

Traffic Impact Study

800 Long Ridge Road Multi-Family Housing Stamford, Connecticut

September 2023

City of Stamford Site Plan and Special Permit Applications
Office of the State Traffic Administration (OSTA) Administrative Decision Review



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Summary Sheet

As an aid to reviewers, this Summary Sheet has been included to outline the various study parameters utilized in this report. Although a full explanation of the study methodologies is included in the text of the report, this summary can serve as a useful reference for reviewers.

Applicant:

800 Long Ridge, LLC

Site Acreage:

25.26

Development Size/Type:

354 Apartment Units

9,394 square foot Supporting Commercial Use

Parking:

628 Parking Spaces (349 garage parking spaces and 279 surface parking spaces including 38 reserved for commercial parking)

Applications:

City of Stamford Site Plan and Special Permit Applications

Office of the State Traffic Administration (OSTA) Administrative Decision Review

Build Year:

2025

Background Traffic Growth Factor:

0.7%

Traffic Counts:

Fuss & O'Neill – August 2023 (Turning Movement Counts)

Peak Hours Analyzed:

Weekday Morning Peak Hour – 7:15 a.m. – 8:15 a.m.

Weekday Afternoon Peak Hour – 5:00 p.m. – 6:00 p.m.

Expected Trip Generation:

Weekday Morning Peak Hour – 250 Trips (90 Entering, 160 Exiting)

Weekday Afternoon Peak Hour – 247 Trips (135 Entering, 112 Exiting)

Capacity Analysis:

Technique – 2000 Highway Capacity Manual Signalized

Execution – Synchro and SimTraffic Professional Software, Version 11.0

1 Introduction

800 Long Ridge, LLC proposes to construct 354 apartment units with a 9,394 square foot supporting commercial use at 800 Long Ridge Road Stamford, Connecticut as shown on the site location map, *Figure No. 1 of Appendix B*. The existing 300,000 square foot office building and parking garage on site will be demolished. The development site is located west of the intersection of Route 104 (Long Ridge Road) and Loughran Avenue. Access to the site will be provided via the existing full access driveway that forms the west leg of the signalized intersection. A total of 628 parking spaces will be provided. The development is expected to open in 2025.

Fuss & O'Neill has been retained to study the impact of the proposed development on traffic conditions throughout the adjacent roadway network. This report has been prepared to document the findings of the study and is being submitted to the City of Stamford in support of the development's Site Plan and Special Permit applications. This report will also be submitted to the Office of the State Traffic Administration (OSTA) in support of an Administrative Decision Review.

2 Existing Condition

2.1 Site of Development

The existing site is identified as 800 Long Ridge Road (Route 104) by the City of Stamford and is located in the C-D Designed Commercial District zone. 800 Long Ridge Road (Route 104) is currently occupied by a 300,000 square foot office building and 512 car parking garage. The site consists of approximately 25.26 acres of land. The site is bounded by commercial mixed-use property to the north, the Westhill High School to the south, medical offices and Long Ridge Road to the east, and single-family residential homes to the west.

2.2 Adjacent Roadway Network

The adjacent roadway network consists of the following roadways:

- Route 104 (Long Ridge Road)
- Loughran Avenue

Route 104 (Long Ridge Road) runs north/south under State jurisdiction in the City of Stamford and is designated as Long Ridge Road for approximately seven miles between the New York State line to the north and its intersection with High Ridge Road to the south. The roadway provides access to commercial and residential land uses as well as Route 15 (Merritt Parkway). Route 104 is classified by the Connecticut Department of Transportation (CTDOT) as a principal arterial that provides two 11-foot travel lanes in each direction and turning lanes at key intersections. The shoulder widths vary in the vicinity of the site. The posted speed limit is 40 miles per hour. Pedestrian and bicycle facilities are not provided on Route 104 in the vicinity of the site however bus stops with shelters are provided on both the northbound and southbound sides of the roadway just north of the site driveway/Loughran Avenue intersection.

Loughran Avenue runs east/west under Local jurisdiction in the City of Stamford and extends approximately 0.23 miles between its intersection with Route 104 to the west and its intersection with Maltbie Avenue to the north. The roadway provides access to residential land uses. Loughran Avenue is classified by the Connecticut Department of Transportation (CTDOT) as a local road that provides an approximately 28-foot travel way with one-lane in each direction. There is no posted speed limit on Loughran Avenue. Pedestrian and bicycle facilities are not provided on Loughran Avenue.

2.3 Study Area Intersections

The following study area intersections were reviewed:

- Route 104 (Long Ridge Road) at Loughran Avenue and Site Drive
- Route 104 (Long Ridge Road) at 900 Long Ridge Road Driveway and a Private Driveway

Route 104 at Loughran Avenue and the site driveway is a signalized four-way intersection with Route 104 providing the northbound and southbound approaches, Loughran Avenue providing the westbound approach, and the site driveway providing the eastbound approach. Route 104 provides one lane dedicated to right turns, two lanes dedicated for through movements, and one lane dedicated for left turns for southbound vehicles. Northbound vehicles are provided with one dedicated left-turn lane, one dedicated lane for through movements, and one lane shared between through movements and right turns. Loughran Avenue provides one lane shared for all movements and the site driveway provides two approach lanes striped as a dedicated left and right turn lane. Pedestrian ramps are provided on the northeast and northwest corners, but crosswalks and sidewalks are not provided. Bicycle facilities are not provided at the intersection. Bus stops with shelters are provided on both sides of the roadway just north of the intersection.

Route 104 at the 900 Long Ridge site driveway and the private driveway to a day care center is a signalized offset four-way intersection with Route 104 providing the northbound and southbound approaches, the 900 Long Ridge site driveway providing the eastbound approach, and the private driveway providing the westbound approach. The day care center generates minimal traffic, is offset approximately 55 feet south of the intersection and is not controlled by the traffic signal. Route 104 provides one lane dedicated to right turns, one lane dedicated for through movements, and one shared lane for through movements and left turns for southbound vehicles. Northbound vehicles are provided with one dedicated left-turn lane, one dedicated lane for through movements, and one lane shared between through movements and right turns. The 900 Long Ridge site driveway provides one lane dedicated for left turns and one shared lane for left and right turns. The private driveway provides one lane shared for all movements. No pedestrian or bicycle facilities are provided at the intersection.

2.4 Traffic Volumes, Speeds and Counts

The greatest potential for traffic impact on the roadway network by the proposed development will occur during the weekday morning and afternoon peak hours, the periods when commuter and residential related trips are at their highest levels. In order to determine the traffic impact of the proposed development on adjacent street traffic, representatives of Fuss & O'Neill, Inc. conducted weekday morning and afternoon peak hour manual turning movement counts on August 31, 2023, at the intersection of Route 104 at the site driveway and Loughran Avenue. Traffic volumes for the intersection of Route 104 at 900 Long Ridge Road were obtained from the 2023 Traffic Assessment prepared by Kimley Horn for the 900 Long Ridge Road development.

The existing office building at 800 Long Ridge Road is currently occupied but occupancy appears to be low based on the turning movement count data.

The traffic count data collected indicates that the weekday morning peak hour of traffic is 7:15 a.m. to 8:15 a.m. and the weekday afternoon peak hour is 5:00 p.m. to 6:00 p.m. These peak hours were subsequently analyzed for impacts. The existing traffic volumes for these peak hours are shown in *Figure No. 2 of Appendix B*. Copies of the turning movement counts have been included in *Appendix E* of this report.

3 Background Traffic Conditions

3.1 Growth Rate

Upon consultation with CTDOT, the 2023 existing traffic volumes were projected to the 2025 design year using a 0.7 percent per year peak hour growth factor to account for normal traffic growth in the study area.

3.2 Other Developments & Roadway Improvements

A residential/mixed-use development is planned to open in 2026 at the adjacent 900 Long Ridge Road property approximately 380 feet north of the 800 Long Ridge Road site driveway. This development is proposed to include 508 residential units and 20,000 square feet of supporting commercial space. The trips associated with this future development site were not captured in the counts performed August 2023, therefore the projected trip generation for this site was obtained from the "Traffic Assessment for Proposed Residential Development" prepared by Kimley-Horn on July 11, 2023. The future trips for this site were added to the grown 2025 traffic volumes collected by this study to obtain the 2025 Background Condition traffic volumes for the Route 104 at 800 Long Ridge Road/Loughran Avenue intersection. At the intersection of Route 104 at the 900 Long Ridge Road site driveway, the existing traffic volumes from the Kimley-Horn study were grown to the 2025 design year and trips from that proposed development were added to obtain the 2025 background condition volumes at this

intersection. These projected background condition traffic volumes are shown in *Figure No. 3 of Appendix B* and represent the 2025 design year traffic volumes without the proposed 800 Long Ridge Road development traffic. Copies of the 900 Long Ridge Road traffic volume figures used in the Kimley-Horn study have been provided in *Appendix F*.

Fuss & O'Neill contacted the CTDOT Bureau of Policy and Planning to identify any other pending or approved developments having site related traffic in the study area. CTDOT identified no other development plans or roadway modifications that would affect traffic volume or behavior in the vicinity of the study area.

4 Proposed Conditions

4.1 Development

800 Long Ridge, LLC proposes to construct 354 apartment units and a 9,394 square foot supporting commercial use at 800 Long Ridge Road as shown on the site location map, *Figure No. 1 of Appendix B*. A total of 628 parking spaces will be provided for the residential development. The existing office building and garage on site will be demolished. The development is expected to open in 2025.

4.2 Site Access and Circulation

Access to the proposed site will be provided via the existing full access signalized driveway operating as the western leg of the intersection of Route 104 (Long Ridge Road) and Loughran Avenue. The site driveway provides two exiting lanes and forms the eastbound approach of the signalized intersection.

4.3 Trip Generation

The expected site generated traffic was calculated 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 weekday morning and afternoon peak hour for the proposed development was calculated using the ITE land use code 221 "Multifamily Housing (Mid-Rise)" and 565 "Day Care Center." The supporting commercial use was analyzed as a day care center to provide a conservative analysis using a higher generating land use. The proposed residential development consisting of 354 apartment units is expected to generate a total of 144 vehicle trips (33 entering, 111 exiting) during the morning peak hour and a total of 139 vehicle trips (85 entering, 54 exiting) during the afternoon peak hour. The supporting 9,394 square foot commercial use of the development is expected to generate a total of 118 vehicle trips (63 entering, 55 exiting) during the morning peak hour and a total of 120 vehicle trips (56 entering, 64 exiting) during the afternoon peak hour. It should be noted that the commercial use trip generation rates were calculated based off a slightly larger building (approximately 10,700 square foot) further resulting in a conservative analysis.

Mixed-use developments frequently generate trips for people who visit multiple land uses within the site. These trips are defined as “internal capture” trips. A typical 10 percent internal capture and transit credit was incorporated into the trip generation for this site. This percentage accounts for residents who will utilize the supporting commercial use (i.e., captured trips) as well as residents who will utilize transit service to commute during the peak hours.

It should also be noted that supporting commercial uses produce a high percentage of “pass-by” trips. These are trips from drivers who are already in the existing traffic stream on Route 104 and would divert their peak hour trips into the. No pass-by credit was taken in our analysis (i.e. all commercial related trips on the road network were considered to be “new”), therefore the results of this study should again be considered conservative.

In total, the proposed residential development with supporting commercial use and applied internal capture/transit credit will generate 250 trips (90 entering and 160 exiting) in the morning peak hour and 247 trips (135 entering and 112 exiting) in the afternoon peak hour.

Trip generation for the weekday morning and afternoon peak hour for the existing office development on site was calculated using the ITE land use code 710 “General Office Building” to represent trips generated by the previous land use. The previous fully occupied land use consisting of 300,000 square feet of general office space would have generated a total of 456 vehicle trips (401 entering, 55 exiting) during the morning peak hour and a total of 432 vehicle trips (73 entering, 359 exiting) during the afternoon peak hour. Therefore, the proposed residential development will result in 206 fewer trips than the existing office use in the morning peak hour and 185 fewer trips in the afternoon peak hour.

A summary of the peak hour trip generation information for the proposed and previous developments is provided in *Table 1 of Appendix A*.

4.4 Trip Distribution

The distribution of traffic entering and exiting the proposed site was applied to the road network based on the existing regional traffic distributions and the layout of the adjacent roadway network. During the peak hours, the following arrival distributions of traffic are anticipated:

- 50% from the north on Route 104 (Long Ridge Road)
- 50% from the south on Route 104 (Long Ridge Road)

A regional arrival/departure distribution for the new site generated traffic traveling to and from the project site is shown in *Figure No. 4 of Appendix B*.

4.5 Combined Volumes

The site generated traffic for the proposed residential development was distributed to the roadway system based on the arrival/departure distributions with the results shown in *Figure No. 6 of Appendix B*.

These volumes were then added to the background volumes to yield the year 2025 peak hour Combined traffic volumes shown in *Figure No. 8 of Appendix B*.

As previously noted, the existing site operates as a 300,000 square foot office building but current occupancy appeared low when counts were performed. Trip generation for this existing land use fully occupied was calculated using land use code (LUC) 710 (General Office Building) and utilized as a comparison to the proposed residential land use. This office use site generated traffic is shown in *Figure No. 5 of Appendix B*. 2025 peak hour Combined traffic volumes for the office use are shown in *Figure No. 7 of Appendix B*.

5 Analyses

5.1 Crash Analysis

Crash data was gathered from CTDOT via the University of Connecticut Crash Data Repository for the following intersections:

- Route 104 (Long Ridge Road) at Loughran Avenue and Site Drive
- Route 104 (Long Ridge Road) at 900 Long Ridge Road Driveway and Private Driveway

The records were gathered for the most recent three years of available data, 2020 through 2022. A summary of the crash data for the study area intersection is provided in *Table 2 of Appendix A*. Copies of the crash data records have been provided in *Appendix G*.

The intersection of Route 104 and Loughran Avenue experienced three crashes during the study period, averaging one crash per year. All three reported crashes were rear end collisions. Of the three collisions, two resulted in suspected minor injuries and one resulted in a possible injury.

The intersection of Route 104 and 900 Long Ridge Road Driveway and a Private Driveway experienced no crashes during the study period.

The type and frequency of crashes reported are not considered abnormal for the traffic volumes and geometric characteristics of the intersections and there were no identifiable crash patterns. The volume of traffic generated by the proposed development is not expected to impact the safety of traffic operations in the study area.

5.2 Intersection Sight Distance Analysis

Intersection sight distances were calculated at the existing site driveway location in accordance with criteria set forth in the 2003 CTDOT *Highway Design Manual*. The sight distance is measured from a point 15 feet back from the edge of travel-way at a height 3.5 feet, the standard height of a driver's eye.

Route 104 (Long Ridge Road) has a posted speed limit of 40 miles per hour. A design speed of 45 miles per hour, five miles per hour above the speed limit, was utilized for the analysis.

For the design speed of 45 miles per hour, 530 feet of intersection sight distance is required for a passenger car turning right or left onto a four-lane roadway.

At the proposed site driveway on Route 104, the sight lines looking left (north) are clear through the signalized intersection of Route 104 and the driveway to 900 Long Ridge Road, and sight lines looking right (south) are measured to be approximately 530 feet. Therefore, sufficient intersection sight distance exists to allow for safe egress of passenger cars in the event that the traffic signal is operating in flash mode or is non-functional.

5.3 Intersection Capacity Analysis

Capacity analysis was conducted for the signalized intersections using Synchro Professional Software, version 11.0.

In discussing signalized 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 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.

These definitions for v/c ratio and LOS, as well as the methodology for conducting signalized intersection capacity analyses, are taken from the “Highway Capacity Manual” published by the Transportation Research Board.

Using the above referenced methodologies, weekday morning and weekday afternoon peak hour capacity analyses were conducted at the following signalized intersections:

- Route 104 (Long Ridge Road) at Loughran Avenue and the Site Driveway
- Route 104 (Long Ridge Road) at 900 Long Ridge Road Site Driveway and a private driveway

Table No. 3 of Appendix A presents a summary of the levels of service at the signalized intersections, for both Background and Combined Condition traffic volumes of the existing office and proposed

residential land uses. Copies of the analysis worksheets can be found in *Appendices C and D*, for the weekday morning and afternoon peak hours respectively.

The determination of the traffic impact from the proposed development is made through a comparison of the Background Conditions LOS (without any proposed development on site) versus the Combined Conditions LOS (with the existing office use development) and the Combined Conditions LOS (with the proposed residential development).

The signalized intersection of Route 104 and Loughran Avenue and the Site Driveway operates efficiently at LOS A under background conditions during morning and afternoon peak hours and continues to do so in the combined condition under the proposed residential land use. This is an improvement in operations in comparison to the existing office use which would yield LOS B operations during the afternoon peak hour under combined conditions.

The signalized intersection of Route 104 and 900 Long Ridge Road Site Driveway and a private driveway operates efficiently at LOS B during the morning peak hour and LOS A during the afternoon peak hour under background conditions and continues to do so in the combined condition under both the existing office land use and proposed residential land use.

5.4 Queue Analysis

Background and Combined Condition 95th percentile (design) queue lengths were reviewed at the study area intersections. 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 located in *Appendix C and D. Tables 4 and 5 of Appendix A* provide a summary of the queue lengths for the critical lanes at each intersection.

At both intersections that were analyzed, the 95th percentile queue lengths on the Long Ridge Road approaches will experience minimal queue increases (four vehicle lengths or less during the morning peak hour and two vehicles lengths or less during the afternoon peak hour) between the background and combined condition with the proposed residential land use. Ample lane storage lengths exist on all approaches to accommodate these anticipated queue increases.

6 Conclusions & Recommendations

The purpose of preparing a Traffic Impact Study is to identify the impact of the proposed development's site generated traffic. The study efforts have indicated that the proposed residential housing development with supporting commercial use will generate 250 new trips (90 entering, 160 exiting) during the weekday morning peak hour and 247 new trips (135 entering, 112 exiting) during the weekday afternoon peak hour. Compared to the existing office land use, the proposed residential development will result in a substantial reduction in site generated traffic of 206 trips during both the morning peak hour and 185 trips during the afternoon peak hour.

The capacity analysis revealed that all of the study area intersection approaches will experience a minimal increase in delay as a result of the proposed residential development traffic and continue to operate with efficient LOS. Queue lengths within the study area are expected to have minimal increases and sufficient lane storage lengths exist at both study area intersections to accommodate any increase in queue lengths.

