Traffic Study

Proposed Senior Living Facility
210 Long Ridge Road
Stamford, Connecticut
August 5, 2019

Prepared for:
Mr. Michael Wilson, Vice President
Trammell Crow Company
300 Conshohocken State Road, Suite 250
West Conshohocken, Pennsylvania 19428

MMI #2182-03-02

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August 5, 2019

Mr. Michael Wilson
Vice President
Trammell Crow Company
300 Conshohocken State Road, Suite 250
West Conshohocken, PA 19428

RE: Traffic Study
Proposed Senior Living Facility
210 Long Ridge Road
Stamford, Connecticut
MMI #2182-03-02

Dear Mr. Wilson:

At your request, we have undertaken this study to evaluate the traffic-related implications associated with the proposed 200-unit senior living facility to be located at 210 Long Ridge Road (State Route 104) in Stamford, Connecticut. The site is currently an undeveloped parcel that is situated on the west side of Long Ridge Road between 120 Long Ridge Road and 260 Long Ridge Road. Site access is to be provided to/from Long Ridge Road via the existing signalized southerly driveway of 260 Long Ridge Road, which intersects opposite Terrace Avenue. The work comprising the study consisted of a number of tasks including field reconnaissance, data collection, review of roadway and traffic conditions, estimation of site-development-generated traffic volumes, and assessment of future traffic operations at and near to the abovementioned signal. Figure 1 shows the site location map.

Site Environs and Existing Traffic

Long Ridge Road runs north/south adjacent to the site as a four-lane road with two lanes in each direction and approximately 3- to 4-foot shoulders. Sidewalks are currently not present near the site although the City of Stamford is in the process of developing plans for a sidewalk to be installed along the west side of Long Ridge Road from Bulls Head to north of the site. As mentioned, the development is to have access via the existing signalized driveway on Long Ridge Road, which is opposite Terrace Avenue (a side street). Review of the Connecticut Department of Transportation (CTDOT) signal plan for this intersection finds that it operates as a three-phase cycle: (i) a northbound left/through advance phase, (ii) the northbound and southbound artery phase, and (iii) the eastbound and westbound side street/site driveway phase.

The posted speed limit on Long Ridge Road is 40 miles per hour (mph). The most recent available travel speed data for Long Ridge Road near the site that was collected by CTDOT in 2014 found that the 85th percentile speeds of northbound and southbound traffic were 46.3 mph and 47.2 mph, respectively. Land use in this area of Stamford is primarily a mix of housing (largely single-family homes) and commercial uses including offices, businesses, and medical.

Crash Data Summary

Data on traffic crashes near the site for the recent 3-year period of January 1, 2016, through December 31, 2018, was obtained via the Connecticut Crash Data Repository. This data is summarized in Table 1 by location, crash severity, and collision type.

TABLE 1
Crash Data Summary

	ACCIDENT SEVERITY				TYPE OF COLLISION				
LOCATION Long Ridge Road at:	SERIOUS INJURY	SUSPECTED/POSSIBLE INJURY	PROPERTY DAMAGE ONLY	**TOTAL**	ANGLE	REAR-END	SIDESWIPE, SAME DIRECTION	DEER	**TOTAL**
Stark Place	0	3	5	**8**	3	2	3	0	**8**
Terrace Avenue and Site Driveway	0	3	6	**9**	0	7	2	0	**9**
McClean Avenue	0	0	1	**1**	0	1	0	0	**1**
Cross Road	1	3	4	**8**	1	4	2	1	**8**
TOTAL	**1**	**9**	**16**	**26**	**4**	**14**	**7**	**1**	**26**

Source: Connecticut Crash Data Repository from January 1, 2016, to December 31, 2018

A total of 26 crashes were reported for this segment of Long Ridge Road during this period. More than 60% of the crashes resulted in property damage only. No fatalities were reported. The most common collision type was the rear-end collision, comprising 54% of reported crashes, followed by same-direction sideswipes at 27% and the remaining 19% consisting of angle collisions and a single wildlife collision with a deer. At the signal of Long Ridge Road, Terrace Avenue, and the 260/210 Long Ridge Road driveway, over three-quarters of the crashes were rear-end collisions, which are common at signalized intersections.

Baseline Traffic Volumes

Traffic monitoring data from late 2017 for Long Ridge Road about 0.4 miles south of the driveway/Terrace Avenue (northwest of Route 137) was obtained from CTDOT. The average daily traffic (ADT) at this location in 2017 was reported by the state to be 20,100 vehicles (combination of northbound and southbound traffic). This is noted to have decreased by around 5% compared to the 2014 ADT at this location (CTDOT typically collects traffic monitoring data every 3 years).

To supplement this state traffic monitoring data, intersection turning movement traffic count data was obtained from the City of Stamford from 2017 for Long Ridge Road at Terrace Avenue and the 260/210 Long Ridge Road driveway. This data shows that during both the weekday morning and afternoon peak hours, approximately 2,500 vehicles pass the site on Long Ridge Road, with a heavier southbound flow in the morning and a more balanced but heavier northbound flow during the afternoon peak hour. Less traffic passes the site during the weekday midday and Saturday midday peak hours, approximately 1,450

vehicles and 1,316 vehicles, respectively. Given these characteristics, the weekday morning and weekday afternoon peak-hour time periods have been analyzed in detail for this study.

At the request of the City of Stamford Transportation, Traffic, and Parking (TTP) Department staff, the nearby intersection of Long Ridge Road and Cross Road was additionally included in this study. Traffic volumes at this intersection were counted on May 21, 2019, during the weekday morning and afternoon peak hours. Comparison of these 2019 traffic volumes to the 2017 city traffic volumes finds that the 2017 volumes were higher. Therefore, to appropriately reflect closely balanced traffic volumes between these two nearby intersections, the 2019 Long Ridge Road traffic volumes were increased at the intersection with Cross Road. Figure 2 shows the resultant weekday morning and afternoon peak-hour baseline traffic volumes at the study intersections.

Proposed Development-Generated Traffic

Site-generated peak-hour trips from the proposed 200-unit senior living facility were estimated using statistical data published by the Institute of Transportation Engineers (ITE).[1] Table 2 summarizes the site-generated traffic estimates for the proposed development during the study peak hours. Note again that these are site-traffic estimates during the heavy weekday morning and afternoon commuter peak hours of Long Ridge Road. The proposed senior living facility itself may generate its busiest hourly traffic during the middle of the day according to industry data, generally reflective of shift changes, lunch, and visitation. Nonetheless, during the middle of the day when the senior living development traffic will likely be busiest, there is much less traffic (nearly 1,000 fewer vehicles) that travels on Long Ridge Road. Therefore, the typical commuter peak periods have been analyzed in this study in order to assess any site-development impacts. The geographic distribution of the site-generated traffic was estimated based on review of the roadway traffic patterns along Long Ridge Road in the vicinity of the site as well as review of census commuting data. Figure 3 shows the estimated site-generated traffic at the study intersections based on the estimated distribution.

TABLE 2
Site Development Traffic Estimates

	Number of Vehicle Trips					
	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Senior Living Facility (200 Units)	15	25	40	30	25	55

Source: ITE Land Use #252

As a point of comparison, trip generation estimates have also been made under a scenario if the site were to be developed with an office building. 210 Long Ridge Road is currently zoned as commercial and could allow approximately 200,000 square feet of office. Based on the aforementioned ITE statistical data, an office building of this size would be estimated to generate anywhere from 225 to 300 total vehicle trips during the weekday commuter peak hours. Thus, the proposed senior living facility will generate only a fraction of the amount of traffic that an office building at 210 Long Ridge Road would otherwise generate.

