

To:	Aaron Martin, P.E.	From:	Sean Neely
	Town of Essex, VT		South Burlington
Project/File:	Essex Traffic Study Review	Date:	June 20, 2025

Reference: Proposed Delivery Station, Kimo Drive, Essex, VT

A peer review of the Traffic Impact Statement (TIS) prepared by Langan dated January 30, 2025 (attached) for the subject package delivery facility was completed. This TIS was supplemental to the TIS prepared for Saxon Hill Industrial Park (SHIP) Phase II by Wall Consultant Group (WCG) dated September 5, 2024 (attached) for the subdivision that includes this package delivery facility. Review comments and recommendations are provided below.

Project Description

Scannell Properties (Scannell) proposes to build a one-story package delivery station with associated site improvements, including parking lots for passenger vehicles, delivery vans, and tractor trailers. The proposed project will be located on two of the six parcels within the SHIP Phase II industrial subdivision. Lot 13 occupies approximately 4.0 acres and Lot 14 occupies approximately 18.9 acres for a total of approximately 22.9 acres of the approved SHIP Phase II subdivision (approximately 38.2 acres). The proposed project is depicted on plans dated January 2, 2025 and prepared by O'Leary-Burke Civil Associates, PLC, included with the attached TIS. The proposed facility includes an approximately 107,000 SF building, with parking for 271 delivery vans, 5 tractor trailers, 5 box trucks, and 11 loading docks. Four driveways will provide site access from Kimo Drive, the proposed public roadway connecting to VT 117. Employee and delivery van parking will be accessed by the two most southerly driveways. Loading docks will be accessed by the next driveway to the north. Delivery van egress will be provided by the most northerly driveway.

Comparison to SHIP Phase II TIS

The Langan TIS incorporates the WCG TIS by default, with supplemental updates specific to the proposed delivery station. The WCG TIS provides a sound and professional analysis of the SHIP Phase II development.

The WCG TIS recommends certain improvements which this peer review supports. Specifically, an eastbound left turn lane at the intersection of Kimo Drive and VT 117 is recommended. Kimo Drive should also include an off-road shared use path, similar to the existing shared use path along Thompson Drive.

The supplemental analysis methodology Langan employed is generally adequate. However, it is recommended that Langan evaluate their development's impacts on the intersection of Kimo Drive and VT 117, in comparison to the evaluation WCG provided for the SHIP Phase II TIS. Specifically, to analyze changes in impacts due to exceeding the trip allowance from the WCG study for exiting vehicles in the AM

Reference: Essex Traffic Study Review

peak hour and entering vehicles in the PM peak hour. With the proposed development exceeding directional trips from the SHIP Phase II TIS, the intersection of Kimo Drive and VT 117 may see different operations than the WCG analysis.

Report Comments

In general, the Langan TIS was completed consistent with standard professional practices including reasonable assumptions leading to valid technical analyses. Comments relative to individual elements of the report are provided below.

Land Use Category

The Institute of Transportation Engineers (ITE) land use code (LUC) used for the SHIP Phase II TIS prepared by WCG was LUC 130: Industrial Park. This land use code is appropriate for the SHIP Phase II TIS given its general inclusion of industrial park activities. The Langan TIS used LUC 156: High-Cube Parcel Hub Warehouse. This land use code is appropriate as it is specific to the operations of the proposed development compared to other ITE LUCs. From the ITE description for this land use code:

A high-cube parcel hub warehouse typically serves as a regional and local freight-forwarder facility for time sensitive shipments via airfreight and ground carriers.

Considerations of this land use code include the low number of studies (4) to develop the trip generation numbers and its use for buildings that are typically a minimum of 200,000 gross square feet, compared to approximately 107,000 SF for the subject facility. However, the other closest matching ITE land use code (LUC 155: High-Cube Fulfillment Center Warehouse – Sort) is based on only three (3) studies, and other relevant ITE land use codes are also used for buildings that are typically a minimum of 200,000 gross square feet.

Trip Generation

The SHIP Phase II TIS used an assumed Floor Area Ratio (FAR) to estimate the building sizes within the subdivision based on parcel size, given the specific developments were unknown at the time of study.

$$\text{FAR} = \text{Gross Floor Area} / \text{Land Area}$$

The FAR for existing SHIP developments along Thompson Drive, at the time of the SHIP Phase II TIS, was increased by 75%, to be conservative, and applied to the SHIP Phase II subdivision.

Applying this assumed FAR to the parcels within the SHIP Phase II subdivision, the WCG TIS estimated total building square footage (528,1000 SF) and applied the average trip generation rate based on ITE LUC 130, for a total of 180 AM peak period trips and 180 PM peak period trips.

Langan used the proposed building square footage for the package delivery facility (107,000 SF) and applied the average trip generation rate based on ITE LUC 156, for a total of 75 AM peak period trips and 68 PM peak period trips. Langan then increased these trip generation values by 20%, to be conservative, for a total of 90 AM peak period trips and 99 PM peak period trips. While the total overall trips generated are within the total trips approved as part of the SHIP Phase II TIS, **directional trips exceed the SHIP**

Reference: Essex Traffic Study Review

Phase II TIS, as previously mentioned. Specifically, Langan estimates **10 more exiting trips in the AM peak hour and 15 more entering trips in the PM peak hour than were approved for the SHIP Phase II TIS**.