Review of the most recent three years of available crash data provided by the University of Connecticut Crash Data Repository indicated that the type and frequency of crashes reported at the study area intersections is not abnormal for signalized intersections with the traffic volume and geometric characteristics present. There were no identifiable crash patterns and the low traffic volume generated by the proposed development is not expected to impact the safety of traffic operations within the study area.

The proposed site driveway on Route 104 will provide sufficient intersection sight distances and will meet or exceed CTDOT criteria for safe egress of vehicles from the site.

In conjunction with the proposed development construction, it is recommended that the existing non-standard pavement arrows on the site driveway approach be eradicated and striped with an exclusive left turn arrow in the left approach lane and a shared through/right turn arrow in the right approach lane. In addition, a lane use sign should be installed on the site driveway approach in line with the pavement arrows.

Based on the results of the foregoing analysis, it is the professional opinion of Fuss & O'Neill, Inc. that the proposed residential development will not have a significant impact on traffic operations within the study area.

Appendix A

Tables

Table 1

**Peak Hour Adjacent Street Site Generated Traffic Volumes
800 Long Ridge Road Multi-Family Housing
Stamford, Connecticut**

Land Use	ITE Land Use Code	Trip Generation					
		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Mid-Rise Housing Units (354 Apartment Units)	221 – Multifamily Housing (Mid-Rise)	33	111	144	85	54	139
Supporting Commercial Use (9,394 SF)*	565 – Day Care Center	63	55	118	56	64	120
Gross Site Trips		96	166	262	141	118	259
Less Internal Capture	(10% of Commercial Trips)	-6	-6	-12	-6	-6	-12
Net New Trips		90	160	250	135	112	247
Existing Office Building (300,000 SF)	710 – General Office Building	401	55	456	73	359	432
Net Trip Reduction w/ Residential Use		-311	+105	-206	+62	-247	-185

Note: Trip generation based on Rate per Land use Code 221 (Mid-Rise Multifamily Housing), Land use Code 565 (Day Care Center), and Land use Code 710 (General Office Building), as published in *Trip Generation*, 11th Edition, 2021.

*Rates conservatively projected based on a daycare use with a building approximately 10,700 square feet in size.

Table 2

**Intersection Crash Data Summary
800 Long Ridge Road Multi-Family Housing
Stamford, Connecticut**

Intersection	Crashes Per Year			
	2020	2021	2022	Average/Year
Long Ridge Road (Route 104) at Loughran Avenue	0	2	1	1
Long Ridge Road (Route 104) at 900 Long Ridge Road Site Driveway	0	0	0	0

*Values indicated are number of crashes within 200 feet of the intersection during time period shown.
Data provided by the Connecticut Department of Transportation via the UConn Crash Data Repository.

Table 3

**Signalized Intersection Level of Service Summary
800 Long Ridge Road Multi-Family Housing
Stamford, Connecticut**

Critical Movements	2025 Weekday Morning Peak Hour			2025 Weekday Afternoon Peak Hour		
	Background	Office Land Use Combined	Residential Land Use Combined	Background	Office Land Use Combined	Residential Land Use Combined
Route 104 at Loughran Avenue and Site Driveway	A	A	A	A	B	A
Eastbound Approach	D	D	D	D	D	D
Westbound Approach	D	D	D	D	C	D
Northbound Approach	A	A	A	A	A	A
Southbound Approach	A	A	A	A	A	A
Route 104 at 900 Long Ridge Road Driveway and Private Driveway	B	B	B	A	A	A
Eastbound Approach	D	D	D	D	D	D
Westbound Approach	D	D	D	D	D	D
Northbound Approach	A	A	A	A	A	A
Southbound Approach	B	B	B	B	B	B

*Values indicated are overall intersection and approach Level of Service (LOS)

Table 4

**Weekday Morning Peak Hour Queue Length Summary
800 Long Ridge Road Multi-Family Housing
Stamford, Connecticut**

Intersection	Approach Lane	2025 Background Queue	2025 Office Use Combined Queue	2025 Residential Use Combined Queue	Available Storage
Route 104 at Loughran Avenue and Site Driveway	EB Left Turn	10 Feet	50 Feet	105 Feet	250 Feet
	EB Through/Right Turn	10 Feet	30 Feet	45 Feet	250 Feet
	WB Approach	25 Feet	25 Feet	20 Feet	1100 Feet
	NB Left Turn	0 Feet	125 Feet	15 Feet	150 Feet
	NB Through/Right Turn	100 Feet	130 Feet	190 Feet	1450 Feet
	SB Left Turn	0 Feet	0 Feet	0 Feet	125 Feet
	SB Through	55 Feet	70 Feet	60 Feet	275 Feet
	SB Right Turn	0 Feet	0 Feet	0 Feet	175 Feet
Route 104 at 900 Long Ridge Road Driveway and Private Driveway	EB Left Turn	90 Feet	90 Feet	90 Feet	100 Feet
	EB Through/Right Turn	60 Feet	60 Feet	60 Feet	+1000 Feet
	WB Approach	0 Feet	0 Feet	0 Feet	25 Feet
	NB Left Turn	10 Feet	35 Feet	20 Feet	65 Feet
	NB Through/Right Turn	50 Feet	60 Feet	70 Feet	275 Feet
	SB Left Turn/Through	475 Feet	620 Feet	505 Feet	1700 Feet
	SB Right Turn	10 Feet	10 Feet	10 Feet	290 Feet

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

Table 5

**Weekday Afternoon Peak Hour Queue Length Summary
800 Long Ridge Road Multi-Family Housing
Stamford, Connecticut**

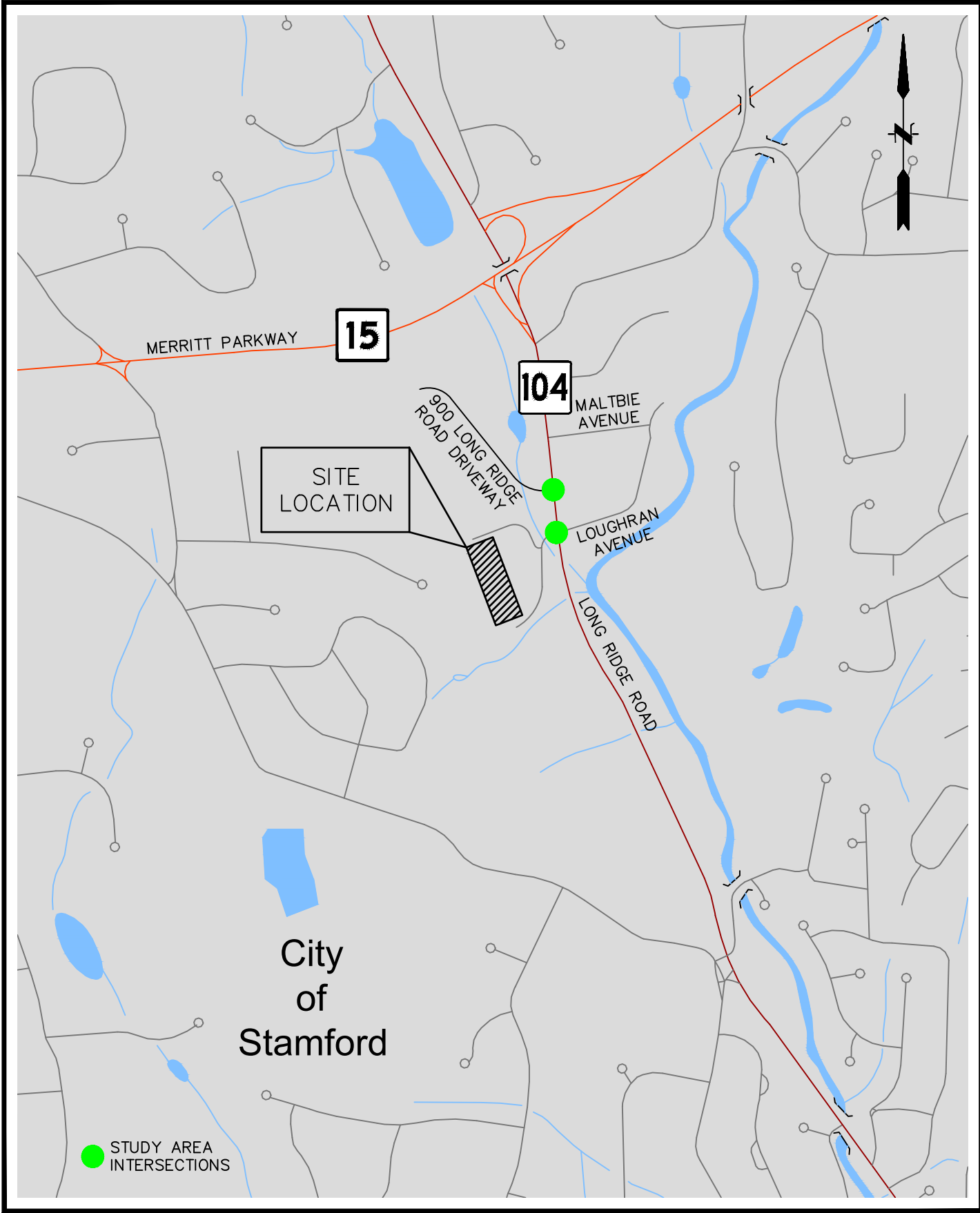
Intersection	Approach Lane	2025 Background Queue	2025 Office Use Combined Queue	2025 Residential Use Combined Queue	Available Storage
Route 104 at Loughran Avenue and Site Driveway	EB Left Turn	5 Feet	200 Feet	80 Feet	250 Feet
	EB Through/Right Turn	0 Feet	110 Feet	5 Feet	250 Feet
	WB Approach	15 Feet	15 Feet	15 Feet	1100 Feet
	NB Left Turn	0 Feet	15 Feet	20 Feet	150 Feet
	NB Through/Right Turn	100 Feet	265 Feet	175 Feet	1450 Feet
	SB Left Turn	0 Feet	0 Feet	0 Feet	125 Feet
	SB Through	100 Feet	95 Feet	95 Feet	220 Feet
	SB Right Turn	0 Feet	0 Feet	0 Feet	175 Feet
Route 104 at 900 Long Ridge Road Driveway and Private Driveway	EB Left Turn	75 Feet	75 Feet	75 Feet	100 Feet
	EB Through/Right Turn	50 Feet	50 Feet	50 Feet	+1000 Feet
	WB Approach	0 Feet	0 Feet	0 Feet	25 Feet
	NB Left Turn	10 Feet	15 Feet	15 Feet	65 Feet
	NB Through/Right Turn	50 Feet	100 Feet	75 Feet	440 Feet
	SB Left Turn/Through	375 Feet	400 Feet	415 Feet	1700 Feet
	SB Right Turn	15 Feet	15 Feet	15 Feet	290 Feet

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

Appendix B

Figures

File: J:\DWG\20101217\A30\Civil\Traffic Figures\20101217\A30_LOC.dwg Layout 08:5X11-P Plotted: 2023-09-29 10:03 AM Saved: 2023-09-29 10:03 AM User: HRussell
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 LAYER STATE:



● STUDY AREA INTERSECTIONS

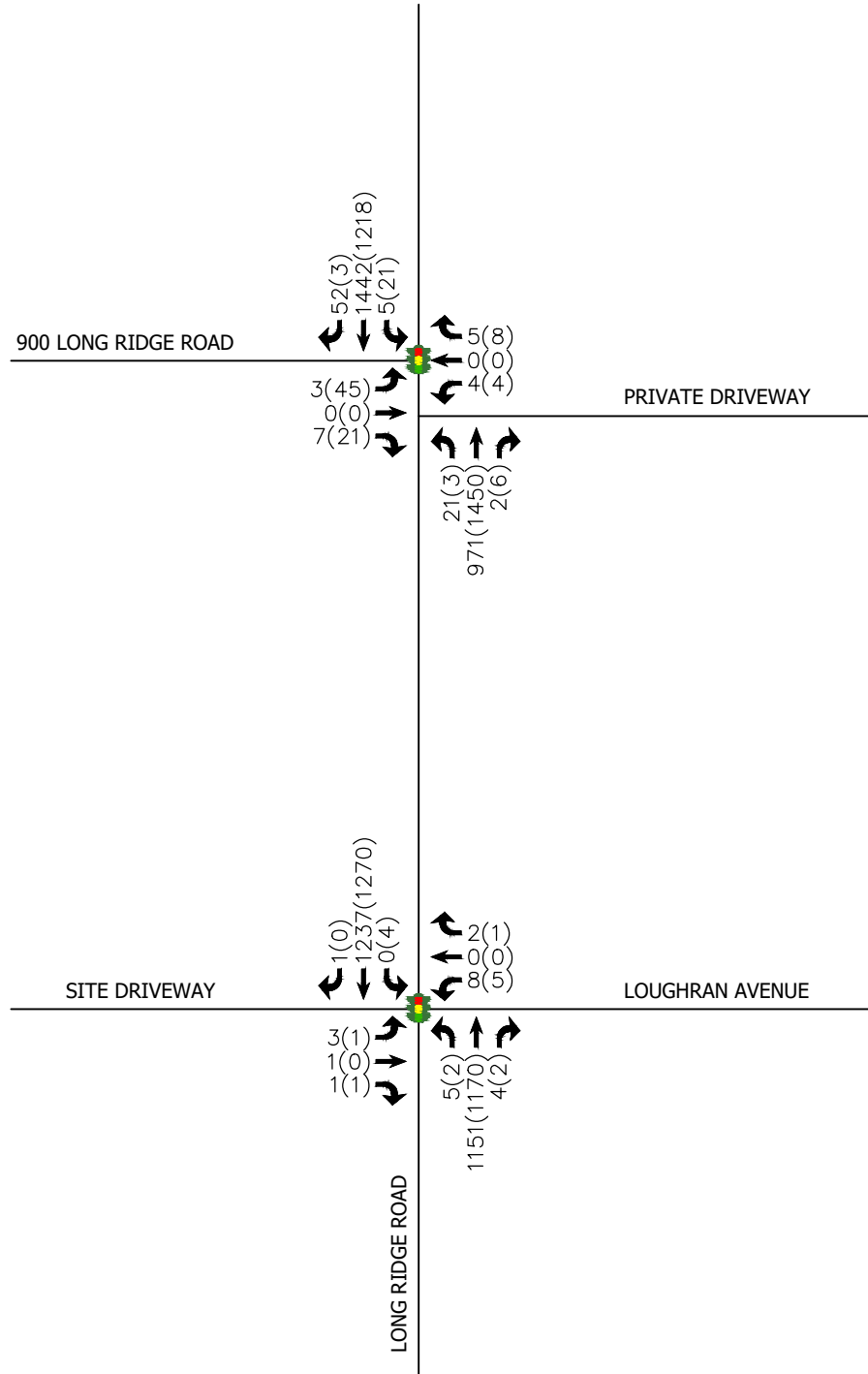
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HORZ.:	1" = 1000'
VERT.:	
DATUM:	
HORZ.:	
VERT.:	
GRAPHIC SCALE	



FUSS & O'NEILL
 146 HARTFORD ROAD
 MANCHESTER, CONNECTICUT 06040
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BLT MANAGEMENT LLC
 SITE LOCATION MAP
 800 LONG RIDGE ROAD
 STAMFORD CONNECTICUT

PROJ. No.: 20101217_A30
 DATE: SEPTEMBER 2023
LOC-01



xxx(xxx) = WEEKDAY MORNING PEAK HOUR (WEEKDAY PM PEAK HOUR)



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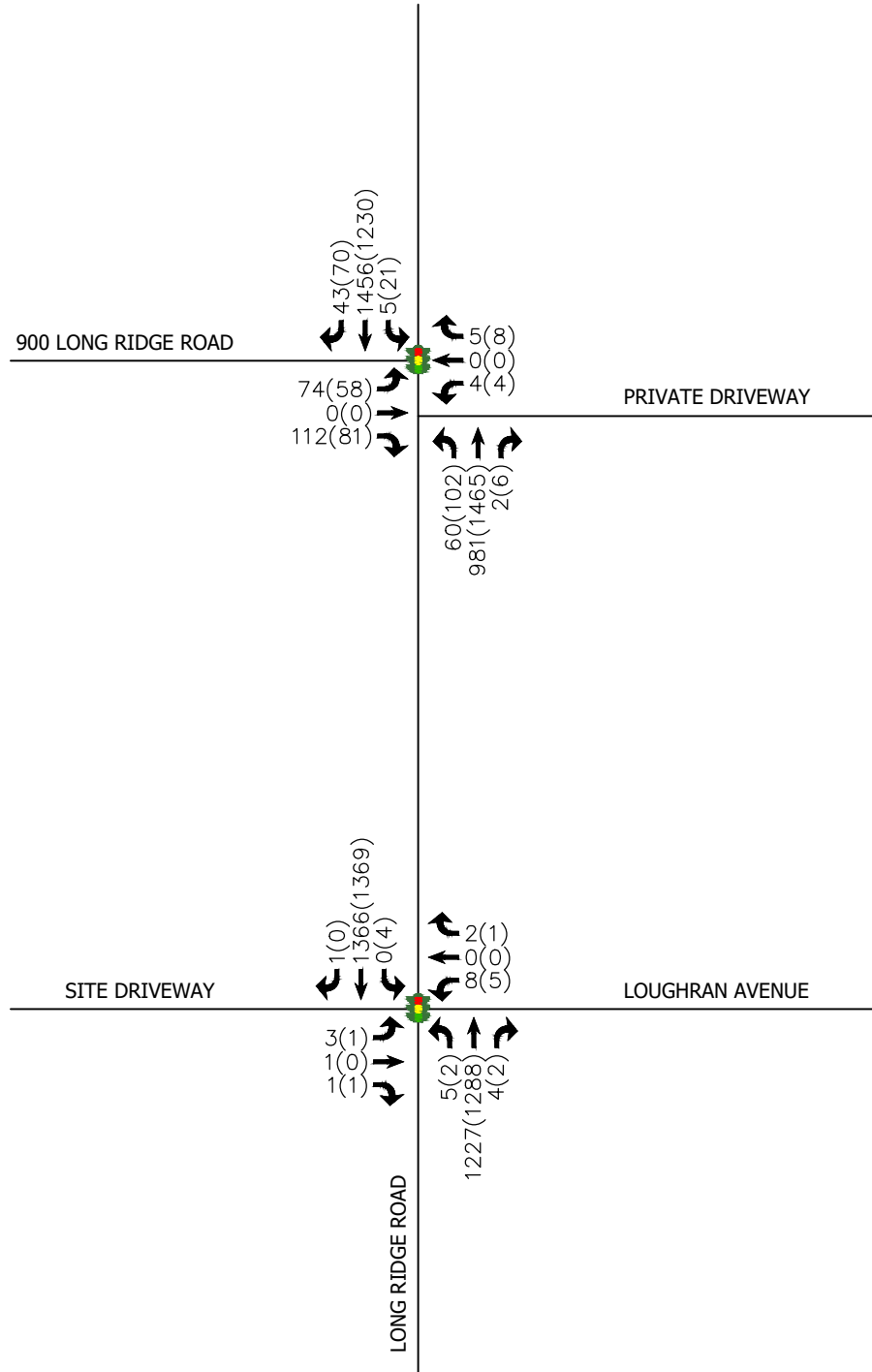
146 HARTFORD ROAD
 MANCHESTER, CONNECTICUT 06040
 860.646.2469
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FIGURE 2: 2023 EXISTING CONDITIONS

