May 13, 2022

Mr. Daniel A. Pennington P.E.
Town Engineer/Manager of Physical Services
Town of Glastonbury , CT
2155 Main Street
Glastonbury, CT 06033

Re: Updated Traffic Impact Statement
400 Hebron Avenue Change in Use
Glastonbury, Connecticut
Fuss & O'Neill Reference No. 20220036.A10

Dear Mr. Pennington:

Fuss & O'Neill has reviewed the traffic impact of the proposed conversion of a portion of the previously approved 19,904 square foot mixed-use development at 400 Hebron Avenue to include a small-scale grocery store and retail furniture store use. This statement has been prepared to document the findings of our review and is being submitted to the Town of Glastonbury in support of your Planning and Zoning Commission application.

Existing Conditions

The 19,904 square foot commercial/retail building is located on the southwest corner of the intersection of Hebron Avenue at Sycamore Street and is vacant with the exception of 2,150 square feet of retail space occupied by the Hartford Baking Company. The existing parking lot site access is provided by a single driveway located on Sycamore Street approximately 450 feet south of the intersection with Hebron Avenue.

Traffic Counts

Traffic entering and exiting the site on Sycamore Street will either originate from the intersection of Sycamore Street/Hebron Avenue/Route 2 Eastbound Off Ramp to the north of the site driveway or the intersection of Sycamore Street and New London Turnpike to the southwest of the site driveway. Consequently, these two intersections were analyzed for impacts. In order to determine existing traffic volumes at these intersections, manual turning movement traffic counts were conducted during the Friday afternoon and Saturday midday retail peak periods on May 6 and 7, 2022. The existing traffic volumes collected are depicted in Figure 1 attached.

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06040
t 860.646.2469
800.286.2469
f 860.533.5143

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Proposed Conditions

The site was previously approved by the Town of Glastonbury for a 19,904 square foot mixed-use development. The approved development consisted of a 1,250 square foot office building, an 8,030 square foot shopping center, and 10,567 square feet for two quality restaurants. The proposed land uses include a 13,154 square foot specialty grocery store and 4,600 square feet of retail furniture store use along with the existing 2,150 square foot fast casual restaurant (Hartford Baking Company).

Site access for patrons of the site will continue to be provided via one full access driveway located on Sycamore Street. One additional full access driveway is proposed on Linden Street and a truck only entrance driveway is proposed on Hebron Avenue to provide access to a small employee only parking lot and the grocery store loading dock.

Trip Generation and Distribution

Site generated traffic for the proposed land uses was initially reviewed using existing empirical data from the Institute of Transportation Engineers (ITE) publication Trip Generation, 11th edition, 2021. This publication is an industry-accepted resource for determining trip generation. Trip generation for the Friday afternoon and Saturday midday peak hours was calculated using the ITE land use code 890 "Furniture Store" and ITE land use code 850 (Supermarket). The ITE manual indicated that the proposed grocery store would generate a total of 149 trips (74 entering and 75 exiting) during the Friday afternoon peak hour and 204 trips (102 entering and 102 exiting) during the Saturday midday peak hour using the fitted curve equation. For the furniture store, the ITE manual projects a total of 3 vehicle trips (1 entering and 2 exiting) during the Friday afternoon peak hour of traffic and 15 vehicle trips (8 entering and 7 exiting) during the Saturday midday peak hour of traffic using the fitted curve equation.

In order to cross check the ITE trip generation for the proposed specialty grocer, manual trip counts at similar specialty retail grocer locations in Manchester, Connecticut and Hingham, Massachusetts were conducted. The actual traffic counts at the similar locations yielded a trip generation rate of 302 trips (151 entering and 151 exiting) during the Friday afternoon peak hour and 412 trips (206 entering and 206 exiting) during the Saturday midday peak hour. Consequently, these higher specialty grocery store trip rates were used in our analysis.

For the small-scale retail furniture store use, the ITE rates were also adjusted upward for a conservative analysis for the Friday afternoon peak hour. 10 total trips (5 entering and 5 exiting trips) are projected during the Friday afternoon peak hour based on projected store operations.

Overall, the development conversion consisting of a 13,154 square foot supermarket and 4,600 square foot of proposed furniture store is expected to generate a total of 312 vehicle trips (156 entering, 156 exiting) during the Friday afternoon peak hour and a total of 427 vehicle trips (214 entering, 213 exiting) during the Saturday midday peak hour. Trip generation for the existing Hartford Baking Company was not calculated as the trips generated by this land use were accounted for within the conducted traffic counts.

It should be noted that the grocery store and furniture store land uses rely heavily on "pass-by" trips. These types of business typically generate a significant proportion of their driveway traffic volumes by attracting vehicles from the existing traffic already using the transportation network in the vicinity of the site. This amount of traffic which enters and leaves the proposed project not as a primary origin or destination but as an intermediate stop in a trip made for some other purpose is defined as the "pass-by" trip percentage. This percentage is applied to the total trip generation of the proposed project to calculate the total amount of new traffic that will be added to the adjacent transportation facilities as a result of the development.

Pass-by trips are attracted from traffic passing the site on an adjacent roadway with direct access to the generator. Pass-by trip percentages reported in the ITE Trip Generation Handbook for site impact assessment of a grocery store have been shown to exceed 36% of the total site generated traffic during the peak hours. This study utilized a conservative retail pass-by credit of 20% in the analysis in accordance with the typical CTDOT methodology.

Additionally, Multi-use developments such as the proposed development frequently generate trips for patrons who visit multiple businesses within the site. The trips of these patrons who visit multiple uses within the development are defined as "internal capture" trips. A 10% reduction was applied to the site generated traffic volumes in order to account for captured trips as well as anticipated multi-modal trips to the site via transit, bicycle, or walking.

As a result of the internal capture and pass-by trips, the proposed development uses are expected to generate a net total of 218 new trips (109 entering, 109 exiting) during the Friday afternoon peak hour and 301 new trips (151 entering, 150 exiting) during the afternoon peak hour.

A summary of peak hour trip generation for the proposed development is provided in *Table 1* on the following page.

Table 1
Site Generated Traffic Volumes
400 Hebron Avenue
Glastonbury, Connecticut

*13,307 sq. ft. Grocery Store	Trips Entering	Trips Exiting	Total Trips
Friday Afternoon Peak Hour	151	151	302
Saturday Midday Peak Hour	206	206	412
4,600 sq. ft. Furniture Store			
**Friday Afternoon Peak Hour	5	5	10
Saturday Midday Peak Hour	8	7	15
10% Internal Capture/TOD			
Friday Afternoon Peak Hour	-16	-16	-32
Saturday Midday Peak Hour	-21	-21	-42
20% Pass-By			
Friday Afternoon Peak Hour	-31	-31	-62
Saturday Midday Peak Hour	-42	-42	-84
Total New Trips			
Friday Afternoon Peak Hour	109	109	218
Saturday Midday Peak Hour	151	150	301

Notes:

*- Trip generation based on similar specialty grocery store traffic counts conducted in Hingham, MA and Manchester, CT in May 2022.

**-Peak hour trip generation rates indicated for the proposed furniture store were adjusted upward from the projected ITE rates for Land use Code 890 (Furniture Store), as a conservative analysis.

As a point of comparison, *Table 2* on the following page presents a summary of the trip generation rates for the previously approved development. In comparison, the currently proposed land use conversion is anticipated to generate 139 more total trips (61 more entering, 78 more exiting) during the morning peak hour and 198 more total trips (93 more entering, 105 more exiting) during the afternoon peak hour.

Table 2
Site Generated Traffic Volume Comparison
Current Proposed Development vs. Originally Proposed Development
400 Hebron Avenue
Glastonbury, Connecticut

1,250 sq. ft. Small Office Building	Trips Entering	Trips Exiting	Total Trips
Friday Afternoon Peak Hour	1	2	3
Saturday Midday Peak Hour	0	0	0
8,030 sq. ft. Shopping Center			
Friday Afternoon Peak Hour	13	14	27
Saturday Midday Peak Hour	18	17	35
10,567 sq. ft. Quality Restaurant			
Friday Afternoon Peak Hour	55	27	82
Saturday Midday Peak Hour	67	46	113
10% Internal Capture/TOD			
Friday Afternoon Peak Hour	-7	-4	-11
Saturday Midday Peak Hour	-9	-6	-15
20% Pass-By			
Friday Afternoon Peak Hour	-14	-8	-22
Saturday Midday Peak Hour	-18	-12	-30
Originally Proposed Total New Trips			
Friday Afternoon Peak Hour	48	31	79
Saturday Midday Peak Hour	58	45	103
Net Change in New Trips			
Friday Afternoon Peak Hour	+61	+78	+139
Saturday Midday Peak Hour	+93	+105	+198

Notes: Trip generation based on Rate per Land use Code 712 (Small Office Building), 820 (Shopping Center), and 931 (Quality Restaurant), as published in *Trip Generation,* 10th Edition, 2017.

The additional site generated traffic was distributed to the adjacent roadway network based on the following arrival/departure distributions. These distributions were determined based on the site driveway location with respect to the layout of the adjacent road network as well as existing traffic volume distributions within the study area:

- 10 percent of the trips arrive from the north on Route 2
- 45 percent arrive and 50 percent depart from/to the east on Route 94 (Hebron Avenue)
- 20 percent arrive and 25 percent depart from/to the west on Hebron Avenue
- 10 percent arrive/depart to/from the north on New London Turnpike
- 15 percent arrive/depart to/from the south on New London Turnpike

Intersection Capacity Analysis

The site generated traffic, along with the pass-by traffic, from the proposed land use change was added to these 2022 existing traffic volumes to obtain the 2022 combined traffic volumes. The site generated traffic distributions, site generated traffic volumes, and combined volumes are depicted in Figures 2 through 6, attached.

Capacity analyses for both signalized and unsignalized intersections were conducted using Synchro Professional Software, version 10.0.

In discussing intersection capacity analyses results, two terms are used to describe the operating condition of the road or intersection. These two terms are volume to capacity ratio (v/c) and level of service (LOS).

The v/c ratio is a ratio of the volume of traffic using an intersection to the total capacity of the intersection (the maximum number of vehicles that can utilize the intersection during an hour). The v/c ratio can be used to describe the percentage of capacity utilized by a single intersection movement, a combination of movements, an entire intersection approach, or the intersection as a whole.

LOS is a measure of the delay experienced by stopped vehicles at an intersection. LOS is rated on a scale from A to F, with A describing a condition of very low delay (less than 10 seconds per vehicle), and F describing a condition where delays will exceed 50 seconds per vehicle for unsignalized intersections and 80 seconds per vehicle for signalized intersections. Delay is described as a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Therefore, intersections with longer delay times are less acceptable to most drivers.

LOS is generally used to describe the operation (based on delay time) of both signalized and unsignalized intersections, while v/c ratio is applied to signalized intersections only. These definitions for v/c ratio and LOS, as well as the methodology for conducting signalized and unsignalized intersection capacity analyses, are taken from the "Highway Capacity Manual 6th Edition" published by the Transportation Research Board.

In discussing two way stop controlled unsignalized intersection capacity analyses, LOS is used to provide a description of the delay and operational characteristics of the turns from the minor street (stop sign controlled) to the major street, and turns from the major street to the minor street. Through vehicles are not delayed by the minor street and do not experience delay, therefore they are not rated with a level of service.

Using the above referenced methodologies, Friday and Saturday midday peak hour capacity analyses were conducted at the signalized intersection of Hebron Avenue at Sycamore Street/Route 2 Eastbound Off-Ramp

Friday and Saturday midday peak hour capacity analyses were also conducted at the unsignalized intersections of Sycamore Street at the Site Driveway and Sycamore Street at New London Turnpike.

Tables No. 3 and 4 attached presents a summary of the levels of service at the signalized and unsignalized intersections, for both Existing and Combined Conditions traffic volumes. Copies of the analysis worksheets can also be found attached.

The determination of the traffic impact from the proposed land use conversion is made through a comparison of the Existing Conditions LOS (without the proposed conversion) versus the Combined Conditions LOS (with the proposed conversion).

The signalized intersection of Route 94 (Hebron Avenue) at Route 2 EB Off-Ramp/Sycamore Street is expected to operate acceptably at LOS C under existing and combined conditions during the Friday afternoon peak hour and the Saturday midday peak hour.

At the unsignalized intersection of the Site Driveway at Sycamore Street the northbound Sycamore Street approach is expected to operate efficiently at LOS A under existing and combined conditions during the Friday afternoon and Saturday midday peak hours. The eastbound site driveway approach is expected to operate acceptably at LOS B or C during the Friday afternoon and Saturday midday peak hours, respectively, under existing and combined conditions.

At the unsignalized intersection of New London Turnpike at Sycamore Street the eastbound New London Turnpike approach is expected to operate efficiently at LOS A during the Friday afternoon

and Saturday midday peak hours during the existing and combined conditions. The southbound Sycamore Street approach operates at LOS E or F with higher peak hour delays during the Friday afternoon and Saturday midday peak hours under both existing and combined conditions. It should be noted that these more significant delays are an existing condition and are generally focused on the commuter and retail peak periods. This approach operates more efficiently during off peak hours.

Queue Analysis

Background and Combined Conditions 95th percentile (design) queue lengths were reviewed at each intersection in the study area. The 95th percentile (design) vehicle queue lengths represent the maximum queue lengths that can be expected at each of the critical approach lanes of the study area intersections. The queue lengths are provided in the Synchro capacity analysis worksheets, which are attached. *Tables 5 and 6* attached provide a summary of the queue lengths for the critical lanes at each intersection.

At the intersection of Hebron Avenue at Sycamore Street and the Route 2 Eastbound Off Ramp, the analysis revealed peak hour queue length increases of one vehicle length or less on the Hebron Avenue eastbound approach and approximately four vehicle lengths on the westbound approach. Ample lane storage is available to accommodate the queue length increase on the westbound approach. On the Sycamore Street northbound approach, existing queue lengths double as a result of the proposed development traffic. Therefore, it is recommended that the northbound approach of Sycamore Street be widened to provide a second turn lane with the lanes striped as a shared left/right lane and an exclusive right turn only lane. In addition, it is recommended that the traffic signal timings at this intersection be optimized to provide additional green time for the Sycamore Street approach. CTDOT is currently completing a District wide closed loop signal system optimization project that will be reviewing and updating timings at this intersection in the coming months.

Upon completion of the proposed road widening and signal timing improvements, the maximum back of queue lengths on the northbound Sycamore Street approach will be restored approximately to their existing lengths.

At the intersection of Sycamore Street and New London Turnpike, the southbound New London Turnpike approach to Sycamore Street experiences minimal queueing of one vehicle length or less in the existing condition with no change in the combined conditions. The southbound Sycamore Street approach is expected to experience a maximum queue length increase of two to three vehicles in the Friday afternoon peak hour and approximately six vehicles during the Saturday midday peak hour. These queues are substantially lower during off peak periods.

Autoturn Analysis

The parking area providing access to the shopping center delivery dock and garbage area on the west side of the building was designed utilizing a WB-62, a tractor trailer with a 48 foot trailer, and a garbage truck. The analysis determined that the WB-62 and garbage truck can safely maneuver through the new curb cut entrance on Hebron Avenue and through the parking area to the loading dock/garbage area without encroachment on Hebron Avenue or Linden Street. See attached *Auto-01to Auto-05* Plans.

