

Traffic Impact Study

446 Hopmeadow Street Multi-Family Housing Simsbury, Connecticut

December 2022

Town of Simsbury Zoning Commission
Site Plan Application

CTDOT Encroachment Permit Application



146 Hartford Road
Manchester, CT 06040

Approved by _____ License No. 23761
Mark G. Vertucci, PE, PTOE

Prepared for:
Vessel Technologies, Inc.
46 West 55th Street
New York, NY 10019

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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:

Vessel Technologies, Inc.

Site Acreage:

1.96

Development Size/Type:

80 Apartment Units

Parking:

94 Total Parking Spaces

Applications:

Town of Simsbury Zoning Commission Site Plan Application

CTDOT Encroachment Permit Application

Build Year:

2024

Background Traffic Growth Factor:

0.6%

Traffic Counts:

Fuss & O'Neill – October 2022 (Turning Movement Counts)

Peak Hours Analyzed:

Weekday Morning Peak Hour – 7:00 a.m. – 8:00 a.m.

Weekday Afternoon Peak Hour – 4:30 p.m. – 5:30 p.m.

Expected Trip Generation:

Weekday Morning Peak Hour – 30 Trips (7 Entering, 23 Exiting)

Weekday Afternoon Peak Hour – 32 trips (19 Entering, 13 Exiting)

Capacity Analysis:

Technique – 2000 Highway Capacity Manual & Highway Capacity Manual 6th Edition

Execution – Synchro and SimTraffic Professional Software, Version 11.0

1 Introduction

Vessel Technologies, Inc. proposes to construct a new residential building consisting of 80 apartment units at 446 Hopmeadow Street in Simsbury, Connecticut as shown on the site location map, *Figure No. 1* of *Appendix B*. The development site is located just north of Powder Forest Drive and a new driveway on the east side of Route 10/202 (Hopmeadow Street) will be constructed providing full access to the site. A total of 94 accompanying parking spaces will be provided. The residential development is expected to open in 2024.

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 Town of Simsbury Zoning Commission in support of the project's Site Plan Application. This report is also being submitted to Connecticut Department of Transportation (CTDOT) District 4 office in support of an encroachment permit application.

2 Existing Condition

2.1 Site of Development

The existing site is identified as 446 Hopmeadow Street by the Town of Simsbury and is located in the R15 (Single Family Residence) zone. 446 Hopmeadow Street consists of approximately 1.96 acres. The existing site consists of one single family home with site access provided by one driveway on the eastern side of Route 10/202 (Hopmeadow Street). The existing building will be demolished to accommodate the proposed residential development. The site is bounded by Second Brook to the north, residential land uses to the south, the Farmington Canal Heritage Trail to the east, and vacant space to the west.

2.2 Adjacent Roadway Network

The adjacent roadway network consists of the following roadways:

- Route 10/202 (Hopmeadow Street)
- Powder Forest Drive

Route 10/202 (Hopmeadow Street) runs primarily north/south under State jurisdiction in the Town of Simsbury and is designated as Hopmeadow Street for approximately 7.5 miles between the Granby Town line to the north and the Avon Town line to the south. The roadway provides access to primarily residential, business, and medical land uses, as well as the Farmington Canal Heritage Trail and Weatogue Park. In the vicinity of the site, Route 10/202 is classified by the CTDOT as a principal arterial that provides two travel lanes, one in each direction, and turn lanes at key intersections. The posted speed limit is 35 miles per hour. Sidewalks are not provided on Route 10/202 in the vicinity of the site.

Powder Forest Drive runs primarily east/west under Town jurisdiction and extends approximately 3,500 feet east from its intersection with Crosswoods Drive and Powder Forest Lane to its terminus at Route 10/202 (Hopmeadow Street). The roadway provides access to primarily residential and office land uses. In

the vicinity of the site, Powder Forest Drive is classified by the CTDOT as an urban local road that provides two lanes of travel, one in each direction. The posted speed limit is 30 miles per hour. A sidewalk is provided along the north side of Powder Forest Drive.

2.3 Study Area Intersection

The following study area intersection was reviewed:

- Route 10/202 (Hopmeadow Street) at Powder Forest Drive

Route 10/202 (Hopmeadow Street) at Powder Forest Drive is a signalized t-intersection. The intersection is part of a coordinated signal system along Route 10/202. The intersection provides northbound/southbound approaches on Route 10/202 and an eastbound approach on Powder Forest Drive. Route 10/202 provides one through lane and one dedicated turning lane onto Powder Forest Drive on both the northbound and southbound approaches. Powder Forest Drive provides a dedicated left and a dedicated right turn lane on the eastbound approach. Push buttons for side street green are available on the northwest corner and northeastern side of the intersection to allow pedestrians to cross Route 10/202. Crosswalks and bicycle facilities are not provided at this 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 October 26, 2022, at the intersection of Route 10/202 (Hopmeadow Street) and Powder Forest Drive. The traffic count data collected indicates that the weekday morning peak hour of traffic is 7:00 a.m. to 8:00 a.m. and the afternoon peak hour is 4:30 p.m. to 5:30 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 TMC traffic data have been included in *Appendix E* of this report.

3 Background Traffic Conditions

3.1 Growth Rate

Upon consultation with the Connecticut Department of Transportation (CTDOT) the 2022 existing traffic volumes were projected to the 2024 design year using a 0.6 percent per year peak hour growth factor to account for normal traffic growth in the study area. These projected grown 2024 traffic volumes were utilized as the background traffic volumes which are defined as design year traffic without the proposed development. The projected background traffic volumes are shown in *Figure No. 3 of Appendix B*.

3.2 Other Developments

Fuss & O'Neill contacted the Office of the State Traffic Administration (OSTA) and the Town of Simsbury Planning and Land Use Department to identify any other pending or approved developments having site related traffic in the study area.

One such development was identified by the Town of Simsbury Planning and Land Use Department. The Ridge at Talcott Mountain is a mixed-use development with approximately 299 multifamily units as well as commercial space and is nearly built out. Most of the site related traffic volumes from this development in its existing condition have been captured in the traffic counts conducted on October 26, 2022. The remaining future site related traffic volumes for this mixed-use development will have minimal traffic impact to the study area and is covered by the background growth rate.

3.3 Planned Roadway Improvement Projects

Fuss & O'Neill contacted the Connecticut Department of Transportation and the Town of Simsbury Engineering Department to identify any roadway improvements scheduled within the study area. CTDOT noted that there are tentative project plans for the installation of new signs and pavement markings along Route 10/202 (Hopmeadow Street) in the study area that will improve the safety of traffic operations.

4 Proposed Conditions

4.1 Development

Vessel Technologies, Inc. proposes to construct a new residential building consisting of 80 apartment units at 446 Hopmeadow Street as shown on the site location map, *Figure No. 1 of Appendix B*. A total of 94 parking spaces will be provided for the residential development. The development is expected to open in 2024.

4.2 Site Access and Circulation

Access to the proposed site will be provided via a new full access driveway on Route 10/202 (Hopmeadow Street) approximately 250 feet north of Powder Forest Drive. The site driveway will be stop-controlled and provide one unrestricted lane of travel in each direction.

4.3 Trip Generation

The expected site generated traffic data 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 was calculated using the ITE land use code 221, “Multifamily Housing (Mid-Rise).” The proposed residential development consisting of 80 apartment units is expected to generate a total of 30 vehicles trips (7 entering, 23 exiting) during the morning peak hour and a total of 32 vehicles trips (19 entering, 13 exiting) during the afternoon peak hour. A summary of the peak hour trip generation information for the proposed development 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:

- 40% from the north on Route 10/202 (Hopmeadow Street)
- 60% from the south on Route 10/202 (Hopmeadow Street)

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 was distributed to the roadway system based on the arrival/departure distributions with the results shown in *Figure No. 5 of Appendix B*. These volumes were then added to the background volumes to yield the year 2024 peak hour Combined traffic volumes shown in *Figure No. 6 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 intersection of Route 10/202 (Hopmeadow Street) and Powder Forest Drive.

The records were gathered for the most recent three years of available data, 2019 through 2021. 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 F*.

The intersection of Route 10/202 at Powder Forest Drive experienced four crashes during the study period, averaging approximately one crash per year. The intersection experienced one front to rear collision, one same direction sideswipe, one non fixed object crash, and one fixed object crash. All four crashes resulted in property damage only.

The crash data revealed no identifiable crash patterns and the type and frequency of crashes reported within the study area is not considered abnormal for a signalized intersection with traffic volumes and geometric characteristics present.

5.2 Intersection Sight Distance Analysis

Intersection sight distances were calculated at the proposed 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 of 3.5 feet, the standard height of a driver's eye. During the time of the field review on October 12, 2022, it was apparent that Route 10/202 (Hopmeadow Street) was recently repaved, and the shoulder lines were not yet applied to the repaved roadway. However, white painted guide lines were installed denoting the alignment of the future shoulder line approximately 5 to 6 feet off the edge of pavement. Therefore, the sight distances were measured both from a point 15 feet back from the edge of road as well as 15 feet back from the edge of travel-way.

Given that Route 10/202 (Hopmeadow Street) has a posted speed limit of 35 miles per hour, a design speed of 40 miles per hour (5 miles per hour above the posted speed limit) was utilized for the analysis.

For the design speed of 40 miles per hour, 445 feet of intersection sight distance is required for a passenger car turning right or left onto a two-lane facility.

At the proposed full access driveway location when measuring from a point 15 feet back from the edge of roadway, approximately 235 feet of intersection sight distance is provided looking right (north) and approximately 470 feet of intersection sight distance is provided looking left (south) past the signalized intersection of Route 10/202 and Powder Forest Drive. Sufficient sight distance exists to allow for safe egress of passenger cars attempting to turn right out from the proposed site driveway onto Route 10/202.

The intersection sight distance from 15 feet back of the edge of road looking right (north) falls short of CTDOT requirements for a 40 mile per hour design speed due to obstructing vegetation on the adjacent property to the north. Therefore, the intersection sight distance was also measured from 15 feet back from the edge of travel-way (shoulder line) or 10 feet back from the edge of road.

Upon measuring the intersection sight distance from 15 feet back from the edge of travel-way, approximately 775 feet of intersection sight distance will be provided looking right (north), therefore providing sufficient sight distance to allow for safe egress of passenger cars attempting to turn left out from the proposed site driveway onto Route 10/202.

5.3 Intersection Capacity Analysis

Capacity analyses for both signalized and unsignalized intersections were conducted using Synchro Professional Software, version 11.0.