PROJ. NO: 20101217.A30

800 LONG RIDGE ROAD STAMFORD, CT

SEPTEMBER 2023



xxx(xxx) = WEEKDAY MORNING PEAK HOUR (WEEKDAY PM PEAK HOUR)



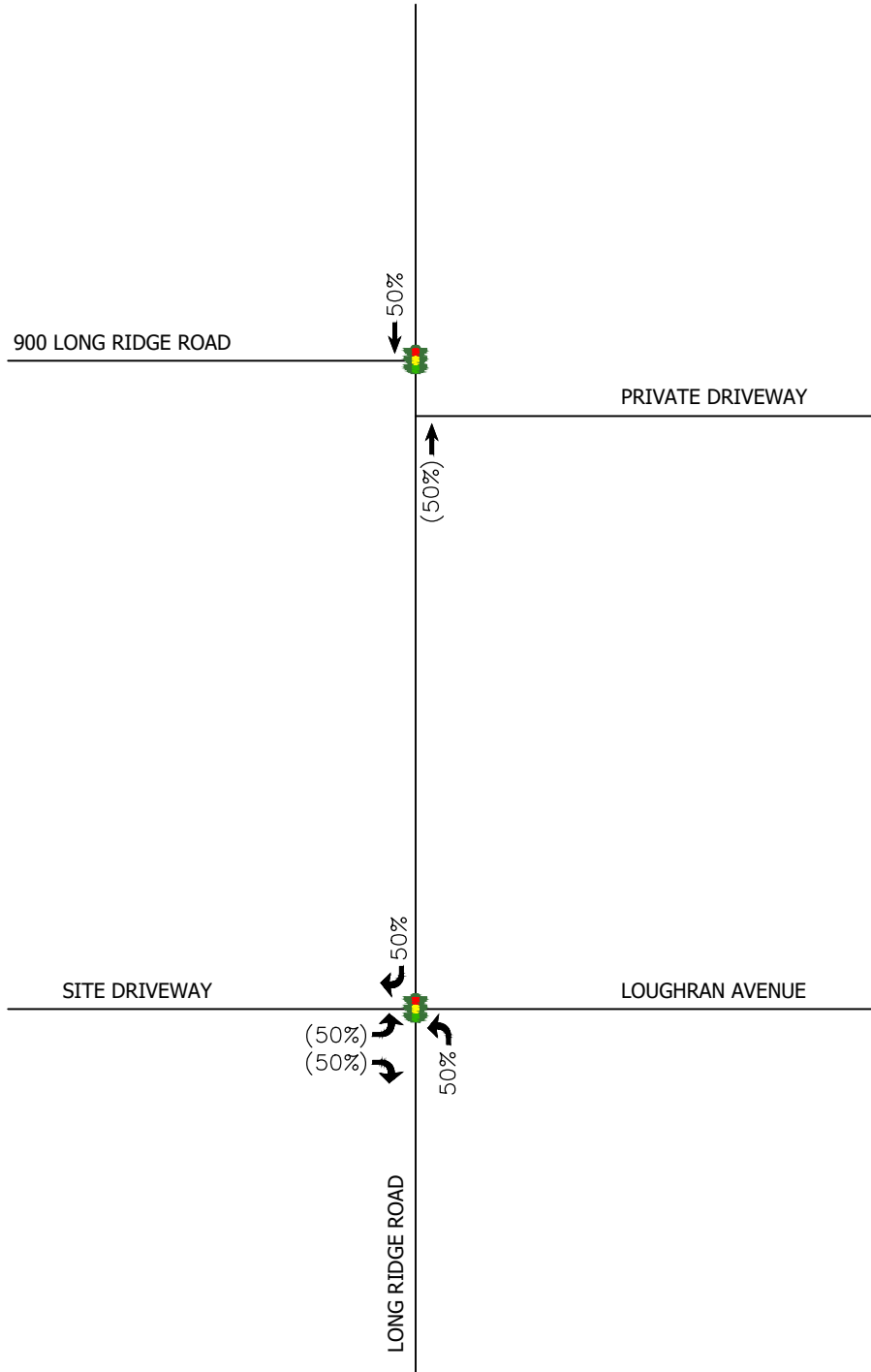
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FIGURE 3: 2025 BACKGROUND CONDITIONS

PROJ. NO: 20101217.A30

800 LONG RIDGE ROAD STAMFORD, CT

SEPTEMBER 2023



xxx(xxx) = ENTERING TRAFFIC (EXITING TRAFFIC)



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FIGURE 4: TRIP DISTRIBUTION

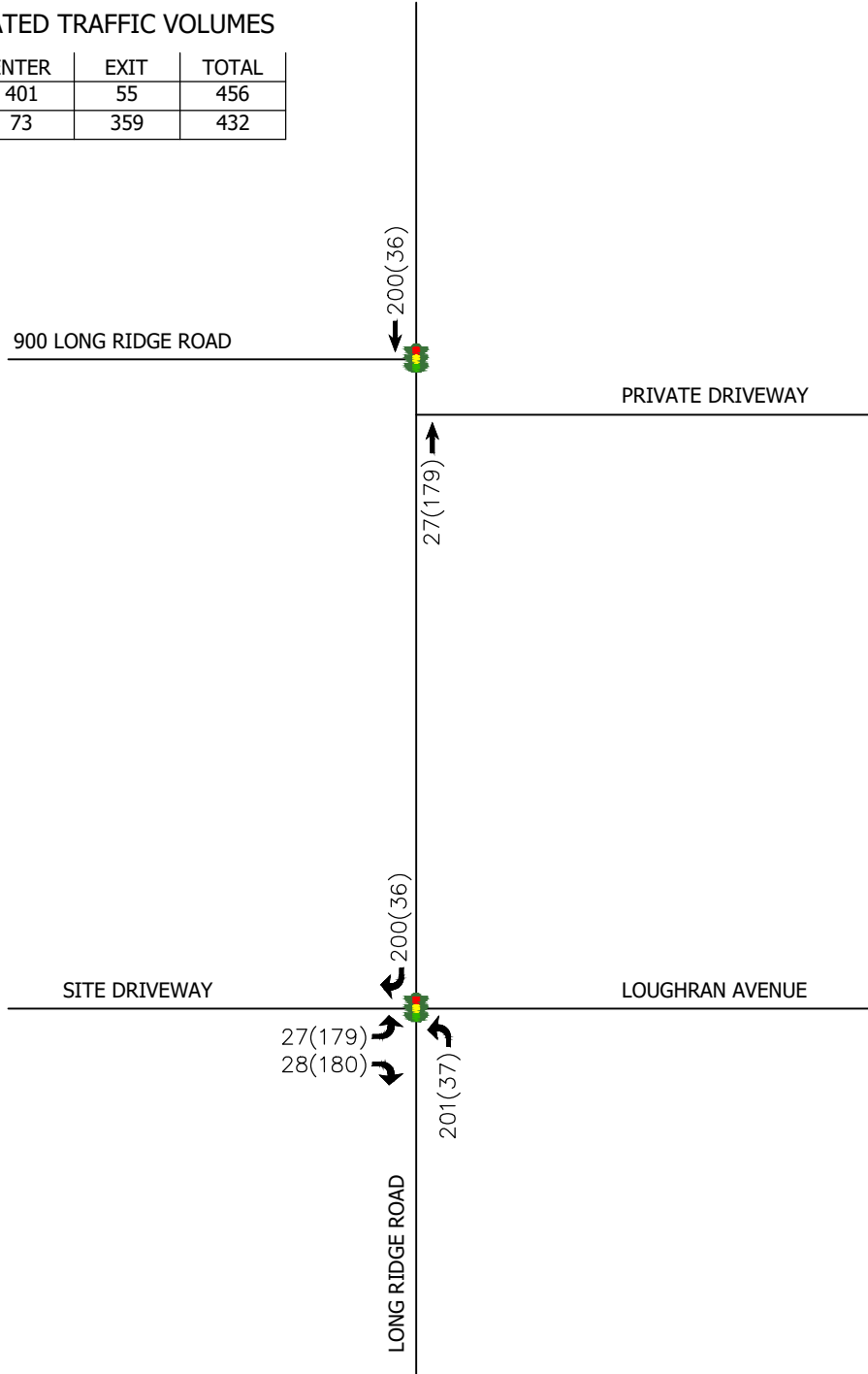
PROJ. NO: 20101217.A30

800 LONG RIDGE ROAD STAMFORD, CT

SEPTEMBER 2023

SITE GENERATED TRAFFIC VOLUMES

	ENTER	EXIT	TOTAL
MORNING	401	55	456
AFTERNOON	73	359	432



xxx(XXX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY PM PEAK HOUR)



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FIGURE 5: TRIP GENERATION - OFFICE LAND USE

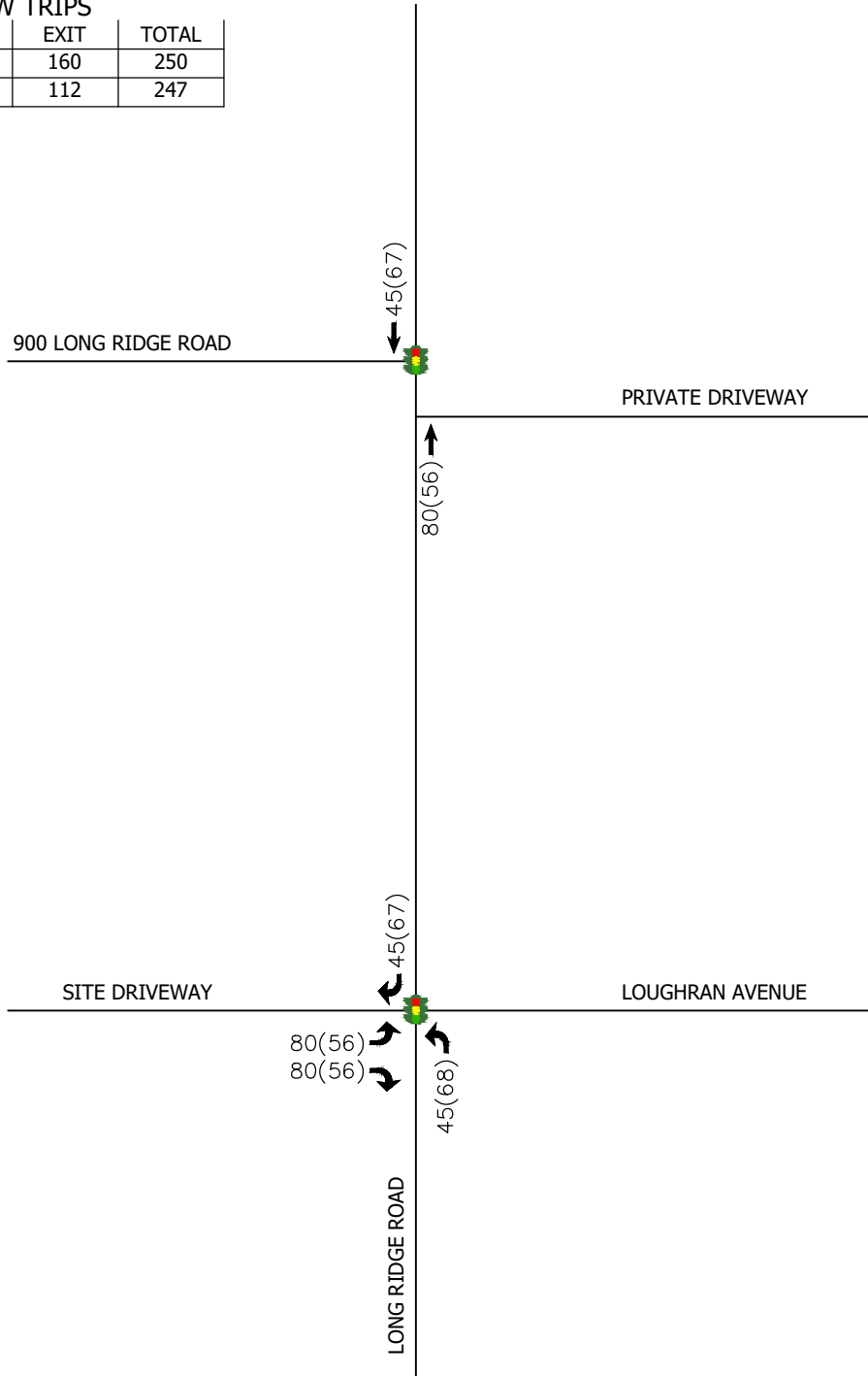
PROJ. NO: 20101217.A30

800 LONG RIDGE ROAD STAMFORD, CT

SEPTEMBER 2023

SITE GENERATED TRAFFIC VOLUMES

NET NEW TRIPS			
	ENTER	EXIT	TOTAL
MORNING	90	160	250
AFTERNOON	135	112	247



xxx(xxx) = WEEKDAY MORNING PEAK HOUR (WEEKDAY PM PEAK HOUR)



FUSS & O'NEILL

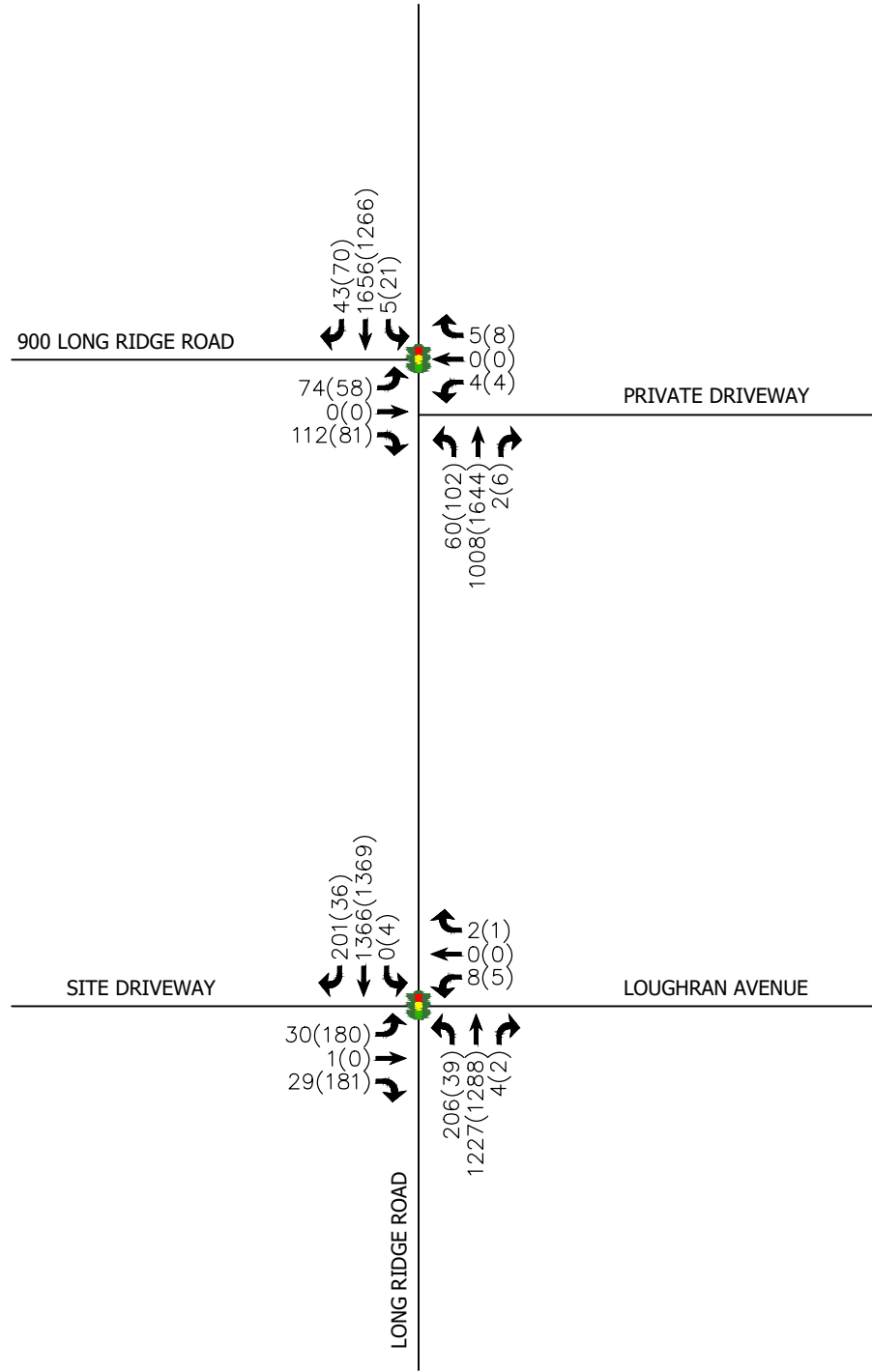
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 MANCHESTER, CONNECTICUT 06040
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FIGURE 6: TRIP GENERATION - RESIDENTIAL LAND USE