[1] *Trip Generation, 10th Edition*, Institute of Transportation Engineers, 2017

Future Traffic Volumes

Future roadway traffic volumes were estimated both with and without the proposed senior living development in place in order to determine possible traffic impacts. This proposed development is anticipated to open in year 2021.

The background traffic scenario is reflective of future conditions before the new development is built and was estimated by including traffic through the study intersections associated with other expected upcoming nearby developments as well as by including general traffic growth to the roadway traffic volumes. Correspondence with the City of Stamford and CTDOT finds that two developments have been proposed near the site in the recent past, one of which gained approvals while the other was not approved by the Stamford Zoning Board. 201 High Ridge Road was approved in late 2018 by the city to become a senior housing development with around 150 dwelling units known as Waterstone at Stamford. A redevelopment of 260 Long Ridge Road that would have contained around 800 apartments was not approved by the city in 2017 (the stated reason was that it was too intense of a proposal). The baseline traffic volumes were expanded to the 2021 estimated opening year using an annual growth rate of 1% and by adding in new traffic from the nearby expected development at 201 High Ridge Road as well as traffic that would be associated with reoccupancy of office space at 225 High Ridge Road and 260 Long Ridge Road. The resultant estimated 2021 volumes reflect conditions just before the proposed development would open and can be seen in Figure 4 as the background traffic volumes.

The combined traffic scenario is reflective of future conditions after the proposed senior living development is built and opened and was estimated by adding the estimated new traffic generated by the senior housing development (shown in Figure 3) to the future background traffic (shown in Figure 4). The resultant estimated 2021 future combined traffic volumes are shown in Figure 5.

Intersection Capacity Analysis

The future background and combined traffic scenarios were evaluated by means of capacity analysis techniques. These analyses were used to determine the quality of operations at the study intersections, and a comparison of background versus combined traffic operations allows for a determination of possible traffic impacts from the proposed development. The quality of operations is measured and expressed as a level of service (LOS). LOS is defined as a measure of inconvenience that motorists experience. The levels are expressed with letter designations of A through F. In urban areas, LOS D/E during peak hours are often deemed acceptable and can indicate an efficient tradeoff between traffic flow and the amount of land devoted to the movement of motor vehicles. Furthermore, in some communities, traffic 'impacts' caused by a new development may only be deemed 'significant' if LOS drops two letter grades between background and combined conditions. A more detailed explanation of LOS and the analysis worksheets are provided in the Appendix. Table 3 summarizes the results of the capacity analysis.

As can be seen, traffic conditions between the background and combined scenarios are expected to largely remain the same. With the exception of a change in LOS from B to C during the afternoon peak hour for southbound traffic on Long Ridge Road, the senior living development is not expected to have any traffic impacts. This LOS B for the southbound approach is noted to already be near the tipping point threshold with LOS C under background conditions. Moreover, LOS C during peak hours is an acceptable level of service. Nonetheless, we investigated modifications to the signal timing to maintain LOS B for the southbound approach during combined traffic conditions and found that the LOS B could be maintained,

if the city chose to do so, by allocating slightly more time to the signal's Long Ridge Road north-south artery phase in lieu of the northbound left turn advance signal phase.

It should be noted that poor LOS during peak hours for motorists egressing the site driveway to Long Ridge Road will occur with or without new traffic from the proposed development. For example, the eastbound left-turn movement at the signal during the weekday afternoon peak hour, for example, will remain LOS F between background and combined conditions with only minor additional delay caused by the proposed development – again indicating that this movement will operate poorly during peak periods regardless of whether the proposed senior living development occurs. The long side street/driveway delays are a function of the way the signal is programed with long cycle lengths during the commuter periods. The signal takes upwards of 2 minutes to cycle through all the movement phases at the intersection, with the northbound and southbound artery flows receiving the majority of the signal time to serve heavy volumes of traffic along Long Ridge Road. The left turn out of the site driveway at the signal has long delays during peak hours now, which will be made somewhat longer if/when the office space at 260 Long Ridge Road is reoccupied, but will not be made worse in terms of a drop in LOS-grade by the proposed senior living development. Again, the proposed senior living development is *not* expected to cause significant traffic impacts to area roadways.

TABLE 3
Capacity Analysis Summary

Intersection/Lane Group	LEVEL OF SERVICE			
	Weekday Morning Peak Hour		Weekday Afternoon Peak Hour	
	Background	Combined	Background	Combined
Signalized				
Long Ridge Road at Terrace Avenue and Site Driveway				
Northbound Left/Through/Right	B	B	A	A
Southbound Left/Through/Right	C	C	B	C *
Eastbound Left	E	E	F	F
Eastbound Through/Right	C	C	C	C
Westbound Left/Through/Right	E	E **	D	D
OVERALL	**C**	**C**	**B**	**B**

* LOS B could be maintained with signal timing adjustment.
** Could be improved to LOS D with signal timing adjustment

Note that to reduce delays for motorists in the future making a left exit out of the site driveway to Long Ridge Road, the signal would have to be taken out of coordination from the coordinated system of multiple signals along Long Ridge Road or the cycle length of the multiple-signal system along Long Ridge Road would have to be decreased. We understand that the city has recently retimed much of the Long Ridge Road corridor and favored the arterial progression of traffic flow over driveway/side street operations, which is common practice for arterials like Long Ridge Road. To improve the driveway LOS, the cycle length of the signal would have to be shortened to around 90 seconds. However, any shortening of the cycle length would to some extent increase delays for motorists traveling along Long Ridge Road.

Motorist queuing on the signalized driveway exit (eastbound approach) to Long Ridge Road was analyzed as part of the signal capacity analysis and is expected to be one to three vehicles on average during the peak hours, with the occasional peak queue of four to five vehicles during the afternoon peak hour. As with the LOS analysis described above, these queuing characteristics are by and large expected to occur regardless of the proposed senior living development. The occasional peak queue may nonetheless briefly interfere with traffic entering the senior living site from time to time. We therefore recommend that (i) the senior living entrance driveway be located around 125 feet from the right-of-way line, and (ii) that the 260 Long Ridge Road driveway (the west leg of the signal with Long Ridge Road/Terrace Avenue) be widened along the senior living entrance in order to allow motorists continuing into the 260 Long Ridge Road rear parking lot to be able to bypass any vehicle that may be temporarily waiting to turn left into the senior living development. We understand that these design aspects have been incorporated into the proposed plans.

Traffic operations at the unsignalized intersection of Cross Road and Long Ridge Road will continue to operate as they do now. Motorists egressing the stop-sign controlled approach of Cross Road to Long Ridge Road, particularly left turners, will continue to experience delays during peak periods with or without the proposed development as this is a function of an unsignalized approach to a busy road.