The presence of a westbound left turn lane and two through lanes on Hebron Avenue will ensure that a tractor trailer waiting to turn into the site will not block through traffic on Hebron Avenue. Tractor trailers and garbage trucks will exit onto Linden Street and turn left onto Hebron Avenue to access House Street (and ultimately Route 2) via the adjacent roundabout.

It should be noted that truck deliveries to the site and garbage pickup will arrive and depart during off peak hours and therefore have minimal impact on the adjacent road network.

Conclusions

The purpose of preparing this Traffic Impact Statement was to identify the impact of the expected traffic generation by the proposed development conversion.

Intersection capacity analysis revealed that the intersection of Route 94 (Hebron Avenue) at Route 2 EB Off-Ramp/Sycamore Street will operate acceptably at LOS C during the Friday afternoon and Saturday midday peak hours under existing and combined conditions. It should be noted that the Connecticut Department of Transportation is in the process of analyzing and retiming all coordinated closed loop signal systems within District 1, including the intersection of Hebron Avenue at Route 2 Off-Ramp/Sycamore Street and nearby signals to the east on Hebron Avenue. This intersection will be reviewed for allocation of additional green time to the Sycamore Street phase, allowing for improved operations on this approach.

At the intersection of the Site Driveway at Sycamore Street, intersection capacity analysis revealed that the northbound Sycamore Street approach to the intersection will operate efficiently at LOS A during the Friday afternoon and Saturday midday peak hours under combined conditions. The eastbound site driveway approach will operate acceptably at LOS B or C during the Friday afternoon and Saturday midday peak hours, respectively.

At the intersection of New London Turnpike at Sycamore Street the eastbound New London Turnpike approach is expected to operate efficiently at LOS A during the Friday afternoon and Saturday midday

peak hours under existing and combined conditions. The southbound Sycamore Street approach is anticipated to operate with higher peak hour delays during the Friday afternoon and Saturday midday peak hours under both existing and combined conditions. It should be noted that these more significant delays are an existing condition and are generally focused on the commuter and retail peak periods. This approach operates more efficiently during off peak hours.

Queue analysis at the intersection of Route 94 (Hebron Avenue) at Sycamore Street/Route 2 Off-Ramp during the Friday afternoon and the Saturday midday peak hours revealed no significant queue length increases on the Hebron Avenue approaches however queues on the Sycamore Street northbound approach doubled as a result of the proposed development traffic. Therefore, it is recommended that the northbound approach of Sycamore Street be widened to provide a second turn lane with the lanes striped as a shared left/right lane and an exclusive right turn only lane. Upon completion of the proposed road widening and CTDOT signal timing improvements, the maximum back of queue lengths on the northbound Sycamore Street approach will be restored to approximately their existing lengths.

At the intersection of Sycamore Street and New London Turnpike, minimal queueing is experienced on the New London Turnpike approaches to the intersection while the southbound Sycamore Street approach is expected to experience a maximum queue length increase of two to three vehicles in the Friday afternoon peak hour and approximately six vehicles during the Saturday midday peak hour. These queues are substantially lower during off peak periods.

Autoturn analysis revealed that the proposed employee parking and loading dock area on Linden Street can safely accommodate a WB-62 truck and garbage truck without either vehicle encroaching on Hebron Avenue or Linden Street to complete the maneuver to the loading dock or dumpster area..

The following improvements are recommended as part of this project to improve traffic operations within the study area:

- Widen Sycamore Street to provide an additional northbound approach lane at the intersection with Hebron Avenue at Route 2 Off-Ramp/Sycamore Street. Stripe the two approach lanes as a shared left/right lane and an exclusive right turn only lane.
- Complete signal timing optimizations at the intersection of Hebron Avenue at the Route 2 Eastbound Off-Ramp/Sycamore Street to provide additional green time for the Sycamore Street approach. This signal timing evaluation and timing optimization is being completed by CTDOT as part of a larger system timing evaluation project in District 1.

It is the professional opinion of Fuss & O'Neill that the proposed development conversion, upon implementation of the above recommendations, will not have a significant impact to traffic operations or safety within the study area.

Sincerely,

Mark G. Vertucci, PE, PTOE
Vice President

FUSS & O'NEILL

Tables

Table 3

Signalized Intersection Level of Service Summary
400 Hebron Avenue
Glastonbury, Connecticut

Signalized Intersections	2022 Friday Afternoon Peak Hour				2022 Saturday Midday Peak Hour			
	Existing	Combined	Combined Improved Option 1**	Combined Improved Option 2***	Existing	Combined	Combined Improved Option 1**	Combined Improved Option 2***
Rte. 94 (Hebron Ave) at Sycamore St/Rte. 2 EB Off-Ramp	24.1/LOS C*	32.3/LOS C	27.6/LOS C	27.4/LOS C***	20.4/LOS C	30.3/LOS C	25.2/LOS C	24.7/LOS C***

*Values indicated are intersection delay/LOS
** Denotes intersection delay and LOS with the addition of a northbound left/right turn lane at the intersection of Route 94 (Hebron Avenue) at Sycamore Street/Route 2 Off-Ramp.
*** Denotes intersection delay and LOS with signal timing optimizations and northbound left/right turn lane at the intersection of Route 94 (Hebron Avenue) at Sycamore Street/Route 2 Off-Ramp

Table 4

Unsignalized Intersection Level of Service Summary
400 Hebron Avenue
Glastonbury, Connecticut

Unsignalized Intersections	2022 Friday Afternoon Peak Hour		2022 Saturday Midday Peak Hour	
	Existing	Combined	Existing	Combined
Site Driveway at Sycamore Street				
Eastbound Approach	N/A	LOS B	N/A	LOS C
Northbound Approach	N/A	LOS A	N/A	LOS A
New London Turnpike at Sycamore Street				
Eastbound Approach	LOS A	LOS A	LOS A	LOS A
Southbound Approach	LOS E	LOS F	LOS F	LOS F

*Values indicated are intersection approach delay

Table 5
Friday Afternoon Peak Hour Queue Length Summary
400 Hebron Avenue
Glastonbury, Connecticut

Intersection	Approach Lane	2022 Existing Queue (Feet)	2022 Combined Queue (Feet)	2022 Combined Improved Option 1 Queue* (feet)	2022 Combined Improved Option 2 Queue** (feet)	Available Storage (Feet)
Rte. 94 (Hebron Ave) at Sycamore St/Rte. 2 EB Off-Ramp	EB Approach	250	260	260	225	400
	WB Approach	210	315	305	245	680
	NB Left/Right	170	380	200	160	>1,000
	NB Right	N/A	N/A	190	160	200
	SB Left	170	170	170	200	400
	SB Through/Right	110	155	155	135	>1,000
Site Driveway at Sycamore Street	EB Approach	N/A	25	N/A	N/A	125
	NB Approach	N/A	5	N/A	N/A	>1,000
New London Turnpike at Sycamore Street	EB Approach	5	5	N/A	N/A	>1,000
	SB Approach	55	115	N/A	N/A	>1,000

NOTE: Values indicated represent 95th percentile (design) vehicle queue lengths. Values are rounded to the nearest 5 feet.

* Denotes intersection delay and LOS with the addition of a northbound left/right turn lane at the intersection of Route 94 (Hebron Avenue) at Sycamore Street/Route 2 Off-Ramp.

** Denotes intersection delay and LOS with signal timing optimizations and northbound left/right turn lane at the intersection of Route 94 (Hebron Avenue) at Sycamore Street/Route 2 Off-Ramp

Table 6
Saturday Midday Peak Hour Queue Length Summary
400 Hebron Avenue
Glastonbury, Connecticut

Intersection	Approach Lane	2022 Existing Queue (Feet)	2022 Combined Queue (Feet)	2022 Combined Improved Option 1 Queue* (feet)	2022 Combined Improved Option 2 Queue** (feet)	Available Storage (Feet)
Rte. 94 (Hebron Ave) at Sycamore St/Rte. 2 EB Off-Ramp	EB Approach	205	235	235	205	400
	WB Approach	175	290	270	235	680
	NB Left/Right	125	375	185	185	>1,000
	NB Right	N/A	N/A	175	175	200
	SB Left	105	100	100	105	400
	SB Through/Right	90	135	135	125	>1,000
Site Driveway at Sycamore Street	EB Approach	N/A	55	N/A	N/A	125
	NB Approach	N/A	5	N/A	N/A	>1,000
New London Turnpike at Sycamore Street	WB Approach	5	5	N/A	N/A	>1,000
	SB Approach	170	335	N/A	N/A	>1,000

NOTE: Values indicated represent 95th percentile (design) vehicle queue lengths. Values are rounded to the nearest 5 feet.
* Denotes intersection delay and LOS with the addition of a northbound left/right turn lane at the intersection of Route 94 (Hebron Avenue) at Sycamore Street/Route 2 Off-Ramp.
** Denotes intersection delay and LOS with signal timing optimizations and northbound left/right turn lane at the intersection of Route 94 (Hebron Avenue) at Sycamore Street/Route 2 Off-Ramp

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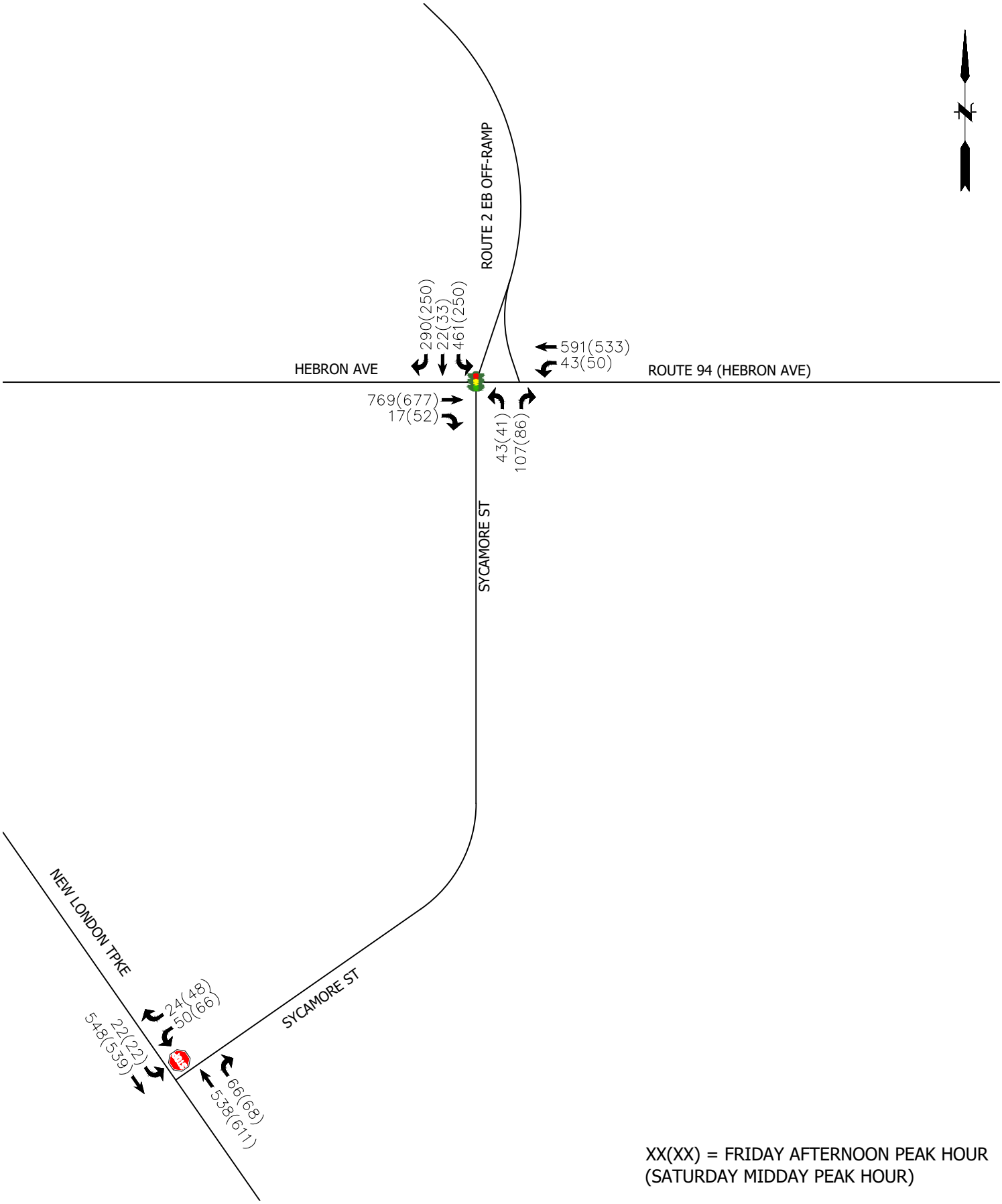
Figures



XX(XX) = FRIDAY AFTERNOON PEAK HOUR
(SATURDAY MIDDAY PEAK HOUR)

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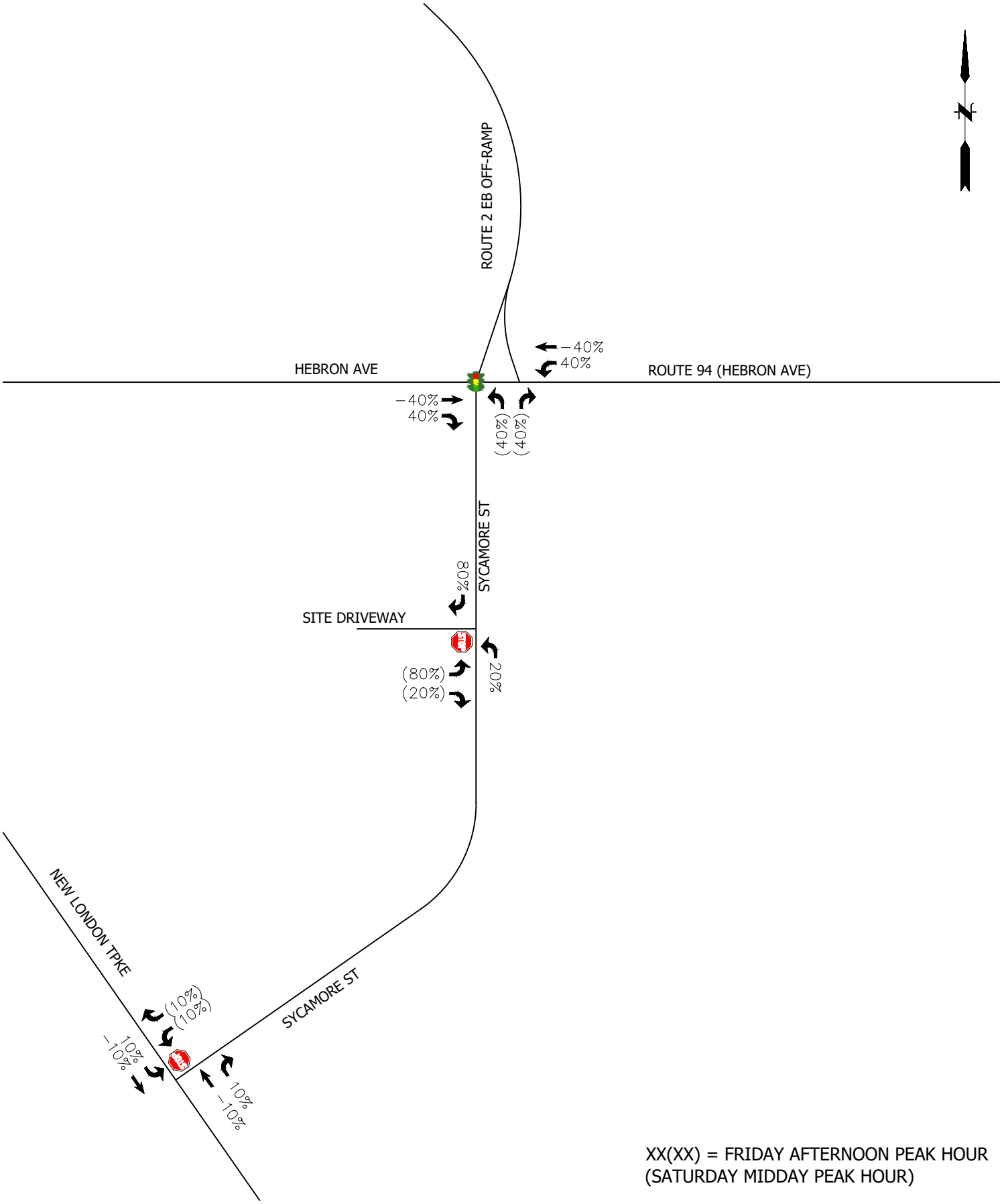
FIGURE 1: 2022 EXISTING TRAFFIC VOLUMES