PROJ. NO: 20101217.A30

800 LONG RIDGE ROAD STAMFORD, CT

SEPTEMBER 2023



xxx(xxx) = WEEKDAY MORNING PEAK HOUR (WEEKDAY PM PEAK HOUR)



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FIGURE 7: 2025 COMBINED CONDITIONS OFFICE LAND USE

PROJ. NO: 20101217.A30

800 LONG RIDGE ROAD STAMFORD, CT

SEPTEMBER 2023



xxx(xxx) = WEEKDAY MORNING PEAK HOUR (WEEKDAY PM PEAK HOUR)



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FIGURE 8: 2025 COMBINED CONDITIONS RESIDENTIAL LAND USE

PROJ. NO: 20101217.A30

800 LONG RIDGE ROAD STAMFORD, CT





















SEPTEMBER 2023

Appendix C

Intersection Capacity Analysis Worksheets
2025 Background Traffic Volumes
Weekday Morning Peak Hour

Lanes, Volumes, Timings
1: Route 104 & Site Driveway/Loughran Avenue

2025 Background Conditions
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	1	1	8	0	2	5	1227	4	0	1366	1
Future Volume (vph)	3	1	1	8	0	2	5	1227	4	0	1366	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	190		0	155		215
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.925			0.975							0.850
Flt Protected	0.950			0.961		0.950						
Satd. Flow (prot)	1770	1723	0	0	1745	0	1770	3539	0	1863	3539	1583
Flt Permitted							0.126					
Satd. Flow (perm)	1863	1723	0	0	1816	0	235	3539	0	1863	3539	1583
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		1						1				75
Link Speed (mph)		30			30			30				30
Link Distance (ft)		154			229			333				361
Travel Time (s)		3.5			5.2			7.6				8.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	1	1	9	0	2	5	1334	4	0	1485	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	2	0	0	11	0	5	1338	0	0	1485	1
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2			2	
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	27.0	27.0		27.0	27.0		7.5			47.0	47.0	47.0
Total Split (s)	27.0	27.0		27.0	27.0		9.0			64.0	64.0	64.0
Total Split (%)	27.0%	27.0%		27.0%	27.0%		9.0%			64.0%	64.0%	64.0%
Maximum Green (s)	21.1	21.1		21.1	21.1		5.0			57.1	57.1	57.1
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	4.4
All-Red Time (s)	2.6	2.6		2.6	2.6		1.0			2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0			0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9			5.9		4.0			6.9	6.9	6.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		None			C-Min	C-Min	C-Min
Walk Time (s)	20.0	20.0		20.0	20.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	5.3	5.3			5.3		87.3	93.7			70.0	70.0
Actuated g/C Ratio	0.05	0.05			0.05		0.87	0.94			0.70	0.70
v/c Ratio	0.03	0.02			0.11		0.01	0.40			0.60	0.00
Control Delay	45.0	38.5			47.5		1.2	1.4			2.9	0.0
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.2	0.0
Total Delay	45.0	38.5			47.5		1.2	1.4			3.0	0.0

Lanes, Volumes, Timings
1: Route 104 & Site Driveway/Loughran Avenue

2025 Background Conditions
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	D			D		A	A			A	A
Approach Delay		42.4			47.5			1.4			3.0	
Approach LOS		D			D			A			A	
Queue Length 50th (ft)	2	1			7		0	0			33	0
Queue Length 95th (ft)	11	8			25		2	101			56	m0
Internal Link Dist (ft)		74			149			253			281	
Turn Bay Length (ft)							190					215
Base Capacity (vph)	393	364			383		427	3317			2475	1130
Starvation Cap Reductn	0	0			0		0	0			252	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.01	0.01			0.03		0.01	0.40			0.67	0.00

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 3.5 (4%), Referenced to phase 2:NBSB and 6:, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 2.5
 Intersection LOS: A
 Intersection Capacity Utilization 55.7%
 ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Route 104 & Site Driveway/Loughran Avenue



HCM Signalized Intersection Capacity Analysis
1: Route 104 & Site Driveway/Loughran Avenue

2025 Background Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	1	1	8	0	2	5	1227	4	0	1366	1
Future Volume (vph)	3	1	1	8	0	2	5	1227	4	0	1366	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9			5.9		4.0	4.0			6.9	6.9
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95			0.95	1.00
Frt	1.00	0.93			0.98		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1723			1746		1770	3538			3539	1583
Flt Permitted	1.00	1.00			1.00		0.13	1.00			1.00	1.00
Satd. Flow (perm)	1863	1723			1817		235	3538			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	1	1	9	0	2	5	1334	4	0	1485	1
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	3	1	0	0	11	0	5	1338	0	0	1485	1
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	12				2
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	2.3	2.3			2.3		80.9	84.9			66.4	66.4
Effective Green, g (s)	2.3	2.3			2.3		80.9	84.9			66.4	66.4
Actuated g/C Ratio	0.02	0.02			0.02		0.81	0.85			0.66	0.66
Clearance Time (s)	5.9	5.9			5.9		4.0				6.9	6.9
Vehicle Extension (s)	1.5	1.5			1.5		2.0				3.0	3.0
Lane Grp Cap (vph)	42	39			41		412	3003			2349	1051
v/s Ratio Prot		0.00					0.00	c0.38			c0.42	
v/s Ratio Perm	0.00				c0.01		0.01					0.00
v/c Ratio	0.07	0.03			0.27		0.01	0.45			0.63	0.00
Uniform Delay, d1	47.8	47.8			48.0		3.6	1.8			9.7	5.6
Progression Factor	1.00	1.00			1.00		1.00	1.00			0.21	1.00
Incremental Delay, d2	0.3	0.1			1.3		0.0	0.0			0.9	0.0
Delay (s)	48.1	47.9			49.3		3.6	1.9			2.9	5.6
Level of Service	D	D			D		A	A			A	A
Approach Delay (s)		48.0			49.3			1.9			2.9	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	2.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Background Conditions
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	0	112	4	0	5	60	981	2	5	1456	43
Future Volume (vph)	74	0	112	4	0	5	60	981	2	5	1456	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	90		0	0		380
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00
Frt		0.859			0.925							0.850
Flt Protected	0.950	0.997			0.978		0.950					
Satd. Flow (prot)	1681	1516	0	0	1685	0	1770	3539	0	0	3539	1583
Flt Permitted	0.752	0.983			0.869		0.095				0.952	
Satd. Flow (perm)	1331	1494	0	0	1497	0	177	3539	0	0	3369	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		122			92							56
Link Speed (mph)		30			30			30				30
Link Distance (ft)		266			226			361				648
Travel Time (s)		6.0			5.1			8.2				14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	0	122	4	0	5	65	1066	2	5	1583	47
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	72	130	0	0	9	0	65	1068	0	0	1588	47
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2				2
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	22.0	22.0		22.0	22.0		9.5			25.4	25.4	25.4
Total Split (s)	22.0	22.0		22.0	22.0		11.0			67.0	67.0	67.0
Total Split (%)	22.0%	22.0%		22.0%	22.0%		11.0%			67.0%	67.0%	67.0%
Maximum Green (s)	17.9	17.9		17.9	17.9		7.0			59.6	59.6	59.6
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0			4.4	4.4	4.4
All-Red Time (s)	1.1	1.1		1.1	1.1		1.0			3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0				0.0	0.0
Total Lost Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		Min			C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0		16.0	16.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	9.4	9.4			9.4		78.5	82.5			62.4	62.4
Actuated g/C Ratio	0.09	0.09			0.09		0.78	0.82			0.62	0.62
v/c Ratio	0.58	0.52			0.04		0.19	0.37			0.76	0.05
Control Delay	60.5	16.6			0.4		4.0	2.1			17.1	2.1
Queue Delay	0.0	0.0			0.0		0.0	0.1			0.0	0.0
Total Delay	60.5	16.6			0.4		4.0	2.3			17.1	2.1

Lanes, Volumes, Timings
 2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Background Conditions
 AM Peak Hour

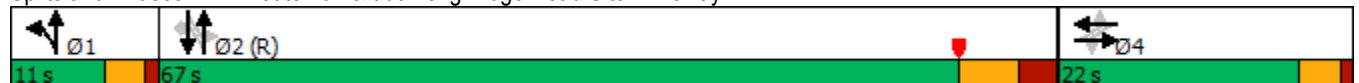
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	B			A		A	A			B	A
Approach Delay		32.3			0.4			2.4			16.6	
Approach LOS		C			A			A			B	
Queue Length 50th (ft)	47	5			0		5	63			377	0
Queue Length 95th (ft)	91	61			0		10	51			477	12
Internal Link Dist (ft)		186			146			281			568	
Turn Bay Length (ft)							90					380
Base Capacity (vph)	238	367			343		341	2919			2101	1008
Starvation Cap Reductn	0	0			0		0	738			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.30	0.35			0.03		0.19	0.49			0.76	0.05

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Yellow, Master Intersection
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 12.2
 Intersection Capacity Utilization 63.3%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 2: Route 104 & 900 Long Ridge Road Site Driveway



HCM Signalized Intersection Capacity Analysis
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Background Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	0	112	4	0	5	60	981	2	5	1456	43
Future Volume (vph)	74	0	112	4	0	5	60	981	2	5	1456	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1			4.1		4.0	4.0			7.4	7.4
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95			0.95	1.00
Frt	1.00	0.86			0.93		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1681	1516			1686		1770	3538			3539	1583
Flt Permitted	0.75	0.98			0.87		0.09	1.00			0.95	1.00
Satd. Flow (perm)	1330	1495			1497		176	3538			3368	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	0	122	4	0	5	65	1066	2	5	1583	47
RTOR Reduction (vph)	0	111	0	0	8	0	0	0	0	0	0	18
Lane Group Flow (vph)	72	19	0	0	1	0	65	1068	0	0	1588	29
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	12				2
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	9.4	9.4			9.4		75.1	79.1			62.4	62.4
Effective Green, g (s)	9.4	9.4			9.4		75.1	79.1			62.4	62.4
Actuated g/C Ratio	0.09	0.09			0.09		0.75	0.79			0.62	0.62
Clearance Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Vehicle Extension (s)	1.5	1.5			1.5		2.0				3.0	3.0
Lane Grp Cap (vph)	125	140			140		334	2798			2101	987
v/s Ratio Prot							0.02	c0.30				
v/s Ratio Perm	c0.05	0.01			0.00		0.12				c0.47	0.02
v/c Ratio	0.58	0.14			0.01		0.19	0.38			0.76	0.03
Uniform Delay, d1	43.4	41.6			41.1		7.3	3.1			13.4	7.2
Progression Factor	1.00	1.00			1.00		1.25	0.73			1.00	1.00
Incremental Delay, d2	3.9	0.2			0.0		0.1	0.0			2.6	0.1
Delay (s)	47.3	41.8			41.1		9.2	2.3			16.0	7.3
Level of Service	D	D			D		A	A			B	A
Approach Delay (s)		43.7			41.1			2.7			15.7	
Approach LOS		D			D			A			B	

Intersection Summary		
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.69	B
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	63.3%	15.5
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

Lanes, Volumes, Timings
1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Office
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1	29	8	0	2	206	1227	4	0	1366	201
Future Volume (vph)	30	1	29	8	0	2	206	1227	4	0	1366	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	190		0	155		215
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.855			0.975							0.850
Flt Protected	0.950				0.961		0.950					
Satd. Flow (prot)	1770	1593	0	0	1745	0	1770	3539	0	1863	3539	1583
Flt Permitted	0.750				0.742		0.099					
Satd. Flow (perm)	1397	1593	0	0	1348	0	184	3539	0	1863	3539	1583
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		32						1				218
Link Speed (mph)		30			30			30				30
Link Distance (ft)		154			229			333				361
Travel Time (s)		3.5			5.2			7.6				8.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	1	32	9	0	2	224	1334	4	0	1485	218
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	33	0	0	11	0	224	1338	0	0	1485	218
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2				2
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	27.0	27.0		27.0	27.0		7.5			47.0	47.0	47.0
Total Split (s)	27.0	27.0		27.0	27.0		9.0			64.0	64.0	64.0
Total Split (%)	27.0%	27.0%		27.0%	27.0%		9.0%			64.0%	64.0%	64.0%
Maximum Green (s)	21.1	21.1		21.1	21.1		5.0			57.1	57.1	57.1
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	4.4
All-Red Time (s)	2.6	2.6		2.6	2.6		1.0			2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0			0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9			5.9		4.0			6.9	6.9	6.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		None			C-Min	C-Min	C-Min
Walk Time (s)	20.0	20.0		20.0	20.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	6.7	6.7			6.7		81.6	86.4			59.1	59.1
Actuated g/C Ratio	0.07	0.07			0.07		0.82	0.86			0.59	0.59
v/c Ratio	0.35	0.24			0.12		0.49	0.44			0.71	0.21
Control Delay	54.5	19.9			45.7		16.5	2.6			4.3	0.3
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.8	0.0
Total Delay	54.5	19.9			45.7		16.5	2.6			5.1	0.3

Lanes, Volumes, Timings
 1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Office
 AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	B			D		B	A			A	A
Approach Delay		37.2			45.7			4.6			4.5	
Approach LOS		D			D			A			A	
Queue Length 50th (ft)	21	1			7		44	80			39	0
Queue Length 95th (ft)	51	30			24		127	131			72	m0
Internal Link Dist (ft)		74			149			253			281	
Turn Bay Length (ft)							190					215
Base Capacity (vph)	294	361			284		461	3058			2090	1024
Starvation Cap Reductn	0	0			0		0	0			297	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.11	0.09			0.04		0.49	0.44			0.83	0.21

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 3.5 (4%), Referenced to phase 2:NBSB and 6:, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 5.3
 Intersection LOS: A
 Intersection Capacity Utilization 70.4%
 ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Route 104 & Site Driveway/Loughran Avenue



HCM Signalized Intersection Capacity Analysis
1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Office
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1	29	8	0	2	206	1227	4	0	1366	201
Future Volume (vph)	30	1	29	8	0	2	206	1227	4	0	1366	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9			5.9		4.0	4.0			6.9	6.9
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95			0.95	1.00
Frt	1.00	0.85			0.98		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1592			1746		1770	3538			3539	1583
Flt Permitted	0.75	1.00			0.74		0.10	1.00			1.00	1.00
Satd. Flow (perm)	1398	1592			1348		184	3538			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	1	32	9	0	2	224	1334	4	0	1485	218
RTOR Reduction (vph)	0	30	0	0	0	0	0	0	0	0	0	92
Lane Group Flow (vph)	33	3	0	0	11	0	224	1338	0	0	1485	126
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	12				2
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	5.7	5.7			5.7		77.5	81.5			57.9	57.9
Effective Green, g (s)	5.7	5.7			5.7		77.5	81.5			57.9	57.9
Actuated g/C Ratio	0.06	0.06			0.06		0.78	0.82			0.58	0.58
Clearance Time (s)	5.9	5.9			5.9		4.0				6.9	6.9
Vehicle Extension (s)	1.5	1.5			1.5		2.0				3.0	3.0
Lane Grp Cap (vph)	79	90			76		453	2883			2049	916
v/s Ratio Prot		0.00					0.10	c0.38			c0.42	
v/s Ratio Perm	c0.02				0.01		0.29					0.08
v/c Ratio	0.42	0.03			0.14		0.49	0.46			0.72	0.14
Uniform Delay, d1	45.5	44.5			44.8		14.7	2.8			15.3	9.6
Progression Factor	1.00	1.00			1.00		1.00	1.00			0.21	0.06
Incremental Delay, d2	1.3	0.1			0.3		0.3	0.0			1.2	0.2
Delay (s)	46.8	44.6			45.2		15.0	2.8			4.5	0.7
Level of Service	D	D			D		B	A			A	A
Approach Delay (s)		45.7			45.2			4.5			4.0	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Combined Conditions - Office
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	0	112	4	0	5	60	1008	2	5	1656	43
Future Volume (vph)	74	0	112	4	0	5	60	1008	2	5	1656	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	90		0	0		380
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00
Frt		0.859			0.925							0.850
Flt Protected	0.950	0.997			0.978		0.950					
Satd. Flow (prot)	1681	1516	0	0	1685	0	1770	3539	0	0	3539	1583
Flt Permitted	0.752	0.983			0.869		0.064				0.952	
Satd. Flow (perm)	1331	1494	0	0	1497	0	119	3539	0	0	3369	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		122			92							56
Link Speed (mph)		30			30			30				30
Link Distance (ft)		266			226			361				648
Travel Time (s)		6.0			5.1			8.2				14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	0	122	4	0	5	65	1096	2	5	1800	47
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	72	130	0	0	9	0	65	1098	0	0	1805	47
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2				2
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	22.0	22.0		22.0	22.0		9.5			25.4	25.4	25.4
Total Split (s)	22.0	22.0		22.0	22.0		11.0			67.0	67.0	67.0
Total Split (%)	22.0%	22.0%		22.0%	22.0%		11.0%			67.0%	67.0%	67.0%
Maximum Green (s)	17.9	17.9		17.9	17.9		7.0			59.6	59.6	59.6
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0			4.4	4.4	4.4
All-Red Time (s)	1.1	1.1		1.1	1.1		1.0			3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0				0.0	0.0
Total Lost Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		Min			C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0		16.0	16.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	9.4	9.4			9.4		78.5	82.5			62.3	62.3
Actuated g/C Ratio	0.09	0.09			0.09		0.78	0.82			0.62	0.62
v/c Ratio	0.58	0.52			0.04		0.21	0.38			0.86	0.05
Control Delay	60.5	16.6			0.4		11.4	2.0			21.7	2.1
Queue Delay	0.0	0.0			0.0		0.0	0.1			0.0	0.0
Total Delay	60.5	16.6			0.4		11.4	2.1			21.7	2.1

Lanes, Volumes, Timings
 2: Route 104 & 900 Long Ridge Road Site Driveway

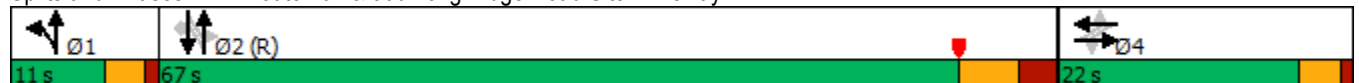
2025 Combined Conditions - Office
 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	B			A		B	A			C	A
Approach Delay		32.3			0.4			2.6			21.2	
Approach LOS		C			A			A			C	
Queue Length 50th (ft)	47	5			0		5	44			490	0
Queue Length 95th (ft)	91	61			0		33	62			621	12
Internal Link Dist (ft)		186			146			281			568	
Turn Bay Length (ft)							90					380
Base Capacity (vph)	238	367			343		304	2919			2098	1007
Starvation Cap Reductn	0	0			0		0	549			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.30	0.35			0.03		0.21	0.46			0.86	0.05

