Mall Entrance
Site Code: Wilton, New York
Start Date: 03/03/2022
Page No: 4



Turning Movement Peak Hour Data Plot (4:30 PM)

Attachment C – LOS Definitions

Level of Service Definitions

Signal Controlled Intersections

The evaluation criteria used to analyze signalized intersections is based on the procedures set forth in the latest version of the *Highway Capacity Manual* (HCM)¹.

The level of service (LOS) of a signalized intersection can be characterized for the entire intersection, each intersection approach, and each lane group. Control delay alone is used to characterize LOS for the entire intersection or an approach. Control delay and volume-to-capacity ratio are used to characterize LOS for a lane group. Delay quantifies the increase in travel time due to traffic signal control. It is also a measure of driver discomfort and fuel consumption. The volume-to-capacity ratio quantifies the degree to which a phase's capacity is utilized by a lane group.

The levels of service range between level of service A (relatively congestion-free) and level of service F (congested).

Level of service A – This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If LOS A is the result of favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

Level of service B – This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

Level of service C – This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

Level of service D – This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective, or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

Level of service E – This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

¹ Highway Capacity Manual, 6th Edition, Transportation Research Board, Washington D.C., 2016.

Level of Service F - This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

A lane group can incur a delay less than 80 s/veh when the volume-to-capacity ratio exceeds 1.0. This condition typically occurs when the cycle length is short, the signal progression is favorable, or both. As a result, both the delay and volume-to-capacity ratio are considered when lane group LOS is established. A ratio of 1.0 or more indicates cycle capacity is fully utilized and represents failure from a capacity perspective (just as delay in excess of 80 s/veh represents failure from a delay perspective).

The following lists the LOS thresholds established for motorized vehicle mode at a signalized intersection.

CONTROL DELAY (s/veh)	LOS by Volume-to-Capacity Ratio ^a	
	≤1.0	≥1.0
≤10	A	F
>10-20	B	F
>20-35	C	F
>35-55	D	F
>55-80	E	F
>80	F	F

^aFor approach-based and intersection wide assessments, LOS is defined solely by control delay.

Two Way Stop Controlled Intersections

The evaluation criteria used to analyze Two-Way Stop Controlled (TWSC) intersections is based on the procedures set forth in the latest version of the *Highway Capacity Manual* (HCM)¹.

Level of service (LOS) for a TWSC intersection is determined by the computed or measured control delay. For motor vehicles, LOS is determined for each minor street movement (or shared movement), as well as the major -street left turns, by using the criteria given in the Table below. LOS is not defined for the intersection as a whole or for major-street approaches for three primary reasons: (a) major-street through vehicles are assumed to experience zero delay; (b) the disproportionate number of major-street through vehicles at a typical TWSC intersection skews the weighted average of all movements, resulting in a very low overall average delay for all vehicles; and (c) the resulting low delay can mask LOS deficiencies for minor movements. LOS F is assigned to a movement if its volume-to-capacity ratio exceeds 1.0, regardless of the control delay.

The LOS criteria for TWSC intersections differ somewhat from the criteria for signalized intersections, primarily because user perceptions differ among transportation facility types. The expectation is that a signalized intersection is designed to carry higher traffic volumes and will present greater delay than an unsignalized intersection. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable than they are at signals.

The levels of service range between level of service A (relatively congestion-free) and level of service F (very congested).

The following thresholds are used to determine TWSC levels of service:

CONTROL DELAY (s/veh)	LOS by Volume-to-Capacity Ratio ^a	
	v/c ≤ 1.0	v/c ≥ 1.0
≤ 10	A	F
> 10-15	B	F
> 15-25	C	F
> 25-35	D	F
> 35-50	E	F
> 50	F	F

^a The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

All Way Stop Controlled Intersections

The evaluation criteria used to analyze All-Way Stop Controlled (AWSC) intersections is based on the procedures set forth in the latest version of the *Highway Capacity Manual* (HCM)¹.