PROJ. NO: 20220036.A10 | 400 HEBRON AVENUE | MAY 2022



XX(XX) = FRIDAY AFTERNOON PEAK HOUR
(SATURDAY MIDDAY PEAK HOUR)

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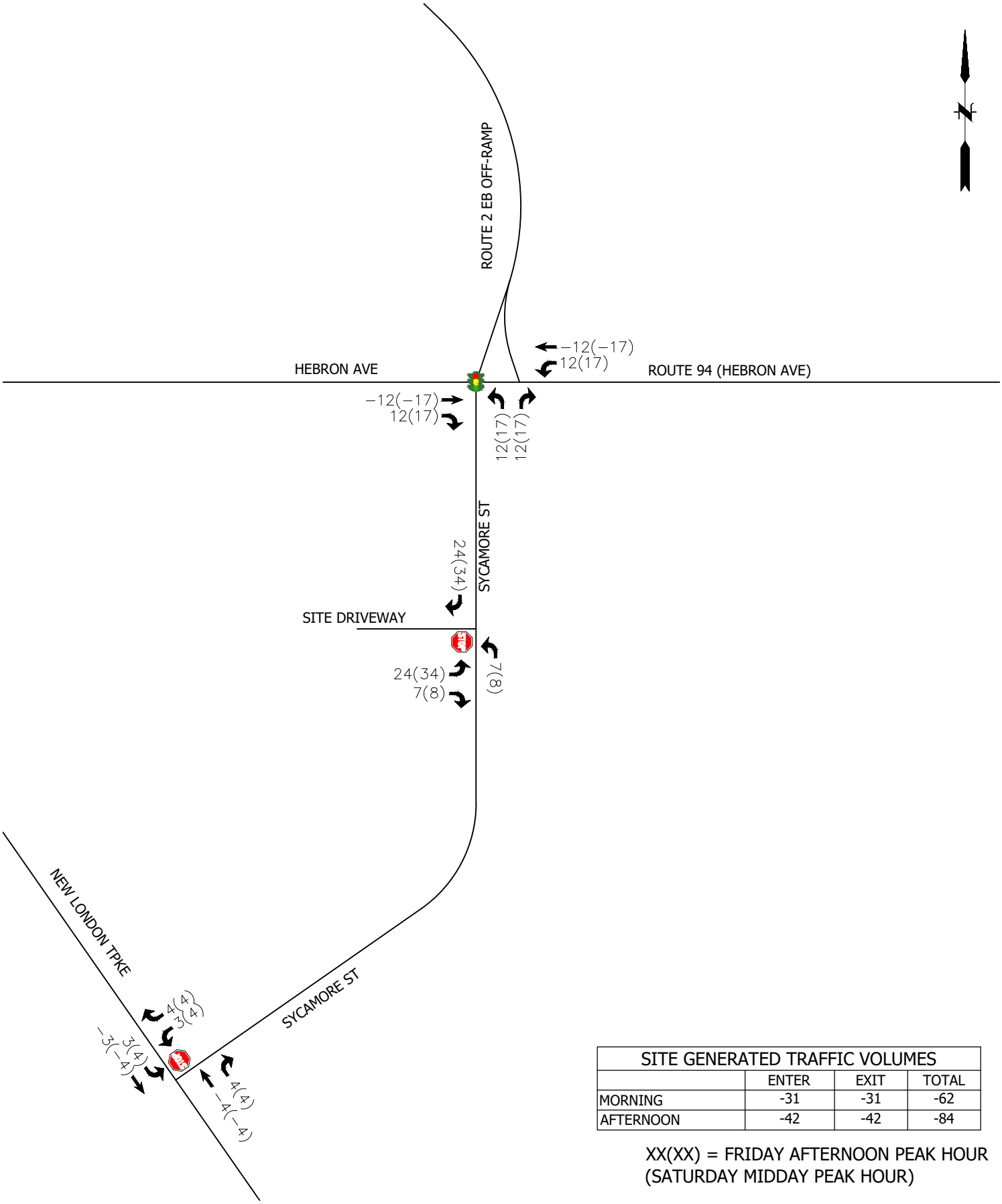
FIGURE 2: SITE GENERATED TRAFFIC PASS-BY DISTRIBUTION

PROJ. NO: 20220036.A10 | 400 HEBRON AVENUE | MAY 2022



SITE GENERATED TRAFFIC VOLUMES			
	ENTER	EXIT	TOTAL
MORNING	-31	-31	-62
AFTERNOON	-42	-42	-84

XX(XX) = FRIDAY AFTERNOON PEAK HOUR
(SATURDAY MIDDAY PEAK HOUR)

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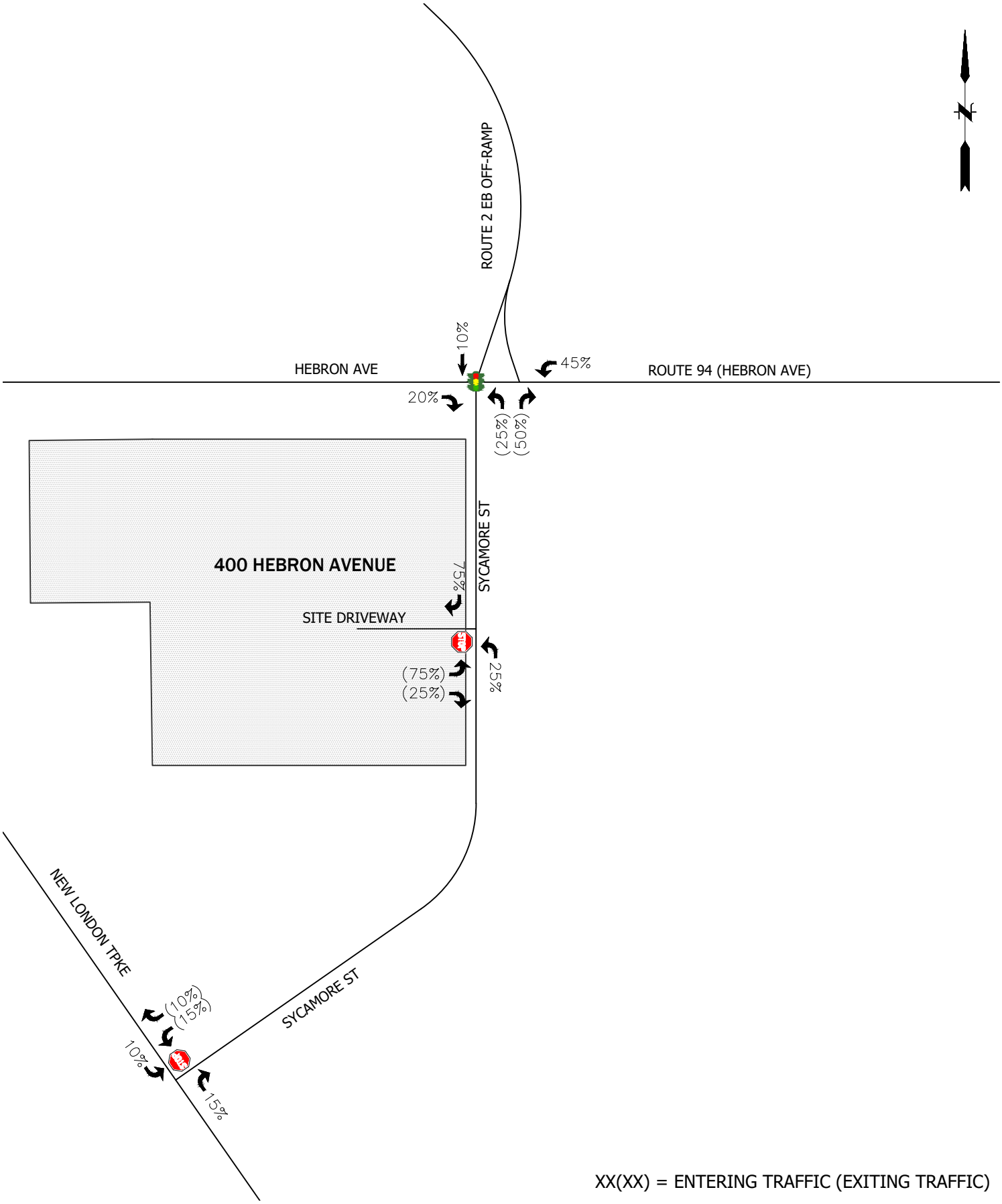
FIGURE 3: SITE GENERATED TRAFFIC PASS-BY VOLUMES

PROJ. NO: 20220036.A10 | 400 HEBRON AVENUE | MAY 2022



XX(XX) = ENTERING TRAFFIC (EXITING TRAFFIC)

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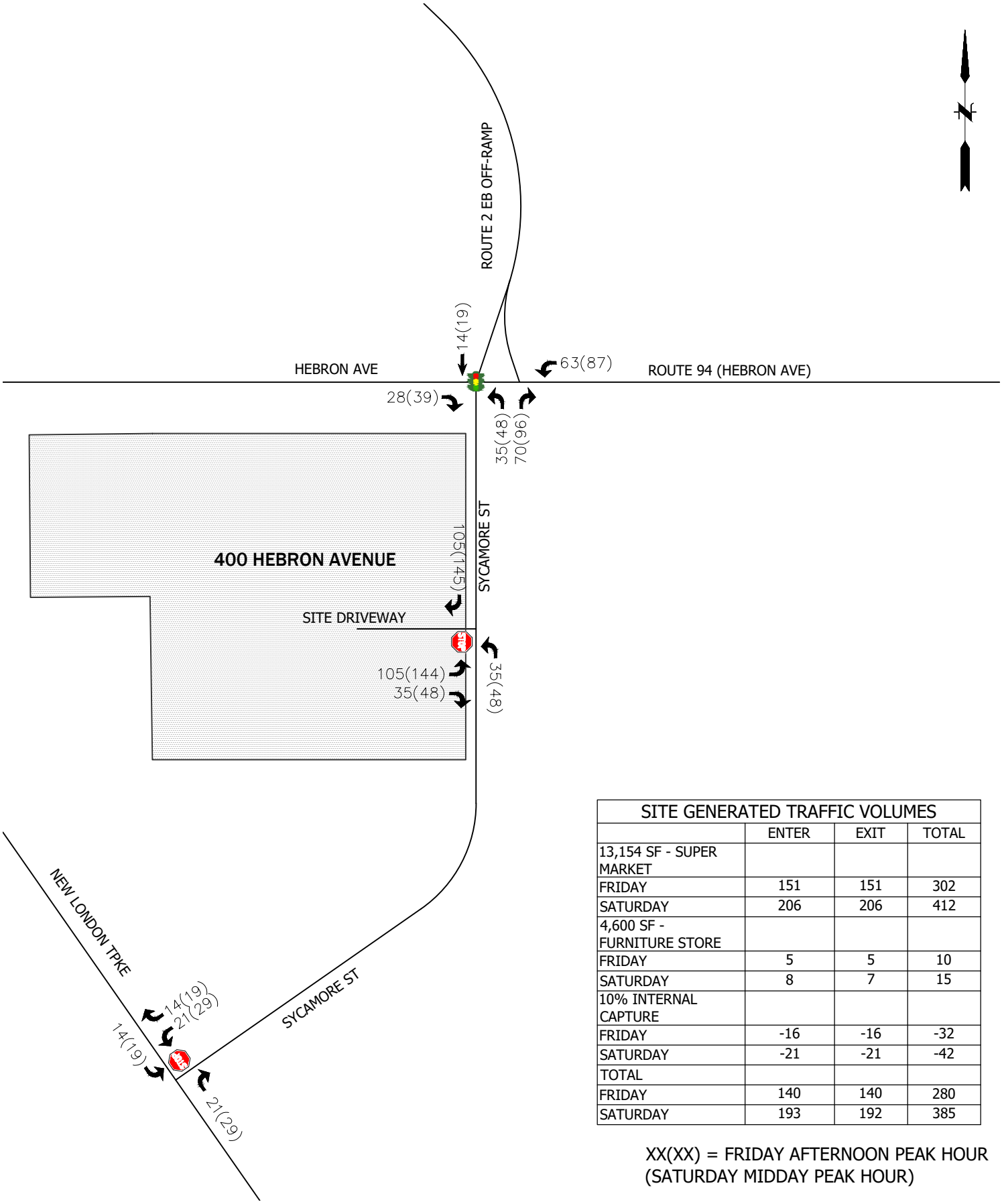
FIGURE 4: SITE GENERATED TRAFFIC DISTRIBUTION

PROJ. NO: 20220036.A10 | 400 HEBRON AVENUE | MAY 2022



SITE GENERATED TRAFFIC VOLUMES			
	ENTER	EXIT	TOTAL
13,154 SF - SUPER MARKET			
FRIDAY	151	151	302
SATURDAY	206	206	412
4,600 SF - FURNITURE STORE			
FRIDAY	5	5	10
SATURDAY	8	7	15
10% INTERNAL CAPTURE			
FRIDAY	-16	-16	-32
SATURDAY	-21	-21	-42
TOTAL			
FRIDAY	140	140	280
SATURDAY	193	192	385

XX(XX) = FRIDAY AFTERNOON PEAK HOUR
(SATURDAY MIDDAY PEAK HOUR)