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Yellow, Master Intersection
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 15.1
 Intersection Capacity Utilization 65.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 2: Route 104 & 900 Long Ridge Road Site Driveway



HCM Signalized Intersection Capacity Analysis
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Combined Conditions - Office
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	0	112	4	0	5	60	1008	2	5	1656	43
Future Volume (vph)	74	0	112	4	0	5	60	1008	2	5	1656	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1			4.1		4.0	4.0			7.4	7.4
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95			0.95	1.00
Frt	1.00	0.86			0.93		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1681	1516			1686		1770	3538			3539	1583
Flt Permitted	0.75	0.98			0.87		0.06	1.00			0.95	1.00
Satd. Flow (perm)	1330	1495			1497		120	3538			3369	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	0	122	4	0	5	65	1096	2	5	1800	47
RTOR Reduction (vph)	0	111	0	0	8	0	0	0	0	0	0	18
Lane Group Flow (vph)	72	19	0	0	1	0	65	1098	0	0	1805	29
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	12				2
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	9.4	9.4			9.4		75.1	79.1			62.3	62.3
Effective Green, g (s)	9.4	9.4			9.4		75.1	79.1			62.3	62.3
Actuated g/C Ratio	0.09	0.09			0.09		0.75	0.79			0.62	0.62
Clearance Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Vehicle Extension (s)	1.5	1.5			1.5		2.0				3.0	3.0
Lane Grp Cap (vph)	125	140			140		301	2798			2098	986
v/s Ratio Prot							0.03	c0.31				
v/s Ratio Perm	c0.05	0.01			0.00		0.13				c0.54	0.02
v/c Ratio	0.58	0.14			0.01		0.22	0.39			0.86	0.03
Uniform Delay, d1	43.4	41.6			41.1		11.2	3.2			15.3	7.2
Progression Factor	1.00	1.00			1.00		2.24	0.67			1.00	1.00
Incremental Delay, d2	3.9	0.2			0.0		0.1	0.0			4.9	0.1
Delay (s)	47.3	41.8			41.1		25.1	2.2			20.2	7.3
Level of Service	D	D			D		C	A			C	A
Approach Delay (s)		43.7			41.1			3.5			19.9	
Approach LOS		D			D			A			B	






















Intersection Summary

HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Residential
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	1	81	8	0	2	50	1227	4	0	1366	46
Future Volume (vph)	83	1	81	8	0	2	50	1227	4	0	1366	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	190		0	155		215
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.852			0.975							0.850
Flt Protected	0.950				0.961		0.950					
Satd. Flow (prot)	1770	1587	0	0	1745	0	1770	3539	0	1863	3539	1583
Flt Permitted	0.750				0.742		0.101					
Satd. Flow (perm)	1397	1587	0	0	1348	0	188	3539	0	1863	3539	1583
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		88						1				75
Link Speed (mph)		30			30			30				30
Link Distance (ft)		154			229			333				361
Travel Time (s)		3.5			5.2			7.6				8.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	1	88	9	0	2	54	1334	4	0	1485	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	89	0	0	11	0	54	1338	0	0	1485	50
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2				2
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	27.0	27.0		27.0	27.0		7.5			47.0	47.0	47.0
Total Split (s)	27.0	27.0		27.0	27.0		9.0			64.0	64.0	64.0
Total Split (%)	27.0%	27.0%		27.0%	27.0%		9.0%			64.0%	64.0%	64.0%
Maximum Green (s)	21.1	21.1		21.1	21.1		5.0			57.1	57.1	57.1
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	4.4
All-Red Time (s)	2.6	2.6		2.6	2.6		1.0			2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0			0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9			5.9		4.0			6.9	6.9	6.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		None			C-Min	C-Min	C-Min
Walk Time (s)	20.0	20.0		20.0	20.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	10.3	10.3			10.3		75.8	79.8			58.5	58.5
Actuated g/C Ratio	0.10	0.10			0.10		0.76	0.80			0.58	0.58
v/c Ratio	0.62	0.37			0.08		0.15	0.47			0.72	0.05
Control Delay	60.8	13.3			39.1		3.7	4.3			4.6	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.5	0.0
Total Delay	60.8	13.3			39.1		3.7	4.3			5.0	0.1

Lanes, Volumes, Timings
 1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Residential
 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	B			D		A	A			A	A
Approach Delay		37.2			39.1			4.3			4.9	
Approach LOS		D			D			A			A	
Queue Length 50th (ft)	56	1			6		6	111			40	0
Queue Length 95th (ft)	103	44			22		16	191			58	m0
Internal Link Dist (ft)		74			149			253			281	
Turn Bay Length (ft)							190					215
Base Capacity (vph)	294	404			284		369	2822			2070	957
Starvation Cap Reductn	0	0			0		0	0			212	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.31	0.22			0.04		0.15	0.47			0.80	0.05

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 3.5 (4%), Referenced to phase 2:NBSB and 6:, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 6.6
 Intersection LOS: A
 Intersection Capacity Utilization 57.0%
 ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Route 104 & Site Driveway/Loughran Avenue



HCM Signalized Intersection Capacity Analysis
 1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Residential
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	1	81	8	0	2	50	1227	4	0	1366	46
Future Volume (vph)	83	1	81	8	0	2	50	1227	4	0	1366	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9			5.9		4.0	4.0			6.9	6.9
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95			0.95	1.00
Frt	1.00	0.85			0.98		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1586			1746		1770	3538			3539	1583
Flt Permitted	0.75	1.00			0.74		0.10	1.00			1.00	1.00
Satd. Flow (perm)	1398	1586			1348		188	3538			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	1	88	9	0	2	54	1334	4	0	1485	50
RTOR Reduction (vph)	0	79	0	0	0	0	0	0	0	0	0	21
Lane Group Flow (vph)	90	10	0	0	11	0	54	1338	0	0	1485	29
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	12				2
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	10.3	10.3			10.3		72.9	76.9			58.5	58.5
Effective Green, g (s)	10.3	10.3			10.3		72.9	76.9			58.5	58.5
Actuated g/C Ratio	0.10	0.10			0.10		0.73	0.77			0.58	0.58
Clearance Time (s)	5.9	5.9			5.9		4.0				6.9	6.9
Vehicle Extension (s)	1.5	1.5			1.5		2.0				3.0	3.0
Lane Grp Cap (vph)	143	163			138		364	2720			2070	926
v/s Ratio Prot		0.01					0.02	c0.38			c0.42	
v/s Ratio Perm	c0.06				0.01		0.09					0.02
v/c Ratio	0.63	0.06			0.08		0.15	0.49			0.72	0.03
Uniform Delay, d1	43.0	40.5			40.6		7.5	4.3			14.8	8.8
Progression Factor	1.00	1.00			1.00		1.00	1.00			0.20	0.03
Incremental Delay, d2	6.1	0.1			0.1		0.1	0.1			1.4	0.0
Delay (s)	49.1	40.5			40.7		7.6	4.3			4.4	0.3
Level of Service	D	D			D		A	A			A	A
Approach Delay (s)		44.9			40.7			4.5			4.3	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Combined Conditions - Residential
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	0	112	4	0	5	60	1061	2	5	1501	43
Future Volume (vph)	74	0	112	4	0	5	60	1061	2	5	1501	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	90		0	0		380
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00
Frt		0.859			0.925							0.850
Flt Protected	0.950	0.997			0.978		0.950					
Satd. Flow (prot)	1681	1516	0	0	1685	0	1770	3539	0	0	3539	1583
Flt Permitted	0.752	0.983			0.869		0.084				0.951	
Satd. Flow (perm)	1331	1494	0	0	1497	0	156	3539	0	0	3366	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		122			92							56
Link Speed (mph)		30			30			30				30
Link Distance (ft)		266			226			361				648
Travel Time (s)		6.0			5.1			8.2				14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	0	122	4	0	5	65	1153	2	5	1632	47
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	72	130	0	0	9	0	65	1155	0	0	1637	47
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2				2
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	22.0	22.0		22.0	22.0		9.5			25.4	25.4	25.4
Total Split (s)	22.0	22.0		22.0	22.0		11.0			67.0	67.0	67.0
Total Split (%)	22.0%	22.0%		22.0%	22.0%		11.0%			67.0%	67.0%	67.0%
Maximum Green (s)	17.9	17.9		17.9	17.9		7.0			59.6	59.6	59.6
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0			4.4	4.4	4.4
All-Red Time (s)	1.1	1.1		1.1	1.1		1.0			3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0				0.0	0.0
Total Lost Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		Min			C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0		16.0	16.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	9.4	9.4			9.4		78.5	82.5			62.1	62.1
Actuated g/C Ratio	0.09	0.09			0.09		0.78	0.82			0.62	0.62
v/c Ratio	0.58	0.52			0.04		0.20	0.40			0.78	0.05
Control Delay	60.5	16.6			0.4		7.2	2.1			18.1	2.1
Queue Delay	0.0	0.0			0.0		0.0	0.1			0.0	0.0
Total Delay	60.5	16.6			0.4		7.2	2.2			18.1	2.1

Lanes, Volumes, Timings
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Combined Conditions - Residential
AM Peak Hour

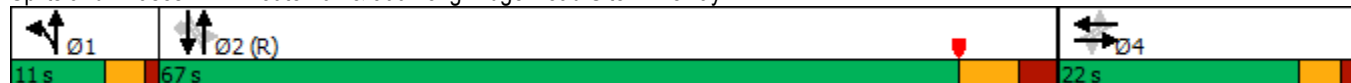


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	B			A		A	A			B	A
Approach Delay		32.3			0.4			2.4			17.6	
Approach LOS		C			A			A			B	
Queue Length 50th (ft)	47	5			0		5	44			401	0
Queue Length 95th (ft)	91	61			0		18	68			505	12
Internal Link Dist (ft)		186			146			281			568	
Turn Bay Length (ft)							90					380
Base Capacity (vph)	238	367			343		331	2919			2091	1005
Starvation Cap Reductn	0	0			0		0	450			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.30	0.35			0.03		0.20	0.47			0.78	0.05

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2:NBSB and 6:, Start of Yellow, Master Intersection
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	12.6
Intersection LOS:	B
Intersection Capacity Utilization	63.3%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 2: Route 104 & 900 Long Ridge Road Site Driveway



HCM Signalized Intersection Capacity Analysis
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Combined Conditions - Residential
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	0	112	4	0	5	60	1061	2	5	1501	43
Future Volume (vph)	74	0	112	4	0	5	60	1061	2	5	1501	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1			4.1		4.0	4.0			7.4	7.4
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95			0.95	1.00
Frt	1.00	0.86			0.93		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1681	1516			1686		1770	3538			3539	1583
Flt Permitted	0.75	0.98			0.87		0.08	1.00			0.95	1.00
Satd. Flow (perm)	1330	1495			1497		157	3538			3367	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	0	122	4	0	5	65	1153	2	5	1632	47
RTOR Reduction (vph)	0	111	0	0	8	0	0	0	0	0	0	18
Lane Group Flow (vph)	72	19	0	0	1	0	65	1155	0	0	1637	29
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	12				2
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	9.4	9.4			9.4		75.1	79.1			62.1	62.1
Effective Green, g (s)	9.4	9.4			9.4		75.1	79.1			62.1	62.1
Actuated g/C Ratio	0.09	0.09			0.09		0.75	0.79			0.62	0.62
Clearance Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Vehicle Extension (s)	1.5	1.5			1.5		2.0				3.0	3.0
Lane Grp Cap (vph)	125	140			140		327	2798			2090	983
v/s Ratio Prot							0.03	c0.33				
v/s Ratio Perm	c0.05	0.01			0.00		0.12				c0.49	0.02
v/c Ratio	0.58	0.14			0.01		0.20	0.41			0.78	0.03
Uniform Delay, d1	43.4	41.6			41.1		8.1	3.2			14.0	7.3
Progression Factor	1.00	1.00			1.00		2.58	0.67			1.00	1.00
Incremental Delay, d2	3.9	0.2			0.0		0.1	0.0			3.0	0.1
Delay (s)	47.3	41.8			41.1		21.0	2.2			17.0	7.4
Level of Service	D	D			D		C	A			B	A
Approach Delay (s)		43.7			41.1			3.2			16.7	
Approach LOS		D			D			A			B	

Intersection Summary		
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.71	B
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	63.3%	15.5
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

Appendix D

Intersection Capacity Analysis Worksheets
2025 Office Land Use Combined Traffic Volumes
Weekday Afternoon Peak Hour

Lanes, Volumes, Timings
1: Route 104 & Site Driveway/Loughran Avenue

2025 Background Conditions
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	1	5	0	1	2	1288	2	4	1369	0
Future Volume (vph)	1	0	1	5	0	1	2	1288	2	4	1369	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	190		0	155		215
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.850			0.977							
Flt Protected	0.950				0.960		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1747	0	1770	3539	0	1770	3539	1863
Flt Permitted							0.131			0.191		
Satd. Flow (perm)	1863	1583	0	0	1820	0	244	3539	0	356	3539	1863
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		117										
Link Speed (mph)		30			30			30				30
Link Distance (ft)		154			229			333				361
Travel Time (s)		3.5			5.2			7.6				8.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	0	1	5	0	1	2	1400	2	4	1488	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1	0	0	6	0	2	1402	0	4	1488	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2				2
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	27.0	27.0		27.0	27.0		7.5			47.0	47.0	47.0
Total Split (s)	27.0	27.0		27.0	27.0		9.0			64.0	64.0	64.0
Total Split (%)	27.0%	27.0%		27.0%	27.0%		9.0%			64.0%	64.0%	64.0%
Maximum Green (s)	21.1	21.1		21.1	21.1		5.0			57.1	57.1	57.1
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	4.4
All-Red Time (s)	2.6	2.6		2.6	2.6		1.0			2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0			0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9			5.9		4.0			6.9	6.9	6.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		None			C-Min	C-Min	C-Min
Walk Time (s)	20.0	20.0		20.0	20.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	5.1	5.1			5.1		89.7	96.9		73.0	73.0	
Actuated g/C Ratio	0.05	0.05			0.05		0.90	0.97		0.73	0.73	
v/c Ratio	0.01	0.01			0.06		0.00	0.41		0.02	0.58	
Control Delay	45.0	0.0			46.7		1.0	0.9		4.2	3.9	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.1	
Total Delay	45.0	0.0			46.7		1.0	0.9		4.2	4.0	

Lanes, Volumes, Timings
1: Route 104 & Site Driveway/Loughran Avenue

2025 Background Conditions
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	A			D		A	A		A	A	
Approach Delay		22.5			46.7			0.9			4.0	
Approach LOS		C			D			A			A	
Queue Length 50th (ft)	1	0			4		0	0		0	65	
Queue Length 95th (ft)	6	0			17		1	100		m1	98	
Internal Link Dist (ft)		74			149			253			281	
Turn Bay Length (ft)							190			155		
Base Capacity (vph)	393	426			384		430	3430		259	2582	
Starvation Cap Reductn	0	0			0		0	0		0	241	
Spillback Cap Reductn	0	0			0		0	11		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.00	0.00			0.02		0.00	0.41		0.02	0.64	

Intersection Summary





















Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 97.5 (98%), Referenced to phase 2:NBSB and 6:, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 2.6
 Intersection LOS: A
 Intersection Capacity Utilization 53.0%
 ICU Level of Service A
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Route 104 & Site Driveway/Loughran Avenue



HCM Signalized Intersection Capacity Analysis
 1: Route 104 & Site Driveway/Loughran Avenue

2025 Background Conditions
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	1	5	0	1	2	1288	2	4	1369	0
Future Volume (vph)	1	0	1	5	0	1	2	1288	2	4	1369	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9			5.9		4.0	4.0		6.9	6.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.98		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1748		1770	3538		1770	3539	
Flt Permitted	1.00	1.00			1.00		0.13	1.00		0.19	1.00	
Satd. Flow (perm)	1863	1583			1821		243	3538		357	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	0	1	5	0	1	2	1400	2	4	1488	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	0	0	6	0	2	1402	0	4	1488	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	12			2	
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	1.1	1.1			1.1		82.1	86.1		68.3	68.3	
Effective Green, g (s)	1.1	1.1			1.1		82.1	86.1		68.3	68.3	
Actuated g/C Ratio	0.01	0.01			0.01		0.82	0.86		0.68	0.68	
Clearance Time (s)	5.9	5.9			5.9		4.0			6.9	6.9	
Vehicle Extension (s)	1.5	1.5			1.5		2.0			3.0	3.0	
Lane Grp Cap (vph)	20	17			20		410	3046		243	2417	
v/s Ratio Prot		0.00					0.00	c0.40			c0.42	
v/s Ratio Perm	0.00				c0.00		0.00			0.01		
v/c Ratio	0.05	0.00			0.30		0.00	0.46		0.02	0.62	
Uniform Delay, d1	48.9	48.9			49.1		3.1	1.6		5.1	8.7	
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.58	0.39	
Incremental Delay, d2	0.4	0.0			3.1		0.0	0.0		0.1	0.9	
Delay (s)	49.3	48.9			52.1		3.1	1.6		3.1	4.3	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		49.1			52.1			1.6			4.3	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			3.2	HCM 2000 Level of Service				A				
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			100.0	Sum of lost time (s)				16.8				
Intersection Capacity Utilization			53.0%	ICU Level of Service				A				
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Background Conditions
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	0	81	4	0	8	102	1465	6	21	1230	70
Future Volume (vph)	58	0	81	4	0	8	102	1465	6	21	1230	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	90		0	0		380
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00
Frt		0.860			0.907			0.999				0.850
Flt Protected	0.950	0.997			0.985		0.950				0.999	
Satd. Flow (prot)	1681	1517	0	0	1664	0	1770	3536	0	0	3536	1583
Flt Permitted	0.749	0.980			0.896		0.147				0.889	
Satd. Flow (perm)	1325	1491	0	0	1514	0	274	3536	0	0	3146	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92			92			1				75
Link Speed (mph)		30			30			30				30
Link Distance (ft)		266			226			361				648
Travel Time (s)		6.0			5.1			8.2				14.7
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
Adj. Flow (vph)	62	0	87	4	0	9	110	1575	6	23	1323	75
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	56	93	0	0	13	0	110	1581	0	0	1346	75
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2			2	
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	22.0	22.0		22.0	22.0		9.5			25.4	25.4	25.4
Total Split (s)	22.0	22.0		22.0	22.0		11.0			67.0	67.0	67.0
Total Split (%)	22.0%	22.0%		22.0%	22.0%		11.0%			67.0%	67.0%	67.0%
Maximum Green (s)	17.9	17.9		17.9	17.9		7.0			59.6	59.6	59.6
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0			4.4	4.4	4.4
All-Red Time (s)	1.1	1.1		1.1	1.1		1.0			3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0				0.0	0.0
Total Lost Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		Min			C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0		16.0	16.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	8.4	8.4			8.4		81.4	86.2			63.1	63.1
Actuated g/C Ratio	0.08	0.08			0.08		0.81	0.86			0.63	0.63
v/c Ratio	0.51	0.45			0.06		0.25	0.52			0.68	0.07
Control Delay	58.7	16.2			0.6		2.8	2.7			15.2	2.3
Queue Delay	0.0	0.0			0.0		0.0	0.1			0.0	0.0
Total Delay	58.7	16.2			0.6		2.8	2.8			15.2	2.3