The level of service of an AWSC intersection are the criteria by which the quality of traffic service is measured. The levels of service range between level of service A (relatively congestion-free) and level of service F (very congested).

AWSC intersections are a type of unsignalized intersection that require drivers on all approaches to stop at the intersection before proceeding. Because each driver must stop, the decision to proceed into the intersection is a function of traffic conditions on the other approaches. If no traffic is present on the other approaches, a driver can proceed immediately after stopping. If there is traffic on one or more of the other approaches, a driver proceeds only after determining that no vehicles are currently in the intersection and that it is the driver's turn to proceed. The AWSC methodology analyzes each intersection approach separately.

The key variable in determining the capacity of an AWSC intersection is the distribution of traffic volumes among the approaches. Under ideal conditions traffic would be

evenly distributed among the approaches. The flow rate for any given approach increases as the traffic decreases on the other approaches, allowing a smaller headway between vehicles departing from the stop line.

The following thresholds are used to determine AWSC levels of service:






















CONTROL DELAY (s/veh)	LOS by Volume-to-Capacity Ratio ^a	
	v/c≤1.0	v/c≥1.0
≤10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

^a For approaches and intersection wide assessment, LOS is defined solely by control delay.

Attachment D – Capacity Analysis Worksheets






















1: S. Wilton Mall Dwy/The Shoppes at Wilton Dwy & NY 50
HCM 6th Signalized Intersection Summary

2022 Existing
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	486	123	11	400	10	128	33	37	8	12	52
Future Volume (veh/h)	108	486	123	11	400	10	128	33	37	8	12	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1870	1900	1885	1900	1900	1900	1900	1976	1976	1945
Adj Flow Rate, veh/h	115	517	116	12	426	11	136	35	19	9	13	14
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	2	0	1	0	0	0	0	0	0	2
Cap, veh/h	724	1409	1184	602	1367	35	227	41	237	107	128	138
Arrive On Green	0.75	0.75	0.75	0.75	0.75	0.75	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	967	1885	1584	806	1829	47	1077	277	1610	1426	870	937
Grp Volume(v), veh/h	115	517	116	12	0	437	171	0	19	9	0	27
Grp Sat Flow(s),veh/h/ln	967	1885	1584	806	0	1877	1354	0	1610	1426	0	1807
Q Serve(g_s), s	4.2	9.1	1.9	0.5	0.0	7.3	10.7	0.0	1.0	0.6	0.0	1.2
Cycle Q Clear(g_c), s	11.5	9.1	1.9	9.6	0.0	7.3	11.9	0.0	1.0	12.5	0.0	1.2
Prop In Lane	1.00		1.00	1.00		0.03	0.80		1.00	1.00		0.52
Lane Grp Cap(c), veh/h	724	1409	1184	602	0	1403	267	0	237	107	0	266
V/C Ratio(X)	0.16	0.37	0.10	0.02	0.00	0.31	0.64	0.00	0.08	0.08	0.00	0.10
Avail Cap(c_a), veh/h	724	1409	1184	602	0	1403	439	0	424	272	0	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.00	0.98	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.8	4.2	3.3	5.8	0.0	3.9	40.2	0.0	35.0	45.8	0.0	35.1
Incr Delay (d2), s/veh	0.5	0.7	0.2	0.0	0.0	0.3	0.9	0.0	0.1	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.7	0.5	0.1	0.0	2.0	4.0	0.0	0.4	0.2	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.3	4.9	3.4	5.9	0.0	4.2	41.2	0.0	35.0	45.9	0.0	35.1
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	D
Approach Vol, veh/h		748			449			190			36	
Approach Delay, s/veh		4.9			4.3			40.6			37.8	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		76.0		19.0		76.0		19.0				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		60.0		25.0		60.0		25.0				
Max Q Clear Time (g_c+I1), s		13.5		14.5		11.6		13.9				
Green Ext Time (p_c), s		10.3		0.0		6.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				10.3								
HCM 6th LOS				B								