While some aspects of the trip generation have additional capacity for the Kimo Drive subdivision after this specific development, there would be no to negative capacity for exiting traffic in the AM peak hour, nor for entering traffic in the PM peak hour for remaining vacant parcels.

Findings and Recommendations

Langan's TIS findings conclude, "The anticipated traffic to be generated by the proposed delivery station falls under the total allotted trip generation estimates under the Transportation Impact Study prepared for the SHIP Phase II subdivision." Based on Stantec's review and understanding of WCG's SHIP Phase II Study and Langan's trip generation analysis, they will be exceeding the values in specific directional trips that were estimated in the SHIP Phase II Study. Based on the WCG's SHIP Phase II Study, **Stantec recommends Langan assess the operations and potential mitigation at the intersection of VT 117 and Kimo Drive with this development**. This assessment will not only assist with identifying operations related to this development, but the capacity remaining upon its completion.

In addition, **traffic monitoring of actual trips to and from the proposed facility should be considered for 12 months after the facility is operational**, to compare to those trip numbers forecasted in the Langan TIS. If actual trip numbers are significantly higher than those forecasted, additional mitigation measures should be considered.

Please contact us if you have any questions or would like to discuss.

Regards,

Stantec Consulting Services Inc.



Sean Neely
Associate
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Attachments: Proposed Delivery Station TIS; SHIP Phase II TIS

555 Long Wharf Drive New Haven, CT 06511 T: 203.562.5771 F: 203.789.6142

To: Essex, Vermont Planning & Zoning

From: Christopher McLean, P.E., SITES AP

CC: O'Leary-Burke Civil Associates

Date: 30 January 2025

Re: Traffic Impact Statement
Proposed Delivery Station
Kimo Drive
Essex, Vermont
Langan Project No.: 140287401

Langan Engineering & Environmental Services, Inc. (Langan) has evaluated traffic operations for the proposed package delivery station on Kimo Drive in Essex, Vermont. Scannell Properties ("Scannell") proposes to construct a single-story, package delivery facility with surface-level car, van and trailer parking and associated site improvements.. Our analysis supplements the findings of the Saxon Hill Industrial Park Phase II – Transportation Impact Study prepared by Wall Consultant Group dated 5 September 2024 for the subdivision.

PROJECT DESCRIPTION

The project site occupies of two parcels within the Saxon Hill Industrial Park ("SHIP") Phase II subdivision. The subdivision is depicted on plans entitled "Saxon Hill Industrial Park ("SHIP") Phase II Six Lot Industrial Subdivision prepared by O'Leary-Burke Civil Associates, PLC dated 1/2/2025. The project site is located on two lots within the subdivision: lots 14 (±18.9 acres) and 13 (±4.0 acres) totaling approximately ±22.9 acres¹. The site is bordered by undeveloped woodland to the north and east, a solar panel farm to the south, and undeveloped Lots 10, 11 and 12 of the SHIP subdivision to the west.

Scannell proposes to construct a single-story, ±107,000 square-foot footprint package delivery station on the site. The facility includes 211 car parking stalls, 271 van parking stalls, 5 trailer parking stalls, 5 box truck parking stalls, and 11 loading docks. The site will be accessed via four driveways off Kimo Drive. The two southern driveways are full access for employees and vans.

¹ Lots 13 and 14 are referred to as lots 4 and 5 in the Wall Consultant Group traffic study. These lots will be combined into a single Lot 13 as part of the Final Subdivision Approval.

The next driveway to the north services the loading docks, exclusively. The northernmost driveway is primarily for van egress. The site plan is provided in the attachments.

SITE OPERATIONS

There are three distinct parking and loading areas on the site. The southeast lot provides 271 van parking spaces. This lot is accessed from the southernmost driveway. Vans are stored in the lot overnight. Delivery drivers take the van from the lot to the loading area on the east side of the facility. Once loaded the vans leave via the northernmost, exit-only driveway. Employees and visitors park in the lot immediately south of the facility. This area is served by an exclusive full access driveway along the west side of the building. Tractor trailer and single-unit vehicle (box truck) deliveries are isolated on the north side of the building via a separate full access driveway.

Tractor trailers are expected to deliver packages to the facility overnight. Associates working in the facility will then sort the boxes into individual routes. Van drivers will arrive in their personal vehicles during the day, park and switch to a van. They will drive the vans from the van parking area to the building, where the vans are loaded with the packages for their route. Once complete with their route and at the end of their shift, the van drivers will return to the facility and switch back to their personal vehicle and leave the facility.

TRIP GENERATION

The trip generation for the proposed delivery station was compared to total estimate for the SHIP Phase II subdivision as presented in the Wall Consultant Group September 2024 traffic study. The trip generation for the approved subdivision and the project's parcels were estimated using trip generation data contained in the ITE *Trip Generation Manual*, 11th Edition². In the SHIP II subdivision study, Land Use Code (LUC) 130 – *Industrial Park* was used to estimate the trip generation of the entire subdivision. The WCG study assumed floor area ratio (FAR) of 0.32 and applied it to the overall subdivision acreage resulting in an estimated overall building area of 528,100 square-feet (SF) for the entire subdivision. The total allotted building square-footage was then used to calculate peak hour trips using ITE.