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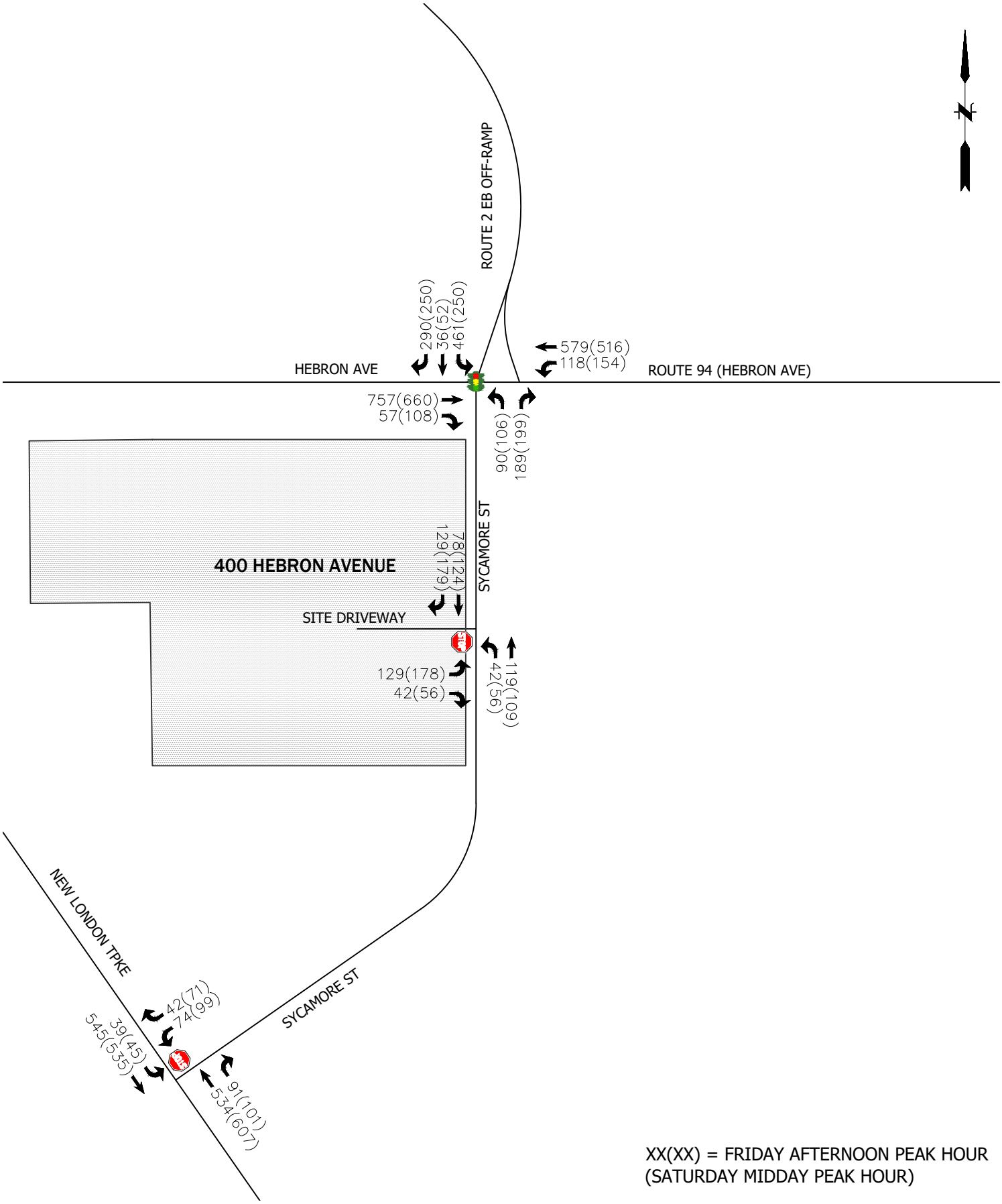
FIGURE 5: SITE GENERATED TRAFFIC VOLUMES

PROJ. NO: 20220036.A10 | 400 HEBRON AVENUE | MAY 2022



XX(XX) = FRIDAY AFTERNOON PEAK HOUR
(SATURDAY MIDDAY PEAK HOUR)

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FIGURE 6: 2022 COMBINED TRAFFIC VOLUMES

PROJ. NO: 20220036.A10 | 400 HEBRON AVENUE | MAY 2022

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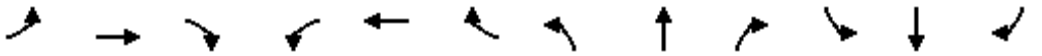
Friday Afternoon Background

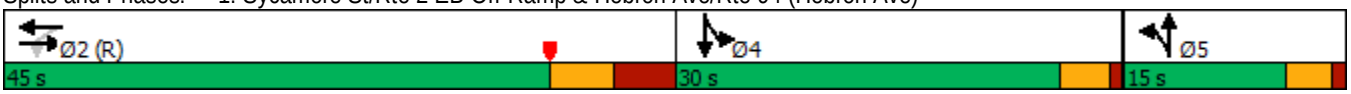


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	769	17	43	591	0	43	0	107	461	22	290
Future Volume (vph)	0	769	17	43	591	0	43	0	107	461	22	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	12	12
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt		0.997						0.904			0.861	
Flt Protected					0.997			0.986		0.950		
Satd. Flow (prot)	0	3599	0	0	3599	0	0	1892	0	3467	1634	0
Flt Permitted					0.825			0.986		0.950		
Satd. Flow (perm)	0	3599	0	0	2978	0	0	1892	0	3467	1634	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		3									261	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		234			799			772			538	
Travel Time (s)		5.3			18.2			17.5			12.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%	0%
Adj. Flow (vph)	0	827	18	46	635	0	46	0	115	496	24	312
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	845	0	0	681	0	0	161	0	496	336	0
Turn Type		NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			2		5	5		4	4	
Permitted Phases				2								
Detector Phase		2		2	2		5	5		4	4	
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)		13.5		13.5	13.5		9.1	9.1		20.3	20.3	
Total Split (s)		45.0		45.0	45.0		15.0	15.0		30.0	30.0	
Total Split (%)		50.0%		50.0%	50.0%		16.7%	16.7%		33.3%	33.3%	
Maximum Green (s)		36.5		36.5	36.5		10.9	10.9		25.7	25.7	
Yellow Time (s)		4.4		4.4	4.4		3.0	3.0		3.3	3.3	
All-Red Time (s)		4.1		4.1	4.1		1.1	1.1		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		8.5			8.5			4.1		4.3	4.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)										15.0	15.0	
Flash Dont Walk (s)										1.0	1.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		43.1			43.1			11.3		18.7	18.7	
Actuated g/C Ratio		0.48			0.48			0.13		0.21	0.21	
v/c Ratio		0.49			0.48			0.68		0.69	0.62	
Control Delay		18.3			18.5			52.8		37.7	12.8	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		18.3			18.5			52.8		37.7	12.8	
LOS		B			B			D		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		18.3			18.5			52.8			27.6	
Approach LOS		B			B			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 23.7		Intersection LOS: C	
Intersection Capacity Utilization 88.6%		ICU Level of Service E	
Analysis Period (min) 15			

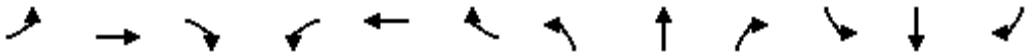
Splits and Phases: 1: Sycamore St/Rte 2 EB Off-Ramp & Hebron Ave/Rte 94 (Hebron Ave)



Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	845	681	161	496	336
v/c Ratio	0.49	0.48	0.68	0.69	0.62
Control Delay	18.3	18.5	52.8	37.7	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	18.5	52.8	37.7	12.8
Queue Length 50th (ft)	170	135	88	134	36
Queue Length 95th (ft)	250	208	#169	170	108
Internal Link Dist (ft)	154	719	692		458
Turn Bay Length (ft)					
Base Capacity (vph)	1726	1427	252	990	653
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	0.49	0.48	0.64	0.50	0.51

Intersection Summary

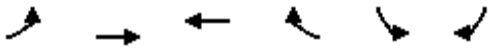
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	769	17	43	591	0	43	0	107	461	22	290
Future Volume (vph)	0	769	17	43	591	0	43	0	107	461	22	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		8.5			8.5			4.1		4.3	4.3	
Lane Util. Factor		0.95			0.95			1.00		0.97	1.00	
Frt		1.00			1.00			0.90		1.00	0.86	
Flt Protected		1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		3598			3598			1891		3467	1633	
Flt Permitted		1.00			0.83			0.99		0.95	1.00	
Satd. Flow (perm)		3598			2978			1891		3467	1633	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	827	18	46	635	0	46	0	115	496	24	312
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	207	0
Lane Group Flow (vph)	0	843	0	0	681	0	0	161	0	496	129	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%	0%
Turn Type		NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			2		5	5		4	4	
Permitted Phases				2								
Actuated Green, G (s)		43.1			43.1			11.3		18.7	18.7	
Effective Green, g (s)		43.1			43.1			11.3		18.7	18.7	
Actuated g/C Ratio		0.48			0.48			0.13		0.21	0.21	
Clearance Time (s)		8.5			8.5			4.1		4.3	4.3	
Vehicle Extension (s)		3.0			3.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		1723			1426			237		720	339	
v/s Ratio Prot		c0.23						c0.09		c0.14	0.08	
v/s Ratio Perm					0.23							
v/c Ratio		0.49			0.48			0.68		0.69	0.38	
Uniform Delay, d1		16.0			15.8			37.6		33.0	30.7	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		1.0			1.1			6.0		2.2	0.3	
Delay (s)		17.0			17.0			43.6		35.2	30.9	
Level of Service		B			B			D		D	C	
Approach Delay (s)		17.0			17.0			43.6			33.5	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.9
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	22	548	538	66	50	24
Future Volume (vph)	22	548	538	66	50	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.985		0.956	
Flt Protected		0.998			0.967	
Satd. Flow (prot)	0	1876	1851	0	1964	0
Flt Permitted		0.998			0.967	
Satd. Flow (perm)	0	1876	1851	0	1964	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		200	243		1336	
Travel Time (s)		4.5	5.5		30.4	
Peak Hour Factor	0.94	0.94	0.82	0.82	0.77	0.77
Heavy Vehicles (%)	3%	1%	1%	2%	2%	0%
Adj. Flow (vph)	23	583	656	80	65	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	606	736	0	96	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.6%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	548	538	66	50	24
Future Vol, veh/h	22	548	538	66	50	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	82	82	77	77
Heavy Vehicles, %	3	1	1	2	2	0
Mvmt Flow	23	583	656	80	65	31

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	736	0	-	0	1325	696
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	629	-
Critical Hdwy	4.13	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.227	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	865	-	-	-	172	445
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	531	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	865	-	-	-	165	445
Mov Cap-2 Maneuver	-	-	-	-	165	-
Stage 1	-	-	-	-	476	-
Stage 2	-	-	-	-	531	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	36.6
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	865	-	-	-	207
HCM Lane V/C Ratio	0.027	-	-	-	0.464
HCM Control Delay (s)	9.3	0	-	-	36.6
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	-	2.2

FUSS & O'NEILL

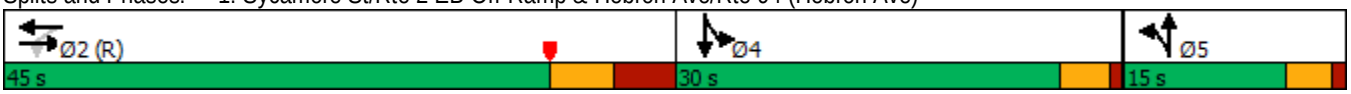
Friday Afternoon Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Future Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	12	12
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt		0.990						0.909			0.867	
Flt Protected					0.992			0.984		0.950		
Satd. Flow (prot)	0	3574	0	0	3581	0	0	1900	0	3467	1644	0
Flt Permitted					0.590			0.984		0.950		
Satd. Flow (perm)	0	3574	0	0	2130	0	0	1900	0	3467	1644	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10									200	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		222			817			470			538	
Travel Time (s)		5.0			18.6			10.7			12.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%	0%
Adj. Flow (vph)	0	814	61	127	623	0	97	0	203	496	39	312
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	875	0	0	750	0	0	300	0	496	351	0
Turn Type		NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			2		5	5		4	4	
Permitted Phases				2								
Detector Phase		2		2	2		5	5		4	4	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0		9.0	9.0		10.0	10.0	
Minimum Split (s)		23.5		23.5	23.5		13.1	13.1		20.3	20.3	
Total Split (s)		45.0		45.0	45.0		15.0	15.0		30.0	30.0	
Total Split (%)		50.0%		50.0%	50.0%		16.7%	16.7%		33.3%	33.3%	
Maximum Green (s)		36.5		36.5	36.5		10.9	10.9		25.7	25.7	
Yellow Time (s)		4.4		4.4	4.4		3.0	3.0		3.3	3.3	
All-Red Time (s)		4.1		4.1	4.1		1.1	1.1		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		8.5			8.5			4.1		4.3	4.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)										15.0	15.0	
Flash Dont Walk (s)										1.0	1.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		36.5			36.5			17.6		19.0	19.0	
Actuated g/C Ratio		0.41			0.41			0.20		0.21	0.21	
v/c Ratio		0.60			0.87			0.81		0.68	0.70	
Control Delay		22.9			37.3			55.9		37.0	20.8	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		22.9			37.3			55.9		37.0	20.8	
LOS		C			D			E		D	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		22.9			37.3			55.9			30.2	
Approach LOS		C			D			E			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 32.6		Intersection LOS: C	
Intersection Capacity Utilization 99.8%		ICU Level of Service F	
Analysis Period (min) 15			

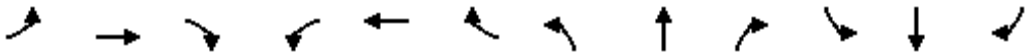
Splits and Phases: 1: Sycamore St/Rte 2 EB Off-Ramp & Hebron Ave/Rte 94 (Hebron Ave)



Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	875	750	300	496	351
v/c Ratio	0.60	0.87	0.81	0.68	0.70
Control Delay	22.9	37.3	55.9	37.0	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	37.3	55.9	37.0	20.8
Queue Length 50th (ft)	198	201	164	134	76
Queue Length 95th (ft)	260	#314	#379	168	156
Internal Link Dist (ft)	142	737	390		458
Turn Bay Length (ft)					
Base Capacity (vph)	1455	863	371	990	612
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	0.60	0.87	0.81	0.50	0.57