Summary

This study was conducted to assess the transportation implications of the proposed senior living development to be located at 201 Long Ridge Road in Stamford, Connecticut. To determine a profile of existing conditions, detailed field reconnaissance and data assembly efforts were undertaken. Estimates of traffic that will be generated by the proposed development were developed based on industry statistical data, and intersection capacity analyses were performed, comparing existing and future conditions adjacent to the site. Analysis of the estimated traffic added to the adjacent roadway from the proposed senior living development finds that the additional traffic can be accommodated with little to no perceptible impact. Overall LOS at the study intersections, as well as LOS for motorists traveling along Long Ridge Road, are expected to remain good at LOS C or better. Some motorists egressing side streets in the area, including the site driveway opposite Terrace Avenue at Long Ridge Road, will continue to experience delays as they do today during peak hours, which is largely a function of the amount of traffic that flows north and south along Long Ridge Road and the priority given to these movements.

We recommend that the entrance portion of the driveway to the senior living development be around 125 feet from the right-of-way line. We additionally recommend that the 260 Long Ridge Road driveway (the west leg of the signal with Long Ridge Road/Terrace Avenue) be widened along the senior living development entrance in order to allow motorists continuing into the 260 Long Ridge Road rear parking lot to be able to bypass any vehicle that may be temporarily waiting to turn left into the senior living development. It is our understanding that these design aspects have been incorporated into the site plans.

We hope this report is useful to you and the City of Stamford. If you have any questions or need anything further, please do not hesitate to contact either of the undersigned.

Very truly yours,

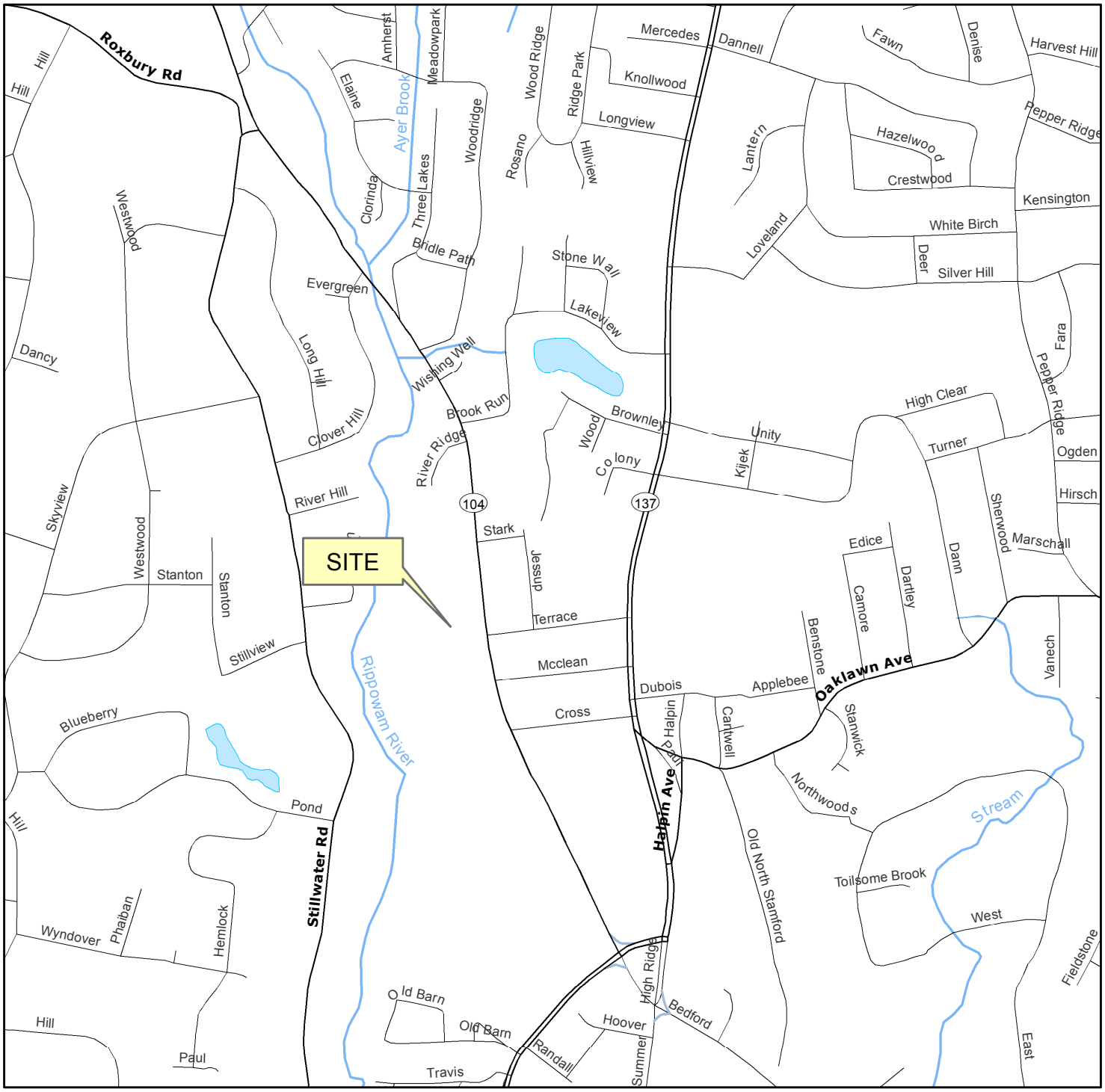
MILONE & MACBROOM, INC.