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

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

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

LOS is generally used to describe the operation (based on delay time) of both signalized and unsignalized intersections, while v/c ratio is applied to signalized intersections only. These definitions for v/c ratio and LOS, as well as the methodology for conducting signalized and unsignalized intersection capacity analyses, are taken from the “2000 Highway capacity manual” and the “Highway Capacity Manual 6th Edition” published by the Transportation Research Board.

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

Using the above referenced methodologies, weekday morning and afternoon peak hour capacity analyses were conducted at the signalized intersection of Route 10/202 (Hopmeadow Street) at Powder Forest Drive as well as the unsignalized intersection of Route 10/202 (Hopmeadow Street) at the Proposed Site Drive.

Tables No. 3 and 4 of Appendix A present a summary of the levels of service at the unsignalized and signalized intersections, for both Background and Combined Conditions traffic volumes. 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 the proposed development) versus the Combined Conditions LOS (with the proposed development).

The capacity analysis at Route 10/202 (Hopmeadow Street) at Powder Forest Drive revealed that the signalized intersection operates efficiently at LOS A in both the background and combined conditions during the weekday morning and afternoon peak hours.

The capacity analysis at the unsignalized intersection of Route 10/202 (Hopmeadow Street) and the Proposed Site Drive revealed that the westbound site drive approach will operate efficiently at LOS B and

the Route 10/202 southbound left turn will operate efficiently at LOS A in the combined conditions during the weekday morning peak hour. During the afternoon peak hour, the westbound site drive approach will operate at an acceptable LOS C and the Route 10/202 southbound left turn will operate efficiently at LOS A in the combined conditions.

5.4 Queue Analysis

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

At both the signalized and unsignalized intersections in the study area, the 95th percentile queue lengths will have de minimis increases (one vehicle length or less) on all intersection approaches during both the morning and afternoon peak hours. Ample lane storage length exists on Route 10/202 (Hopmeadow Street) 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 residential development's site generated traffic. The study efforts have indicated that the proposed 80-unit development will generate a total of 30 new trips (7 entering, 23 exiting) during the weekday morning peak hour and a total of 32 new trips (19 entering, 13 exiting) during the weekday afternoon peak hour.

The capacity analysis revealed that both the study area intersection approaches will experience a minimal increase in delay as a result of the proposed development traffic and the signalized intersection of Route 10/202 (Hopmeadow Street) and Powder Forest Drive will operate efficiently at LOS A in the combined conditions during both the weekday morning and afternoon peak hours.

Queue lengths within the study area are expected to have a minimal increase of approximately one vehicle length or less. Additionally, the queue lengths at the intersection of Route 10/202 and the Proposed Site Drive are expected to be approximately one vehicle length or less for both the morning and afternoon peak hour combined conditions. Sufficient lane storage length exists on Route 10/202 to accommodate the 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 intersection is not abnormal for a signalized intersection with the traffic volume and geometric characteristics present. The small increase in traffic expected at the study intersection is not anticipated to have detrimental impact to roadway safety.

The proposed site driveway will provide sufficient intersection sight distances for exiting vehicles looking both left (south) and right (north) when measured from a point 15 feet back from the edge of the Route 10/202 travel-way (shoulder line). These sight distances will allow for safe egress of vehicles turning out of the site.

In order to safely accommodate vehicular traffic turning left in and out of the site, it is recommended to restripe the pavement markings on Route 10/202 to break the double yellow centerline median at the site driveway location and indicate that vehicles are able to cross the northbound lane of traffic to turn left in or left out of the site.

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

Appendix A

Tables

Table 1

**Peak Hour Site Generated Traffic Volumes
446 Hopmeadow Street Multi-Family Housing
Simsbury, Connecticut**

Land Use Code 221 – 80 Apartment Units	Total Trips	Trips Entering	Trips Exiting
Weekday Morning Peak Hour	30	7	23
Weekday Afternoon Peak Hour	32	19	13

Note: Trip generation based on Rate per Land use Code 221 (Mid-Rise Multifamily Housing), as published in *Trip Generation*, 11th Edition, 2021.

Table 2

**Intersection Crash Data Summary
446 Hopmeadow Street Multi-Family Housing
Simsbury, Connecticut**

Intersection	Crashes Per Year			
	2019	2020	2021	Average/Year
Route 10/202 (Hopmeadow Street) at Powder Forest Drive	3*	0	1	1.33

*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

**Unsignalized Intersection Level Of Service Summary
446 Hopmeadow Street Multi-Family Housing
Simsbury, Connecticut**

Two-Way Stop Controlled Intersection (Critical Movements)	2024 Weekday Morning Peak Hour		2024 Weekday Afternoon Peak Hour	
	Background	Combined	Background	Combined
Route 10/202 (Hopmeadow Street) at Proposed Site Drive				
WB Approach	N/A*	LOS B	N/A	LOS C
SB Left Turn	N/A	LOS A	N/A	LOS A

*Values indicated are critical movement Level of Service (LOS)

Table 4

**Signalized Intersection Level of Service Summary
446 Hopmeadow Street Multi-Family Housing
Simsbury, Connecticut**

Signalized Intersection	2024 Weekday Morning Peak Hour		2024 Weekday Afternoon Peak Hour	
	Background	Combined	Background	Combined
Route 10/202 (Hopmeadow Street) at Powder Forest Drive	0.37/LOS A*	0.38/LOS A	0.42/LOS A	0.43/LOS A
EB Approach	LOS D	LOS D	LOS D	LOS D
NB Approach	LOS A	LOS A	LOS A	LOS A
SB Approach	LOS A	LOS A	LOS A	LOS A

*Values indicated are intersection v/c Ratio/LOS

Table 5

**Weekday Morning Peak Hour Queue Length Summary
446 Hopmeadow Street Multi-Family Housing
Simsbury, Connecticut**

Intersection	Approach Lane	2024 Background Queue	2024 Combined Queue	Available Storage
Route 10/202 (Hopmeadow Street) at Powder Forest Drive	EB Left Turn	75 Feet	75 Feet	150 Feet
	EB Right Turn	30 Feet	30 Feet	>1,000 Feet
	NB Left Turn	5 Feet	5 Feet	340 Feet
	NB Through	70 Feet	70 Feet	>1,000 Feet
	SB Through	170 Feet	175 Feet	>1,000 Feet
	SB Right	10 Feet	10 Feet	300 Feet
Route 10/202 (Hopmeadow Street) at Proposed Site Drive	WB Left/Right Turn	N/A	5 Feet	>100 Feet
	SB Left Turn	N/A	0 Feet	>1,000 Feet

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

Table 6

**Weekday Afternoon Peak Hour Queue Length Summary
446 Hopmeadow Street Multi-Family Housing
Simsbury, Connecticut**

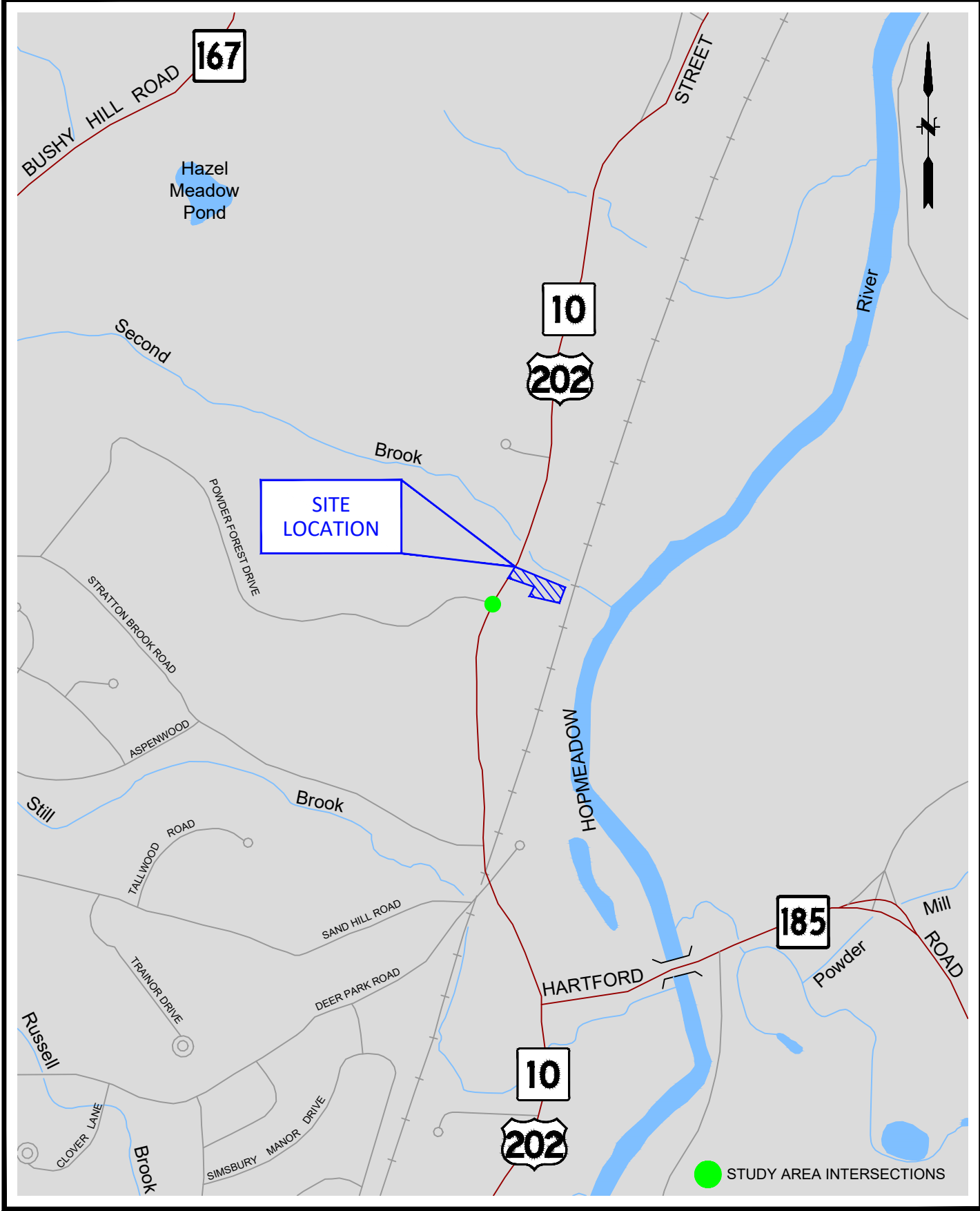
Intersection	Approach Lane	2024 Background Queue	2024 Combined Queue	Available Storage
Route 10/202 (Hopmeadow Street) at Powder Forest Drive	EB Left Turn	55 Feet	55 Feet	150 Feet
	EB Right Turn	30 Feet	30 Feet	>1,000 Feet
	NB Left Turn	5 Feet	5 Feet	340 Feet
	NB Through	95 Feet	100 Feet	>1,000 Feet
	SB Through	215 Feet	220 Feet	>1,000 Feet
	SB Right	10 Feet	10 Feet	300 Feet
Route 10/202 (Hopmeadow Street) at Proposed Site Drive	WB Left/Right Turn	N/A	5 Feet	>100 Feet
	SB Left Turn	N/A	0 Feet	>1,000 Feet