The delivery station's anticipated trip generation for the project was estimated using LUC 156 – *High-Cube Parcel Hub Warehouse* as it most closely represents the planned use. Additionally, we applied a 20% increase to the ITE trip generation estimates as a conservative measure. The intent of the adjustment is to provide a buffer for potential tenant-specific traffic schedule due to its nature of being a newer facility with less empirical data than a typical delivery station. The

² Trip Generation Manual, 11th Edition published by the Institution of Transportation Engineers (ITE).

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Proposed Delivery Station
Essex, Vermont
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resulting trip generation estimates and comparisons during the AM and PM peak hour periods can be seen below in **Table 1**.

TABLE 1 ANTICIPATED TRIP GENERATION – ESSEX, VT DELIVERY STATION							
USE	LAND USE CODE¹	AM PEAK HOUR			PM PEAK HOUR		
		ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
SHIP Subdivision Trip Gen (528,100 SF)	130 ²	145	34	180	40	140	180
Proposed Delivery Station (107,000 SF)	156 ³	38	37	75	46	22	68
Adjustment Escalation (20%)		8	7	15	9	4	13
Proposed Delivery Station (107,000 SF)	156 ³	46	44	90	55	26	81
Remaining Trips		99	-10	90	-15	114	99

¹ Land Use Codes based on ITE Trip Generation Manual 11th Edition

² Volume based on ITE Trip Generation Manual 11th Edition: Land Use Code 130: Industrial Park as presented in the September 2024 SHIP II Subdivision traffic study by WCG

³ Volume based on ITE Trip Generation Manual 11th Edition: Land Use Code 156: High-Cube Parcel Hub Warehouse

The resulting trip generation calculations indicate that the proposed delivery station will generate 90 total morning peak hour trips (46 in, 44 out) and 82 total afternoon peak hour trips (55 in, 26 out). Although the enter/exit distribution of trips may exceed their respective allotment from the approved Transportation Impact Study for the SHIP subdivision, the total overall traffic to be generated by the proposed delivery station during the AM and PM peak hours falls within the total approved trips.

Employees and van drivers are expected to be hired from the greater Essex area and will arrive from and delivery to the surrounding area. Vans will provide deliveries to the west via Route 117 and Route 15 and to the south/east via Route 117 and I-89. The proposed trip distribution is similar to the approved trip distribution for the overall SHIP subdivision, which expects employees to arrive/depart from the greater Essex area. Therefore, no revisions to the subdivision trip distribution is proposed as part of this traffic statement.

SAFETY ANALYSIS

Intersection Sight Distance

Langan evaluated the sight distances at the site driveways on Thompson Drive to determine if the available sight distances meet the minimum requirements established in the AASHTO publication titled *A Policy on Geometric Design of Highways and Streets 7th Edition*³.

Intersection sight distance is the distance a vehicle stopped on the minor leg of an intersection is required to see in each direction on the major road to provide enough time to make a turn. The calculation uses the design speed of the major road, the distance the stopped vehicle is required to travel across lanes, and reaction times based on the design vehicle. The sight triangle is measured from the driver's eye 3.5 feet above the road surface and 15 feet behind the edge of the traveled way. The driver must see an object 3.5 feet off the ground in the distance. A clear sight triangle is established within based on these measurements.

The site driveway's are proposed to provide access to the new Kimo Drive to be constructed under the SHIP subdivision. Due to the nature of the subdivision and the anticipated users, an assumed speed limit for the new industrial park was determined to be 25 MPH. Based on this, a design speed of 30 MPH was selected (5 MPH over assumed posted speed limit). A summary of the available and required sight distances at the site driveways (numbered one through four from north to south) can be seen below in **Table 2**.

³ A Policy on Geometric Design of Highways and Streets, 7th Edition published by the American Association of State Highway and Transportation Officials (AASHTO) in 2018

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TABLE 2 INTERSECTION SIGHT DISTANCE SUMMARY			
LOCATION	Design Speed	Intersection Sight Distance	
		Required	Provided
Driveway 1 Looking Right Looking Left	30 mph	335' 335'	335' 400'
Driveway 2 Looking Right Looking Left	30 mph	335' 335'	350' 750'
Driveway 3 Looking Right Looking Left	30 mph	335' 335'	355' 550'
Driveway 4 Looking Right Looking Left	30 mph	335' 335'	490' 390'

As shown, the intersection sight distances (ISDs) provided at the site driveways for exiting vehicles meet AASHTO's minimum requirements. In instances where sight lines are required to cross over the development's property, unobstructed sight triangles will be ensured by the developer.

CONCLUSION

This assessment investigates the potential traffic impacts generated by the proposed delivery station on Kimo Drive in Essex, Vermont on the surrounding area roadway network. Our evaluation indicates that the existing roadway infrastructure within the project vicinity has the capacity to accommodate the traffic generated by the site. The anticipated traffic to be generated by the proposed delivery station falls under the total allotted trip generation estimates under the Transportation Impact Study prepared for the SHIP Phase II subdivision.