Lanes, Volumes, Timings
 2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Background Conditions
 PM Peak Hour

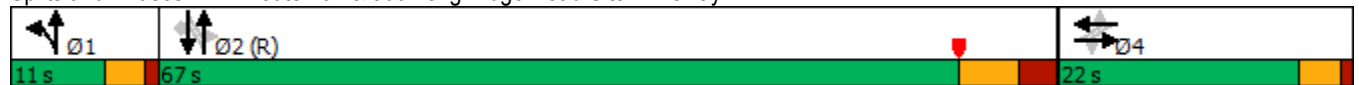
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	B			A		A	A			B	A
Approach Delay		32.1			0.6			2.8			14.5	
Approach LOS		C			A			A			B	
Queue Length 50th (ft)	36	1			0		8	107			296	0
Queue Length 95th (ft)	76	48			0		9	48			377	17
Internal Link Dist (ft)		186			146			281			568	
Turn Bay Length (ft)							90					380
Base Capacity (vph)	237	342			346		445	3046			1984	1025
Starvation Cap Reductn	0	0			0		0	292			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.24	0.27			0.04		0.25	0.57			0.68	0.07

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Yellow, Master Intersection
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 9.2
 Intersection Capacity Utilization 94.1%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service F

Splits and Phases: 2: Route 104 & 900 Long Ridge Road Site Driveway



HCM Signalized Intersection Capacity Analysis
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Background Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	0	81	4	0	8	102	1465	6	21	1230	70
Future Volume (vph)	58	0	81	4	0	8	102	1465	6	21	1230	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1			4.1		4.0	4.0			7.4	7.4
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95			0.95	1.00
Frt	1.00	0.86			0.91		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1681	1516			1663		1770	3537			3536	1583
Flt Permitted	0.75	0.98			0.90		0.15	1.00			0.89	1.00
Satd. Flow (perm)	1326	1491			1513		274	3537			3148	1583
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)	62	0	87	4	0	9	110	1575	6	23	1323	75
RTOR Reduction (vph)	0	85	0	0	12	0	0	0	0	0	0	28
Lane Group Flow (vph)	56	8	0	0	1	0	110	1581	0	0	1346	47
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	12				2
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	7.4	7.4			7.4		77.1	81.1			62.2	62.2
Effective Green, g (s)	7.4	7.4			7.4		77.1	81.1			62.2	62.2
Actuated g/C Ratio	0.07	0.07			0.07		0.77	0.81			0.62	0.62
Clearance Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Vehicle Extension (s)	1.5	1.5			1.5		2.0				3.0	3.0
Lane Grp Cap (vph)	98	110			111		434	2868			1958	984
v/s Ratio Prot							0.04	c0.45				
v/s Ratio Perm	c0.04	0.01			0.00		0.16				c0.43	0.03
v/c Ratio	0.57	0.07			0.01		0.25	0.55			0.69	0.05
Uniform Delay, d1	44.8	43.1			42.9		4.9	3.2			12.5	7.4
Progression Factor	1.00	1.00			1.00		0.82	0.82			1.00	1.00
Incremental Delay, d2	4.9	0.1			0.0		0.1	0.1			2.0	0.1
Delay (s)	49.7	43.2			42.9		4.1	2.8			14.5	7.5
Level of Service	D	D			D		A	A			B	A
Approach Delay (s)		45.6			42.9			2.9			14.1	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Office
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗			↔		↘	↕		↘	↕	↗
Traffic Volume (vph)	180	0	181	5	0	1	39	1288	2	4	1369	36
Future Volume (vph)	180	0	181	5	0	1	39	1288	2	4	1369	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	190		0	155		215
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.850			0.977							0.850
Flt Protected	0.950				0.960		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1747	0	1770	3539	0	1770	3539	1583
Flt Permitted	0.754				0.792		0.095			0.179		
Satd. Flow (perm)	1405	1583	0	0	1441	0	177	3539	0	333	3539	1583
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		117										75
Link Speed (mph)		30			30			30				30
Link Distance (ft)		154			229			333				361
Travel Time (s)		3.5			5.2			7.6				8.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	0	197	5	0	1	42	1400	2	4	1488	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	196	197	0	0	6	0	42	1402	0	4	1488	39
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2				2
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	27.0	27.0		27.0	27.0		7.5			47.0	47.0	47.0
Total Split (s)	27.0	27.0		27.0	27.0		9.0			64.0	64.0	64.0
Total Split (%)	27.0%	27.0%		27.0%	27.0%		9.0%			64.0%	64.0%	64.0%
Maximum Green (s)	21.1	21.1		21.1	21.1		5.0			57.1	57.1	57.1
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	4.4
All-Red Time (s)	2.6	2.6		2.6	2.6		1.0			2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0			0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9			5.9		4.0			6.9	6.9	6.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		None			C-Min	C-Min	C-Min
Walk Time (s)	20.0	20.0		20.0	20.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	17.0	17.0			17.0		69.1	73.1		57.1	57.1	57.1
Actuated g/C Ratio	0.17	0.17			0.17		0.69	0.73		0.57	0.57	0.57
v/c Ratio	0.82	0.54			0.02		0.16	0.54		0.02	0.74	0.04
Control Delay	66.0	21.0			32.2		6.0	7.5		5.5	7.8	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.4	0.0
Total Delay	66.0	21.0			32.2		6.0	7.5		5.5	8.1	0.1

Lanes, Volumes, Timings
1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Office
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	C			C		A	A		A	A	A
Approach Delay		43.4			32.2			7.4			7.9	
Approach LOS		D			C			A			A	
Queue Length 50th (ft)	120	45			3		7	185		0	77	0
Queue Length 95th (ft)	#198	110			14		17	265		m1	97	m0
Internal Link Dist (ft)		74			149			253			281	
Turn Bay Length (ft)							190			155		215
Base Capacity (vph)	296	426			304		267	2586		190	2020	936
Starvation Cap Reductn	0	0			0		0	0		0	148	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.66	0.46			0.02		0.16	0.54		0.02	0.79	0.04

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 97.5 (98%), Referenced to phase 2:NBSB and 6:, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 11.9
 Intersection LOS: B
 Intersection Capacity Utilization 59.7%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Route 104 & Site Driveway/Loughran Avenue



HCM Signalized Intersection Capacity Analysis
 1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Office
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	0	181	5	0	1	39	1288	2	4	1369	36
Future Volume (vph)	180	0	181	5	0	1	39	1288	2	4	1369	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9			5.9		4.0	4.0		6.9	6.9	6.9
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.85			0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1583			1748		1770	3538		1770	3539	1583
Flt Permitted	0.75	1.00			0.79		0.10	1.00		0.18	1.00	1.00
Satd. Flow (perm)	1404	1583			1443		177	3538		334	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	0	197	5	0	1	42	1400	2	4	1488	39
RTOR Reduction (vph)	0	97	0	0	0	0	0	0	0	0	0	17
Lane Group Flow (vph)	196	100	0	0	6	0	42	1402	0	4	1488	22
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2				2
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	17.0	17.0			17.0		66.2	70.2		57.1	57.1	57.1
Effective Green, g (s)	17.0	17.0			17.0		66.2	70.2		57.1	57.1	57.1
Actuated g/C Ratio	0.17	0.17			0.17		0.66	0.70		0.57	0.57	0.57
Clearance Time (s)	5.9	5.9			5.9		4.0			6.9	6.9	6.9
Vehicle Extension (s)	1.5	1.5			1.5		2.0			3.0	3.0	3.0
Lane Grp Cap (vph)	238	269			245		262	2483		190	2020	903
v/s Ratio Prot		0.06					0.01	c0.40			c0.42	
v/s Ratio Perm	c0.14				0.00		0.09			0.01		0.01
v/c Ratio	0.82	0.37			0.02		0.16	0.56		0.02	0.74	0.02
Uniform Delay, d1	40.1	36.8			34.6		9.8	7.4		9.3	15.9	9.3
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.55	0.36	0.06
Incremental Delay, d2	19.2	0.3			0.0		0.1	0.2		0.2	1.9	0.0
Delay (s)	59.3	37.1			34.6		9.9	7.5		5.3	7.6	0.6
Level of Service	E	D			C		A	A		A	A	A
Approach Delay (s)		48.1			34.6			7.6			7.5	
Approach LOS		D			C			A			A	

Intersection Summary		
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.75	B
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	59.7%	16.8
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

Lanes, Volumes, Timings
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Combined Conditions - Office
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	0	81	4	0	8	102	1644	6	21	1266	70
Future Volume (vph)	58	0	81	4	0	8	102	1644	6	21	1266	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	90		0	0		380
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00
Frt		0.860			0.907			0.999				0.850
Flt Protected	0.950	0.997			0.985		0.950				0.999	
Satd. Flow (prot)	1681	1517	0	0	1664	0	1770	3536	0	0	3536	1583
Flt Permitted	0.749	0.980			0.896		0.136				0.878	
Satd. Flow (perm)	1325	1491	0	0	1514	0	253	3536	0	0	3107	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92			92			1				75
Link Speed (mph)		30			30			30				30
Link Distance (ft)		266			226			361				648
Travel Time (s)		6.0			5.1			8.2				14.7
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
Adj. Flow (vph)	62	0	87	4	0	9	110	1768	6	23	1361	75
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	56	93	0	0	13	0	110	1774	0	0	1384	75
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2			2	
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	22.0	22.0		22.0	22.0		11.0			25.4	25.4	25.4
Total Split (s)	22.0	22.0		22.0	22.0		11.0			67.0	67.0	67.0
Total Split (%)	22.0%	22.0%		22.0%	22.0%		11.0%			67.0%	67.0%	67.0%
Maximum Green (s)	17.9	17.9		17.9	17.9		7.0			59.6	59.6	59.6
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0			4.4	4.4	4.4
All-Red Time (s)	1.1	1.1		1.1	1.1		1.0			3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0				0.0	0.0
Total Lost Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		Min			C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0		16.0	16.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	8.4	8.4			8.4		81.4	86.2			62.6	62.6
Actuated g/C Ratio	0.08	0.08			0.08		0.81	0.86			0.63	0.63
v/c Ratio	0.51	0.45			0.06		0.25	0.58			0.71	0.07
Control Delay	58.7	16.2			0.6		4.2	2.2			16.2	2.3
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	58.7	16.2			0.6		4.2	2.2			16.2	2.3

Lanes, Volumes, Timings
 2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Combined Conditions - Office
 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	B			A		A	A			B	A
Approach Delay		32.1			0.6			2.3			15.5	
Approach LOS		C			A			A			B	
Queue Length 50th (ft)	36	1			0		5	73			313	0
Queue Length 95th (ft)	76	48			0		m13	99			402	17
Internal Link Dist (ft)		186			146			281			568	
Turn Bay Length (ft)							90					380
Base Capacity (vph)	237	342			346		439	3046			1943	1018
Starvation Cap Reductn	0	0			0		0	0			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.24	0.27			0.04		0.25	0.58			0.71	0.07

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Yellow, Master Intersection
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 9.1
 Intersection LOS: A
 Intersection Capacity Utilization 97.4%
 ICU Level of Service F
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Route 104 & 900 Long Ridge Road Site Driveway



HCM Signalized Intersection Capacity Analysis
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Combined Conditions - Office
PM Peak Hour























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	0	81	4	0	8	102	1644	6	21	1266	70
Future Volume (vph)	58	0	81	4	0	8	102	1644	6	21	1266	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1			4.1		4.0	4.0			7.4	7.4
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95			0.95	1.00
Frt	1.00	0.86			0.91		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1681	1516			1663		1770	3537			3536	1583
Flt Permitted	0.75	0.98			0.90		0.14	1.00			0.88	1.00
Satd. Flow (perm)	1326	1491			1513		254	3537			3107	1583
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)	62	0	87	4	0	9	110	1768	6	23	1361	75
RTOR Reduction (vph)	0	85	0	0	12	0	0	0	0	0	0	29
Lane Group Flow (vph)	56	8	0	0	1	0	110	1774	0	0	1384	46
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	12				2
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	7.4	7.4			7.4		77.1	81.1			61.7	61.7
Effective Green, g (s)	7.4	7.4			7.4		77.1	81.1			61.7	61.7
Actuated g/C Ratio	0.07	0.07			0.07		0.77	0.81			0.62	0.62
Clearance Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Vehicle Extension (s)	1.5	1.5			1.5		2.0				3.0	3.0
Lane Grp Cap (vph)	98	110			111		429	2868			1917	976
v/s Ratio Prot							0.04	c0.50				
v/s Ratio Perm	c0.04	0.01			0.00		0.16				c0.45	0.03
v/c Ratio	0.57	0.07			0.01		0.26	0.62			0.72	0.05
Uniform Delay, d1	44.8	43.1			42.9		5.3	3.6			13.2	7.6
Progression Factor	1.00	1.00			1.00		1.54	0.51			1.00	1.00
Incremental Delay, d2	4.9	0.1			0.0		0.1	0.3			2.4	0.1
Delay (s)	49.7	43.2			42.9		8.2	2.1			15.6	7.6
Level of Service	D	D			D		A	A			B	A
Approach Delay (s)		45.6			42.9			2.4			15.2	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Residential
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	0	57	5	0	1	70	1288	2	4	1369	67
Future Volume (vph)	57	0	57	5	0	1	70	1288	2	4	1369	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	190		0	155		215
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.850			0.977							0.850
Flt Protected	0.950				0.960		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1747	0	1770	3539	0	1770	3539	1583
Flt Permitted	0.754				0.719		0.107			0.191		
Satd. Flow (perm)	1405	1583	0	0	1309	0	199	3539	0	356	3539	1583
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		117										75
Link Speed (mph)		30			30			30				30
Link Distance (ft)		154			229			333				361
Travel Time (s)		3.5			5.2			7.6				8.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	0	62	5	0	1	76	1400	2	4	1488	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	62	0	0	6	0	76	1402	0	4	1488	73
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2				2
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	27.0	27.0		27.0	27.0		7.5			47.0	47.0	47.0
Total Split (s)	27.0	27.0		27.0	27.0		9.0			64.0	64.0	64.0
Total Split (%)	27.0%	27.0%		27.0%	27.0%		9.0%			64.0%	64.0%	64.0%
Maximum Green (s)	21.1	21.1		21.1	21.1		5.0			57.1	57.1	57.1
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0			4.4	4.4	4.4
All-Red Time (s)	2.6	2.6		2.6	2.6		1.0			2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0			0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9			5.9		4.0			6.9	6.9	6.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		None			C-Min	C-Min	C-Min
Walk Time (s)	20.0	20.0		20.0	20.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	8.5	8.5			8.5		79.7	84.5		61.6	61.6	61.6
Actuated g/C Ratio	0.08	0.08			0.08		0.80	0.84		0.62	0.62	0.62
v/c Ratio	0.52	0.26			0.05		0.19	0.47		0.02	0.68	0.07
Control Delay	58.1	3.3			40.8		3.4	3.4		5.2	6.0	0.4
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.2	0.0
Total Delay	58.1	3.3			40.8		3.4	3.4		5.2	6.2	0.4

Lanes, Volumes, Timings
1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Residential
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	A			D		A	A		A	A	A
Approach Delay		30.7			40.8			3.4			6.0	
Approach LOS		C			D			A			A	
Queue Length 50th (ft)	39	0			4		7	103		0	77	0
Queue Length 95th (ft)	78	5			16		18	176		m1	96	m1
Internal Link Dist (ft)		74			149			253			281	
Turn Bay Length (ft)							190			155		215
Base Capacity (vph)	296	426			276		398	2992		219	2179	1003
Starvation Cap Reductn	0	0			0		0	0		0	158	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.21	0.15			0.02		0.19	0.47		0.02	0.74	0.07

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 97.5 (98%), Referenced to phase 2:NBSB and 6:, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 5.8
 Intersection LOS: A
 Intersection Capacity Utilization 66.6%
 ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Route 104 & Site Driveway/Loughran Avenue



HCM Signalized Intersection Capacity Analysis
 1: Route 104 & Site Driveway/Loughran Avenue