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

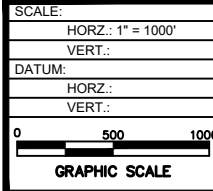
Appendix B

Figures

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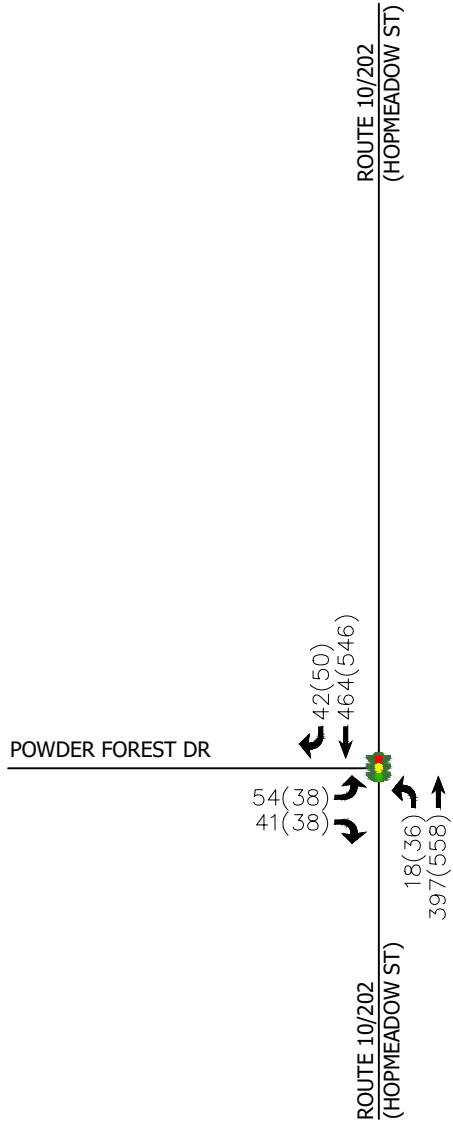
● STUDY AREA INTERSECTIONS



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VESSEL TECHNOLOGIES, INC.
 SITE LOCATION FIGURE
 446 HOPMEADOW STREET
 SIMSBURY CONNECTICUT

PROJ. No.: 20220886.A10
 DATE: NOVEMBER 2022
 LOC-01



XX(XX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)



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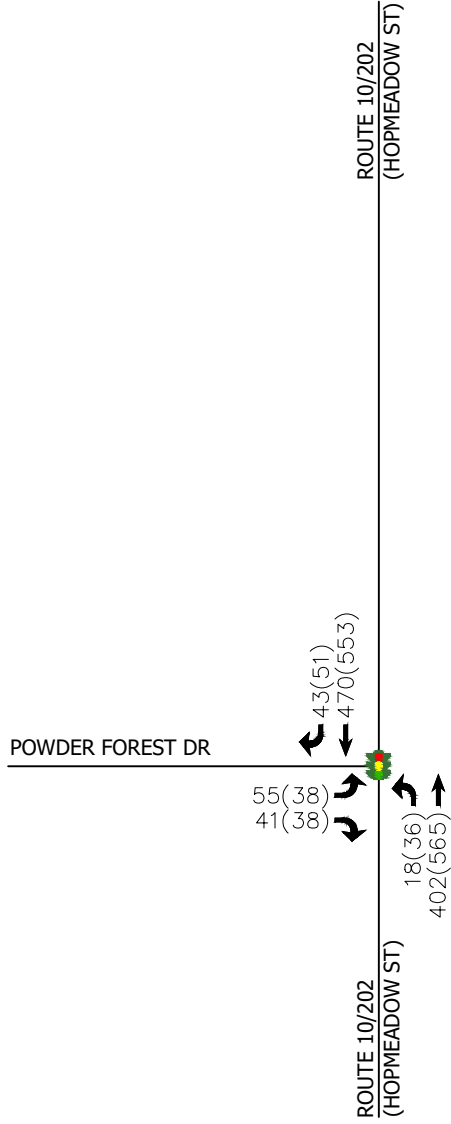
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FIGURE 2: 2022 EXISTING TRAFFIC VOLUMES

PROJ. NO: 20220886.A10

446 HOPMEADOW STREET MULTI-FAMILY HOUSING

NOVEMBER 2022



XX(XX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)



FUSS & O'NEILL

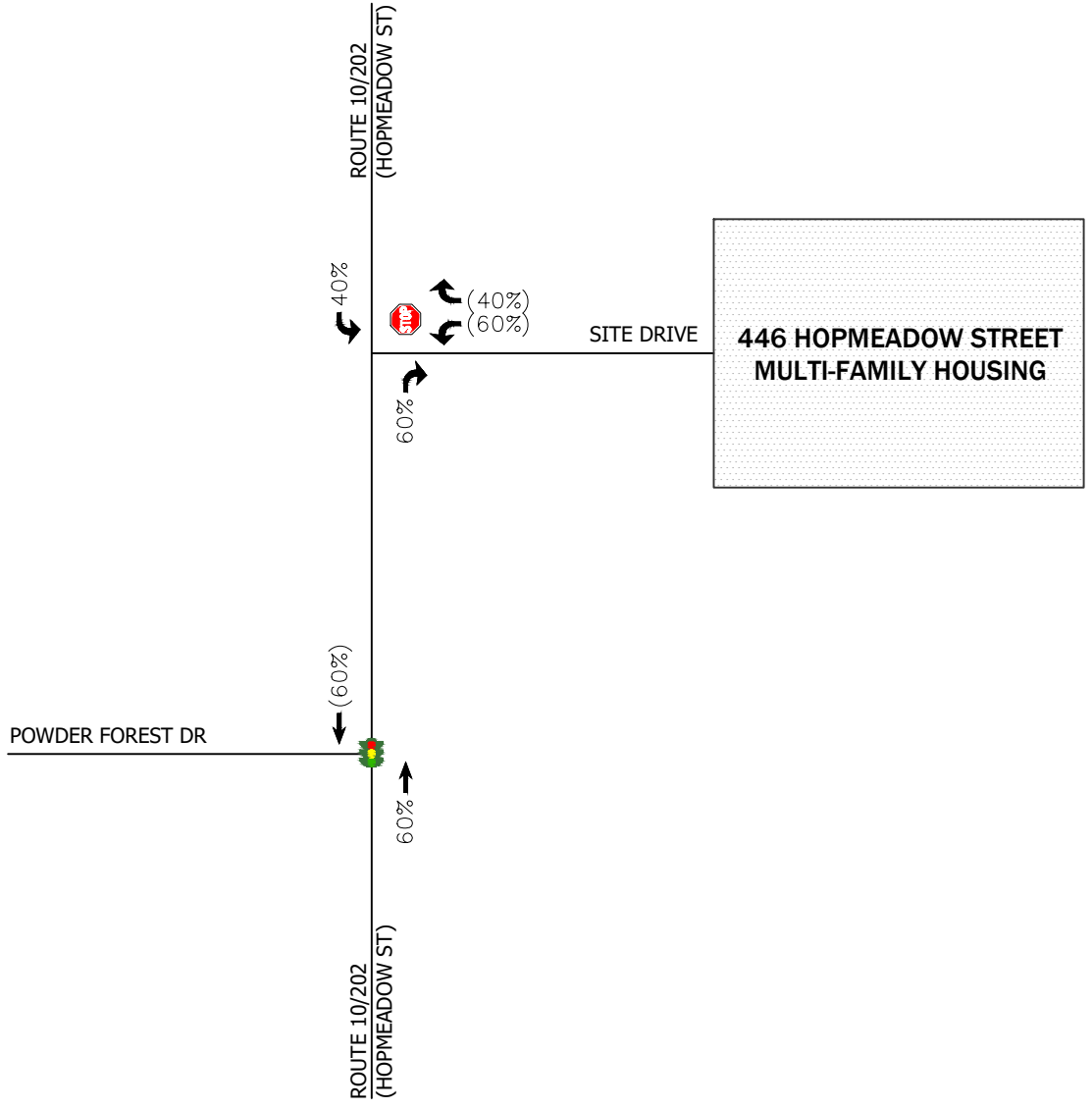
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FIGURE 3: 2024 BACKGROUND TRAFFIC VOLUMES

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446 HOPMEADOW STREET MULTI-FAMILY HOUSING

NOVEMBER 2022



XX(XX) = ENTERING TRAFFIC (EXITING TRAFFIC)