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- Essex, VT - Traffic Statement.docx

ZONING REQUIREMENTS			
ZONE: RPD-1 40% = RESOURCE PRESERVATION DISTRICT INDUSTRIAL			
PARCEL AREA: ±999,266 SF = ±2.24 AC			
	REQUIRED	PROPOSED	SECTION
MINIMUM LOT AREA	40,000 SF	999,266 SF	TABLE 2.14
MINIMUM LOT FRONTAGE	200'	1,669'	TABLE 2.14
MINIMUM SETBACK FRONT	50'	97.3'	TABLE 2.14
MINIMUM SETBACK/SIDE	25'	301.6'	TABLE 2.14
MINIMUM SETBACK/REAR	25'	143.6'	TABLE 2.14
MAXIMUM LOT COVERAGE	60.0%	55.2%	TABLE 2.14
MAXIMUM HEIGHT	45' 31"	31'	TABLE 2.14

NOTES:
1. LOT MAXIMUM COVERAGE = $\pm(501,782/999,266) * 100 = 50.2\%$

PARKING REQUIREMENTS			
ITEM	REQUIRED	PROPOSED	SECTION
MIN. PARKING SPACE DIMENSIONS REQUIRED	9'x18'	9'x18' (MIN)	SECTION 3.9 (A)
NUMBER OF PARKING ¹ SPACES REQUIRED	268 SPACES	482 SPACES	SECTION 3.9 (B)
NUMBER OF ACCESSIBLE PARKING SPACES REQUIRED	9 SPACES	9 SPACES	SECTION 3.9 (H)
NUMBER OF LOADING ² SPACES REQUIRED	11 SPACES	11 SPACES	SECTION 3.9(J)

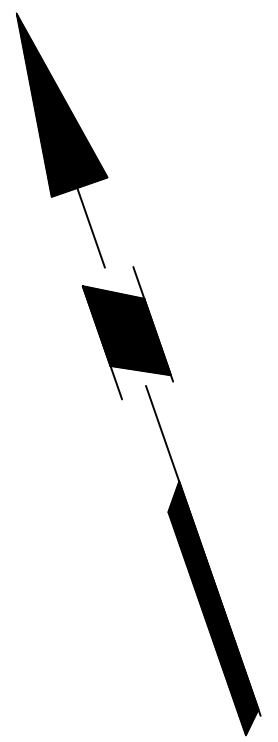
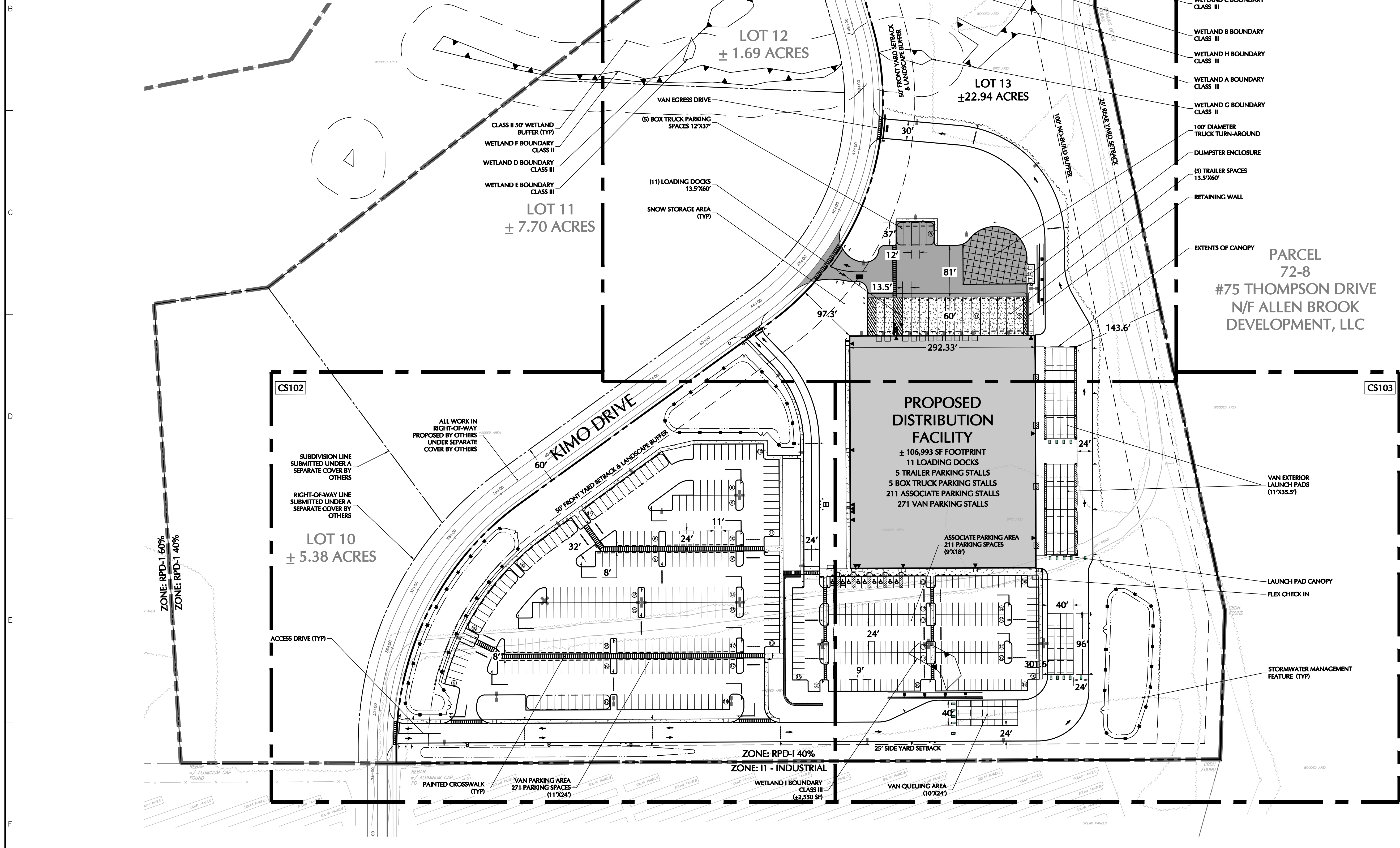
NOTES:

PER SECTION 3.9(B), PARKING SPACES REQUIRED FOR A DISTRIBUTION FACILITY: 1 SPACE FOR EVERY 400 GROSS SF OF FLOOR SPACE OR 2 SPACES FOR EVERY 3 EMPLOYEES.