2: N. Wilton Mall Dwy/Lowes Drive & NY 50 HCM 6th Signalized Intersection Summary

2022 Existing
PM Peak






												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	453	3	57	276	117	48	45	106	207	61	97
Future Volume (veh/h)	75	453	3	57	276	117	48	45	106	207	61	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1885	922	1900	1885	1900	1976	1868	1976	1976	1826	1900
Adj Flow Rate, veh/h	81	487	3	61	297	94	52	48	72	223	66	71
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	66	0	1	0	0	7	0	0	5	0
Cap, veh/h	318	673	4	199	678	579	308	164	246	325	196	211
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1009	1872	12	921	1885	1610	1323	674	1012	1343	805	866
Grp Volume(v), veh/h	81	0	490	61	297	94	52	0	120	223	0	137
Grp Sat Flow(s),veh/h/ln	1009	0	1883	921	1885	1610	1323	0	1686	1343	0	1670
Q Serve(g_s), s	6.3	0.0	21.4	5.8	11.4	3.8	3.2	0.0	5.5	15.4	0.0	6.4
Cycle Q Clear(g_c), s	17.7	0.0	21.4	27.2	11.4	3.8	9.6	0.0	5.5	20.9	0.0	6.4
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.60	1.00		0.52
Lane Grp Cap(c), veh/h	318	0	677	199	678	579	308	0	410	325	0	407
V/C Ratio(X)	0.26	0.00	0.72	0.31	0.44	0.16	0.17	0.00	0.29	0.69	0.00	0.34
Avail Cap(c_a), veh/h	592	0	1189	450	1191	1017	334	0	444	351	0	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.00	0.95	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.9	0.0	26.3	38.1	23.1	20.7	33.6	0.0	29.3	37.8	0.0	29.6
Incr Delay (d2), s/veh	0.9	0.0	3.0	3.9	2.1	0.6	0.4	0.0	0.6	3.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	9.5	1.5	5.2	1.5	1.1	0.0	2.3	5.3	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.7	0.0	29.3	42.1	25.2	21.3	34.0	0.0	29.8	41.7	0.0	29.8
LnGrp LOS	C	A	C	D	C	C	C	A	C	D	A	C
Approach Vol, veh/h	571				452		172				360	
Approach Delay, s/veh	29.5				26.7		31.1				37.1	
Approach LOS	C				C		C				D	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	39.2		28.1		39.2		28.1					
Change Period (Y+Rc), s	5.0		5.0		5.0		5.0					
Max Green Setting (Gmax), s	60.0		25.0		60.0		25.0					
Max Q Clear Time (g_c+l1), s	23.4		22.9		29.2		11.6					
Green Ext Time (p_c), s	7.5		0.2		4.9		0.9					
Intersection Summary												
HCM 6th Ctrl Delay			30.6									
HCM 6th LOS			C									

3: Louden Road & Wilton Mall Dwy HCM 6th TWSC

2022 Existing
PM Peak

Intersection

Int Delay, s/veh 4.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	134	238	100	17	54	151
Future Vol, veh/h	134	238	100	17	54	151
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	110	-	-	-	0	90
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	149	264	111	19	60	168






















Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	130	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1468	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1468	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1468	-	-	-	376	933
HCM Lane V/C Ratio	0.101	-	-	-	0.16	0.18
HCM Control Delay (s)	7.7	-	-	-	16.4	9.7
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6	0.7

1: S. Wilton Mall Dwy/The Shoppes at Wilton Dwy & NY 50
HCM 6th Signalized Intersection Summary