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FIGURE 4: SITE GENERATED TRAFFIC DISTRIBUTION

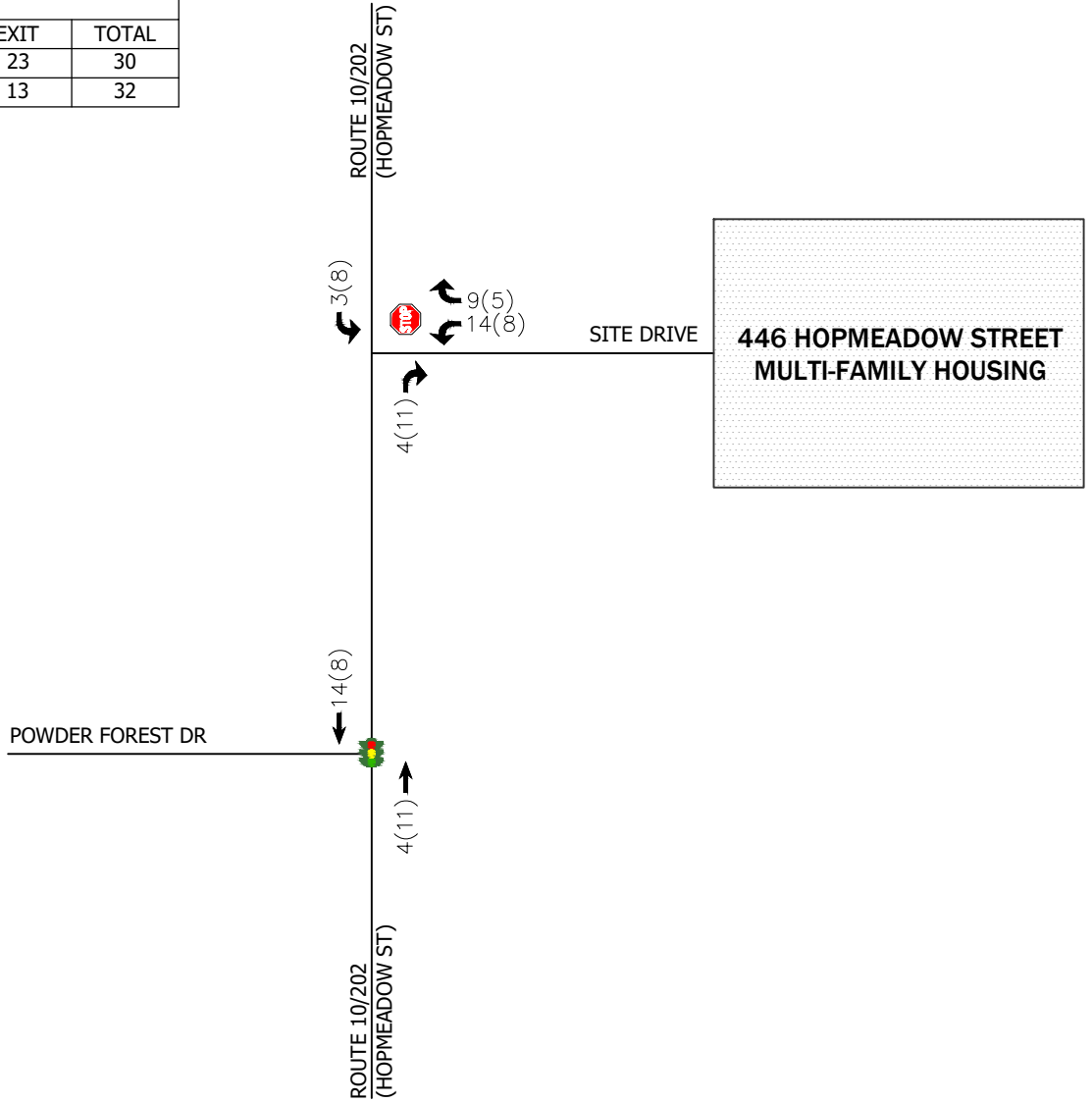
PROJ. NO: 20220886.A10

446 HOPMEADOW STREET MULTI-FAMILY HOUSING

NOVEMBER 2022



SITE GENERATED TRAFFIC VOLUMES			
	ENTER	EXIT	TOTAL
MORNING	7	23	30
AFTERNOON	19	13	32



XX(XX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)



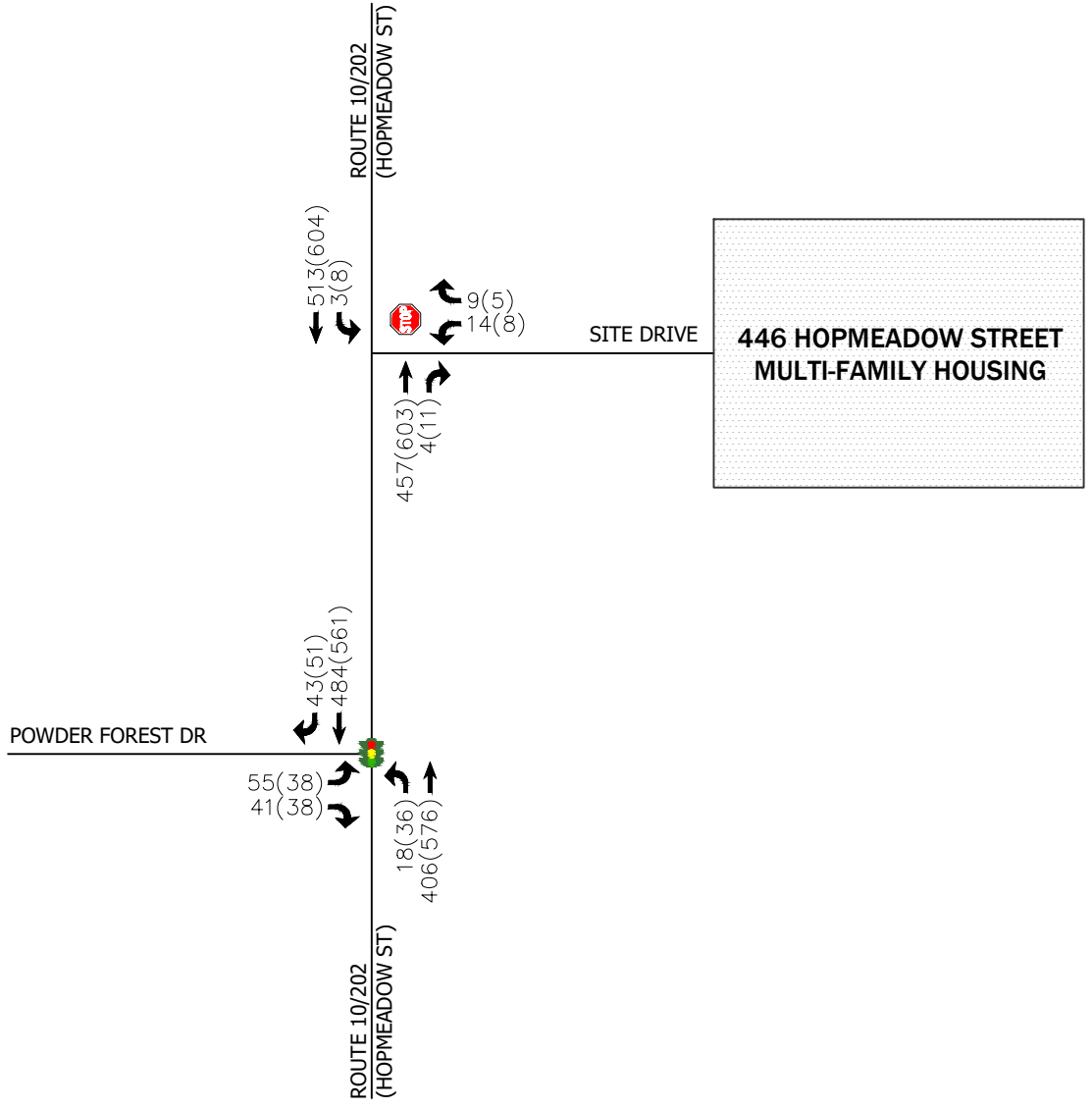
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FIGURE 5: SITE GENERATED TRAFFIC VOLUMES

PROJ. NO: 20220886.A10

446 HOPMEADOW STREET MULTI-FAMILY HOUSING

NOVEMBER 2022



XX(YY) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)



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FIGURE 6: 2024 COMBINED TRAFFIC VOLUMES

PROJ. NO: 20220886.A10

446 HOPMEADOW STREET MULTI-FAMILY HOUSING

NOVEMBER 2022

Appendix C

Intersection Capacity Analysis Worksheets
2024 Background Traffic Volumes
Weekday Morning Peak Hour

Lanes, Volumes, Timings
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Background Conditions
 Weekday Morning Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	55	41	18	402	470	43
Future Volume (vph)	55	41	18	402	470	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	340			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25		115			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.850				0.850
Fl _t Protected	0.950		0.950			
Satd. Flow (prot)	1719	1615	1805	1863	1845	1553
Fl _t Permitted	0.950		0.454			
Satd. Flow (perm)	1719	1615	863	1863	1845	1553
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		42				44
Link Speed (mph)	30			30	30	
Link Distance (ft)	889			545	707	
Travel Time (s)	20.2			12.4	16.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	0%	0%	2%	3%	4%
Adj. Flow (vph)	57	42	19	414	485	44
Shared Lane Traffic (%)						
Lane Group Flow (vph)	57	42	19	414	485	44
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Prot	D.P+P	NA	NA	Prot
Protected Phases	4	4	1	12	2	2

Lanes, Volumes, Timings
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Background Conditions
 Weekday Morning Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases	2					
Detector Phase	4	4	1	1 2	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	5.0		15.0	15.0
Minimum Split (s)	11.0	11.0	9.0		20.4	20.4
Total Split (s)	16.0	16.0	10.0		74.0	74.0
Total Split (%)	16.0%	16.0%	10.0%		74.0%	74.0%
Maximum Green (s)	12.0	12.0	6.0		68.6	68.6
Yellow Time (s)	3.0	3.0	3.0		4.0	4.0
All-Red Time (s)	1.0	1.0	1.0		1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0		5.4	5.4
Lead/Lag	Lead			Lag		
Lead-Lag Optimize?	Yes			Yes		
Vehicle Extension (s)	2.0	2.0	1.5		3.5	3.5
Recall Mode	None	None	None		C-Max	C-Max
Act Effct Green (s)	8.4	8.4	81.8	86.6	73.1	73.1
Actuated g/C Ratio	0.08	0.08	0.82	0.87	0.73	0.73
v/c Ratio	0.40	0.24	0.02	0.26	0.36	0.04
Control Delay	51.2	16.5	1.7	2.1	6.6	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	16.5	1.7	2.1	6.6	1.7
LOS	D	B	A	A	A	A
Approach Delay	36.5			2.1	6.2	
Approach LOS	D			A	A	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 72 (72%), Referenced to phase 2:NBSB, Start of Yellow
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.40
 Intersection Signal Delay: 7.3
 Intersection LOS: A
 Intersection Capacity Utilization 38.4%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive



Queues

2024 Background Conditions

1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

Weekday Morning Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	57	42	19	414	485	44
v/c Ratio	0.40	0.24	0.02	0.26	0.36	0.04
Control Delay	51.2	16.5	1.7	2.1	6.6	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	16.5	1.7	2.1	6.6	1.7
Queue Length 50th (ft)	35	0	1	36	108	0
Queue Length 95th (ft)	74	32	5	71	170	10
Internal Link Dist (ft)	809		465		627	
Turn Bay Length (ft)	340					
Base Capacity (vph)	206	230	779	1603	1348	1147
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.18	0.02	0.26	0.36	0.04