David G. Sullivan, PE, Associate
Manager of Traffic and Transportation Planning

Neil C. Olinski, MS, PTP
Lead Transportation Planner

Enclosures

2182-03-02-au519-rpt



0 500 1,000 2,000 Feet

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SITE LOCATION

PROPOSED SENIOR LIVING FACILITY

210 Long Ridge Road
Stamford, Connecticut

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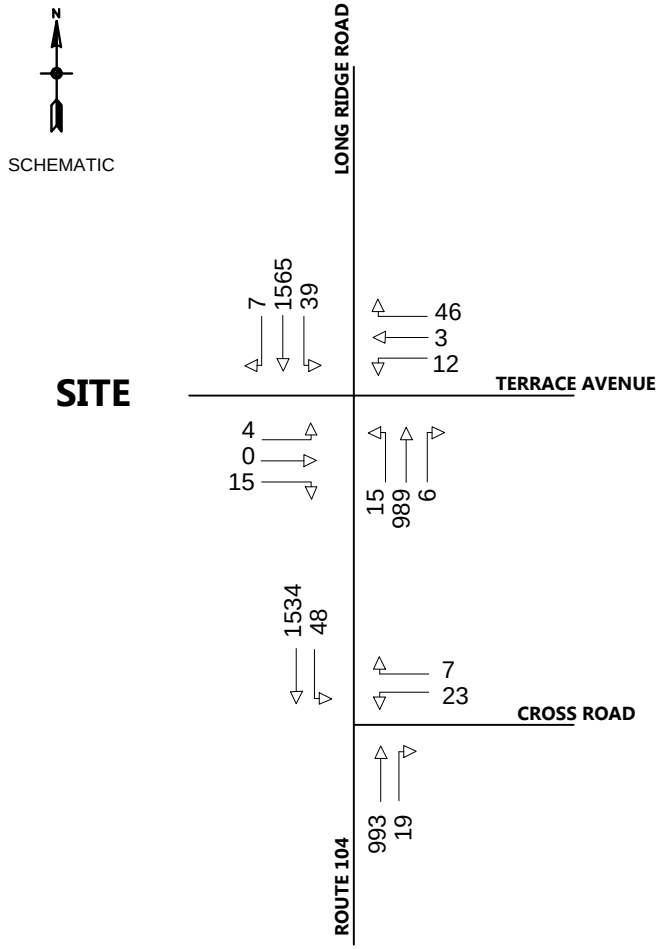
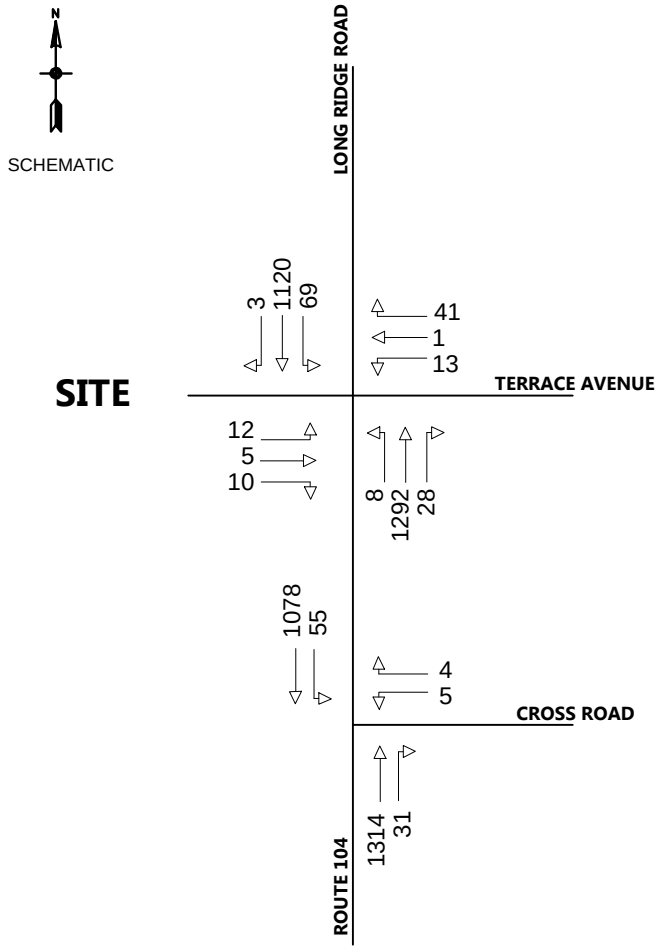
FIGURE 1



WEEKDAY MORNING PEAK HOUR



WEEKDAY AFTERNOON PEAK HOUR

BASELINE TRAFFIC VOLUMES

PROPOSED SENIOR LIVING FACILITY

210 Long Ridge Road
Stamford, Connecticut

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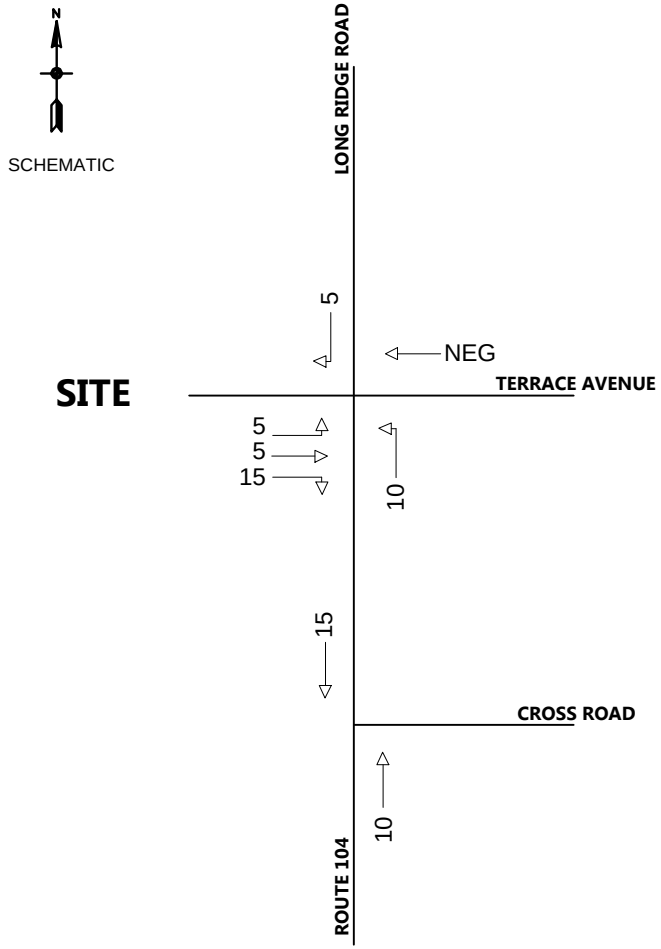
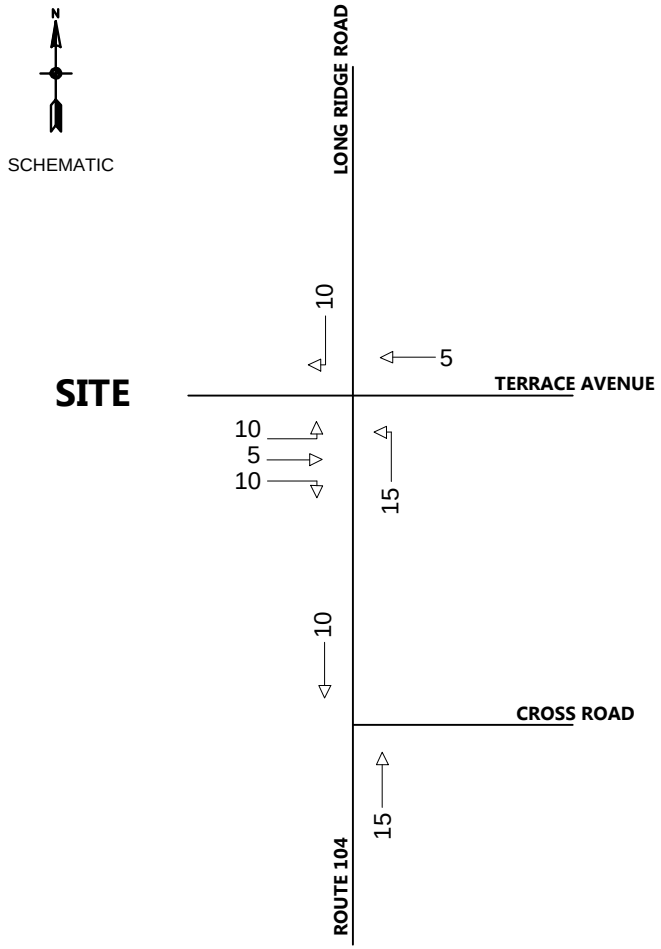
FIGURE 02