Intersection Summary

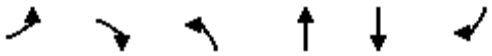
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Future Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		8.5			8.5			4.1		4.3	4.3	
Lane Util. Factor		0.95			0.95			1.00		0.97	1.00	
Frt		0.99			1.00			0.91		1.00	0.87	
Flt Protected		1.00			0.99			0.98		0.95	1.00	
Satd. Flow (prot)		3572			3580			1900		3467	1643	
Flt Permitted		1.00			0.59			0.98		0.95	1.00	
Satd. Flow (perm)		3572			2131			1900		3467	1643	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	814	61	127	623	0	97	0	203	496	39	312
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	158	0
Lane Group Flow (vph)	0	869	0	0	750	0	0	300	0	496	193	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%	0%
Turn Type		NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			2		5	5		4	4	
Permitted Phases				2								
Actuated Green, G (s)		36.5			36.5			17.6		19.0	19.0	
Effective Green, g (s)		36.5			36.5			17.6		19.0	19.0	
Actuated g/C Ratio		0.41			0.41			0.20		0.21	0.21	
Clearance Time (s)		8.5			8.5			4.1		4.3	4.3	
Vehicle Extension (s)		3.0			3.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		1448			864			371		731	346	
v/s Ratio Prot		0.24						c0.16		c0.14	0.12	
v/s Ratio Perm					c0.35							
v/c Ratio		0.60			0.87			0.81		0.68	0.56	
Uniform Delay, d1		21.0			24.5			34.6		32.7	31.7	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		1.8			11.5			11.6		2.0	1.1	
Delay (s)		22.9			36.0			46.2		34.7	32.9	
Level of Service		C			D			D		C	C	
Approach Delay (s)		22.9			36.0			46.2			33.9	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.9
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	129	42	42	119	78	129
Future Volume (vph)	129	42	42	119	78	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	14	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.967				0.916	
Flt Protected	0.964			0.987		
Satd. Flow (prot)	1736	0	0	2084	1820	0
Flt Permitted	0.964			0.987		
Satd. Flow (perm)	1736	0	0	2084	1820	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	165			292	470	
Travel Time (s)	3.8			6.6	10.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	140	46	46	129	85	140
Shared Lane Traffic (%)						
Lane Group Flow (vph)	186	0	0	175	225	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 40.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	129	42	42	119	78	129
Future Vol, veh/h	129	42	42	119	78	129
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	140	46	46	129	85	140

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	376	155	225	0	-	0
Stage 1	155	-	-	-	-	-
Stage 2	221	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	625	891	1344	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	816	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	602	891	1344	-	-	-
Mov Cap-2 Maneuver	602	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	816	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1344	-	654	-	-
HCM Lane V/C Ratio	0.034	-	0.284	-	-
HCM Control Delay (s)	7.8	0	12.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	-	-

Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	39	545	534	91	74	42
Future Volume (vph)	39	545	534	91	74	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.980		0.951	
Flt Protected		0.997			0.969	
Satd. Flow (prot)	0	1873	1841	0	1959	0
Flt Permitted		0.997			0.969	
Satd. Flow (perm)	0	1873	1841	0	1959	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		222	211		1367	
Travel Time (s)		5.0	4.8		31.1	
Peak Hour Factor	0.94	0.94	0.82	0.82	0.83	0.83
Heavy Vehicles (%)	3%	1%	1%	2%	2%	0%
Adj. Flow (vph)	41	580	651	111	89	51
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	621	762	0	140	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 74.1%		ICU Level of Service D	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	39	545	534	91	74	42
Future Vol, veh/h	39	545	534	91	74	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	82	82	83	83
Heavy Vehicles, %	3	1	1	2	2	0
Mvmt Flow	41	580	651	111	89	51

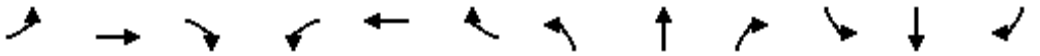
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	762	0	-	0	1369	707
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	662	-
Critical Hdwy	4.13	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.227	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	846	-	-	-	162	439
Stage 1	-	-	-	-	489	-
Stage 2	-	-	-	-	513	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	846	-	-	-	150	439
Mov Cap-2 Maneuver	-	-	-	-	150	-
Stage 1	-	-	-	-	454	-
Stage 2	-	-	-	-	513	-

Approach	EB	WB	SW
HCM Control Delay, s	0.6	0	58.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
Capacity (veh/h)	846	-	-	-	197
HCM Lane V/C Ratio	0.049	-	-	-	0.709
HCM Control Delay (s)	9.5	0	-	-	58.4
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.2	-	-	-	4.5

FUSS & O'NEILL

Friday Afternoon Combined Improved

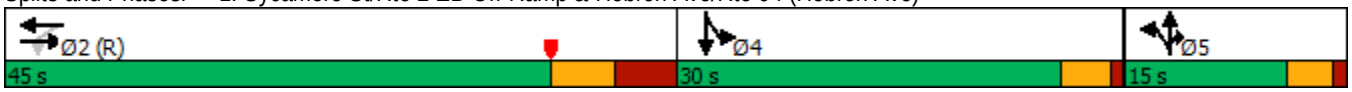


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Future Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		200	0		0
Storage Lanes	0		0	0		0	0		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	0.97	1.00	1.00
Frt		0.990						0.943	0.850		0.867	
Flt Protected					0.992			0.970		0.950		
Satd. Flow (prot)	0	3574	0	0	3581	0	0	1639	1504	3467	1644	0
Flt Permitted					0.607			0.970		0.950		
Satd. Flow (perm)	0	3574	0	0	2191	0	0	1639	1504	3467	1644	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10									200	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		222			817			470			538	
Travel Time (s)		5.0			18.6			10.7			12.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%	0%
Adj. Flow (vph)	0	814	61	127	623	0	97	0	203	496	39	312
Shared Lane Traffic (%)									29%			
Lane Group Flow (vph)	0	875	0	0	750	0	0	156	144	496	351	0
Turn Type		NA		Perm	NA		Split	NA	Prot	Split	NA	
Protected Phases		2			2		5	5	5	4	4	
Permitted Phases				2								
Detector Phase		2		2	2		5	5	5	4	4	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0		9.0	9.0	9.0	10.0	10.0	
Minimum Split (s)		23.5		23.5	23.5		13.1	13.1	13.1	20.3	20.3	
Total Split (s)		45.0		45.0	45.0		15.0	15.0	15.0	30.0	30.0	
Total Split (%)		50.0%		50.0%	50.0%		16.7%	16.7%	16.7%	33.3%	33.3%	
Maximum Green (s)		36.5		36.5	36.5		10.9	10.9	10.9	25.7	25.7	
Yellow Time (s)		4.4		4.4	4.4		3.0	3.0	3.0	3.3	3.3	
All-Red Time (s)		4.1		4.1	4.1		1.1	1.1	1.1	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)										15.0	15.0	
Flash Dont Walk (s)										1.0	1.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		41.9			41.9			12.2	12.2	19.0	19.0	
Actuated g/C Ratio		0.47			0.47			0.14	0.14	0.21	0.21	
v/c Ratio		0.52			0.74			0.71	0.71	0.68	0.70	
Control Delay		19.3			26.7			56.0	57.8	37.0	20.8	
Queue Delay		0.0			0.0			0.0	0.0	0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		19.3			26.7			56.0	57.8	37.0	20.8	
LOS		B			C			E	E	D	C	
Approach Delay		19.3			26.7			56.8			30.2	
Approach LOS		B			C			E			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 28.7		Intersection LOS: C	
Intersection Capacity Utilization 92.0%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Sycamore St/Rte 2 EB Off-Ramp & Hebron Ave/Rte 94 (Hebron Ave)



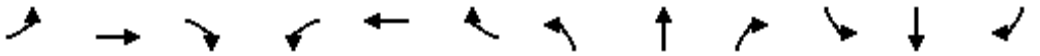
Lane Group	EBT	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	875	750	156	144	496	351
v/c Ratio	0.52	0.74	0.71	0.71	0.68	0.70
Control Delay	19.3	26.7	56.0	57.8	37.0	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	26.7	56.0	57.8	37.0	20.8
Queue Length 50th (ft)	184	183	88	81	134	76
Queue Length 95th (ft)	260	#306	#198	#189	168	156
Internal Link Dist (ft)	142	737	390			458
Turn Bay Length (ft)				200		
Base Capacity (vph)	1670	1020	228	209	990	612
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.74	0.68	0.69	0.50	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Future Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Lane Util. Factor		0.95			0.95			0.95	0.95	0.97	1.00	
Frt		0.99			1.00			0.94	0.85	1.00	0.87	
Flt Protected		1.00			0.99			0.97	1.00	0.95	1.00	
Satd. Flow (prot)		3572			3580			1639	1504	3467	1643	
Flt Permitted		1.00			0.61			0.97	1.00	0.95	1.00	
Satd. Flow (perm)		3572			2191			1639	1504	3467	1643	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	814	61	127	623	0	97	0	203	496	39	312
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	158	0
Lane Group Flow (vph)	0	870	0	0	750	0	0	156	144	496	193	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%	0%
Turn Type		NA		Perm	NA		Split	NA	Prot	Split	NA	
Protected Phases		2			2		5	5	5	4	4	
Permitted Phases				2								
Actuated Green, G (s)		41.9			41.9			12.2	12.2	19.0	19.0	
Effective Green, g (s)		41.9			41.9			12.2	12.2	19.0	19.0	
Actuated g/C Ratio		0.47			0.47			0.14	0.14	0.21	0.21	
Clearance Time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Vehicle Extension (s)		3.0			3.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		1662			1020			222	203	731	346	
v/s Ratio Prot		0.24						0.10	c0.10	c0.14	0.12	
v/s Ratio Perm					c0.34							
v/c Ratio		0.52			0.74			0.70	0.71	0.68	0.56	
Uniform Delay, d1		17.0			19.5			37.2	37.2	32.7	31.7	
Progression Factor		1.00			1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.2			4.7			8.0	8.9	2.0	1.1	
Delay (s)		18.2			24.3			45.1	46.1	34.7	32.9	
Level of Service		B			C			D	D	C	C	
Approach Delay (s)		18.2			24.3			45.6			33.9	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.9
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

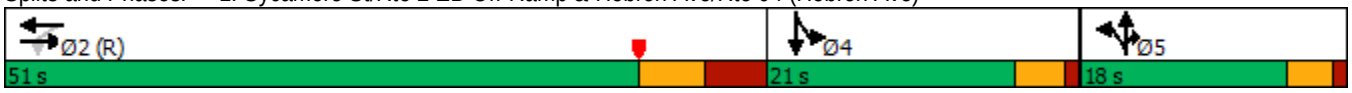


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Future Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		200	0		0
Storage Lanes	0		0	0		0	0		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	0.97	1.00	1.00
Frt		0.990						0.943	0.850		0.867	
Flt Protected					0.992			0.970		0.950		
Satd. Flow (prot)	0	3574	0	0	3581	0	0	1639	1504	3467	1644	0
Flt Permitted					0.615			0.970		0.950		
Satd. Flow (perm)	0	3574	0	0	2220	0	0	1639	1504	3467	1644	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		12									266	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		222			817			470			538	
Travel Time (s)		5.0			18.6			10.7			12.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%	0%
Adj. Flow (vph)	0	814	61	127	623	0	97	0	203	496	39	312
Shared Lane Traffic (%)									29%			
Lane Group Flow (vph)	0	875	0	0	750	0	0	156	144	496	351	0
Turn Type		NA		Perm	NA		Split	NA	Prot	Split	NA	
Protected Phases		2			2		5	5	5	4	4	
Permitted Phases				2								
Detector Phase		2		2	2		5	5	5	4	4	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0		9.0	9.0	9.0	10.0	10.0	
Minimum Split (s)		23.5		23.5	23.5		13.1	13.1	13.1	20.3	20.3	
Total Split (s)		51.0		51.0	51.0		18.0	18.0	18.0	21.0	21.0	
Total Split (%)		56.7%		56.7%	56.7%		20.0%	20.0%	20.0%	23.3%	23.3%	
Maximum Green (s)		42.5		42.5	42.5		13.9	13.9	13.9	16.7	16.7	
Yellow Time (s)		4.4		4.4	4.4		3.0	3.0	3.0	3.3	3.3	
All-Red Time (s)		4.1		4.1	4.1		1.1	1.1	1.1	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)										15.0	15.0	
Flash Dont Walk (s)										1.0	1.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		45.2			45.2			12.1	12.1	15.8	15.8	
Actuated g/C Ratio		0.50			0.50			0.13	0.13	0.18	0.18	
v/c Ratio		0.49			0.67			0.71	0.71	0.81	0.69	
Control Delay		16.2			21.4			55.0	56.8	47.4	17.1	
Queue Delay		0.0			0.0			0.0	0.0	0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		16.2			21.4			55.0	56.8	47.4	17.1	
LOS		B			C			D	E	D	B	
Approach Delay		16.2			21.4			55.9			34.9	
Approach LOS		B			C			E			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 27.6		Intersection LOS: C	
Intersection Capacity Utilization 92.0%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Sycamore St/Rte 2 EB Off-Ramp & Hebron Ave/Rte 94 (Hebron Ave)



Lane Group	EBT	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	875	750	156	144	496	351
v/c Ratio	0.49	0.67	0.71	0.71	0.81	0.69
Control Delay	16.2	21.4	55.0	56.8	47.4	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	21.4	55.0	56.8	47.4	17.1
Queue Length 50th (ft)	169	168	89	83	139	42
Queue Length 95th (ft)	227	243	#158	#157	#198	135
Internal Link Dist (ft)	142	737	390			458
Turn Bay Length (ft)				200		
Base Capacity (vph)	1800	1114	253	232	643	521
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.67	0.62	0.62	0.77	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Future Volume (vph)	0	757	57	118	579	0	90	0	189	461	36	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Lane Util. Factor		0.95			0.95			0.95	0.95	0.97	1.00	
Frt		0.99			1.00			0.94	0.85	1.00	0.87	
Flt Protected		1.00			0.99			0.97	1.00	0.95	1.00	
Satd. Flow (prot)		3572			3580			1639	1504	3467	1643	
Flt Permitted		1.00			0.62			0.97	1.00	0.95	1.00	
Satd. Flow (perm)		3572			2220			1639	1504	3467	1643	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	814	61	127	623	0	97	0	203	496	39	312
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	219	0
Lane Group Flow (vph)	0	869	0	0	750	0	0	156	144	496	132	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%	0%
Turn Type		NA		Perm	NA		Split	NA	Prot	Split	NA	
Protected Phases		2			2		5	5	5	4	4	
Permitted Phases				2								
Actuated Green, G (s)		45.2			45.2			12.1	12.1	15.8	15.8	
Effective Green, g (s)		45.2			45.2			12.1	12.1	15.8	15.8	
Actuated g/C Ratio		0.50			0.50			0.13	0.13	0.18	0.18	
Clearance Time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Vehicle Extension (s)		3.0			3.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		1793			1114			220	202	608	288	
v/s Ratio Prot		0.24						0.10	c0.10	c0.14	0.08	
v/s Ratio Perm					c0.34							
v/c Ratio		0.48			0.67			0.71	0.71	0.82	0.46	
Uniform Delay, d1		14.7			16.8			37.3	37.3	35.7	33.3	
Progression Factor		1.00			1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.9			3.3			8.3	9.5	7.9	0.4	
Delay (s)		15.7			20.1			45.5	46.8	43.6	33.7	
Level of Service		B			C			D	D	D	C	
Approach Delay (s)		15.7			20.1			46.1			39.5	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.9
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

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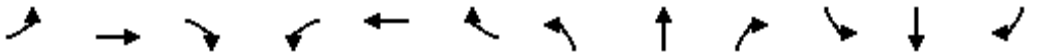
Saturday Midday Background