2025 Combined Conditions - Residential
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	0	57	5	0	1	70	1288	2	4	1369	67
Future Volume (vph)	57	0	57	5	0	1	70	1288	2	4	1369	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9			5.9		4.0	4.0		6.9	6.9	6.9
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.85			0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1583			1748		1770	3538		1770	3539	1583
Flt Permitted	0.75	1.00			0.72		0.11	1.00		0.19	1.00	1.00
Satd. Flow (perm)	1404	1583			1309		199	3538		357	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	0	62	5	0	1	76	1400	2	4	1488	73
RTOR Reduction (vph)	0	57	0	0	0	0	0	0	0	0	0	29
Lane Group Flow (vph)	62	5	0	0	6	0	76	1402	0	4	1488	44
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	12			2	
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	7.5	7.5			7.5		75.7	79.7		60.4	60.4	60.4
Effective Green, g (s)	7.5	7.5			7.5		75.7	79.7		60.4	60.4	60.4
Actuated g/C Ratio	0.08	0.08			0.08		0.76	0.80		0.60	0.60	0.60
Clearance Time (s)	5.9	5.9			5.9		4.0			6.9	6.9	6.9
Vehicle Extension (s)	1.5	1.5			1.5		2.0			3.0	3.0	3.0
Lane Grp Cap (vph)	105	118			98		391	2819		215	2137	956
v/s Ratio Prot		0.00					0.03	c0.40			c0.42	
v/s Ratio Perm	c0.04				0.00		0.12			0.01		0.03
v/c Ratio	0.59	0.04			0.06		0.19	0.50		0.02	0.70	0.05
Uniform Delay, d1	44.8	42.9			43.0		6.7	3.4		7.9	13.5	8.1
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.53	0.32	0.11
Incremental Delay, d2	5.8	0.1			0.1		0.1	0.1		0.1	1.4	0.1
Delay (s)	50.6	43.0			43.1		6.8	3.5		4.4	5.8	1.0
Level of Service	D	D			D		A	A		A	A	A
Approach Delay (s)		46.8			43.1			3.6			5.6	
Approach LOS		D			D			A			A	

Intersection Summary		
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.66	A
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	66.6%	16.8
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

Lanes, Volumes, Timings
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Combined Conditions - Residential
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	0	81	4	0	8	102	1521	6	21	1297	70
Future Volume (vph)	58	0	81	4	0	8	102	1521	6	21	1297	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	90		0	0		380
Storage Lanes	1		0	0		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00
Frt		0.860			0.907			0.999				0.850
Flt Protected	0.950	0.997			0.985		0.950				0.999	
Satd. Flow (prot)	1681	1517	0	0	1664	0	1770	3536	0	0	3536	1583
Flt Permitted	0.749	0.980			0.896		0.130				0.888	
Satd. Flow (perm)	1325	1491	0	0	1514	0	242	3536	0	0	3143	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92			92			1				75
Link Speed (mph)		30			30			30				30
Link Distance (ft)		266			226			361				648
Travel Time (s)		6.0			5.1			8.2				14.7
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
Adj. Flow (vph)	62	0	87	4	0	9	110	1635	6	23	1395	75
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	56	93	0	0	13	0	110	1641	0	0	1418	75
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	1 2			2	
Permitted Phases	4			4			2			2		2
Detector Phase	4	4		4	4		1	1 2		2	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0			15.0	15.0	15.0
Minimum Split (s)	22.0	22.0		22.0	22.0		9.5			22.5	22.5	22.5
Total Split (s)	22.0	22.0		22.0	22.0		11.0			67.0	67.0	67.0
Total Split (%)	22.0%	22.0%		22.0%	22.0%		11.0%			67.0%	67.0%	67.0%
Maximum Green (s)	17.9	17.9		17.9	17.9		7.0			59.6	59.6	59.6
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0			4.4	4.4	4.4
All-Red Time (s)	1.1	1.1		1.1	1.1		1.0			3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0				0.0	0.0
Total Lost Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	1.5	1.5		1.5	1.5		2.0			3.0	3.0	3.0
Recall Mode	None	None		None	None		Min			C-Max	C-Max	C-Max
Walk Time (s)	16.0	16.0		16.0	16.0							
Flash Dont Walk (s)	1.0	1.0		1.0	1.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)	8.4	8.4			8.4		81.4	86.2			63.0	63.0
Actuated g/C Ratio	0.08	0.08			0.08		0.81	0.86			0.63	0.63
v/c Ratio	0.51	0.45			0.06		0.26	0.54			0.72	0.07
Control Delay	58.7	16.2			0.6		4.5	1.8			16.2	2.3
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	58.7	16.2			0.6		4.5	1.8			16.2	2.3

Lanes, Volumes, Timings
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Combined Conditions - Residential
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	B			A		A	A			B	A
Approach Delay		32.1			0.6			2.0			15.5	
Approach LOS		C			A			A			B	
Queue Length 50th (ft)	36	1			0		5	60			325	0
Queue Length 95th (ft)	76	48			0		15	73			415	17
Internal Link Dist (ft)		186			146			281			568	
Turn Bay Length (ft)							90					380
Base Capacity (vph)	237	342			346		424	3046			1980	1025
Starvation Cap Reductn	0	0			0		0	23			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.24	0.27			0.04		0.26	0.54			0.72	0.07

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2:NBSB and 6:, Start of Yellow, Master Intersection
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	9.2
Intersection LOS:	A
Intersection Capacity Utilization:	97.4%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 2: Route 104 & 900 Long Ridge Road Site Driveway



HCM Signalized Intersection Capacity Analysis
2: Route 104 & 900 Long Ridge Road Site Driveway

2025 Combined Conditions - Residential
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	0	81	4	0	8	102	1521	6	21	1297	70
Future Volume (vph)	58	0	81	4	0	8	102	1521	6	21	1297	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1			4.1		4.0	4.0			7.4	7.4
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95			0.95	1.00
Frt	1.00	0.86			0.91		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1681	1516			1663		1770	3537			3536	1583
Flt Permitted	0.75	0.98			0.90		0.13	1.00			0.89	1.00
Satd. Flow (perm)	1326	1491			1513		242	3537			3144	1583
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)	62	0	87	4	0	9	110	1635	6	23	1395	75
RTOR Reduction (vph)	0	85	0	0	12	0	0	0	0	0	0	28
Lane Group Flow (vph)	56	8	0	0	1	0	110	1641	0	0	1418	47
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	Perm
Protected Phases		4			4		1	12			2	
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	7.4	7.4			7.4		77.1	81.1			62.2	62.2
Effective Green, g (s)	7.4	7.4			7.4		77.1	81.1			62.2	62.2
Actuated g/C Ratio	0.07	0.07			0.07		0.77	0.81			0.62	0.62
Clearance Time (s)	4.1	4.1			4.1		4.0				7.4	7.4
Vehicle Extension (s)	1.5	1.5			1.5		2.0				3.0	3.0
Lane Grp Cap (vph)	98	110			111		414	2868			1955	984
v/s Ratio Prot							0.04	c0.46				
v/s Ratio Perm	c0.04	0.01			0.00		0.17				c0.45	0.03
v/c Ratio	0.57	0.07			0.01		0.27	0.57			0.73	0.05
Uniform Delay, d1	44.8	43.1			42.9		5.5	3.3			13.0	7.4
Progression Factor	1.00	1.00			1.00		1.58	0.45			1.00	1.00
Incremental Delay, d2	4.9	0.1			0.0		0.1	0.2			2.4	0.1
Delay (s)	49.7	43.2			42.9		8.9	1.6			15.4	7.5
Level of Service	D	D			D		A	A			B	A
Approach Delay (s)		45.6			42.9			2.1			15.0	
Approach LOS		D			D			A			B	

Intersection Summary		
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.69	A
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	97.4%	15.5
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

Appendix E

Turning Movement Count (TMC) Data



NE Traffic Counts

(413) 579-8366

emayboroda@netrafficcounts.com

www.netrafficcounts.com

CLIENT	Fuss & O'Neill
CITY/TOWN	Stamford, CT
WEATHER	Sunny
INTERSECTION #	1

STREET 1	Long Ridge Road
STREET 2	Loughran Avenue
DATE	08/31/2023

Heavy Vehicles

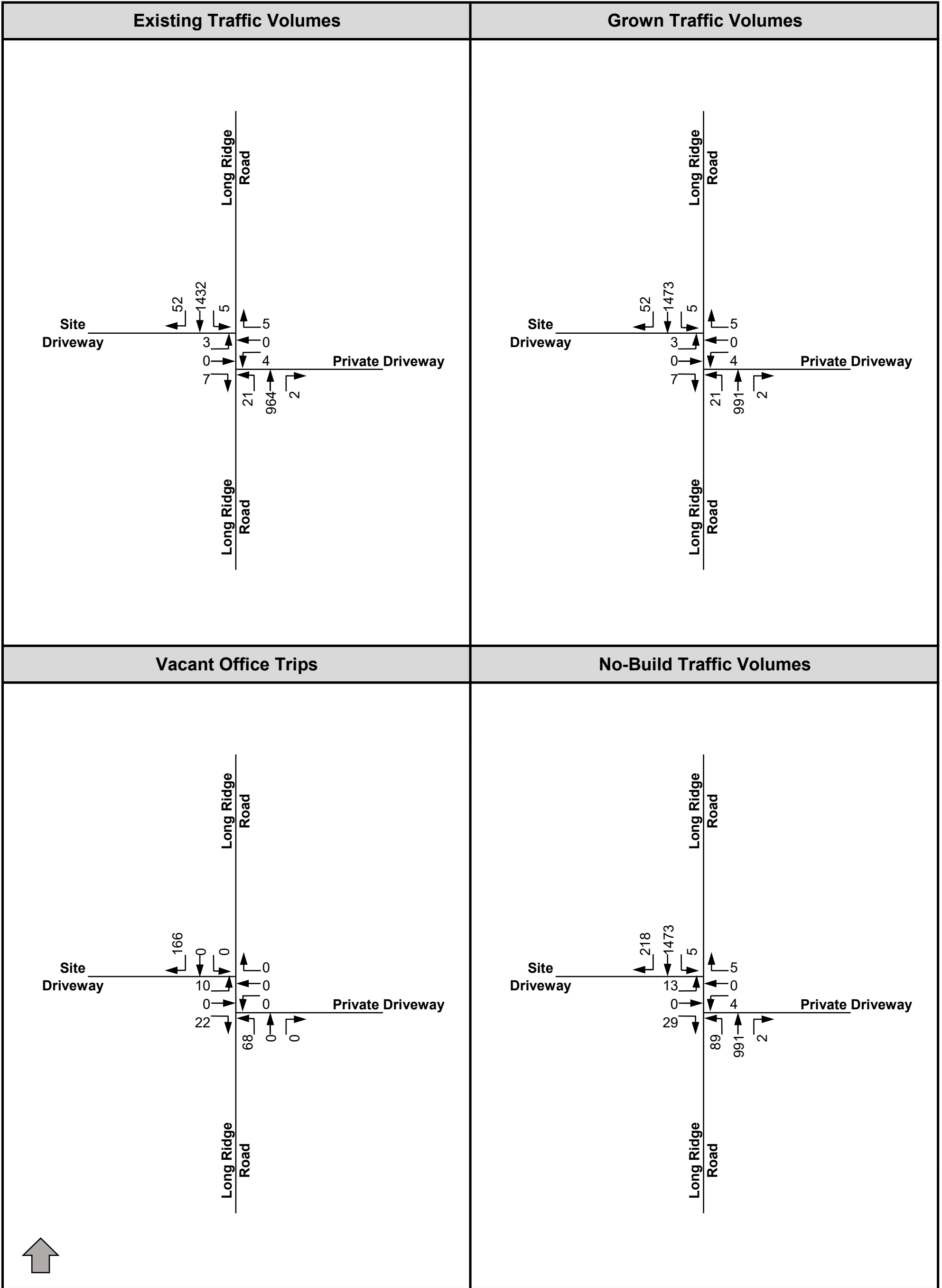
Start Time	Long Ridge Road - Northbound				Long Ridge Road - Southbound				Loughran Avenue - Eastbound				Loughran Avenue - Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	4	0	0	0	7	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	6	0	0	0	4	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	4	0	0	0	2	0	0	2	0	0	0	0	0	0
7:45 AM	0	0	7	0	0	0	3	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	11	0	0	0	7	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	3	0	0	0	11	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0
5:15 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

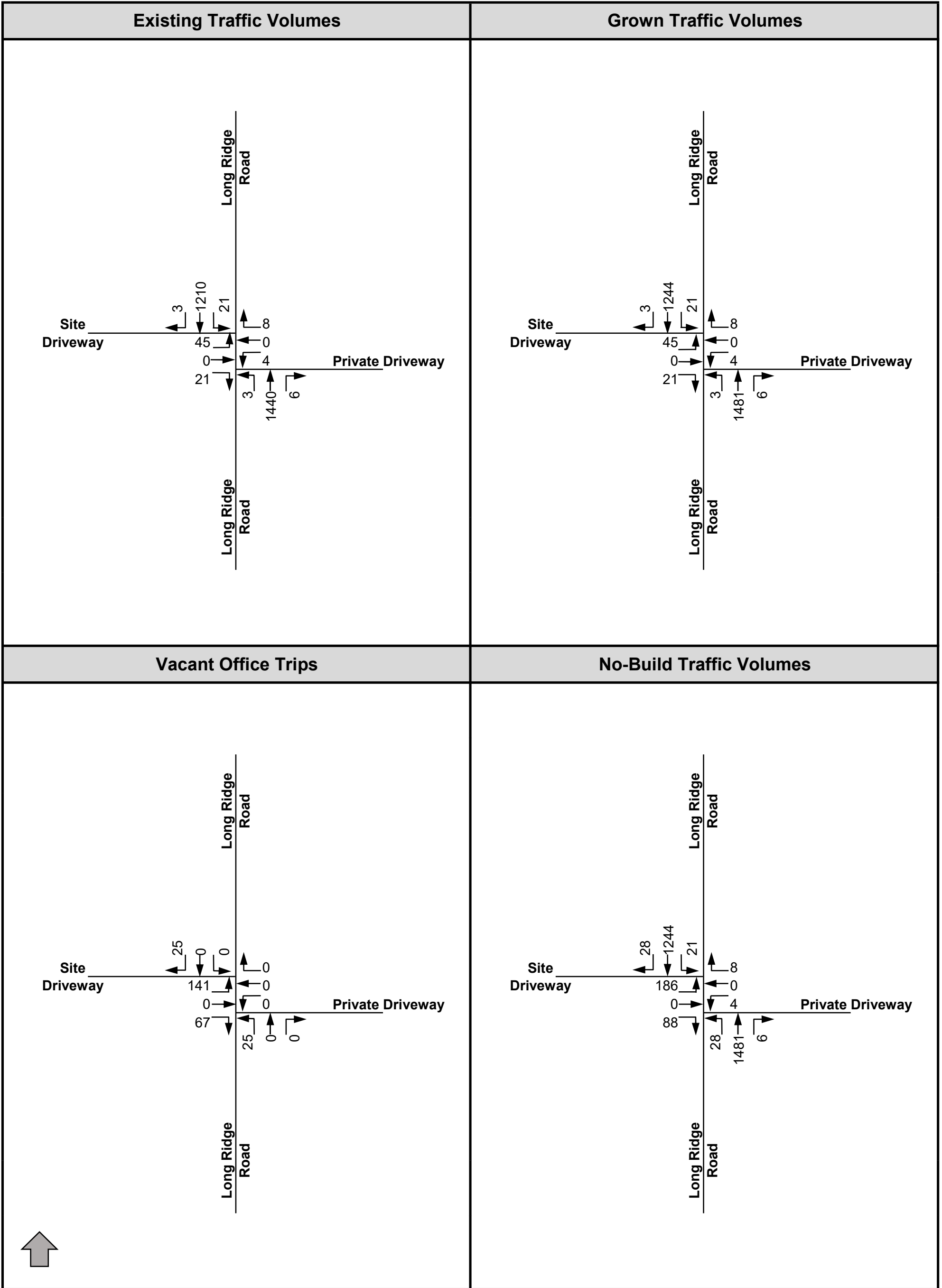
AM PEAK HOURS 7:15 AM	Long Ridge Road - Northbound				Long Ridge Road - Southbound				Loughran Avenue - Eastbound				Loughran Avenue - Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	28	0	0	0	16	0	0	2	0	0	0	0	0	0

PM PEAK HOURS 5:00 PM	Long Ridge Road - Northbound				Long Ridge Road - Southbound				Loughran Avenue - Eastbound				Loughran Avenue - Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	3	0	0	0	3	0	0	1	0	0	0	0	0	0