2024 No-Build
PM Peak






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	564	158	15	449	10	161	35	40	8	14	53
Future Volume (veh/h)	109	564	158	15	449	10	161	35	40	8	14	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1870	1900	1885	1900	1900	1900	1900	1976	1976	1945
Adj Flow Rate, veh/h	116	600	153	16	478	11	171	37	23	9	15	15
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	2	0	1	0	0	0	0	0	0	2
Cap, veh/h	648	1358	1141	501	1322	30	263	42	281	108	158	158
Arrive On Green	0.72	0.72	0.72	0.72	0.72	0.72	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	921	1885	1584	721	1835	42	1112	241	1610	1419	906	906
Grp Volume(v), veh/h	116	600	153	16	0	489	208	0	23	9	0	30
Grp Sat Flow(s),veh/h/ln	921	1885	1584	721	0	1878	1353	0	1610	1419	0	1813
Q Serve(g_s), s	5.2	12.4	2.8	0.9	0.0	9.4	13.1	0.0	1.1	0.6	0.0	1.3
Cycle Q Clear(g_c), s	14.5	12.4	2.8	13.3	0.0	9.4	14.5	0.0	1.1	15.1	0.0	1.3
Prop In Lane	1.00		1.00	1.00		0.02	0.82		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	648	1358	1141	501	0	1352	305	0	281	108	0	317
V/C Ratio(X)	0.18	0.44	0.13	0.03	0.00	0.36	0.68	0.00	0.08	0.08	0.00	0.09
Avail Cap(c_a), veh/h	648	1358	1141	501	0	1352	436	0	424	233	0	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.97	0.00	0.97	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.8	5.5	4.1	8.2	0.0	5.0	39.0	0.0	32.8	45.7	0.0	32.9
Incr Delay (d2), s/veh	0.6	1.0	0.2	0.1	0.0	0.3	1.0	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.9	0.8	0.1	0.0	2.8	4.8	0.0	0.4	0.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.4	6.5	4.4	8.2	0.0	5.4	40.0	0.0	32.9	45.8	0.0	33.0
LnGrp LOS	A	A	A	A	A	A	D	A	C	D	A	C
Approach Vol, veh/h		869			505			231			39	
Approach Delay, s/veh		6.4			5.5			39.3			35.9	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		73.4		21.6		73.4		21.6				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		60.0		25.0		60.0		25.0				
Max Q Clear Time (g_c+l1), s		16.5		17.1		15.3		16.5				
Green Ext Time (p_c), s		12.5		0.0		7.1		0.2				

Intersection Summary

HCM 6th Ctrl Delay 11.4
HCM 6th LOS B

2: N. Wilton Mall Dwy/Lowes Drive & NY 50 HCM 6th Signalized Intersection Summary

2024 No-Build
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	529	7	88	323	118	53	48	136	209	68	98
Future Volume (veh/h)	76	529	7	88	323	118	53	48	136	209	68	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1885	922	1900	1885	1900	1976	1868	1976	1976	1826	1900
Adj Flow Rate, veh/h	82	569	8	95	347	95	57	52	104	225	73	72
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	66	0	1	0	0	7	0	0	5	0
Cap, veh/h	371	805	11	232	819	699	330	146	293	319	222	219
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	962	1854	26	850	1885	1610	1313	556	1112	1300	844	832
Grp Volume(v), veh/h	82	0	577	95	347	95	57	0	156	225	0	145
Grp Sat Flow(s),veh/h/ln	962	0	1880	850	1885	1610	1313	0	1668	1300	0	1676
Q Serve(g_s), s	6.1	0.0	23.8	9.8	12.1	3.4	3.5	0.0	7.2	16.2	0.0	6.6
Cycle Q Clear(g_c), s	18.3	0.0	23.8	33.5	12.1	3.4	10.1	0.0	7.2	23.4	0.0	6.6
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.67	1.00		0.50
Lane Grp Cap(c), veh/h	371	0	817	232	819	699	330	0	439	319	0	441
V/C Ratio(X)	0.22	0.00	0.71	0.41	0.42	0.14	0.17	0.00	0.36	0.71	0.00	0.33
Avail Cap(c_a), veh/h	561	0	1188	400	1191	1017	330	0	439	319	0	441
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.00	0.91	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.0	0.0	21.9	35.6	18.6	16.2	32.3	0.0	28.5	38.0	0.0	28.2
Incr Delay (d2), s/veh	0.6	0.0	2.2	5.3	1.6	0.4	0.4	0.0	0.7	5.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	10.1	2.3	5.3	1.3	1.1	0.0	3.0	5.6	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	0.0	24.1	40.9	20.2	16.6	32.7	0.0	29.1	43.9	0.0	28.4
LnGrp LOS	C	A	C	D	C	B	C	A	C	D	A	C
Approach Vol, veh/h	659				537		213				370	
Approach Delay, s/veh	24.3				23.2		30.1				37.8	
Approach LOS	C				C		C				D	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	46.3		30.0		46.3		30.0					
Change Period (Y+Rc), s	5.0		5.0		5.0		5.0					
Max Green Setting (Gmax), s	60.0		25.0		60.0		25.0					
Max Q Clear Time (g_c+I1), s	25.8		25.4		35.5		12.1					
Green Ext Time (p_c), s	9.1		0.0		5.7		1.2					