1. $1 \text{ SPACE}/400 \text{ SF} * 106,993 \text{ SF} = 268 \text{ SPACES}$

PER SECTION 3.9(J), WHOLESALE, MANUFACTURING, WAREHOUSING, AND TRUCKING USES—ONE (1) LOADING SPACE OF AT LEAST 1,000 SF FOR EACH 10,000 SF OF GROSS FLOOR AREA.

2.1. $1 \text{ SPACES}/10,000 \text{ SF} * 106,993 \text{ SF} = 11 \text{ SPACES}$



Date	Description	No.
Revisions		
Signature		Date
LANGAN		
Langan Engineering & Environmental Services, Inc.		
555 Long Wharf Drive, 9th Floor New Haven, CT 06511		
T: 203.562.5771	F: 203.789.6142	www.langan.com
Project		
PROJECT MOOSE		
ESSEX		
CHITTENDEN COUNTY	VERMONT	
Drawing Title		
OVERALL SITE PLAN		
Project No. 140278401		Drawing No. CS100
Date 01/30/2025		
Drawn By BCP		
Checked By TSO		

Land Use: 156

High-Cube Parcel Hub Warehouse

Description

A high-cube warehouse (HCW) is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. A typical HCW has a high level of on-site automation and logistics management. The automation and logistics enable highly-efficient processing of goods through the HCW. A high-cube warehouse can be free-standing or located in an industrial park.

A high-cube parcel hub warehouses typically serves as a regional and local freight-forwarder facility for time sensitive shipments via airfreight and ground carriers. A site can also include truck maintenance, wash, or fueling facilities. Some limited assembly and repackaging may occur within the facility.

A high-cube warehouse may contain a mezzanine. In a HCW setting, a mezzanine is a free-standing, semi-permanent structure that is commonly supported by structural steel columns and that is lined with racks or shelves. The gross floor area (GFA) values for the study sites in the database for this land use do NOT include the floor area of the mezzanine. The GFA values represent only the permanent ground-floor square footage.

The amount of office/employee welfare space that is provided within a HCW can be highly variable but is typically an insignificant portion of the overall building square footage. Within the trip generation database, common values are between 3,000 and 5,000 square feet for a Cold Storage HCW and between 5,000 and 10,000 square feet for Transload, Fulfillment Center, and Parcel Hub HCW (all of which are less than one percent of total GFA for a site). Therefore, for the trip generation data plots, any office space that is part of the normal operation of the warehouse is included in the total GFA.

Warehousing (Land Use 150), high-cube transload and short-term storage warehouse (Land Use 154), high-cube fulfillment center warehouse (Land Use 155), and high-cube cold storage warehouse (Land Use 157) are related land uses.

Additional Data

The High-Cube Warehouse/Distribution Center-related land uses underwent specialized consideration through a commissioned study titled "High-Cube Warehouse Vehicle Trip Generation Analysis," published in October 2016. The results of this study are posted on the ITE website at <http://library.ite.org/pub/a3e6679a-e3a8-bf38-7f29-2961becdd498>.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip

generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 2010s in California, Connecticut, and Minnesota.

Source Numbers

869, 892, 941, 1001, 1011

High-Cube Parcel Hub Warehouse (156)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 4