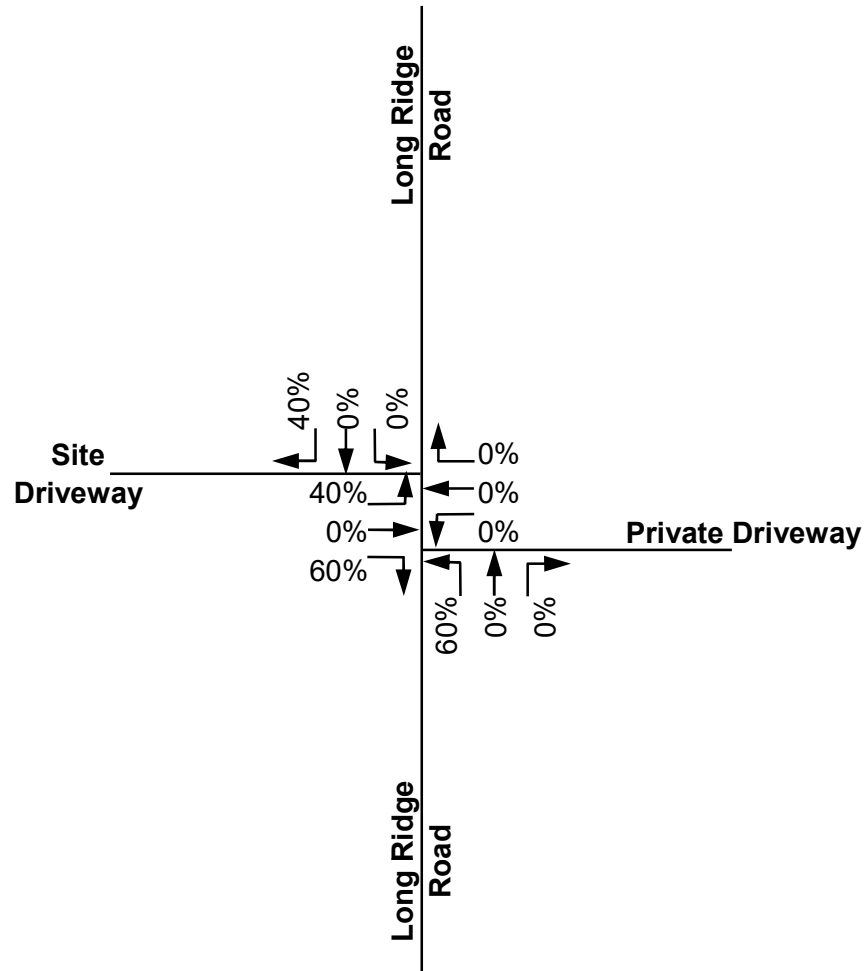
Appendix F

Traffic Volume Figures 900 Long Ridge Road Traffic Assessment



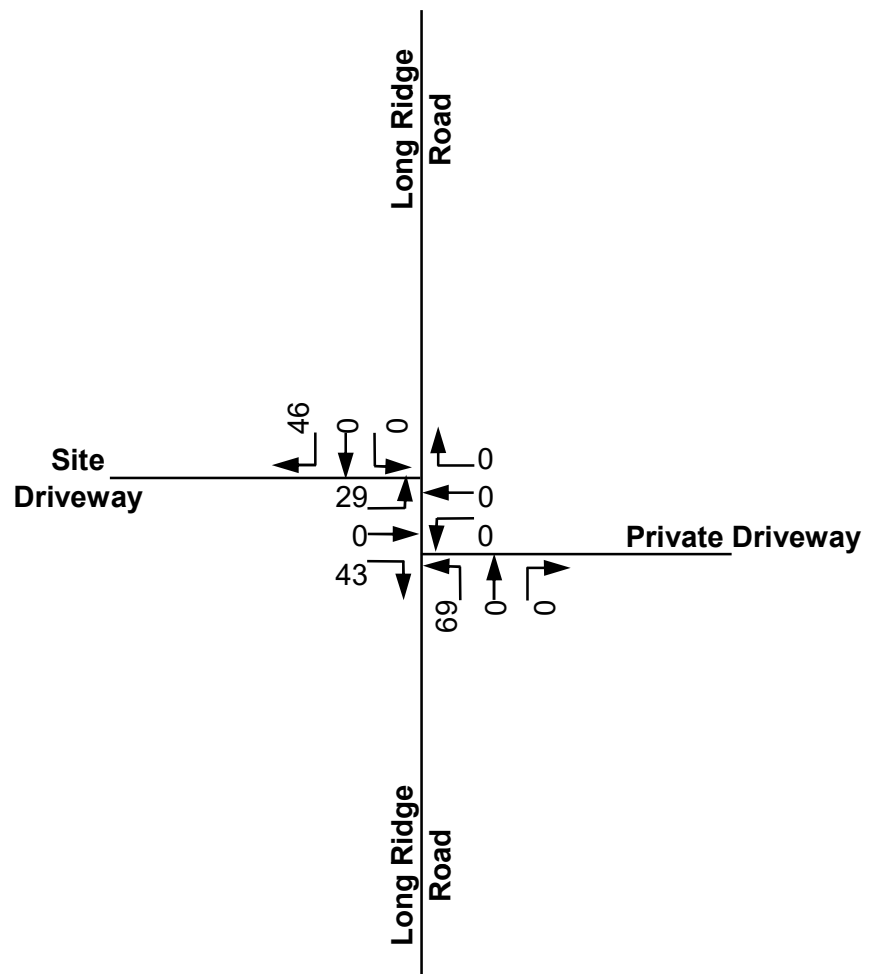
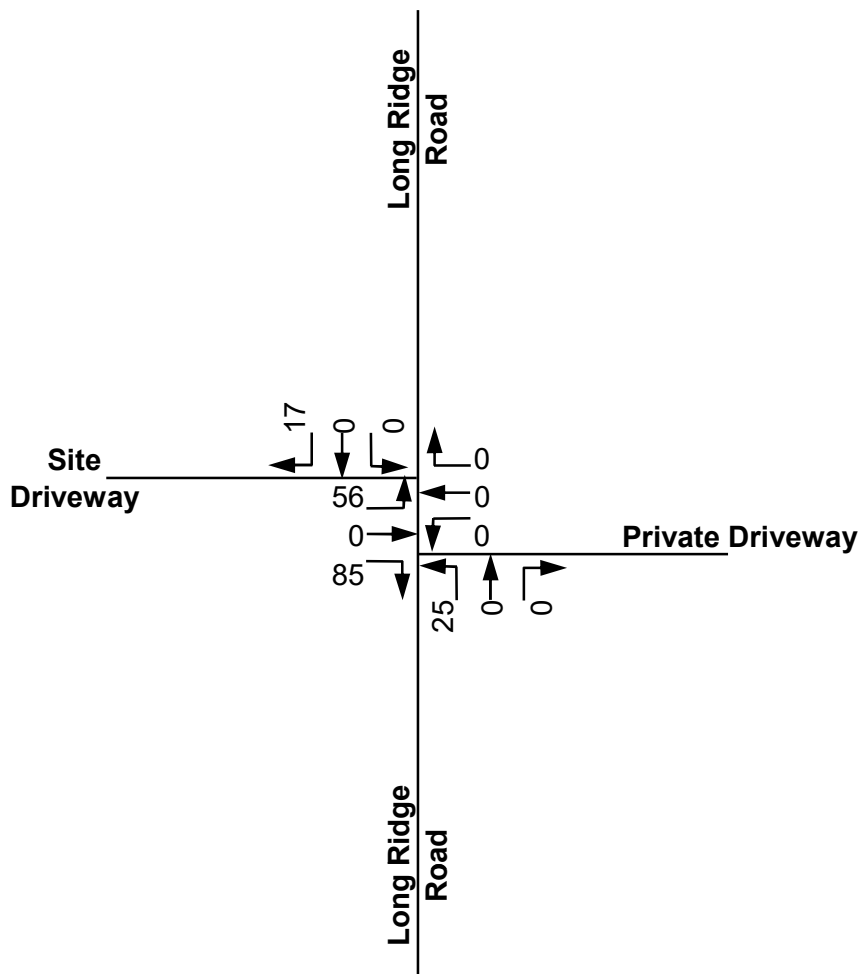


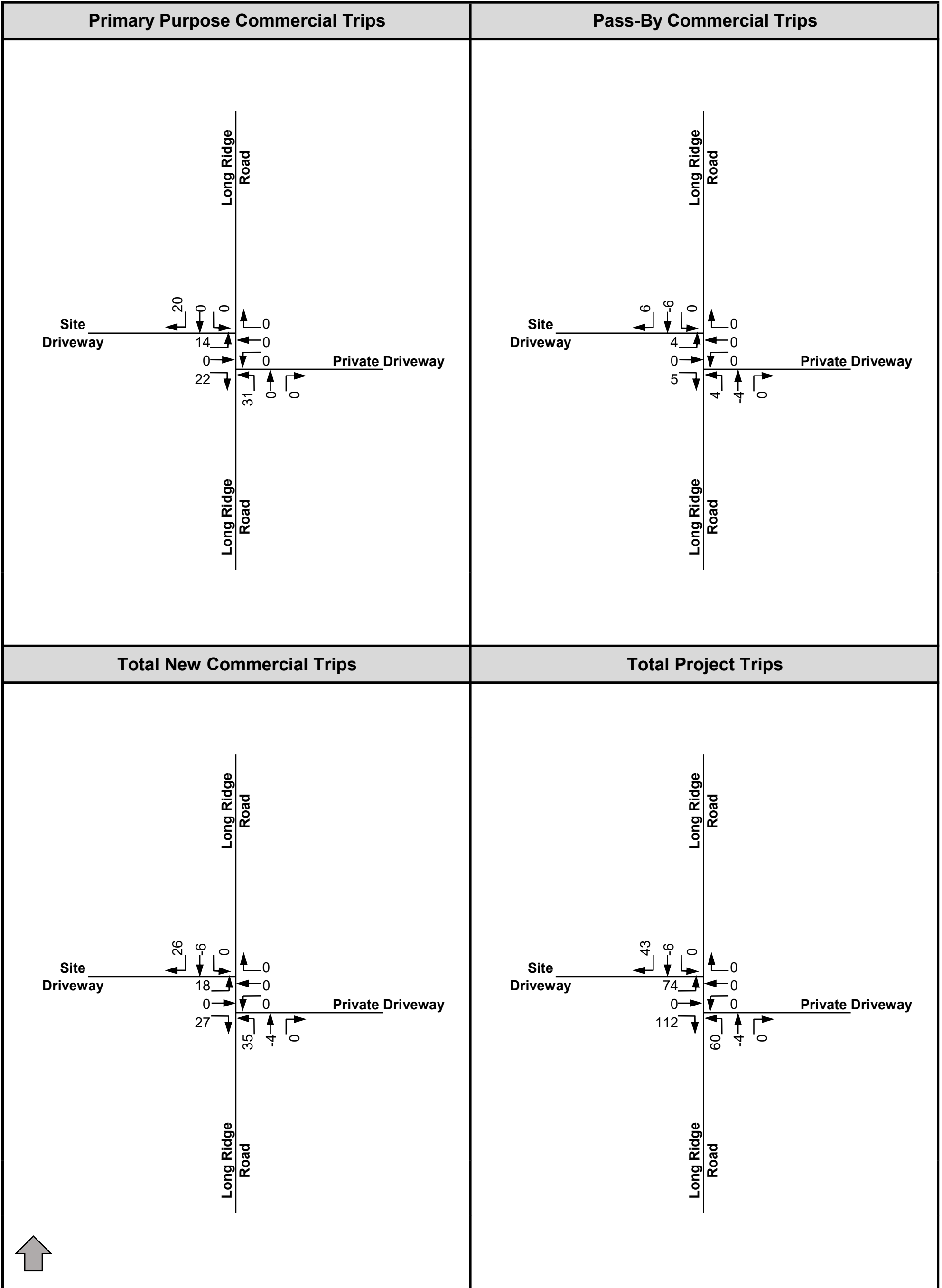
Trip Distributions

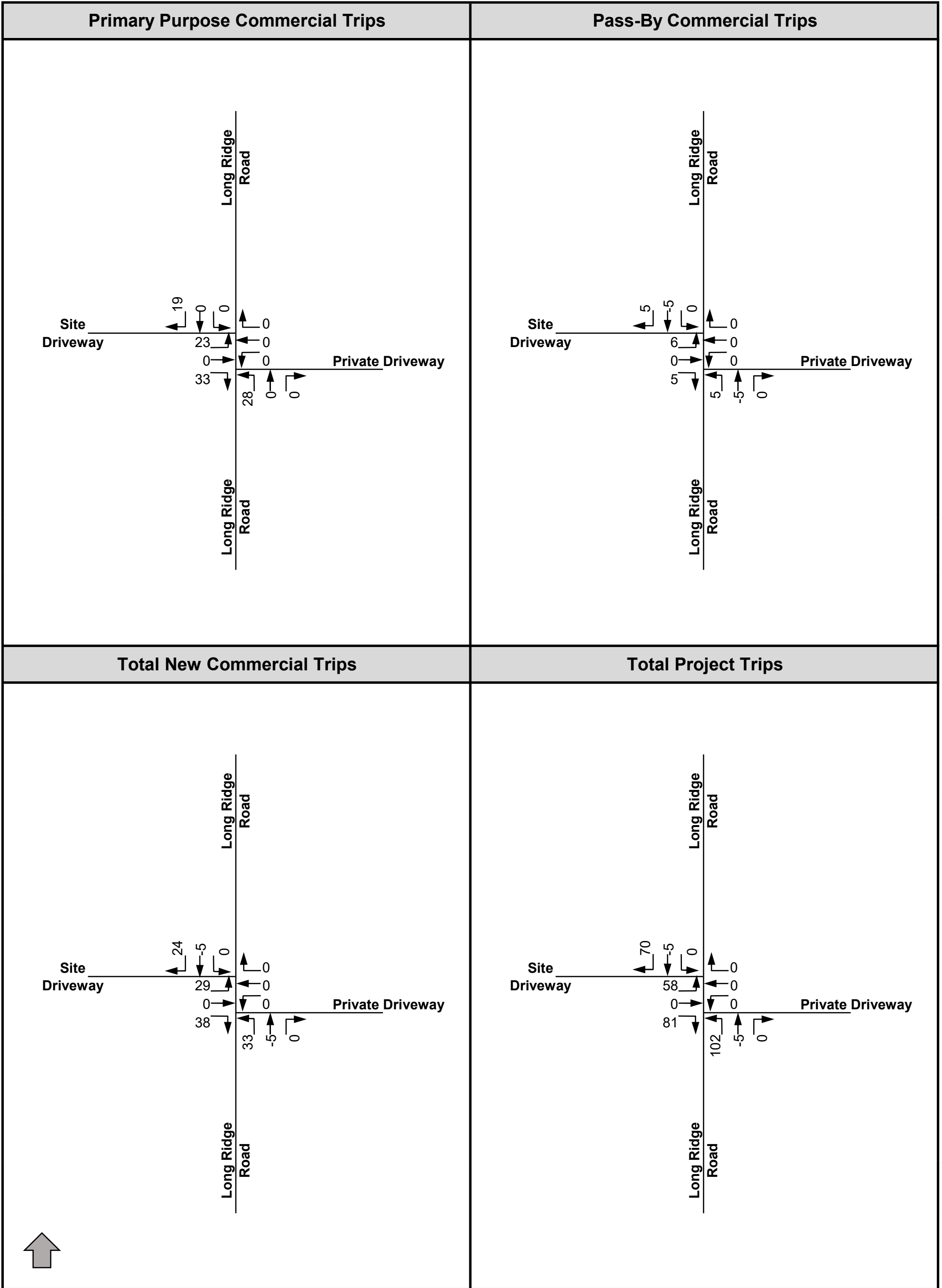


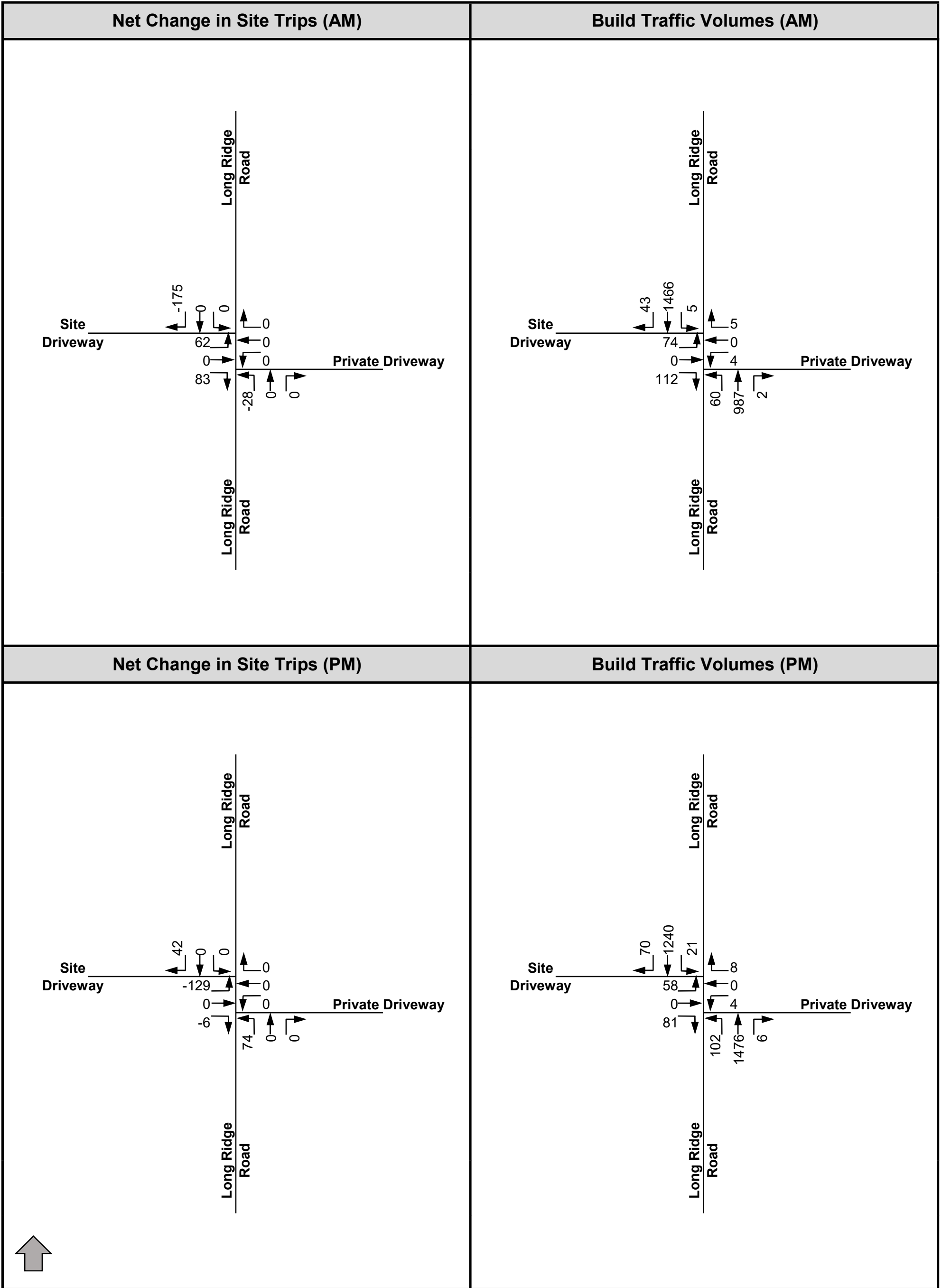
Residential Project Trips (AM)

Residential Project Trips (PM)









Appendix G

Crash Data Records

Uconn Crash Data

800 Long Ridge Road Multi-Family Housing
 Stamford, Connecticut
 January 1, 2020 - December 31, 2022

Date Of Crash	Time of Crash	Severity	No. Of Veh.	No. Of Non-Motorists	Town	Mileage	Roadway	Intersecting Roadway Name	Collision Type	Weather	Light Condition	Road Surface Condition	Contributing Circumstances	Contributing Circumstances Roadway
01) Route 104 (Long Ridge Road) at Loughran Avenue and Site Driveway														
11/24/2021	8:58:00	Suspected Minor Injury (B)	2	0	Stamford	1.9	104-N	Loughran Ave	Front to rear	Clear	Daylight	Dry	None	None
10/29/2021	16:50:00	Possible Injury (C)	2	0	Stamford	1.91	104-N	Loughran Ave	Front to rear	Clear	Daylight	Dry	None	None
10/6/2022	15:28:00	Suspected Minor Injury (B)	2	0	Stamford	1.9	104-N	Loughran Ave	Front to rear	Clear	Daylight	Dry	None	None