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Background Conditions
 Weekday Morning Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	55	41	18	402	470	43
Future Volume (vph)	55	41	18	402	470	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1719	1615	1805	1863	1845	1553
Flt Permitted	0.95	1.00	0.45	1.00	1.00	1.00
Satd. Flow (perm)	1719	1615	863	1863	1845	1553
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	57	42	19	414	485	44
RTOR Reduction (vph)	0	39	0	0	0	12
Lane Group Flow (vph)	57	3	19	414	485	32
Heavy Vehicles (%)	5%	0%	0%	2%	3%	4%
Turn Type	Prot	Prot	D.P+P	NA	NA	Prot
Protected Phases	4	4	1	12	2	2
Permitted Phases			2			
Actuated Green, G (s)	7.0	7.0	79.6	83.6	72.3	72.3
Effective Green, g (s)	7.0	7.0	79.6	83.6	72.3	72.3
Actuated g/C Ratio	0.07	0.07	0.80	0.84	0.72	0.72
Clearance Time (s)	4.0	4.0	4.0		5.4	5.4
Vehicle Extension (s)	2.0	2.0	1.5		3.5	3.5
Lane Grp Cap (vph)	120	113	755	1557	1333	1122
v/s Ratio Prot	c0.03	0.00	0.00	c0.22	c0.26	0.02
v/s Ratio Perm			0.02			
v/c Ratio	0.47	0.03	0.03	0.27	0.36	0.03
Uniform Delay, d1	44.7	43.3	2.2	1.7	5.2	3.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.0	0.0	0.0	0.8	0.0
Delay (s)	45.8	43.4	2.2	1.8	6.0	4.0
Level of Service	D	D	A	A	A	A
Approach Delay (s)	44.8			1.8	5.8	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix C

Intersection Capacity Analysis Worksheets
2024 Combined Traffic Volumes
Weekday Morning Peak Hour

Lanes, Volumes, Timings
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Combined Conditions
 Weekday Morning Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	55	41	18	406	484	43
Future Volume (vph)	55	41	18	406	484	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	340			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25		115			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.850				0.850
Fl _t Protected	0.950		0.950			
Satd. Flow (prot)	1719	1615	1805	1863	1845	1553
Fl _t Permitted	0.950		0.446			
Satd. Flow (perm)	1719	1615	847	1863	1845	1553
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		42				44
Link Speed (mph)	30			30	30	
Link Distance (ft)	889			545	314	
Travel Time (s)	20.2			12.4	7.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	0%	0%	2%	3%	4%
Adj. Flow (vph)	57	42	19	419	499	44
Shared Lane Traffic (%)						
Lane Group Flow (vph)	57	42	19	419	499	44
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Prot	D.P+P	NA	NA	Prot
Protected Phases	4	4	1	12	2	2

Lanes, Volumes, Timings
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Combined Conditions
 Weekday Morning Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases	2					
Detector Phase	4	4	1	12	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	5.0		15.0	15.0
Minimum Split (s)	11.0	11.0	9.0		20.4	20.4
Total Split (s)	16.0	16.0	10.0		74.0	74.0
Total Split (%)	16.0%	16.0%	10.0%		74.0%	74.0%
Maximum Green (s)	12.0	12.0	6.0		68.6	68.6
Yellow Time (s)	3.0	3.0	3.0		4.0	4.0
All-Red Time (s)	1.0	1.0	1.0		1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0		5.4	5.4
Lead/Lag	Lead			Lag		
Lead-Lag Optimize?	Yes			Yes		
Vehicle Extension (s)	2.0	2.0	1.5		3.5	3.5
Recall Mode	None	None	None		C-Max	C-Max
Act Effct Green (s)	8.4	8.4	81.8	86.6	73.1	73.1
Actuated g/C Ratio	0.08	0.08	0.82	0.87	0.73	0.73
v/c Ratio	0.40	0.24	0.02	0.26	0.37	0.04
Control Delay	51.2	16.5	1.8	2.1	6.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	16.5	1.8	2.1	6.7	1.7
LOS	D	B	A	A	A	A
Approach Delay	36.5			2.1	6.3	
Approach LOS	D			A	A	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 72 (72%), Referenced to phase 2:NBSB, Start of Yellow
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.40
 Intersection Signal Delay: 7.4
 Intersection Capacity Utilization 39.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive



Queues

2024 Combined Conditions

1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

Weekday Morning Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	57	42	19	419	499	44
v/c Ratio	0.40	0.24	0.02	0.26	0.37	0.04
Control Delay	51.2	16.5	1.8	2.1	6.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	16.5	1.8	2.1	6.7	1.7
Queue Length 50th (ft)	35	0	1	37	112	0
Queue Length 95th (ft)	74	32	5	72	176	10
Internal Link Dist (ft)	809			465	234	
Turn Bay Length (ft)			340			
Base Capacity (vph)	206	230	767	1603	1347	1146
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.18	0.02	0.26	0.37	0.04

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Combined Conditions
 Weekday Morning Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	55	41	18	406	484	43
Future Volume (vph)	55	41	18	406	484	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1719	1615	1805	1863	1845	1553
Flt Permitted	0.95	1.00	0.45	1.00	1.00	1.00
Satd. Flow (perm)	1719	1615	847	1863	1845	1553
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	57	42	19	419	499	44
RTOR Reduction (vph)	0	39	0	0	0	12
Lane Group Flow (vph)	57	3	19	419	499	32
Heavy Vehicles (%)	5%	0%	0%	2%	3%	4%
Turn Type	Prot	Prot	D.P+P	NA	NA	Prot
Protected Phases	4	4	1	12	2	2
Permitted Phases			2			
Actuated Green, G (s)	7.0	7.0	79.6	83.6	72.2	72.2
Effective Green, g (s)	7.0	7.0	79.6	83.6	72.2	72.2
Actuated g/C Ratio	0.07	0.07	0.80	0.84	0.72	0.72
Clearance Time (s)	4.0	4.0	4.0		5.4	5.4
Vehicle Extension (s)	2.0	2.0	1.5		3.5	3.5
Lane Grp Cap (vph)	120	113	745	1557	1332	1121
v/s Ratio Prot	c0.03	0.00	0.00	c0.22	c0.27	0.02
v/s Ratio Perm			0.02			
v/c Ratio	0.47	0.03	0.03	0.27	0.37	0.03
Uniform Delay, d1	44.7	43.3	2.2	1.7	5.3	3.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.0	0.0	0.0	0.8	0.0
Delay (s)	45.8	43.4	2.2	1.8	6.1	4.0
Level of Service	D	D	A	A	A	A
Approach Delay (s)	44.8			1.8	5.9	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 2: Route 10/202 (Hopmeadow Street) & Proposed Site Drive

2024 Combined Conditions
 Weekday Morning Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	14	9	457	4	3	513
Future Volume (vph)	14	9	457	4	3	513
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt	0.946		0.999			
Flt Protected	0.971					
Satd. Flow (prot)	1711	0	1861	0	0	3539
Flt Permitted	0.971					
Satd. Flow (perm)	1711	0	1861	0	0	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	242		314			348
Travel Time (s)	5.5		7.1			7.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	10	497	4	3	558
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	0	501	0	0	561
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM 6th TWSC
 2: Route 10/202 (Hopmeadow Street) & Proposed Site Drive

2024 Combined Conditions
 Weekday Morning Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	14	9	457	4	3	513
Future Vol, veh/h	14	9	457	4	3	513
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	10	497	4	3	558

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	784	499	0	0	501
Stage 1	499	-	-	-	-
Stage 2	285	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	346	571	-	-	1061
Stage 1	609	-	-	-	-
Stage 2	739	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	345	571	-	-	1061
Mov Cap-2 Maneuver	345	-	-	-	-
Stage 1	609	-	-	-	-
Stage 2	736	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	408	1061
HCM Lane V/C Ratio	-	-	0.061	0.003
HCM Control Delay (s)	-	-	14.4	8.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Appendix D

Intersection Capacity Analysis Worksheets 2024 Background Traffic Volumes Weekday Afternoon Peak Hour

Lanes, Volumes, Timings
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Background Conditions
 Weekday Afternoon Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	38	38	36	565	553	51
Future Volume (vph)	38	38	36	565	553	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	340			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25		115			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.850				0.850
Fl _t Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1881	1881	1615
Fl _t Permitted	0.950		0.399			
Satd. Flow (perm)	1805	1615	758	1881	1881	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		39				53
Link Speed (mph)	30			30	30	
Link Distance (ft)	889			545	707	
Travel Time (s)	20.2			12.4	16.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Adj. Flow (vph)	39	39	37	582	570	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	39	37	582	570	53
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Prot	D.P+P	NA	NA	Prot
Protected Phases	4	4	1	12	2	2

Lanes, Volumes, Timings
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Background Conditions
 Weekday Afternoon Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases			2			
Detector Phase	4	4	1	12	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	5.0		15.0	15.0
Minimum Split (s)	11.0	11.0	9.0		20.4	20.4
Total Split (s)	15.0	15.0	12.0		73.0	73.0
Total Split (%)	15.0%	15.0%	12.0%		73.0%	73.0%
Maximum Green (s)	11.0	11.0	8.0		67.6	67.6
Yellow Time (s)	3.0	3.0	3.0		4.0	4.0
All-Red Time (s)	1.0	1.0	1.0		1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0		5.4	5.4
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	2.0	2.0	1.5		3.5	3.5
Recall Mode	None	None	None		C-Max	C-Max
Act Effct Green (s)	7.6	7.6	82.6	87.4	72.0	72.0
Actuated g/C Ratio	0.08	0.08	0.83	0.87	0.72	0.72
v/c Ratio	0.29	0.25	0.05	0.35	0.42	0.05
Control Delay	48.9	17.9	1.6	2.3	7.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	17.9	1.6	2.3	7.7	1.7
LOS	D	B	A	A	A	A
Approach Delay	33.4			2.2	7.2	
Approach LOS	C			A	A	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 48 (48%), Referenced to phase 2:NBSB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.42
 Intersection Signal Delay: 6.4
 Intersection Capacity Utilization 42.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive



Queues

2024 Background Conditions

1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

Weekday Afternoon Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	39	39	37	582	570	53
v/c Ratio	0.29	0.25	0.05	0.35	0.42	0.05
Control Delay	48.9	17.9	1.6	2.3	7.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	17.9	1.6	2.3	7.7	1.7
Queue Length 50th (ft)	24	0	2	53	143	0
Queue Length 95th (ft)	57	32	7	95	217	11
Internal Link Dist (ft)	809		465		627	
Turn Bay Length (ft)	340					
Base Capacity (vph)	198	212	733	1640	1353	1176
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.18	0.05	0.35	0.42	0.05