WEEKDAY MORNING PEAK HOUR



WEEKDAY AFTERNOON PEAK HOUR

NEW SITE GENERATED TRAFFIC VOLUMES

PROPOSED SENIOR LIVING FACILITY

210 Long Ridge Road
Stamford, Connecticut

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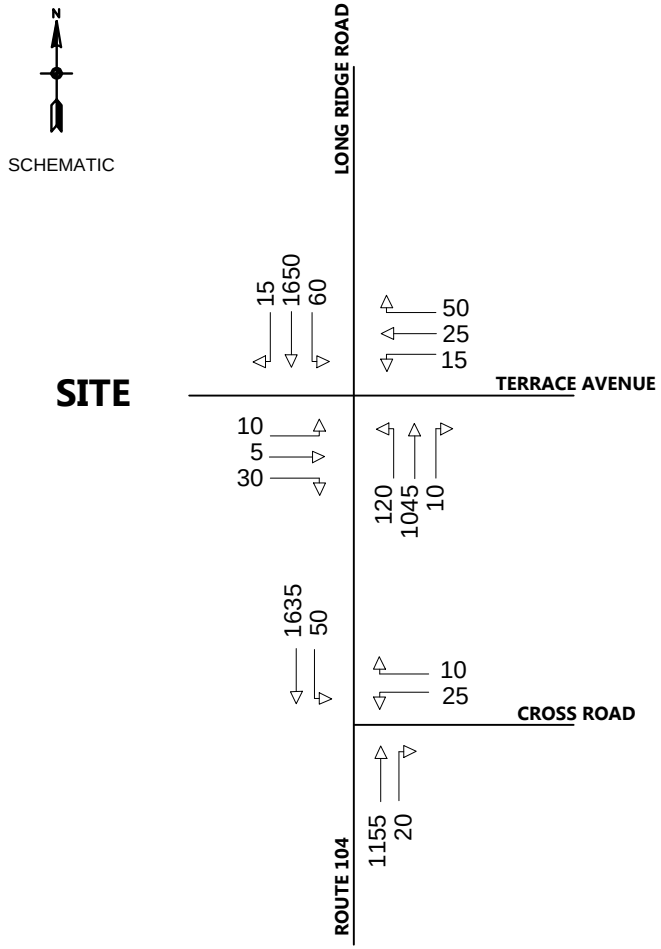
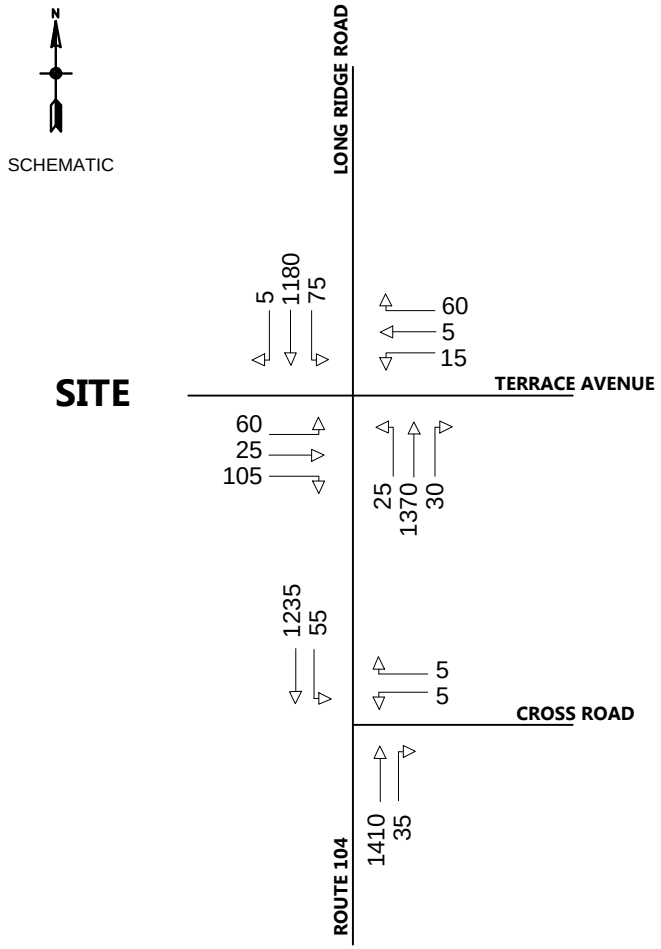
FIGURE 03



WEEKDAY MORNING PEAK HOUR



WEEKDAY AFTERNOON PEAK HOUR

2021 BACKGROUND TRAFFIC VOLUMES

PROPOSED SENIOR LIVING FACILITY

210 Long Ridge Road
Stamford, Connecticut

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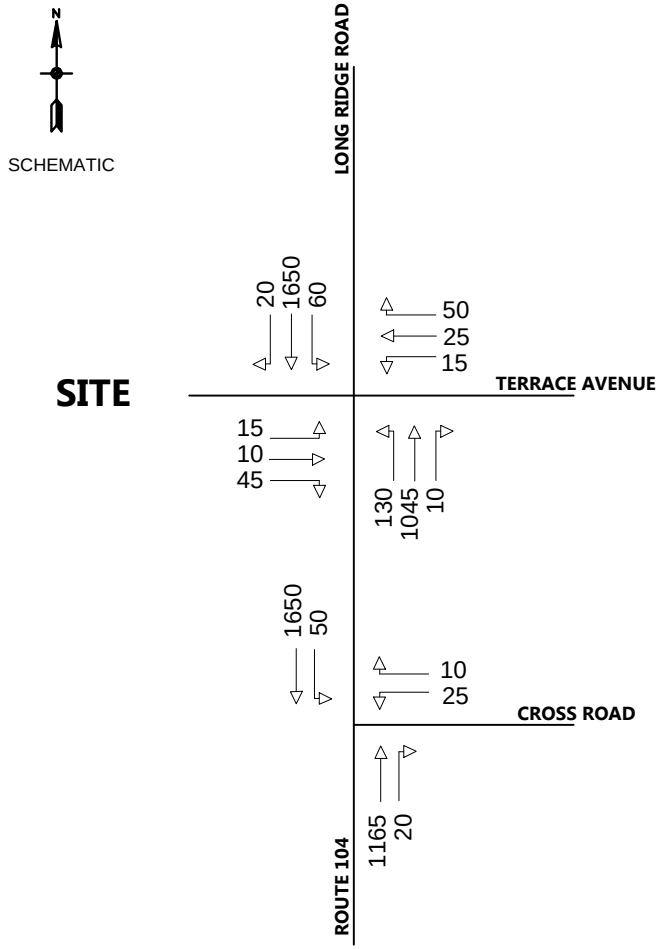
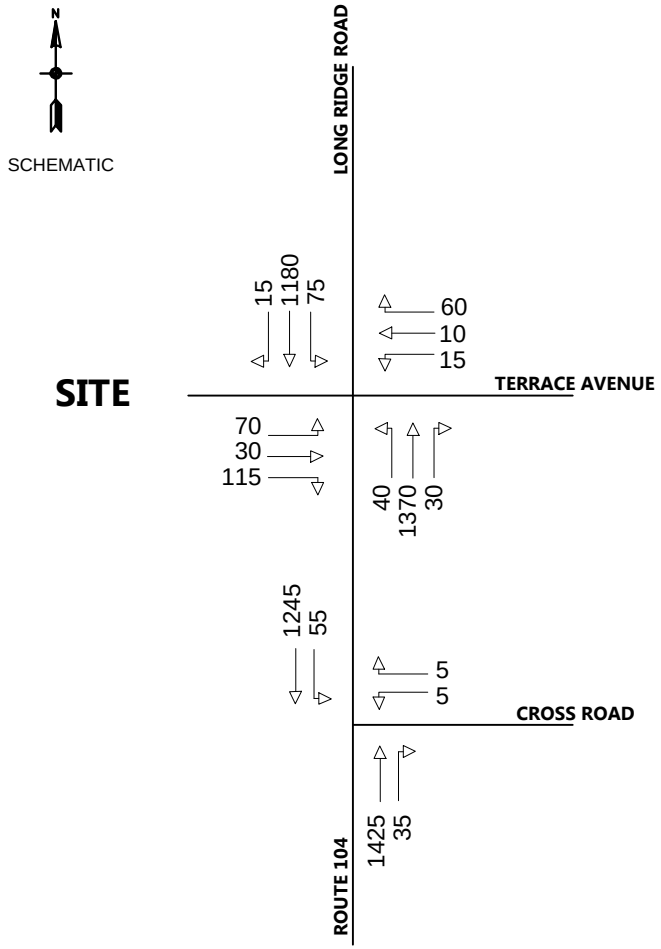
FIGURE 04



WEEKDAY MORNING PEAK HOUR



WEEKDAY AFTERNOON PEAK HOUR

2021 COMBINED TRAFFIC VOLUMES

PROPOSED SENIOR LIVING FACILITY

210 Long Ridge Road
Stamford, Connecticut

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FIGURE 05

APPENDIX

LEVEL OF SERVICE
FOR
SIGNALIZED INTERSECTIONS
(MOTORIZED VEHICLE MODE)

Level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions: in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle, typically for a 15-min analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group. The criteria are given below.