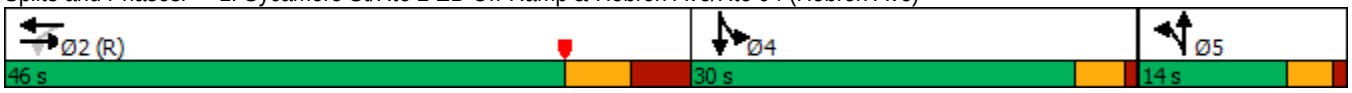


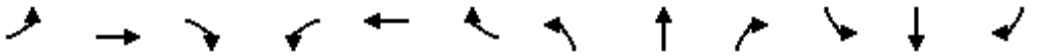
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	677	52	50	533	0	41	0	86	250	33	250
Future Volume (vph)	0	677	52	50	533	0	41	0	86	250	33	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	16	12	12	12	12
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt		0.989						0.909			0.867	
Flt Protected					0.996			0.984		0.950		
Satd. Flow (prot)	0	3451	0	0	3476	0	0	1913	0	3467	1643	0
Flt Permitted					0.811			0.984		0.950		
Satd. Flow (perm)	0	3451	0	0	2830	0	0	1913	0	3467	1643	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		11									266	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		176			818			763			527	
Travel Time (s)		4.0			18.6			17.3			12.0	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	0%
Adj. Flow (vph)	0	720	55	53	567	0	44	0	91	266	35	266
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	775	0	0	620	0	0	135	0	266	301	0
Turn Type		NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			2		5	5		4	4	
Permitted Phases				2								
Detector Phase		2		2	2		5	5		4	4	
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)		13.5		13.5	13.5		9.1	9.1		20.3	20.3	
Total Split (s)		46.0		46.0	46.0		14.0	14.0		30.0	30.0	
Total Split (%)		51.1%		51.1%	51.1%		15.6%	15.6%		33.3%	33.3%	
Maximum Green (s)		37.5		37.5	37.5		9.9	9.9		25.7	25.7	
Yellow Time (s)		4.4		4.4	4.4		3.0	3.0		3.3	3.3	
All-Red Time (s)		4.1		4.1	4.1		1.1	1.1		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		8.5			8.5			4.1		4.3	4.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)										15.0	15.0	
Flash Dont Walk (s)										1.0	1.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		50.2			50.2			10.8		12.1	12.1	
Actuated g/C Ratio		0.56			0.56			0.12		0.13	0.13	
v/c Ratio		0.40			0.39			0.59		0.57	0.67	
Control Delay		13.1			13.5			47.4		40.9	14.6	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		13.1			13.5			47.4		40.9	14.6	
LOS		B			B			D		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		13.1			13.5			47.4			26.9	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)		118			95			74		75	18	
Queue Length 95th (ft)		207			174			125		105	90	
Internal Link Dist (ft)		96			738			683			447	
Turn Bay Length (ft)												
Base Capacity (vph)		1929			1578			247		990	659	
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		0.40			0.39			0.55		0.27	0.46	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 19.2		Intersection LOS: B	
Intersection Capacity Utilization 82.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Sycamore St/Rte 2 EB Off-Ramp & Hebron Ave/Rte 94 (Hebron Ave)

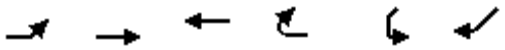




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	677	52	50	533	0	41	0	86	250	33	250
Future Volume (vph)	0	677	52	50	533	0	41	0	86	250	33	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	16	12	12	12	12
Total Lost time (s)		8.5			8.5			4.1		4.3	4.3	
Lane Util. Factor		0.95			0.95			1.00		0.97	1.00	
Frt		0.99			1.00			0.91		1.00	0.87	
Flt Protected		1.00			1.00			0.98		0.95	1.00	
Satd. Flow (prot)		3453			3475			1913		3467	1644	
Flt Permitted		1.00			0.81			0.98		0.95	1.00	
Satd. Flow (perm)		3453			2830			1913		3467	1644	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	720	55	53	567	0	44	0	91	266	35	266
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	230	0
Lane Group Flow (vph)	0	770	0	0	620	0	0	135	0	266	71	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	0%
Turn Type		NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			2		5	5		4	4	
Permitted Phases				2								
Actuated Green, G (s)		50.2			50.2			10.8		12.1	12.1	
Effective Green, g (s)		50.2			50.2			10.8		12.1	12.1	
Actuated g/C Ratio		0.56			0.56			0.12		0.13	0.13	
Clearance Time (s)		8.5			8.5			4.1		4.3	4.3	
Vehicle Extension (s)		3.0			3.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		1926			1578			229		466	221	
v/s Ratio Prot		c0.22						c0.07		c0.08	0.04	
v/s Ratio Perm					0.22							
v/c Ratio		0.40			0.39			0.59		0.57	0.32	
Uniform Delay, d1		11.3			11.3			37.5		36.5	35.2	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.6			0.7			2.5		1.1	0.3	
Delay (s)		11.9			12.0			40.0		37.6	35.5	
Level of Service		B			B			D		D	D	
Approach Delay (s)		11.9			12.0			40.0			36.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.9
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	22	539	611	68	66	48
Future Volume (vph)	22	539	611	68	66	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.986		0.943	
Flt Protected		0.998			0.972	
Satd. Flow (prot)	0	1893	1873	0	1943	0
Flt Permitted		0.998			0.972	
Satd. Flow (perm)	0	1893	1873	0	1943	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		200	273		1379	
Travel Time (s)		4.5	6.2		31.3	
Peak Hour Factor	0.91	0.91	0.82	0.82	0.66	0.66
Heavy Vehicles (%)	4%	0%	0%	0%	2%	1%
Adj. Flow (vph)	24	592	745	83	100	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	616	828	0	173	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 59.5%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	9.6

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	22	539	611	68	66	48
Future Vol, veh/h	22	539	611	68	66	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	82	82	66	66
Heavy Vehicles, %	4	0	0	0	2	1
Mvmt Flow	24	592	745	83	100	73

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	828	0	-	0	1427	787
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	640	-
Critical Hdwy	4.14	-	-	-	6.42	6.21
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.236	-	-	-	3.518	3.309
Pot Cap-1 Maneuver	795	-	-	-	149	393
Stage 1	-	-	-	-	449	-
Stage 2	-	-	-	-	525	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	795	-	-	-	142	393
Mov Cap-2 Maneuver	-	-	-	-	142	-
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	525	-

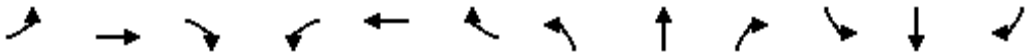
Approach	EB	WB	SW
HCM Control Delay, s	0.4	0	88.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
Capacity (veh/h)	795	-	-	-	194
HCM Lane V/C Ratio	0.03	-	-	-	0.89
HCM Control Delay (s)	9.7	0	-	-	88.6
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	6.8

FUSS & O'NEILL

Saturday Midday Combined

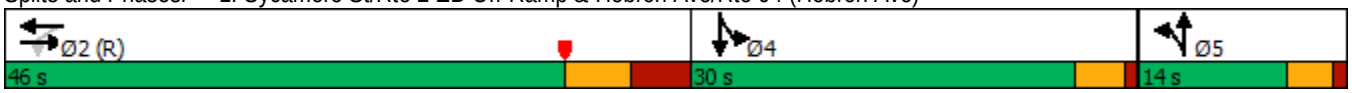
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Future Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	16	12	12	12	12
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt		0.979						0.912			0.876	
Flt Protected					0.989			0.983		0.950		
Satd. Flow (prot)	0	3416	0	0	3451	0	0	1918	0	3467	1659	0
Flt Permitted					0.587			0.983		0.950		
Satd. Flow (perm)	0	3416	0	0	2048	0	0	1918	0	3467	1659	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		25									213	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		187			810			461			538	
Travel Time (s)		4.3			18.4			10.5			12.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	0%
Adj. Flow (vph)	0	702	115	164	549	0	113	0	212	266	55	266
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	817	0	0	713	0	0	325	0	266	321	0
Turn Type		NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			2		5	5		4	4	
Permitted Phases				2								
Detector Phase		2		2	2		5	5		4	4	
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)		13.5		13.5	13.5		9.1	9.1		20.3	20.3	
Total Split (s)		46.0		46.0	46.0		14.0	14.0		30.0	30.0	
Total Split (%)		51.1%		51.1%	51.1%		15.6%	15.6%		33.3%	33.3%	
Maximum Green (s)		37.5		37.5	37.5		9.9	9.9		25.7	25.7	
Yellow Time (s)		4.4		4.4	4.4		3.0	3.0		3.3	3.3	
All-Red Time (s)		4.1		4.1	4.1		1.1	1.1		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		8.5			8.5			4.1		4.3	4.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)										15.0	15.0	
Flash Dont Walk (s)										1.0	1.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		37.5			37.5			22.1		13.5	13.5	
Actuated g/C Ratio		0.42			0.42			0.25		0.15	0.15	
v/c Ratio		0.57			0.84			0.69		0.51	0.75	
Control Delay		21.3			34.1			42.4		37.7	23.4	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		21.3			34.1			42.4		37.7	23.4	
LOS		C			C			D		D	C	

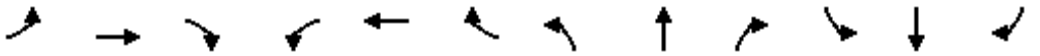


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		21.3			34.1			42.4			29.9	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)		175			185			165		74	58	
Queue Length 95th (ft)		234			#292			#375		98	133	
Internal Link Dist (ft)		107			730			381			458	
Turn Bay Length (ft)												
Base Capacity (vph)		1437			853			471		990	625	
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		0.57			0.84			0.69		0.27	0.51	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 29.9		Intersection LOS: C	
Intersection Capacity Utilization 97.8%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Sycamore St/Rte 2 EB Off-Ramp & Hebron Ave/Rte 94 (Hebron Ave)

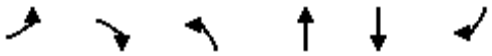




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Future Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	16	12	12	12	12
Total Lost time (s)		8.5			8.5			4.1		4.3	4.3	
Lane Util. Factor		0.95			0.95			1.00		0.97	1.00	
Frt		0.98			1.00			0.91		1.00	0.88	
Flt Protected		1.00			0.99			0.98		0.95	1.00	
Satd. Flow (prot)		3416			3450			1918		3467	1658	
Flt Permitted		1.00			0.59			0.98		0.95	1.00	
Satd. Flow (perm)		3416			2047			1918		3467	1658	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	702	115	164	549	0	113	0	212	266	55	266
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	181	0
Lane Group Flow (vph)	0	802	0	0	713	0	0	325	0	266	140	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	0%
Turn Type		NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			2		5	5		4	4	
Permitted Phases				2								
Actuated Green, G (s)		37.5			37.5			22.1		13.5	13.5	
Effective Green, g (s)		37.5			37.5			22.1		13.5	13.5	
Actuated g/C Ratio		0.42			0.42			0.25		0.15	0.15	
Clearance Time (s)		8.5			8.5			4.1		4.3	4.3	
Vehicle Extension (s)		3.0			3.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		1423			852			470		520	248	
v/s Ratio Prot		0.23						c0.17		0.08	c0.08	
v/s Ratio Perm					c0.35							
v/c Ratio		0.56			0.84			0.69		0.51	0.56	
Uniform Delay, d1		20.0			23.5			30.9		35.2	35.5	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		1.6			9.6			3.5		0.4	1.8	
Delay (s)		21.6			33.1			34.4		35.6	37.3	
Level of Service		C			C			C		D	D	
Approach Delay (s)		21.6			33.1			34.4			36.5	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.9
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	178	56	56	109	124	179
Future Volume (vph)	178	56	56	109	124	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	14	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.968				0.920	
Flt Protected	0.963			0.983		
Satd. Flow (prot)	1736	0	0	2075	1828	0
Flt Permitted	0.963			0.983		
Satd. Flow (perm)	1736	0	0	2075	1828	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	161			302	461	
Travel Time (s)	3.7			6.9	10.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	193	61	61	118	135	195
Shared Lane Traffic (%)						
Lane Group Flow (vph)	254	0	0	179	330	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.6%		ICU Level of Service A	
Analysis Period (min) 15			

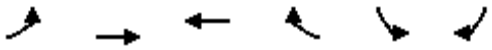
Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	178	56	56	109	124	179
Future Vol, veh/h	178	56	56	109	124	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	193	61	61	118	135	195

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	473	233	330	0	-	0
Stage 1	233	-	-	-	-	-
Stage 2	240	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	550	806	1229	-	-	-
Stage 1	806	-	-	-	-	-
Stage 2	800	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	521	806	1229	-	-	-
Mov Cap-2 Maneuver	521	-	-	-	-	-
Stage 1	763	-	-	-	-	-
Stage 2	800	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.3	2.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1229	-	569	-	-
HCM Lane V/C Ratio	0.05	-	0.447	-	-
HCM Control Delay (s)	8.1	0	16.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.2	-	2.3	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	45	535	607	101	99	71
Future Volume (vph)	45	535	607	101	99	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.981		0.944	
Flt Protected		0.996			0.972	
Satd. Flow (prot)	0	1887	1864	0	1945	0
Flt Permitted		0.996			0.972	
Satd. Flow (perm)	0	1887	1864	0	1945	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		200	158		1350	
Travel Time (s)		4.5	3.6		30.7	
Peak Hour Factor	0.91	0.91	0.82	0.82	0.74	0.74
Heavy Vehicles (%)	4%	0%	0%	0%	2%	1%
Adj. Flow (vph)	49	588	740	123	134	96
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	637	863	0	230	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 81.9%		ICU Level of Service D	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	31.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	45	535	607	101	99	71
Future Vol, veh/h	45	535	607	101	99	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	82	82	74	74
Heavy Vehicles, %	4	0	0	0	2	1
Mvmt Flow	49	588	740	123	134	96

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	863	0	-	0	1488	802
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	686	-
Critical Hdwy	4.14	-	-	-	6.42	6.21
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.236	-	-	-	3.518	3.309
Pot Cap-1 Maneuver	771	-	-	-	137	386
Stage 1	-	-	-	-	441	-
Stage 2	-	-	-	-	500	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	771	-	-	-	~ 124	386
Mov Cap-2 Maneuver	-	-	-	-	~ 124	-
Stage 1	-	-	-	-	400	-
Stage 2	-	-	-	-	500	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	233.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	771	-	-	-	173
HCM Lane V/C Ratio	0.064	-	-	-	1.328
HCM Control Delay (s)	10	0	-	-	233.3
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.2	-	-	-	13.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