Intersection Summary

HCM 6th Ctrl Delay 27.5
HCM 6th LOS C

Notes






User approved pedestrian interval to be less than phase max green.

3: Louden Road & Wilton Mall Dwy HCM 6th TWSC

2024 No-Build
PM Peak

Intersection

Int Delay, s/veh 4.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	135	240	101	17	55	153
Future Vol, veh/h	135	240	101	17	55	153
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	110	-	-	-	0	90
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	150	267	112	19	61	170






















Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	131	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1467	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1467	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1467	-	-	-	373	932
HCM Lane V/C Ratio	0.102	-	-	-	0.164	0.182
HCM Control Delay (s)	7.7	-	-	-	16.5	9.7
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6	0.7























1: S. Wilton Mall Dwy/The Shoppes at Wilton Dwy & NY 50
HCM 6th Signalized Intersection Summary

2024 Build
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	575	185	15	473	10	174	35	40	8	14	53
Future Volume (veh/h)	109	575	185	15	473	10	174	35	40	8	14	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1870	1900	1885	1900	1900	1900	1900	1976	1976	1945
Adj Flow Rate, veh/h	116	612	182	16	503	11	185	37	23	9	15	15
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	2	0	1	0	0	0	0	0	0	2
Cap, veh/h	617	1339	1125	472	1305	29	278	42	297	108	167	167
Arrive On Green	0.71	0.71	0.71	0.71	0.71	0.71	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	900	1885	1584	694	1838	40	1130	226	1610	1419	906	906
Grp Volume(v), veh/h	116	612	182	16	0	514	222	0	23	9	0	30
Grp Sat Flow(s),veh/h/ln	900	1885	1584	694	0	1878	1356	0	1610	1419	0	1813
Q Serve(g_s), s	5.6	13.2	3.6	1.0	0.0	10.4	14.1	0.0	1.1	0.6	0.0	1.3
Cycle Q Clear(g_c), s	16.0	13.2	3.6	14.2	0.0	10.4	15.4	0.0	1.1	16.0	0.0	1.3
Prop In Lane	1.00		1.00	1.00		0.02	0.83		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	617	1339	1125	472	0	1334	320	0	297	108	0	334
V/C Ratio(X)	0.19	0.46	0.16	0.03	0.00	0.39	0.69	0.00	0.08	0.08	0.00	0.09
Avail Cap(c_a), veh/h	617	1339	1125	472	0	1334	435	0	424	220	0	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.00	0.97	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.7	5.9	4.5	8.9	0.0	5.5	38.5	0.0	32.1	45.7	0.0	32.1
Incr Delay (d2), s/veh	0.7	1.1	0.3	0.1	0.0	0.4	1.3	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	4.3	1.0	0.1	0.0	3.2	5.1	0.0	0.4	0.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.3	7.0	4.8	9.0	0.0	5.9	39.8	0.0	32.1	45.8	0.0	32.2
LnGrp LOS	A	A	A	A	A	A	D	A	C	D	A	C
Approach Vol, veh/h		910			530			245			39	
Approach Delay, s/veh		6.9			6.0			39.0			35.3	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		72.5		22.5		72.5		22.5				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		60.0		25.0		60.0		25.0				
Max Q Clear Time (g_c+I1), s		18.0		18.0		16.2		17.4				
Green Ext Time (p_c), s		13.1		0.0		7.6		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				11.8								
HCM 6th LOS				B								