LEVEL-OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS
MOTORIZED VEHICLE MODE

LOS By Volume-to-Capacity Ratio[1]		CONTROL DELAY (s/veh)
v/c ≤ 1.0	v/c > 1.0	
A	F	≤ 10
B	F	> 10 AND ≤ 20
C	F	> 20 AND ≤ 35
D	F	> 35 AND ≤ 55
E	F	> 55 AND ≤ 80
F	F	> 80

[1] For approach-based and intersection-wide assessments, LOS is defined solely by control delay.

Specific descriptions of each LOS for signalized intersections are provided below:

Level of Service A describes operations with a control delay of 10 s/veh and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. 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 describes operations with control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. 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 describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. 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 describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. 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 describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. 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.

Level of Service F describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. 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.

Reference: Highway Capacity Manual 6, Transportation Research Board, 2016.

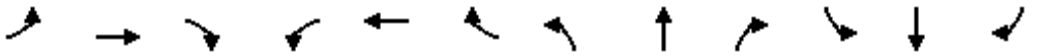
LEVEL OF SERVICE
FOR TWO-WAY
STOP SIGN CONTROLLED INTERSECTIONS

The level of service for a TWSC (two-way stop controlled) intersection is determined by the computed or measured control delay and is defined for each minor movement. Level of service is not defined for the intersection as a whole. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. LOS criteria are given in the Table**.** LOS criteria are given below:

LEVEL-OF SERVICE CRITERIA FOR AWSC INTERSECTIONS	
LOS[1]	**CONTROL DELAY (s/veh)**
A	**≤ 10**
B	**> 10 AND ≤ 15**
C	**> 15 AND ≤ 25**
D	**> 25 AND ≤ 35**
E	**> 35 AND ≤ 50**
F	**> 50**

Note: 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.
LOS F is assigned to a movement if the volume-to-capacity ratio exceeds 1.0, regardless of the control delay

Reference: Highway Capacity Manual Version 6.0, Transportation Research Board, 2016.

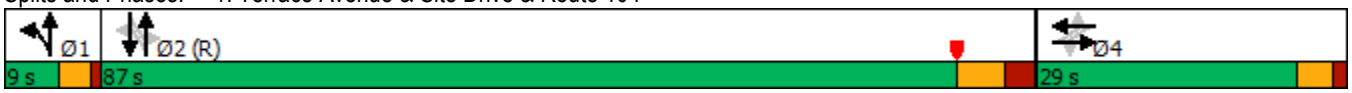


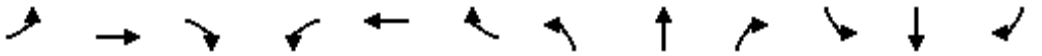
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	5	30	15	25	50	120	1045	10	60	1650	15
Future Volume (vph)	10	5	30	15	25	50	120	1045	10	60	1650	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.873			0.925			0.999			0.999	
Flt Protected	0.950				0.992			0.995			0.998	
Satd. Flow (prot)	1711	1572	0	0	1652	0	0	3401	0	0	3411	0
Flt Permitted	0.471				0.932			0.514			0.789	
Satd. Flow (perm)	848	1572	0	0	1552	0	0	1757	0	0	2697	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			44			2			1	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		333			485			678			660	
Travel Time (s)		9.1			13.2			11.6			11.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	6	33	17	28	56	133	1161	11	67	1833	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	39	0	0	101	0	0	1305	0	0	1917	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	
Protected Phases		4			4		1	1 2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0			15.0	15.0	
Minimum Split (s)	9.8	9.8		9.8	9.8		9.0			22.4	22.4	
Total Split (s)	29.0	29.0		29.0	29.0		9.0			87.0	87.0	
Total Split (%)	23.2%	23.2%		23.2%	23.2%		7.2%			69.6%	69.6%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.0			3.0	3.0	
Lost Time Adjust (s)	0.0	0.0			0.0						0.0	
Total Lost Time (s)	4.8	4.8			4.8						7.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max			C-Min	C-Min	
Act Effct Green (s)	8.5	8.5			8.5			103.7			95.3	
Actuated g/C Ratio	0.07	0.07			0.07			0.83			0.76	
v/c Ratio	0.19	0.28			0.69			0.86			0.93	
Control Delay	60.4	25.8			55.9			12.6			23.1	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	60.4	25.8			55.9			12.6			23.1	
LOS	E	C			E			B			C	
Approach Delay		33.4			55.9			12.6			23.1	
Approach LOS		C			E			B			C	
Stops (vph)	11	13			52			249			1227	
Fuel Used(gal)	0	0			2			11			28	
CO Emissions (g/hr)	14	23			113			759			1950	
NOx Emissions (g/hr)	3	5			22			148			379	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
VOC Emissions (g/hr)	3	5			26			176			452	
Dilemma Vehicles (#)	0	0			0			92			67	
Queue Length 50th (ft)	9	5			46			84			562	
Queue Length 95th (ft)	28	39			103			#161			#975	
Internal Link Dist (ft)		253			405			598			580	
Turn Bay Length (ft)												
Base Capacity (vph)	164	330			335			1523			2055	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.07	0.12			0.30			0.86			0.93	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 125			
Offset: 52 (42%), Referenced to phase 2:NBSB, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 20.2		Intersection LOS: C	
Intersection Capacity Utilization 105.9%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Terrace Avenue & Site Drive & Route 104