FUSS & O'NEILL

Saturday Midday Combined Improved

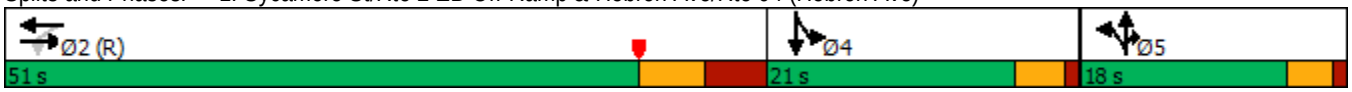
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Future Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	0		200	0		0
Storage Lanes	0		0	0		0	0		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	0.97	1.00	1.00
Frt		0.979						0.951	0.850		0.876	
Flt Protected					0.989			0.967		0.950		
Satd. Flow (prot)	0	3416	0	0	3451	0	0	1654	1519	3467	1659	0
Flt Permitted					0.608			0.967		0.950		
Satd. Flow (perm)	0	3416	0	0	2122	0	0	1654	1519	3467	1659	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		28									238	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		187			810			461			538	
Travel Time (s)		4.3			18.4			10.5			12.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	0%
Adj. Flow (vph)	0	702	115	164	549	0	113	0	212	266	55	266
Shared Lane Traffic (%)									26%			
Lane Group Flow (vph)	0	817	0	0	713	0	0	168	157	266	321	0
Turn Type		NA		Perm	NA		Split	NA	Prot	Split	NA	
Protected Phases		2			2		5	5	5	4	4	
Permitted Phases				2								
Detector Phase		2		2	2		5	5	5	4	4	
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)		13.5		13.5	13.5		9.1	9.1	9.1	20.3	20.3	
Total Split (s)		51.0		51.0	51.0		18.0	18.0	18.0	21.0	21.0	
Total Split (%)		56.7%		56.7%	56.7%		20.0%	20.0%	20.0%	23.3%	23.3%	
Maximum Green (s)		42.5		42.5	42.5		13.9	13.9	13.9	16.7	16.7	
Yellow Time (s)		4.4		4.4	4.4		3.0	3.0	3.0	3.3	3.3	
All-Red Time (s)		4.1		4.1	4.1		1.1	1.1	1.1	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)										15.0	15.0	
Flash Dont Walk (s)										1.0	1.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		48.2			48.2			12.7	12.7	12.2	12.2	
Actuated g/C Ratio		0.54			0.54			0.14	0.14	0.14	0.14	
v/c Ratio		0.44			0.63			0.72	0.73	0.57	0.75	
Control Delay		14.2			19.2			54.4	57.0	40.7	21.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0			0.0	0.0	0.0	0.0	
Total Delay		14.2			19.2			54.4	57.0	40.7	21.8	
LOS		B			B			D	E	D	C	
Approach Delay		14.2			19.2			55.7			30.4	
Approach LOS		B			B			E			C	
Queue Length 50th (ft)		139			145			95	89	74	44	
Queue Length 95th (ft)		208			233			#183	#176	106	127	
Internal Link Dist (ft)		107			730			381			458	
Turn Bay Length (ft)									200			
Base Capacity (vph)		1841			1136			264	242	643	501	
Starvation Cap Reductn		0			0			0	0	0	0	
Spillback Cap Reductn		0			0			0	0	0	0	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		0.44			0.63			0.64	0.65	0.41	0.64	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 25.1 Intersection LOS: C
Intersection Capacity Utilization 89.7% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

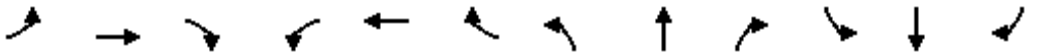
Splits and Phases: 1: Sycamore St/Rte 2 EB Off-Ramp & Hebron Ave/Rte 94 (Hebron Ave)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Future Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	12	12	12	12	12
Total Lost time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Lane Util. Factor		0.95			0.95			0.95	0.95	0.97	1.00	
Frt		0.98			1.00			0.95	0.85	1.00	0.88	
Flt Protected		1.00			0.99			0.97	1.00	0.95	1.00	
Satd. Flow (prot)		3416			3450			1655	1519	3467	1658	
Flt Permitted		1.00			0.61			0.97	1.00	0.95	1.00	
Satd. Flow (perm)		3416			2123			1655	1519	3467	1658	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	702	115	164	549	0	113	0	212	266	55	266
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	206	0
Lane Group Flow (vph)	0	804	0	0	713	0	0	168	157	266	115	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	0%
Turn Type		NA		Perm	NA		Split	NA	Prot	Split	NA	
Protected Phases		2			2		5	5	5	4	4	
Permitted Phases				2								
Actuated Green, G (s)		48.2			48.2			12.7	12.7	12.2	12.2	
Effective Green, g (s)		48.2			48.2			12.7	12.7	12.2	12.2	
Actuated g/C Ratio		0.54			0.54			0.14	0.14	0.14	0.14	
Clearance Time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Vehicle Extension (s)		3.0			3.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		1829			1136			233	214	469	224	
v/s Ratio Prot		0.24						0.10	c0.10	c0.08	0.07	
v/s Ratio Perm					c0.34							
v/c Ratio		0.44			0.63			0.72	0.73	0.57	0.51	
Uniform Delay, d1		12.7			14.6			37.0	37.0	36.4	36.1	
Progression Factor		1.00			1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8			2.6			8.9	10.6	0.9	0.8	
Delay (s)		13.5			17.3			45.9	47.7	37.4	37.0	
Level of Service		B			B			D	D	D	D	
Approach Delay (s)		13.5			17.3			46.8			37.2	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.9
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



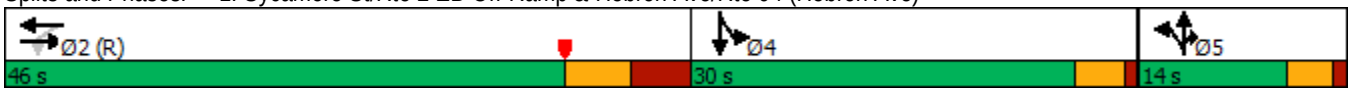
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Future Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	0		200	0		0
Storage Lanes	0		0	0		0	0		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	0.97	1.00	1.00
Frt		0.979						0.951	0.850		0.876	
Flt Protected					0.989			0.967		0.950		
Satd. Flow (prot)	0	3416	0	0	3451	0	0	1654	1519	3467	1659	0
Flt Permitted					0.603			0.967		0.950		
Satd. Flow (perm)	0	3416	0	0	2104	0	0	1654	1519	3467	1659	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		25									213	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		187			810			461			538	
Travel Time (s)		4.3			18.4			10.5			12.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	0%
Adj. Flow (vph)	0	702	115	164	549	0	113	0	212	266	55	266
Shared Lane Traffic (%)									26%			
Lane Group Flow (vph)	0	817	0	0	713	0	0	168	157	266	321	0
Turn Type		NA		Perm	NA		Split	NA	Prot	Split	NA	
Protected Phases		2			2		5	5	5	4	4	
Permitted Phases				2								
Detector Phase		2		2	2		5	5	5	4	4	
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)		13.5		13.5	13.5		9.1	9.1	9.1	20.3	20.3	
Total Split (s)		46.0		46.0	46.0		14.0	14.0	14.0	30.0	30.0	
Total Split (%)		51.1%		51.1%	51.1%		15.6%	15.6%	15.6%	33.3%	33.3%	
Maximum Green (s)		37.5		37.5	37.5		9.9	9.9	9.9	25.7	25.7	
Yellow Time (s)		4.4		4.4	4.4		3.0	3.0	3.0	3.3	3.3	
All-Red Time (s)		4.1		4.1	4.1		1.1	1.1	1.1	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)										15.0	15.0	
Flash Dont Walk (s)										1.0	1.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		45.1			45.1			14.6	14.6	13.5	13.5	
Actuated g/C Ratio		0.50			0.50			0.16	0.16	0.15	0.15	
v/c Ratio		0.47			0.68			0.63	0.64	0.51	0.75	
Control Delay		16.6			22.9			46.6	48.3	37.7	23.4	

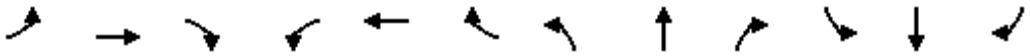
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0			0.0	0.0	0.0	0.0	
Total Delay		16.6			22.9			46.6	48.3	37.7	23.4	
LOS		B			C			D	D	D	C	
Approach Delay		16.6			22.9			47.4			29.9	
Approach LOS		B			C			D			C	
Queue Length 50th (ft)		147			153			92	87	74	58	
Queue Length 95th (ft)		234			#271			#183	#176	98	133	
Internal Link Dist (ft)		107			730			381			458	
Turn Bay Length (ft)									200			
Base Capacity (vph)		1722			1053			267	245	990	625	
Starvation Cap Reductn		0			0			0	0	0	0	
Spillback Cap Reductn		0			0			0	0	0	0	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		0.47			0.68			0.63	0.64	0.27	0.51	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 25.7 Intersection LOS: C
Intersection Capacity Utilization 89.7% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Sycamore St/Rte 2 EB Off-Ramp & Hebron Ave/Rte 94 (Hebron Ave)





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Future Volume (vph)	0	660	108	154	516	0	106	0	199	250	52	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	12	12	12	12	12
Total Lost time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Lane Util. Factor		0.95			0.95			0.95	0.95	0.97	1.00	
Frt		0.98			1.00			0.95	0.85	1.00	0.88	
Flt Protected		1.00			0.99			0.97	1.00	0.95	1.00	
Satd. Flow (prot)		3416			3450			1655	1519	3467	1658	
Flt Permitted		1.00			0.60			0.97	1.00	0.95	1.00	
Satd. Flow (perm)		3416			2104			1655	1519	3467	1658	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	702	115	164	549	0	113	0	212	266	55	266
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	181	0
Lane Group Flow (vph)	0	805	0	0	713	0	0	168	157	266	140	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	0%
Turn Type		NA		Perm	NA		Split	NA	Prot	Split	NA	
Protected Phases		2			2		5	5	5	4	4	
Permitted Phases				2								
Actuated Green, G (s)		45.0			45.0			14.6	14.6	13.5	13.5	
Effective Green, g (s)		45.0			45.0			14.6	14.6	13.5	13.5	
Actuated g/C Ratio		0.50			0.50			0.16	0.16	0.15	0.15	
Clearance Time (s)		8.5			8.5			4.1	4.1	4.3	4.3	
Vehicle Extension (s)		3.0			3.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		1708			1052			268	246	520	248	
v/s Ratio Prot		0.24						0.10	c0.10	0.08	c0.08	
v/s Ratio Perm					c0.34							
v/c Ratio		0.47			0.68			0.63	0.64	0.51	0.56	
Uniform Delay, d1		14.7			17.0			35.2	35.2	35.2	35.5	
Progression Factor		1.00			1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.9			3.5			3.3	4.0	0.4	1.8	
Delay (s)		15.7			20.5			38.4	39.2	35.6	37.3	
Level of Service		B			C			D	D	D	D	
Approach Delay (s)		15.7			20.5			38.8			36.5	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.9
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

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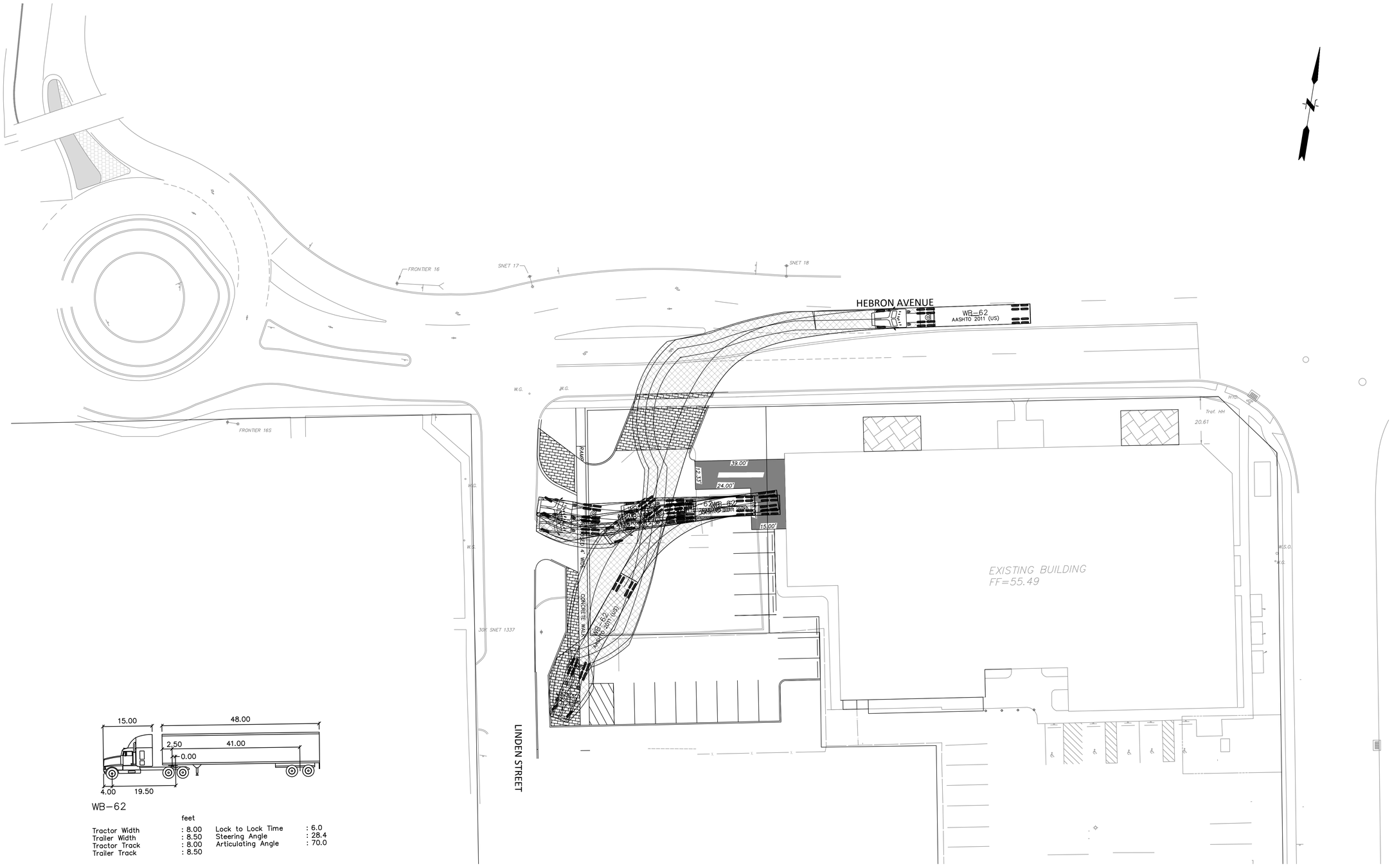
Turning Movement Plans