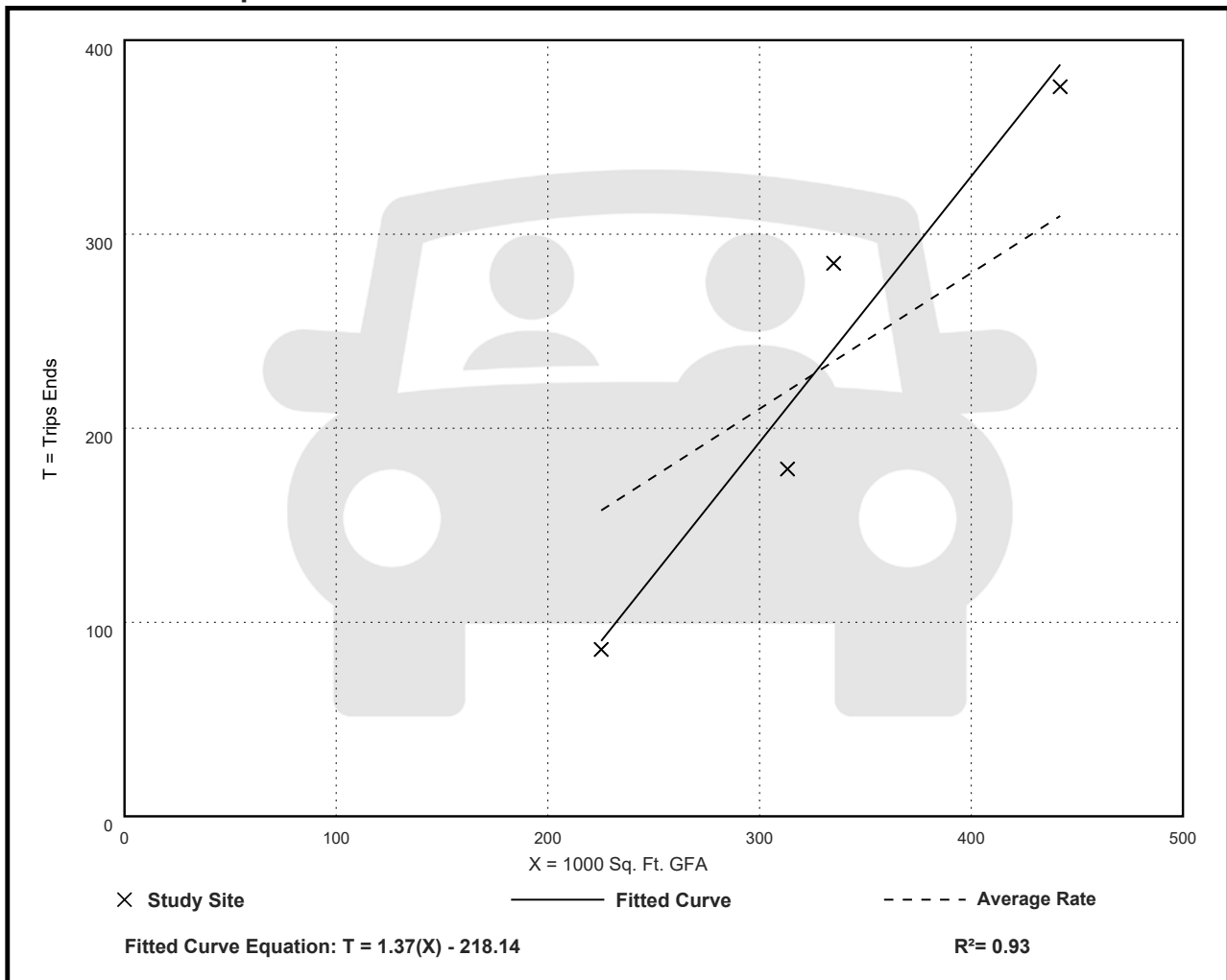
Avg. 1000 Sq. Ft. GFA: 329

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.70	0.38 - 0.85	0.21

Data Plot and Equation



High-Cube Parcel Hub Warehouse (156)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 4