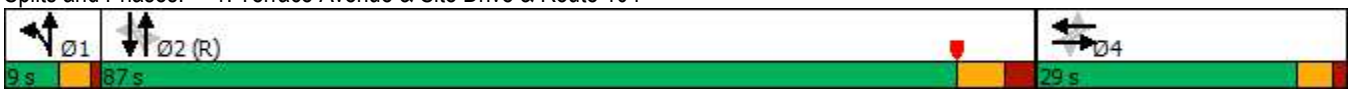


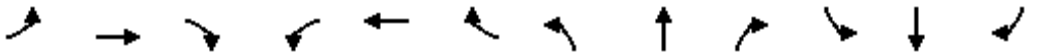
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	10	45	15	25	50	130	1045	10	60	1650	20
Future Volume (vph)	15	10	45	15	25	50	130	1045	10	60	1650	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.877			0.925			0.999			0.998	
Flt Protected	0.950				0.992			0.995			0.998	
Satd. Flow (prot)	1711	1579	0	0	1652	0	0	3401	0	0	3408	0
Flt Permitted	0.465				0.927			0.503			0.787	
Satd. Flow (perm)	837	1579	0	0	1544	0	0	1719	0	0	2687	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50			44			2			2	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		333			485			678			660	
Travel Time (s)		9.1			13.2			11.6			11.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	11	50	17	28	56	144	1161	11	67	1833	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	61	0	0	101	0	0	1316	0	0	1922	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	
Protected Phases		4			4		1	1 2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0			15.0	15.0	
Minimum Split (s)	9.8	9.8		9.8	9.8		9.0			22.4	22.4	
Total Split (s)	29.0	29.0		29.0	29.0		9.0			87.0	87.0	
Total Split (%)	23.2%	23.2%		23.2%	23.2%		7.2%			69.6%	69.6%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.0			3.0	3.0	
Lost Time Adjust (s)	0.0	0.0			0.0						0.0	
Total Lost Time (s)	4.8	4.8			4.8						7.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max			C-Min	C-Min	
Act Effct Green (s)	8.6	8.6			8.6			103.6			95.2	
Actuated g/C Ratio	0.07	0.07			0.07			0.83			0.76	
v/c Ratio	0.30	0.40			0.69			0.88			0.94	
Control Delay	66.9	26.3			56.1			14.6			23.9	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	66.9	26.3			56.1			14.6			23.9	
LOS	E	C			E			B			C	
Approach Delay		35.1			56.1			14.6			23.9	
Approach LOS		D			E			B			C	
Stops (vph)	15	18			52			250			1237	
Fuel Used(gal)	0	1			2			11			28	
CO Emissions (g/hr)	21	36			113			798			1980	
NOx Emissions (g/hr)	4	7			22			155			385	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
VOC Emissions (g/hr)	5	8			26			185			459	
Dilemma Vehicles (#)	0	0			0			92			67	
Queue Length 50th (ft)	13	9			46			85			574	
Queue Length 95th (ft)	37	51			103			#194			#982	
Internal Link Dist (ft)		253			405			598			580	
Turn Bay Length (ft)												
Base Capacity (vph)	162	346			334			1492			2047	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.10	0.18			0.30			0.88			0.94	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 125			
Offset: 52 (42%), Referenced to phase 2:NBSB, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 21.5		Intersection LOS: C	
Intersection Capacity Utilization 106.3%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Terrace Avenue & Site Drive & Route 104



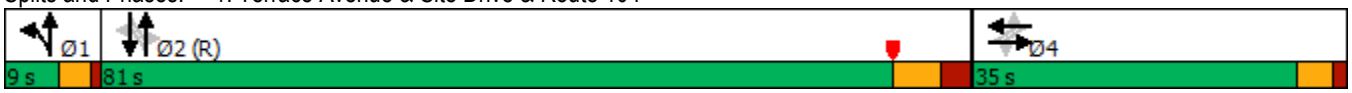


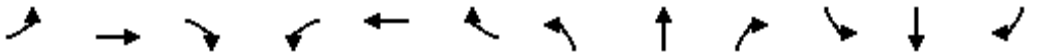
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	10	45	15	25	50	130	1045	10	60	1650	20
Future Volume (vph)	15	10	45	15	25	50	130	1045	10	60	1650	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.877			0.925			0.999			0.998	
Flt Protected	0.950				0.992			0.995			0.998	
Satd. Flow (prot)	1711	1579	0	0	1652	0	0	3401	0	0	3408	0
Flt Permitted	0.476				0.927			0.504			0.787	
Satd. Flow (perm)	857	1579	0	0	1544	0	0	1723	0	0	2687	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50			47			1			2	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		333			485			678			660	
Travel Time (s)		9.1			13.2			11.6			11.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	11	50	17	28	56	144	1161	11	67	1833	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	61	0	0	101	0	0	1316	0	0	1922	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	
Protected Phases		4			4		1	1 2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0			15.0	15.0	
Minimum Split (s)	9.8	9.8		9.8	9.8		9.0			22.4	22.4	
Total Split (s)	35.0	35.0		35.0	35.0		9.0			81.0	81.0	
Total Split (%)	28.0%	28.0%		28.0%	28.0%		7.2%			64.8%	64.8%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.0			3.0	3.0	
Lost Time Adjust (s)	0.0	0.0			0.0						0.0	
Total Lost Time (s)	4.8	4.8			4.8						7.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max			C-Min	C-Min	
Act Effct Green (s)	8.4	8.4			8.4			103.8			95.4	
Actuated g/C Ratio	0.07	0.07			0.07			0.83			0.76	
v/c Ratio	0.30	0.40			0.69			0.88			0.94	
Control Delay	67.1	26.7			54.8			14.2			23.5	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	67.1	26.7			54.8			14.2			23.5	
LOS	E	C			D			B			C	
Approach Delay		35.5			54.8			14.2			23.5	
Approach LOS		D			D			B			C	
Stops (vph)	15	18			50			247			1231	
Fuel Used(gal)	0	1			2			11			28	
CO Emissions (g/hr)	21	37			111			789			1967	
NOx Emissions (g/hr)	4	7			22			154			383	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
VOC Emissions (g/hr)	5	8			26			183			456	
Dilemma Vehicles (#)	0	0			0			92			67	
Queue Length 50th (ft)	13	9			43			83			566	
Queue Length 95th (ft)	37	51			100			#188			#980	
Internal Link Dist (ft)		253			405			598			580	
Turn Bay Length (ft)												
Base Capacity (vph)	207	419			408			1498			2052	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.08	0.15			0.25			0.88			0.94	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 125			
Offset: 52 (42%), Referenced to phase 2:NBSB, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 21.1		Intersection LOS: C	
Intersection Capacity Utilization 106.3%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Terrace Avenue & Site Drive & Route 104



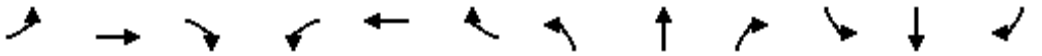


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	25	105	15	5	60	25	1370	30	75	1180	5
Future Volume (vph)	60	25	105	15	5	60	25	1370	30	75	1180	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.879			0.899			0.997			0.999	
Flt Protected	0.950				0.991			0.999			0.997	
Satd. Flow (prot)	1711	1583	0	0	1604	0	0	3408	0	0	3408	0
Flt Permitted	0.567				0.579			0.900			0.657	
Satd. Flow (perm)	1021	1583	0	0	937	0	0	3070	0	0	2246	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		117			61			4			1	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		333			485			678			660	
Travel Time (s)		9.1			13.2			11.6			11.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	67	28	117	17	6	67	28	1522	33	83	1311	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	145	0	0	90	0	0	1583	0	0	1400	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	
Protected Phases		4			4		1	1 2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0			15.0	15.0	
Minimum Split (s)	9.8	9.8		9.8	9.8		9.0			22.4	22.4	
Total Split (s)	26.0	26.0		26.0	26.0		9.0			80.0	80.0	
Total Split (%)	22.6%	22.6%		22.6%	22.6%		7.8%			69.6%	69.6%	
Maximum Green (s)	21.2	21.2		21.2	21.2		5.0			72.6	72.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.0			3.0	3.0	
Lost Time Adjust (s)	0.0	0.0			0.0						0.0	
Total Lost Time (s)	4.8	4.8			4.8						7.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		0.2			2.5	2.5	
Recall Mode	None	None		None	None		Max			C-Min	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	6.0	6.0		6.0	6.0							
Pedestrian Calls (#/hr)	1	1		1	1							
Act Effct Green (s)	10.0	10.0			10.0			92.2			83.8	
Actuated g/C Ratio	0.09	0.09			0.09			0.80			0.73	
v/c Ratio	0.76	0.59			0.66			0.64			0.86	
Control Delay	95.9	23.7			42.1			6.0			19.1	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	95.9	23.7			42.1			6.0			19.1	
LOS	F	C			D			A			B	
Approach Delay		46.5			42.1			6.0			19.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			D			A			B	
Stops (vph)	58	36			32			415			843	
Fuel Used(gal)	2	1			1			12			19	
CO Emissions (g/hr)	109	79			80			865			1315	
NOx Emissions (g/hr)	21	15			16			168			256	
VOC Emissions (g/hr)	25	18			19			200			305	
Dilemma Vehicles (#)	0	0			0			124			54	
Queue Length 50th (ft)	49	20			21			135			340	
Queue Length 95th (ft)	95	80			74			241			#654	
Internal Link Dist (ft)		253			405			598			580	
Turn Bay Length (ft)												
Base Capacity (vph)	188	387			222			2477			1637	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.36	0.37			0.41			0.64			0.86	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 103 (90%), Referenced to phase 2:NBSB, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 104.6%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Site Drive/Terrace Avenue & Route 104