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Background Conditions
 Weekday Afternoon Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	38	38	36	565	553	51
Future Volume (vph)	38	38	36	565	553	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1805	1615	1805	1881	1881	1615
Flt Permitted	0.95	1.00	0.40	1.00	1.00	1.00
Satd. Flow (perm)	1805	1615	759	1881	1881	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	39	39	37	582	570	53
RTOR Reduction (vph)	0	37	0	0	0	15
Lane Group Flow (vph)	39	2	37	582	570	38
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Turn Type	Prot	Prot	D.P+P	NA	NA	Prot
Protected Phases	4	4	1	12	2	2
Permitted Phases			2			
Actuated Green, G (s)	6.2	6.2	80.4	84.4	71.1	71.1
Effective Green, g (s)	6.2	6.2	80.4	84.4	71.1	71.1
Actuated g/C Ratio	0.06	0.06	0.80	0.84	0.71	0.71
Clearance Time (s)	4.0	4.0	4.0		5.4	5.4
Vehicle Extension (s)	2.0	2.0	1.5		3.5	3.5
Lane Grp Cap (vph)	111	100	707	1587	1337	1148
v/s Ratio Prot	c0.02	0.00	0.00	c0.31	c0.30	0.02
v/s Ratio Perm			0.04			
v/c Ratio	0.35	0.02	0.05	0.37	0.43	0.03
Uniform Delay, d1	45.0	44.1	2.3	1.8	6.0	4.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0	0.0	0.1	1.0	0.1
Delay (s)	45.7	44.1	2.3	1.8	7.0	4.3
Level of Service	D	D	A	A	A	A
Approach Delay (s)	44.9			1.8	6.8	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix D

Intersection Capacity Analysis Worksheets
2024 Combined Traffic Volumes
Weekday Afternoon Peak Hour

Lanes, Volumes, Timings
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Combined Conditions
 Weekday Afternoon Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	38	38	36	576	561	51
Future Volume (vph)	38	38	36	576	561	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	340			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25		115			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.850				0.850
Fl _t Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1881	1881	1615
Fl _t Permitted	0.950		0.395			
Satd. Flow (perm)	1805	1615	750	1881	1881	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		39				53
Link Speed (mph)	30			30	30	
Link Distance (ft)	889			545	314	
Travel Time (s)	20.2			12.4	7.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Adj. Flow (vph)	39	39	37	594	578	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	39	37	594	578	53
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Prot	D.P+P	NA	NA	Prot
Protected Phases	4	4	1	12	2	2

Lanes, Volumes, Timings
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Combined Conditions
 Weekday Afternoon Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases				2		
Detector Phase	4	4	1	12	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	5.0		15.0	15.0
Minimum Split (s)	11.0	11.0	9.0		20.4	20.4
Total Split (s)	15.0	15.0	12.0		73.0	73.0
Total Split (%)	15.0%	15.0%	12.0%		73.0%	73.0%
Maximum Green (s)	11.0	11.0	8.0		67.6	67.6
Yellow Time (s)	3.0	3.0	3.0		4.0	4.0
All-Red Time (s)	1.0	1.0	1.0		1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0		5.4	5.4
Lead/Lag	Lead			Lag		
Lead-Lag Optimize?	Yes			Yes		
Vehicle Extension (s)	2.0	2.0	1.5		3.5	3.5
Recall Mode	None	None	None		C-Max	C-Max
Act Effct Green (s)	7.6	7.6	82.6	87.4	71.9	71.9
Actuated g/C Ratio	0.08	0.08	0.83	0.87	0.72	0.72
v/c Ratio	0.29	0.25	0.05	0.36	0.43	0.05
Control Delay	48.9	17.9	1.6	2.3	7.8	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	17.9	1.6	2.3	7.8	1.7
LOS	D	B	A	A	A	A
Approach Delay	33.4			2.3	7.3	
Approach LOS	C			A	A	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 48 (48%), Referenced to phase 2:NBSB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.43
 Intersection Signal Delay: 6.4
 Intersection LOS: A
 Intersection Capacity Utilization 43.2%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive



Queues

2024 Combined Conditions

1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

Weekday Afternoon Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	39	39	37	594	578	53
v/c Ratio	0.29	0.25	0.05	0.36	0.43	0.05
Control Delay	48.9	17.9	1.6	2.3	7.8	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	17.9	1.6	2.3	7.8	1.7
Queue Length 50th (ft)	24	0	2	55	147	0
Queue Length 95th (ft)	57	32	7	98	221	11
Internal Link Dist (ft)	809		465		234	
Turn Bay Length (ft)	340					
Base Capacity (vph)	198	212	728	1640	1352	1175
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.18	0.05	0.36	0.43	0.05

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Route 10/202 (Hopmeadow Street) & Powder Forest Drive

2024 Combined Conditions
 Weekday Afternoon Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	38	38	36	576	561	51
Future Volume (vph)	38	38	36	576	561	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1805	1615	1805	1881	1881	1615
Flt Permitted	0.95	1.00	0.39	1.00	1.00	1.00
Satd. Flow (perm)	1805	1615	750	1881	1881	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	39	39	37	594	578	53
RTOR Reduction (vph)	0	37	0	0	0	15
Lane Group Flow (vph)	39	2	37	594	578	38
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Turn Type	Prot	Prot	D.P+P	NA	NA	Prot
Protected Phases	4	4	1	12	2	2
Permitted Phases			2			
Actuated Green, G (s)	6.2	6.2	80.4	84.4	71.1	71.1
Effective Green, g (s)	6.2	6.2	80.4	84.4	71.1	71.1
Actuated g/C Ratio	0.06	0.06	0.80	0.84	0.71	0.71
Clearance Time (s)	4.0	4.0	4.0		5.4	5.4
Vehicle Extension (s)	2.0	2.0	1.5		3.5	3.5
Lane Grp Cap (vph)	111	100	701	1587	1337	1148
v/s Ratio Prot	c0.02	0.00	0.00	c0.32	c0.31	0.02
v/s Ratio Perm			0.04			
v/c Ratio	0.35	0.02	0.05	0.37	0.43	0.03
Uniform Delay, d1	45.0	44.1	2.3	1.8	6.0	4.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0	0.0	0.1	1.0	0.1
Delay (s)	45.7	44.1	2.3	1.8	7.1	4.3
Level of Service	D	D	A	A	A	A
Approach Delay (s)	44.9			1.9	6.8	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 2: Route 10/202 (Hopmeadow Street) & Proposed Site Drive

2024 Combined Conditions
 Weekday Afternoon Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	8	5	603	11	8	604
Future Volume (vph)	8	5	603	11	8	604
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt	0.952		0.998			
Flt Protected	0.969					0.999
Satd. Flow (prot)	1718	0	1859	0	0	3536
Flt Permitted	0.969					0.999
Satd. Flow (perm)	1718	0	1859	0	0	3536
Link Speed (mph)	30		30			30
Link Distance (ft)	242		314			348
Travel Time (s)	5.5		7.1			7.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	5	655	12	9	657
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	0	667	0	0	666
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60	60		60	60	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.4%
Analysis Period (min)	15
	ICU Level of Service A

HCM 6th TWSC
 2: Route 10/202 (Hopmeadow Street) & Proposed Site Drive

2024 Combined Conditions
 Weekday Afternoon Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	5	603	11	8	604
Future Vol, veh/h	8	5	603	11	8	604
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	5	655	12	9	657

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1008	661	0	0	667
Stage 1	661	-	-	-	-
Stage 2	347	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	251	461	-	-	921
Stage 1	512	-	-	-	-
Stage 2	688	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	247	461	-	-	921
Mov Cap-2 Maneuver	247	-	-	-	-
Stage 1	512	-	-	-	-
Stage 2	678	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.5	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	301	921
HCM Lane V/C Ratio	-	-	0.047	0.009
HCM Control Delay (s)	-	-	17.5	8.9
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Appendix E

Turning Movement Count (TMC) Data

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Route 202 at Powder Forest Drive
 Simsbury, Connecticut

File Name : 23554
 Site Code : 23554
 Start Date : 10/26/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Route 202 From North					From East					Route 202 From South					Powder Forest Drive From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	7	129	0	0	136	0	0	0	0	0	0	93	2	0	95	9	0	16	0	25	256
07:15 AM	14	127	0	0	141	0	0	0	0	0	0	92	5	0	97	13	0	11	0	24	262
07:30 AM	11	117	0	0	128	0	0	0	0	0	0	96	3	0	99	15	0	15	0	30	257
07:45 AM	10	91	0	0	101	0	0	0	0	0	0	116	8	0	124	4	1	12	1	18	243
Total	42	464	0	0	506	0	0	0	0	0	0	397	18	0	415	41	1	54	1	97	1018
08:00 AM	5	100	0	0	105	0	0	0	0	0	0	121	12	0	133	8	0	4	0	12	250
08:15 AM	7	106	0	0	113	0	0	0	0	0	0	95	10	0	105	12	0	9	0	21	239
08:30 AM	6	122	0	0	128	0	0	0	0	0	0	97	6	0	103	14	0	10	0	24	255
08:45 AM	13	98	0	0	111	0	0	0	0	0	0	115	6	0	121	11	0	11	0	22	254
Total	31	426	0	0	457	0	0	0	0	0	0	428	34	0	462	45	0	34	0	79	998
Grand Total	73	890	0	0	963	0	0	0	0	0	0	825	52	0	877	86	1	88	1	176	2016
Apprch %	7.6	92.4	0	0		0	0	0	0		0	94.1	5.9	0		48.9	0.6	50	0.6		
Total %	3.6	44.1	0	0	47.8	0	0	0	0	0	0	40.9	2.6	0	43.5	4.3	0	4.4	0	8.7	
Lights	70	866	0	0	936	0	0	0	0	0	0	806	52	0	858	86	1	84	1	172	1966
% Lights	95.9	97.3	0	0	97.2	0	0	0	0	0	0	97.7	100	0	97.8	100	100	95.5	100	97.7	97.5
Buses	0	14	0	0	14	0	0	0	0	0	0	9	0	0	9	0	0	2	0	2	25
% Buses	0	1.6	0	0	1.5	0	0	0	0	0	0	1.1	0	0	1	0	0	2.3	0	1.1	1.2
Trucks	3	10	0	0	13	0	0	0	0	0	0	10	0	0	10	0	0	2	0	2	25
% Trucks	4.1	1.1	0	0	1.3	0	0	0	0	0	0	1.2	0	0	1.1	0	0	2.3	0	1.1	1.2