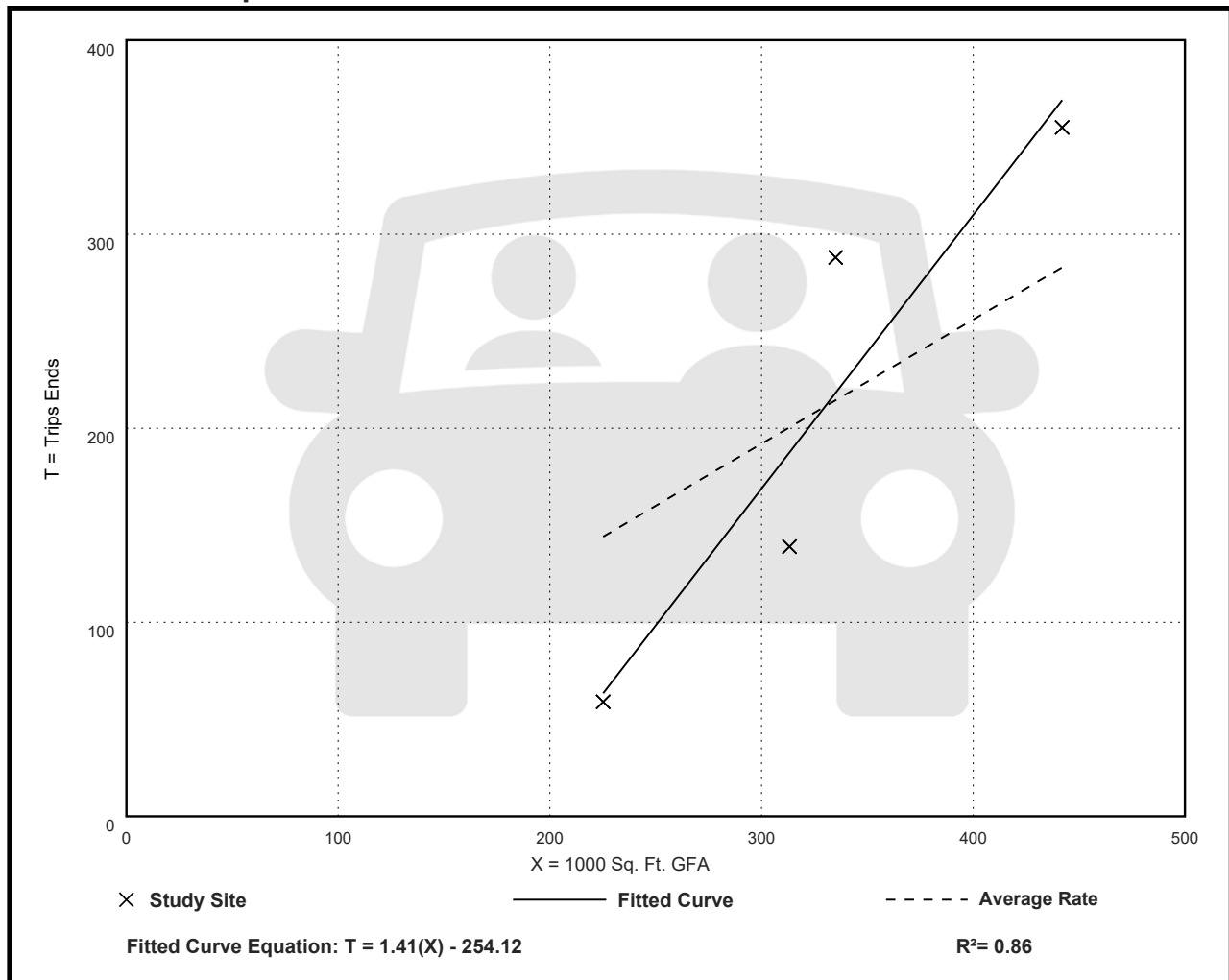
Avg. 1000 Sq. Ft. GFA: 329

Directional Distribution: 68% entering, 32% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.64	0.26 - 0.86	0.27

Data Plot and Equation



Date: 5 September 2024
To: Allen Brook Development c/o Al Senecal
From: Corey Mack, PE, PTOE, Consultant Transportation Engineer
Subject: Saxon Hill Industrial Park Phase II – Transportation Impact Study

WCG has reviewed the proposed development of the Saxon Hill Industrial Park Phase II in Essex, Vermont. WCG has prepared the following assessment of the likely transportation impacts in accordance with the Town of Essex Official Zoning Regulations (OZR) effective 9 October 2023, Town of Essex Standard Specifications for Construction Section 220 Traffic Studies dated January 2017, Transportation Impact Study Guidelines from the Vermont Agency of Transportation (VTrans), and standard engineering practices outlined by the Institute of Transportation Engineers (ITE) and other sources.

This TIS includes the following analysis:

1. [Proposed Project Parameters](#), including the project description and trip generation estimates.
2. [Existing Roadway Context](#), describing the existing road network and crash history.
3. [Traffic Projections](#), including traffic adjustments, trip distribution, other development volumes, and documentation of estimated operating conditions.
4. [Capacity Analyses](#), including definition of the capacity and performance measures and a summary of the capacity analysis results.
5. [Bicycle, Pedestrian, and Transit Access](#) to the site.
6. [Recommendations and Mitigation](#), including the estimated transportation impact fee.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

- The Saxon Hill Industrial Park (SHIP) Phase II project proposes to construct a five-lot industrial park with access directly to VT-117 via a new public road along the existing alignment of the site driveway / haul road. Future development of the SHIP may extend the proposed future road to the current terminus of Thompson Drive.
- The proposed project is expected to generate 180 new external vehicle trip ends in the AM and PM peak hours.
- VTrans guidelines specify that a traffic study should be considered if the proposed development will generate 75 or more new peak hour trips.
- Capacity analyses of the no build and build scenarios in build year and planning year scenarios indicate:

- The proposed project will have a negligible impact on the performance of the VT-117 & Sand Hill Road and the VT-117 & Site Access intersections.
- VT-117 & North Williston Road is overcapacity in the no-build scenario, and a capacity-improving project is scheduled to be completed in 2027. Upon completion of the capacity-improving project, the VT-117 & North Williston Road intersection is expected to operate acceptably in the no-build and build scenarios.
- An eastbound left turn lane at VT-117 into the future public roadway / existing site access is warranted by volume in the full build condition and recommended for installation. The volume warrant is met with 38 eastbound left turning vehicles in the morning peak hour. This turning demand is estimated at the 44% build threshold, or roughly 225,000 SF of occupied industrial park GFA. The warranting volume and criteria may be reevaluated as the individual lots are constructed.
- The proposed public road should include an off-road shared use path of similar design to the existing path along Thompson Drive, or at least secure the rights of way for future construction of an off-road shared use path of similar design.
- There are five Act 145 fee-generating projects within 5 road miles of the proposed project. The estimated Act 145 impact fee is \$167,474.
- As the site plans develop, the site design team should consider including convenient bicycle parking racks within each development lot.
- As the site plans develop, the site design team should avoid low growing shrubs, plantings, signs, or other features that may impact sight lines at the stop-controlled intersection on VT-117 and at intersections along the new public roadway.

Based on the analysis conducted for this report, the proposed project is not expected to impact the condition or capacity of the affected roads and associated infrastructure. The proposed project will not cause or exacerbate any unreasonable congestion or unsafe conditions on the local roadway network and will not unnecessarily or unreasonably endanger the public's investment in any local roads, highways, or related infrastructure.

PROJECT PARAMETERS

Allen Brook Development is proposing the development of Saxon Hill Industrial Park (SHIP) Phase II, which includes the subdivision and construction of five industrial park lots, including construction of a new public road and offset 5-foot wide sidewalk to serve the industrial park. The proposed new public road follows the alignment of the existing driveway and haul road serving 243 / 245 River Road and the existing solar array. The existing driveway / haul road intersects with VT-117 near mile marker 3.40. Future phases of development within the park may include extension of the proposed new public road to the current terminus at Thompson Drive.

The proposed site development program SHIP Phase II is currently unknown. One concept layout is illustrated on the Lot 3 site plan, showing a roughly 33,000 SF building on a 4.7-acre lot, with an associated floor area ratio (FAR) of 0.16. A portion of the existing SHIP along Thompson Drive consists of seven lots totaling 495,000 square feet over 66.7 acres, for an associated FAR of 0.18.