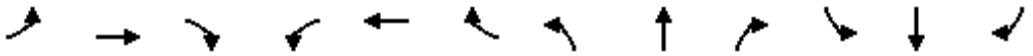


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	30	115	15	10	60	40	1370	30	75	1180	15
Future Volume (vph)	70	30	115	15	10	60	40	1370	30	75	1180	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.881			0.905			0.997			0.998	
Flt Protected	0.950				0.991			0.999			0.997	
Satd. Flow (prot)	1711	1586	0	0	1615	0	0	3408	0	0	3404	0
Flt Permitted	0.561				0.585			0.850			0.651	
Satd. Flow (perm)	1010	1586	0	0	953	0	0	2899	0	0	2223	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		128			61			4			2	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		333			485			678			660	
Travel Time (s)		9.1			13.2			11.6			11.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	33	128	17	11	67	44	1522	33	83	1311	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	161	0	0	95	0	0	1599	0	0	1411	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	
Protected Phases		4			4		1	1 2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0			15.0	15.0	
Minimum Split (s)	9.8	9.8		9.8	9.8		9.0			22.4	22.4	
Total Split (s)	26.0	26.0		26.0	26.0		9.0			80.0	80.0	
Total Split (%)	22.6%	22.6%		22.6%	22.6%		7.8%			69.6%	69.6%	
Maximum Green (s)	21.2	21.2		21.2	21.2		5.0			72.6	72.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.0			3.0	3.0	
Lost Time Adjust (s)	0.0	0.0			0.0						0.0	
Total Lost Time (s)	4.8	4.8			4.8						7.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		0.2			2.5	2.5	
Recall Mode	None	None		None	None		Max			C-Min	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	6.0	6.0		6.0	6.0							
Pedestrian Calls (#/hr)	1	1		1	1							
Act Effct Green (s)	11.1	11.1			11.1			91.1			82.7	
Actuated g/C Ratio	0.10	0.10			0.10			0.79			0.72	
v/c Ratio	0.80	0.60			0.65			0.69			0.88	
Control Delay	99.2	22.6			40.8			7.4			21.9	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	99.2	22.6			40.8			7.4			21.9	
LOS	F	C			D			A			C	
Approach Delay		47.6			40.8			7.4			21.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			D			A			C	
Stops (vph)	69	40			36			453			885	
Fuel Used(gal)	2	1			1			13			20	
CO Emissions (g/hr)	131	86			84			926			1401	
NOx Emissions (g/hr)	26	17			16			180			273	
VOC Emissions (g/hr)	30	20			20			215			325	
Dilemma Vehicles (#)	0	0			0			125			54	
Queue Length 50th (ft)	57	23			24			153			371	
Queue Length 95th (ft)	106	86			79			268			#683	
Internal Link Dist (ft)		253			405			598			580	
Turn Bay Length (ft)												
Base Capacity (vph)	186	396			225			2319			1599	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.42	0.41			0.42			0.69			0.88	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 103 (90%), Referenced to phase 2:NBSB, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 17.3		Intersection LOS: B	
Intersection Capacity Utilization 106.5%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Site Drive/Terrace Avenue & Route 104



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	30	115	15	10	60	40	1370	30	75	1180	15
Future Volume (vph)	70	30	115	15	10	60	40	1370	30	75	1180	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.881			0.905			0.997			0.998	
Flt Protected	0.950				0.991			0.999			0.997	
Satd. Flow (prot)	1711	1586	0	0	1615	0	0	3408	0	0	3404	0
Flt Permitted	0.561				0.585			0.848			0.648	
Satd. Flow (perm)	1010	1586	0	0	953	0	0	2893	0	0	2213	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		113			61			4			2	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		333			485			678			660	
Travel Time (s)		9.1			13.2			11.6			11.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	33	128	17	11	67	44	1522	33	83	1311	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	161	0	0	95	0	0	1599	0	0	1411	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	
Protected Phases		4			4		1	1 2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	
Minimum Split (s)	17.8	17.8		17.8	17.8		7.0			22.4	22.4	
Total Split (s)	26.0	26.0		26.0	26.0		7.0			82.0	82.0	
Total Split (%)	22.6%	22.6%		22.6%	22.6%		6.1%			71.3%	71.3%	
Maximum Green (s)	21.2	21.2		21.2	21.2		3.0			74.6	74.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.0			3.0	3.0	
Lost Time Adjust (s)	0.0	0.0			0.0						0.0	
Total Lost Time (s)	4.8	4.8			4.8						7.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		0.2			2.5	2.5	
Recall Mode	None	None		None	None		Max			C-Min	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	6.0	6.0		6.0	6.0							
Pedestrian Calls (#/hr)	1	1		1	1							
Act Effct Green (s)	11.1	11.1			11.1			91.1			84.7	
Actuated g/C Ratio	0.10	0.10			0.10			0.79			0.74	
v/c Ratio	0.80	0.63			0.65			0.69			0.87	
Control Delay	99.2	27.9			40.8			7.8			19.5	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	99.2	27.9			40.8			7.8			19.5	
LOS	F	C			D			A			B	
Approach Delay		51.2			40.8			7.8			19.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			D			A			B	
Stops (vph)	69	50			36			433			848	
Fuel Used(gal)	2	1			1			13			19	
CO Emissions (g/hr)	131	100			84			919			1332	
NOx Emissions (g/hr)	26	19			16			179			259	
VOC Emissions (g/hr)	30	23			20			213			309	
Dilemma Vehicles (#)	0	0			0			125			54	
Queue Length 50th (ft)	57	34			24			153			345	
Queue Length 95th (ft)	106	98			79			268			#670	
Internal Link Dist (ft)		253			405			598			580	
Turn Bay Length (ft)												
Base Capacity (vph)	186	384			225			2306			1630	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.42	0.42			0.42			0.69			0.87	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 103 (90%), Referenced to phase 2:NBSB, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 16.7		Intersection LOS: B	
Intersection Capacity Utilization 106.5%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Site Drive/Terrace Avenue & Route 104