Connecticut Counts LLC

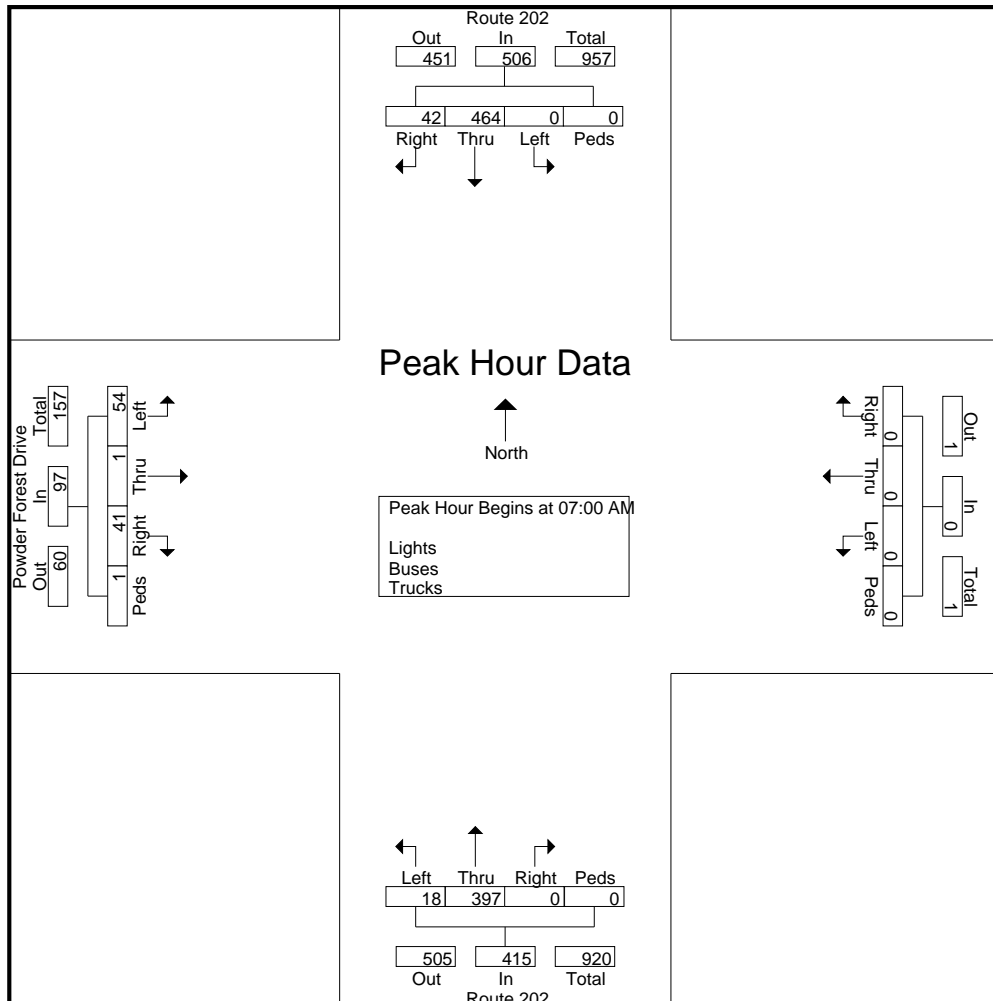
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23554
Site Code : 23554
Start Date : 10/26/2022
Page No : 2

Start Time	Route 202 From North					From East					Route 202 From South					Powder Forest Drive From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:00 AM

07:00 AM	7	129	0	0	136	0	0	0	0	0	0	93	2	0	95	9	0	16	0	25	256
07:15 AM	14	127	0	0	141	0	0	0	0	0	0	92	5	0	97	13	0	11	0	24	262
07:30 AM	11	117	0	0	128	0	0	0	0	0	0	96	3	0	99	15	0	15	0	30	257
07:45 AM	10	91	0	0	101	0	0	0	0	0	0	116	8	0	124	4	1	12	1	18	243
Total Volume	42	464	0	0	506	0	0	0	0	0	0	397	18	0	415	41	1	54	1	97	1018
% App. Total	8.3	91.7	0	0		0	0	0	0		0	95.7	4.3	0		42.3	1	55.7	1		
PHF	.750	.899	.000	.000	.897	.000	.000	.000	.000	.000	.000	.856	.563	.000	.837	.683	.250	.844	.250	.808	.971



Connecticut Counts LLC

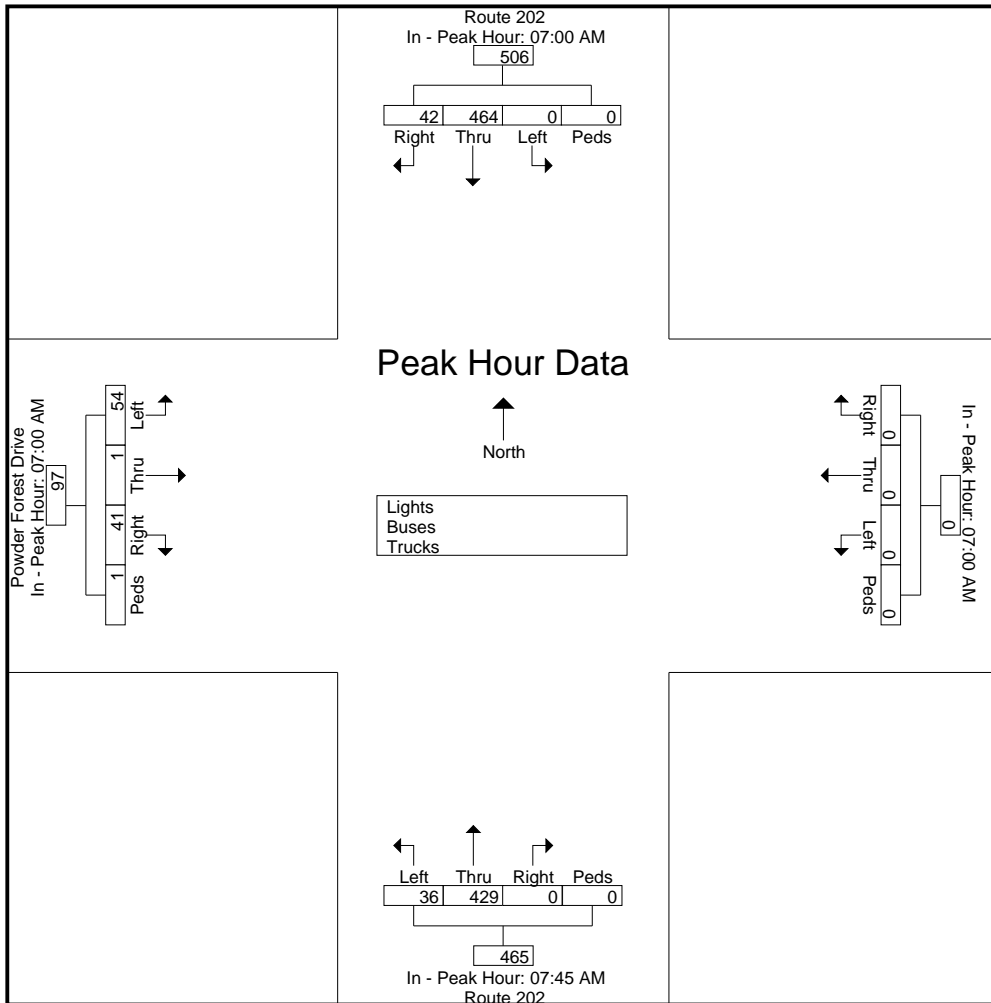
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23554
Site Code : 23554
Start Date : 10/26/2022
Page No : 3

Start Time	Route 202 From North					From East					Route 202 From South					Powder Forest Drive From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM					07:00 AM					07:45 AM					07:00 AM				
+0 mins.	7	129	0	0	136	0	0	0	0	0	0	116	8	0	124	9	0	16	0	25
+15 mins.	14	127	0	0	141	0	0	0	0	0	0	121	12	0	133	13	0	11	0	24
+30 mins.	11	117	0	0	128	0	0	0	0	0	0	95	10	0	105	15	0	15	0	30
+45 mins.	10	91	0	0	101	0	0	0	0	0	0	97	6	0	103	4	1	12	1	18
Total Volume	42	464	0	0	506	0	0	0	0	0	0	429	36	0	465	41	1	54	1	97
% App. Total	8.3	91.7	0	0		0	0	0	0		0	92.3	7.7	0		42.3	1	55.7	1	
PHF	.750	.899	.000	.000	.897	.000	.000	.000	.000	.000	.000	.886	.750	.000	.874	.683	.250	.844	.250	.808



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Route 202 at Powder Forest Drive
 Simsbury, Connecticut

File Name : 23555
 Site Code : 23555
 Start Date : 10/26/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Route 202 From North					From East					Route 202 From South					Powder Forest Drive From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	10	144	0	0	154	0	0	0	0	0	0	129	8	0	137	8	0	10	0	18	309
04:15 PM	8	123	0	0	131	0	0	0	0	0	0	129	8	0	137	9	0	9	0	18	286
04:30 PM	11	139	0	1	151	0	0	0	0	0	0	127	8	0	135	11	0	6	0	17	303
04:45 PM	12	118	0	0	130	0	0	0	0	0	0	160	10	0	170	11	0	9	0	20	320
Total	41	524	0	1	566	0	0	0	0	0	0	545	34	0	579	39	0	34	0	73	1218
05:00 PM	13	148	0	0	161	0	0	0	0	0	0	131	9	0	140	11	0	15	0	26	327
05:15 PM	14	141	0	0	155	0	0	0	0	0	0	140	9	0	149	5	1	8	0	14	318
05:30 PM	8	112	0	0	120	0	0	0	0	0	0	127	11	0	138	3	0	12	0	15	273
05:45 PM	12	101	0	0	113	0	0	0	0	0	0	118	11	0	129	10	0	7	0	17	259
Total	47	502	0	0	549	0	0	0	0	0	0	516	40	0	556	29	1	42	0	72	1177
Grand Total	88	1026	0	1	1115	0	0	0	0	0	0	1061	74	0	1135	68	1	76	0	145	2395
Apprch %	7.9	92	0	0.1		0	0	0	0		0	93.5	6.5	0		46.9	0.7	52.4	0		
Total %	3.7	42.8	0	0	46.6	0	0	0	0	0	0	44.3	3.1	0	47.4	2.8	0	3.2	0	6.1	
Lights	88	1020										1052									
% Lights	100	99.4	0	100	99.5	0	0	0	0	0	0	99.2	100	0	99.2	100	100	100	0	100	99.4
Buses	0	4	0	0	4	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	12
% Buses	0	0.4	0	0	0.4	0	0	0	0	0	0	0.8	0	0	0.7	0	0	0	0	0	0.5
Trucks	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
% Trucks	0	0.2	0	0	0.2	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0.1