WB-62

feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		

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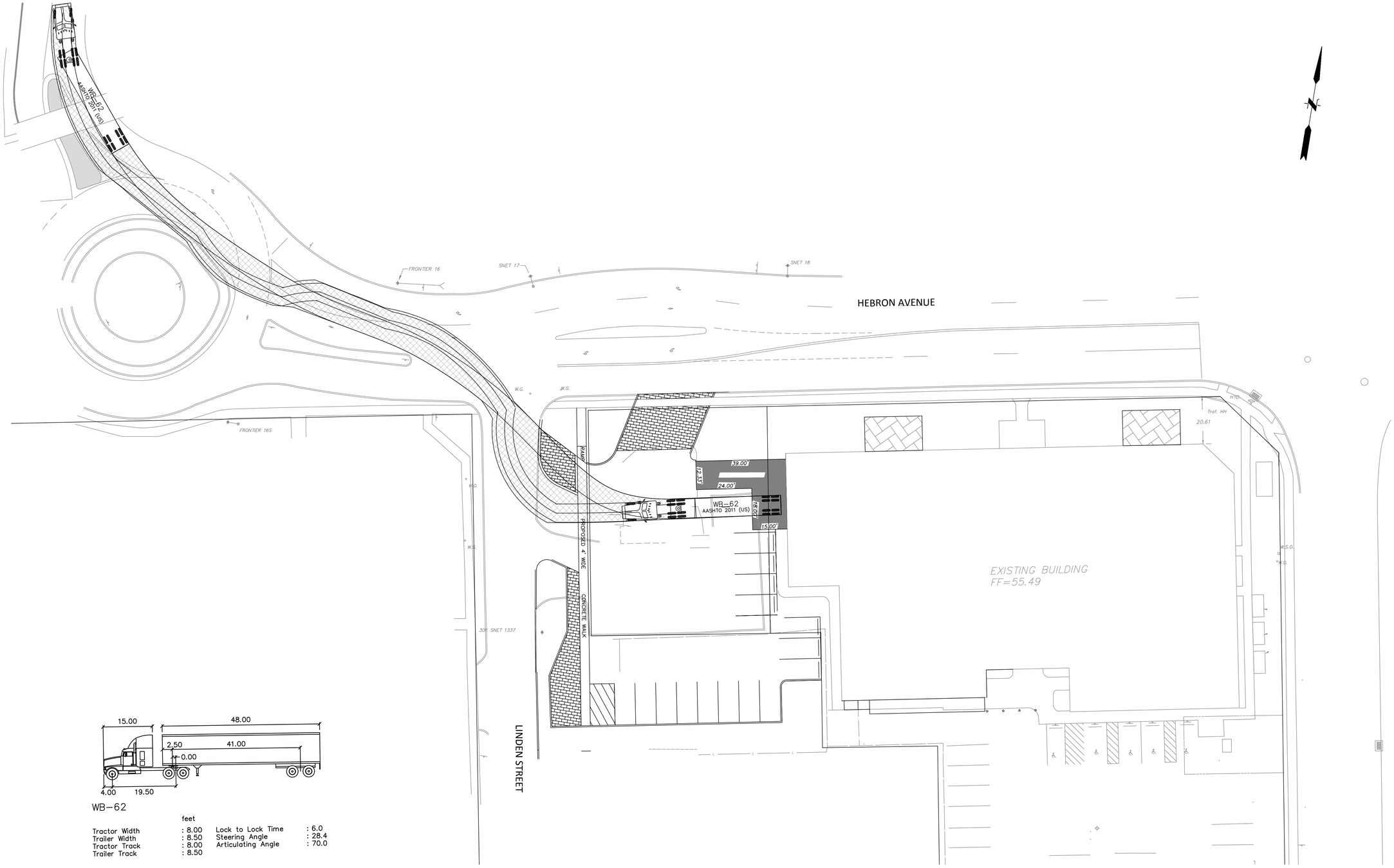
WB-62 TURNING MOVEMENT PLAN

400 HEBRON AVENUE

GLASTONBURY CONNECTICUT

PROJ. No.: 20220036.A10
DATE: MAY 2022

AUTO-01



WB—62

feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		

FOR INFORMATION PURPOSES ONLY.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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400 HEBRON AVENUE

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AUTO-02

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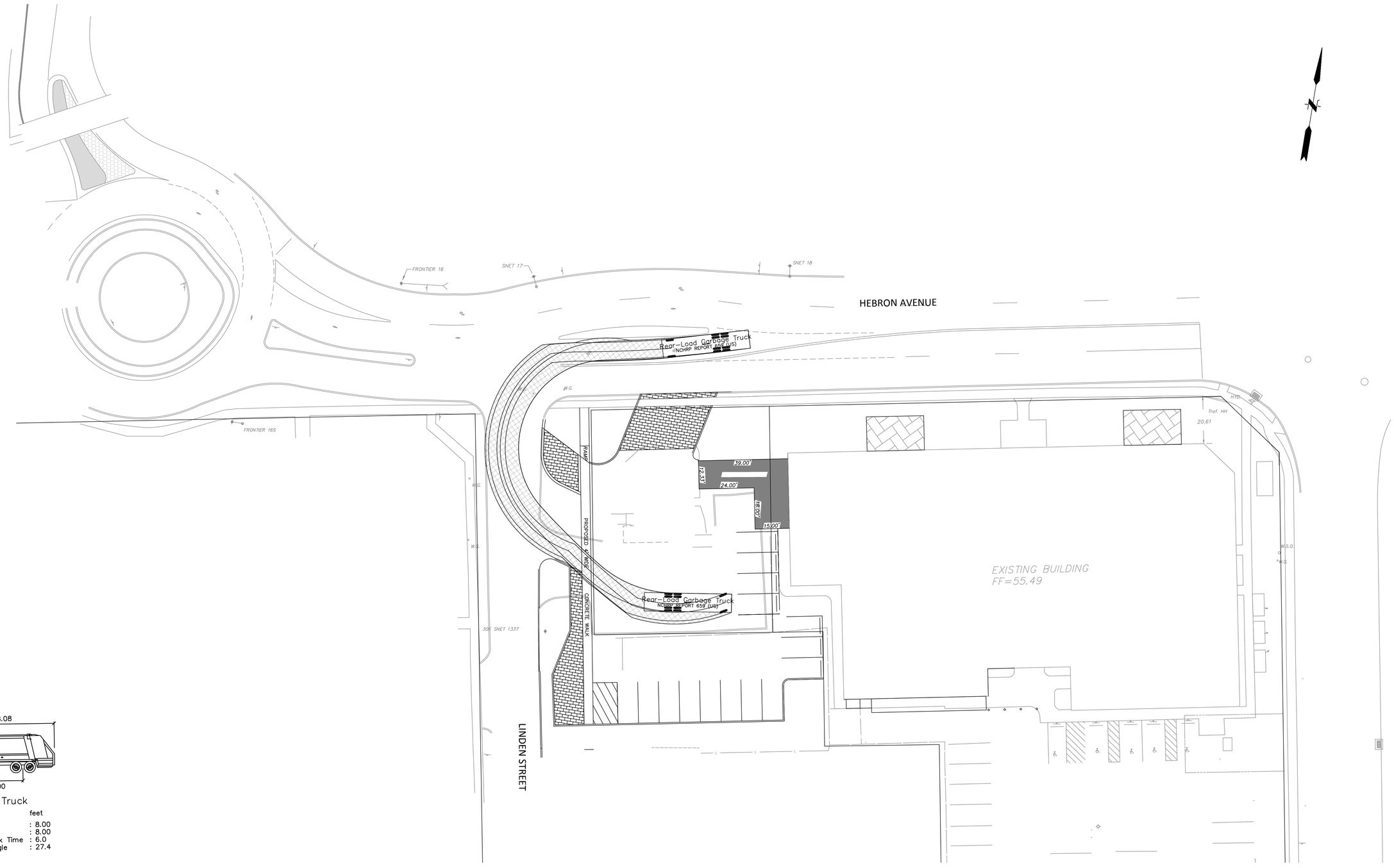

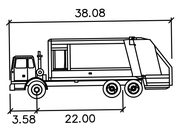

Garbage Truck

	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 27.4

FOR INFORMATION PURPOSES ONLY.

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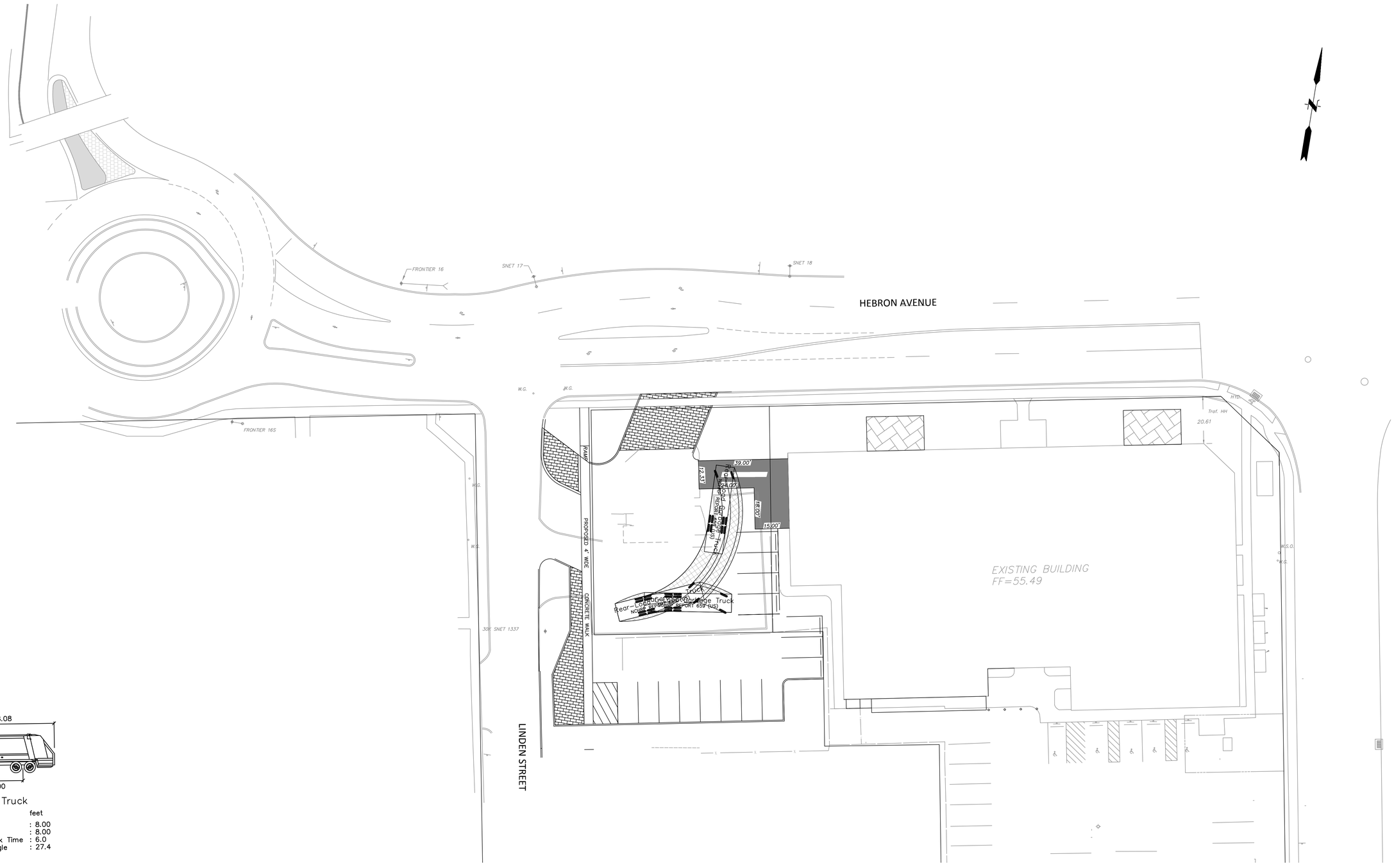
GARBAGE TRUCK TURNING MOVEMENT PLAN

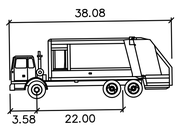
400 HEBRON AVENUE

GLASTONBURY CONNECTICUT

PROJ. No.: 20220036.A10
DATE: APRIL 2022

AUTO-03





Garbage Truck

	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 27.4

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No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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AUTO-04

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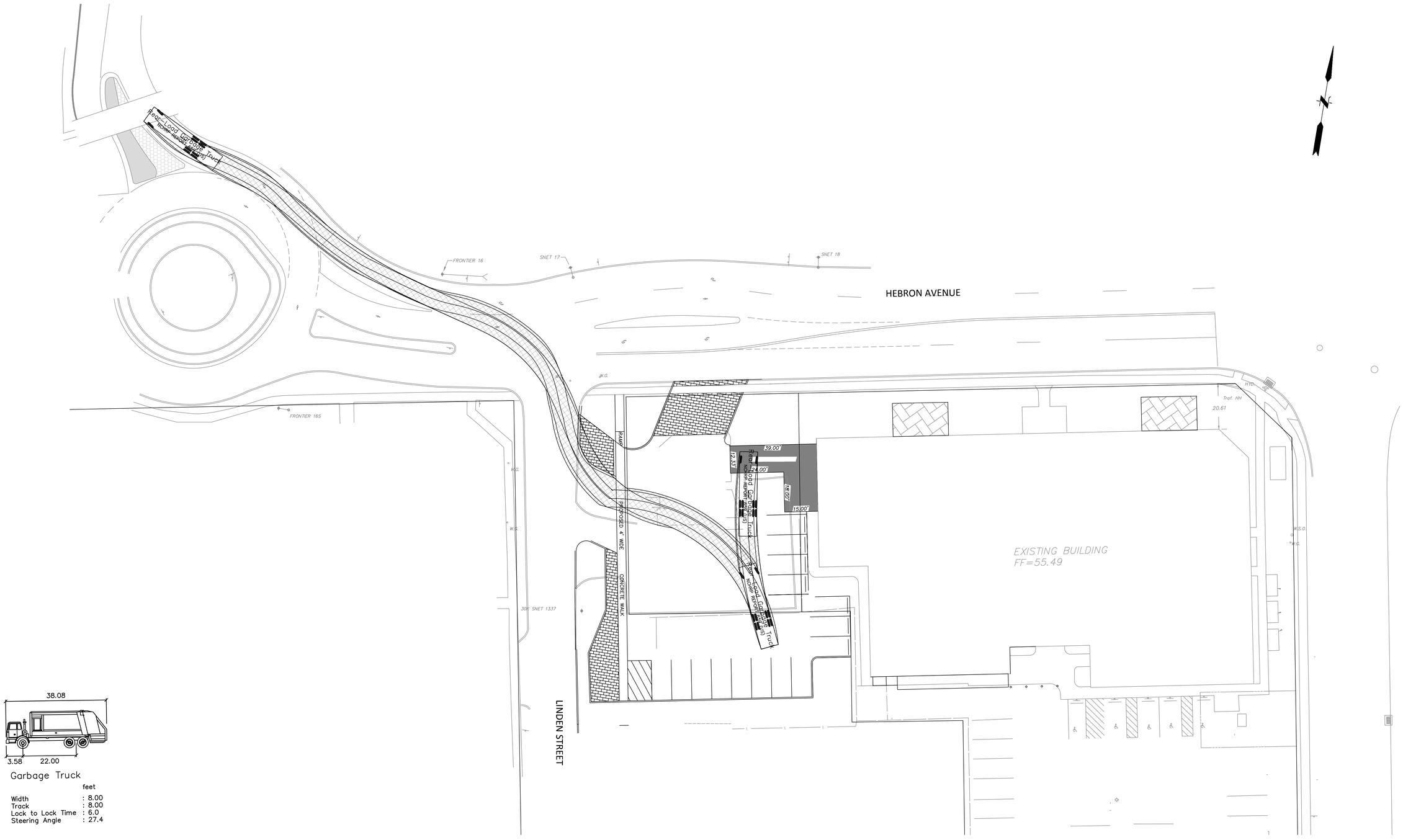

Garbage Truck

	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 27.4

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No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
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AUTO-05

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