2: N. Wilton Mall Dwy/Lowes Drive & NY 50 HCM 6th Signalized Intersection Summary

2024 Build
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	529	18	120	323	118	77	48	156	209	68	98
Future Volume (veh/h)	76	529	18	120	323	118	77	48	156	209	68	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1885	922	1900	1885	1900	1976	1868	1976	1976	1826	1900
Adj Flow Rate, veh/h	82	569	19	129	347	95	83	52	126	225	73	72
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	66	0	1	0	0	7	0	0	5	0
Cap, veh/h	409	847	28	264	880	752	330	127	309	298	222	219
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	962	1814	61	841	1885	1610	1313	484	1173	1274	844	832
Grp Volume(v), veh/h	82	0	588	129	347	95	83	0	178	225	0	145
Grp Sat Flow(s),veh/h/ln	962	0	1874	841	1885	1610	1313	0	1657	1274	0	1676
Q Serve(g_s), s	5.8	0.0	23.1	13.4	11.4	3.2	5.2	0.0	8.4	16.6	0.0	6.6
Cycle Q Clear(g_c), s	17.2	0.0	23.1	36.5	11.4	3.2	11.8	0.0	8.4	25.0	0.0	6.6
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.71	1.00		0.50
Lane Grp Cap(c), veh/h	409	0	875	264	880	752	330	0	436	298	0	441
V/C Ratio(X)	0.20	0.00	0.67	0.49	0.39	0.13	0.25	0.00	0.41	0.75	0.00	0.33
Avail Cap(c_a), veh/h	568	0	1184	402	1191	1017	330	0	436	298	0	441
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.00	0.90	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.2	0.0	19.7	33.9	16.5	14.3	33.0	0.0	28.9	39.3	0.0	28.2
Incr Delay (d2), s/veh	0.5	0.0	1.7	6.4	1.3	0.3	0.6	0.0	0.9	9.4	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	9.6	3.1	4.9	1.2	1.7	0.0	3.4	5.9	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	0.0	21.4	40.2	17.9	14.7	33.6	0.0	29.8	48.7	0.0	28.4
LnGrp LOS	C	A	C	D	B	B	C	A	C	D	A	C
Approach Vol, veh/h	670				571		261				370	
Approach Delay, s/veh	21.6				22.4		31.0				40.7	
Approach LOS	C				C		C				D	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	49.4		30.0		49.4		30.0					
Change Period (Y+Rc), s	5.0		5.0		5.0		5.0					
Max Green Setting (Gmax), s	60.0		25.0		60.0		25.0					
Max Q Clear Time (g_c+l1), s	25.1		27.0		38.5		13.8					
Green Ext Time (p_c), s	9.4		0.0		5.8		1.4					

Intersection Summary

HCM 6th Ctrl Delay 26.9
HCM 6th LOS C

Notes






User approved pedestrian interval to be less than phase max green.

3: Louden Road & Wilton Mall Dwy HCM 6th TWSC

2024 Build
PM Peak

Intersection

Int Delay, s/veh 5.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	167	240	101	22	58	160
Future Vol, veh/h	167	240	101	22	58	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	110	-	-	-	0	90
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	186	267	112	24	64	178

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	136	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1461	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1461	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1461	-	-	-	327	929
HCM Lane V/C Ratio	0.127	-	-	-	0.197	0.191
HCM Control Delay (s)	7.8	-	-	-	18.7	9.8
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.7	0.7