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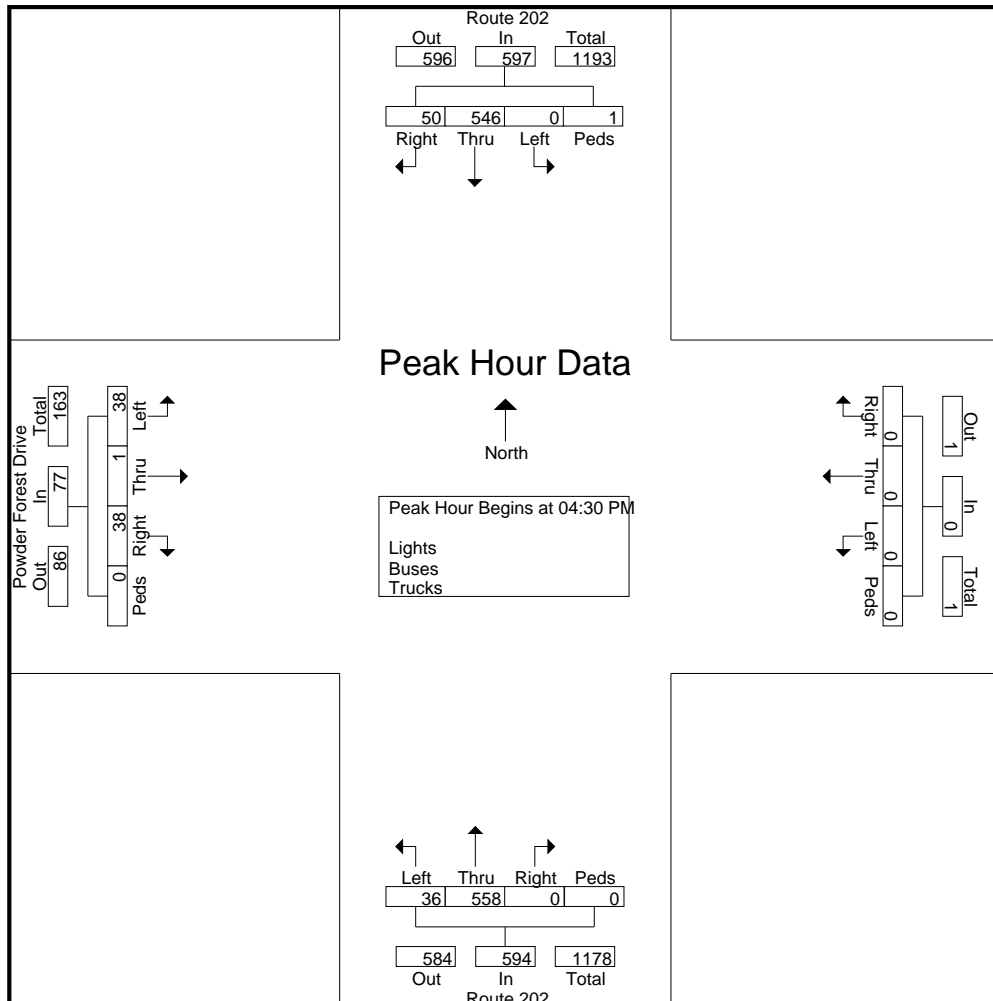
File Name : 23555
Site Code : 23555
Start Date : 10/26/2022
Page No : 2

Start Time	Route 202 From North					From East					Route 202 From South					Powder Forest Drive From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:30 PM

04:30 PM	11	139	0	1	151	0	0	0	0	0	0	127	8	0	135	11	0	6	0	17	303
04:45 PM	12	118	0	0	130	0	0	0	0	0	0	160	10	0	170	11	0	9	0	20	320
05:00 PM	13	148	0	0	161	0	0	0	0	0	0	131	9	0	140	11	0	15	0	26	327
05:15 PM	14	141	0	0	155	0	0	0	0	0	0	140	9	0	149	5	1	8	0	14	318
Total Volume	50	546	0	1	597	0	0	0	0	0	0	558	36	0	594	38	1	38	0	77	1268
% App. Total	8.4	91.5	0	0.2		0	0	0	0		0	93.9	6.1	0		49.4	1.3	49.4	0		
PHF	.893	.922	.000	.250	.927	.000	.000	.000	.000	.000	.000	.872	.900	.000	.874	.864	.250	.633	.000	.740	.969



Connecticut Counts LLC

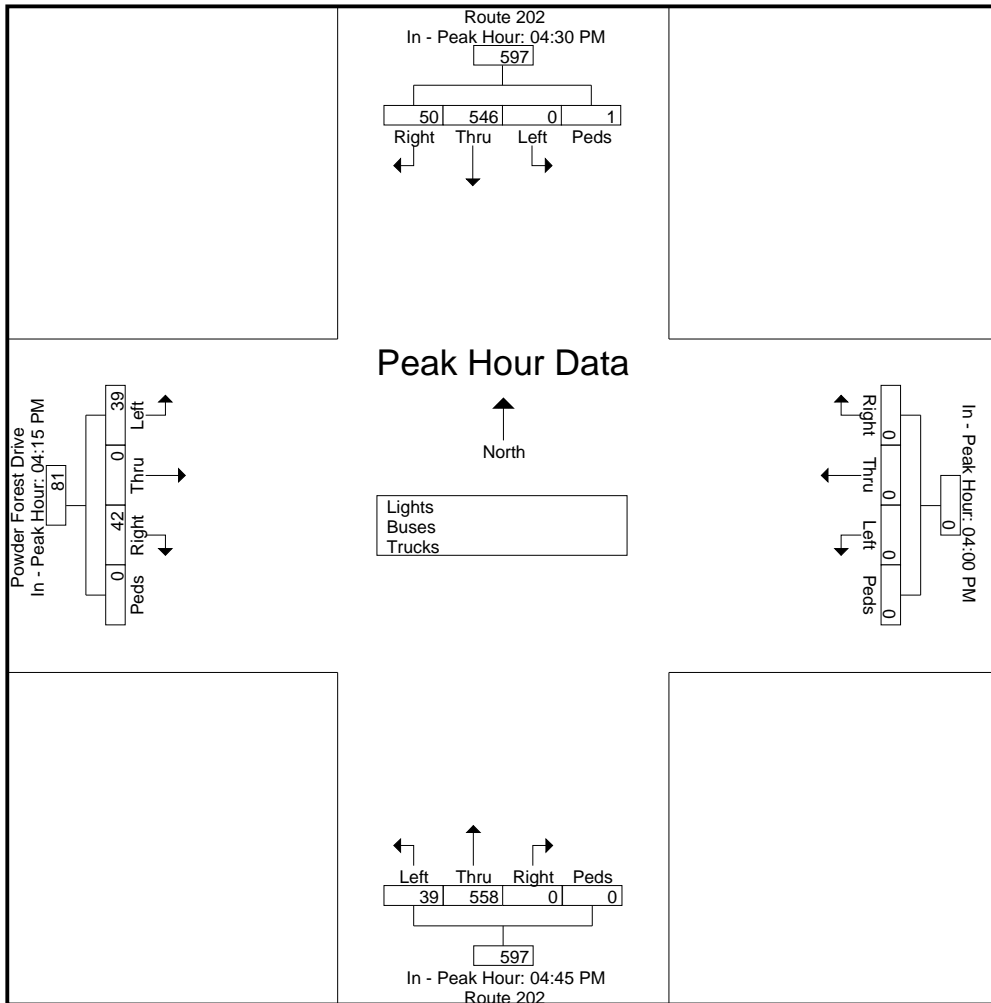
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23555
Site Code : 23555
Start Date : 10/26/2022
Page No : 3

Start Time	Route 202 From North					From East					Route 202 From South					Powder Forest Drive From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM					04:00 PM					04:45 PM					04:15 PM				
+0 mins.	11	139	0	1	151	0	0	0	0	0	0	160	10	0	170	9	0	9	0	18
+15 mins.	12	118	0	0	130	0	0	0	0	0	0	131	9	0	140	11	0	6	0	17
+30 mins.	13	148	0	0	161	0	0	0	0	0	0	140	9	0	149	11	0	9	0	20
+45 mins.	14	141	0	0	155	0	0	0	0	0	0	127	11	0	138	11	0	15	0	26
Total Volume	50	546	0	1	597	0	0	0	0	0	0	558	39	0	597	42	0	39	0	81
% App. Total	8.4	91.5	0	0.2		0	0	0	0		0	93.5	6.5	0		51.9	0	48.1	0	
PHF	.893	.922	.000	.250	.927	.000	.000	.000	.000	.000	.000	.872	.886	.000	.878	.955	.000	.650	.000	.779



Appendix F

Crash Data Records

Uconn Crash Data

446 Hopmeadow Street Multi-Family Housing
Simsbury, Connecticut
January 1, 2019 - December 31, 2021

Date Of Crash	Time of Crash	Severity	No. Of		Town	Mileage	Intersecting Roadway		Collision Type	Weather	Light Condition	Road Surface	Contributing	Contributing Circumstances
			Veh.	Motorists			Condition	Circumstances				Roadway		
01) Route 10/202 (Hopmeadow Street) at Powder Forest Drive														
6/24/2019	6:39:00	PDO	2	0	Simsbury	43.6	10-N		Front to rear	Clear	Daylight	Dry	Animal(s) in Roadway	None
11/5/2019	17:35:00	PDO	2	0	Simsbury	43.56	10-N		Sideswipe, same direction	Clear	Dark-Lighted	Dry	None	None
12/19/2019	22:25:00	PDO	1	0	Simsbury	43.58	10-N	POWDER FOREST DR	Non Fixed Object	Clear	Dark-Lighted	Dry	Animal(s) in Roadway	None
7/28/2021	18:03:00	PDO	1	0	Simsbury	43.75	10-N		Fixed Object	Clear	Daylight	Dry	None	None

PDO - Property Damage Only