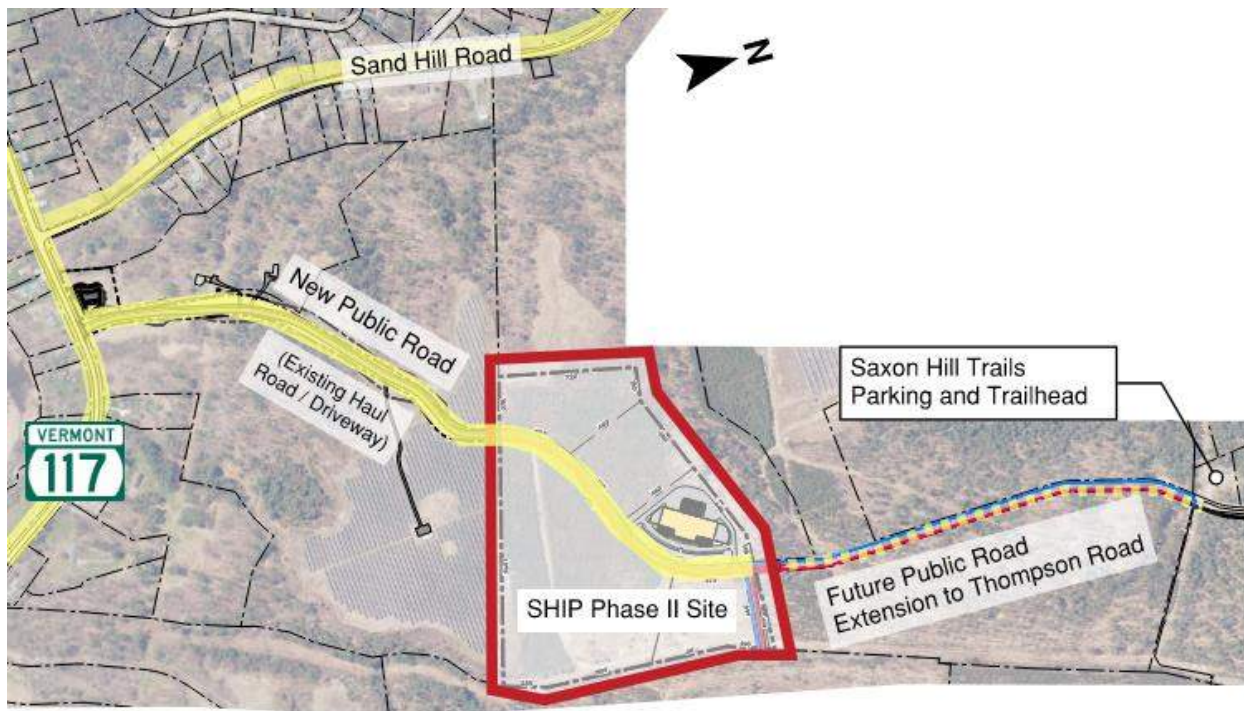
Assuming a 75% increase in the Thompson Drive FAR for a denser design (and more conservative estimate of trip generation), the estimated building floor area per lot is detailed in Table 1.

TABLE 1: ESTIMATED BUILDING FLOOR AREA PER LOT

	Lot Size (AC)	Est. Building Size (SF) (FAR 0.32)
Lot 1	4.7	65,000
Lot 2	4.7	65,000
Lot 3	5.4	74,700
Lot 4	4.4	60,800
Lot 5	19.0	262,600
Total SHIP Phase II Building Floor Area (SF)		528,100

The total estimated floor area of the SHIP Phase II development, assuming a 75% increase in density over the existing SHIP buildings, is 528,100 SF.

FIGURE 1: PROPOSED SITE PLAN (O'LEARY BURKE CIVIL ASSOCIATES DATED 2/21/2023) WITH WCG MARKUP



Estimated Trip Generation

Trip generation refers to the number of vehicle trips originating at or destined for a particular land use development. Data from the Institute of Transportation Engineers (ITE) can be applied to estimate base vehicle trip generation associated with the existing and proposed land uses. Base vehicle trips are the total estimated vehicle trips prior to any reductions associated with internal capture, pass-by, or transportation demand management (TDM) practices. For this proposed land use, adjustments to the base vehicle trip generation is not recommended.

The ITE Trip Generation Manual, 11th Edition, includes trip generation data for land use code (LUC) 130: Industrial Park, described as:

An industrial park contains several individual industrial or related facilities. It is characterized by a mix of manufacturing, service, and warehouse facilities with a wide variation in the proportion of each type of use from one location to another. Many industrial parks contain highly diversified facilities. Some parks in the database have a large number of small businesses and others have one or two dominant industries.

The estimated base vehicle trip generation of the proposed site is detailed in Table 2.

TABLE 2: ESTIMATED BASE VEHICLE TRIP GENERATION OF THE PROPOSED SITE

Saxon Hill Industrial Park Phase II				AM Peak Hour			PM Peak Hour			Weekday
Proposed Build				Base			Base			Base
ITE LUC	Description	Size	Unit	Enter	Exit	Total	Enter	Exit	Total	Total
130	Industrial Park	528.1	1,000 SF GFA	145	34	180	40	140	180	2231

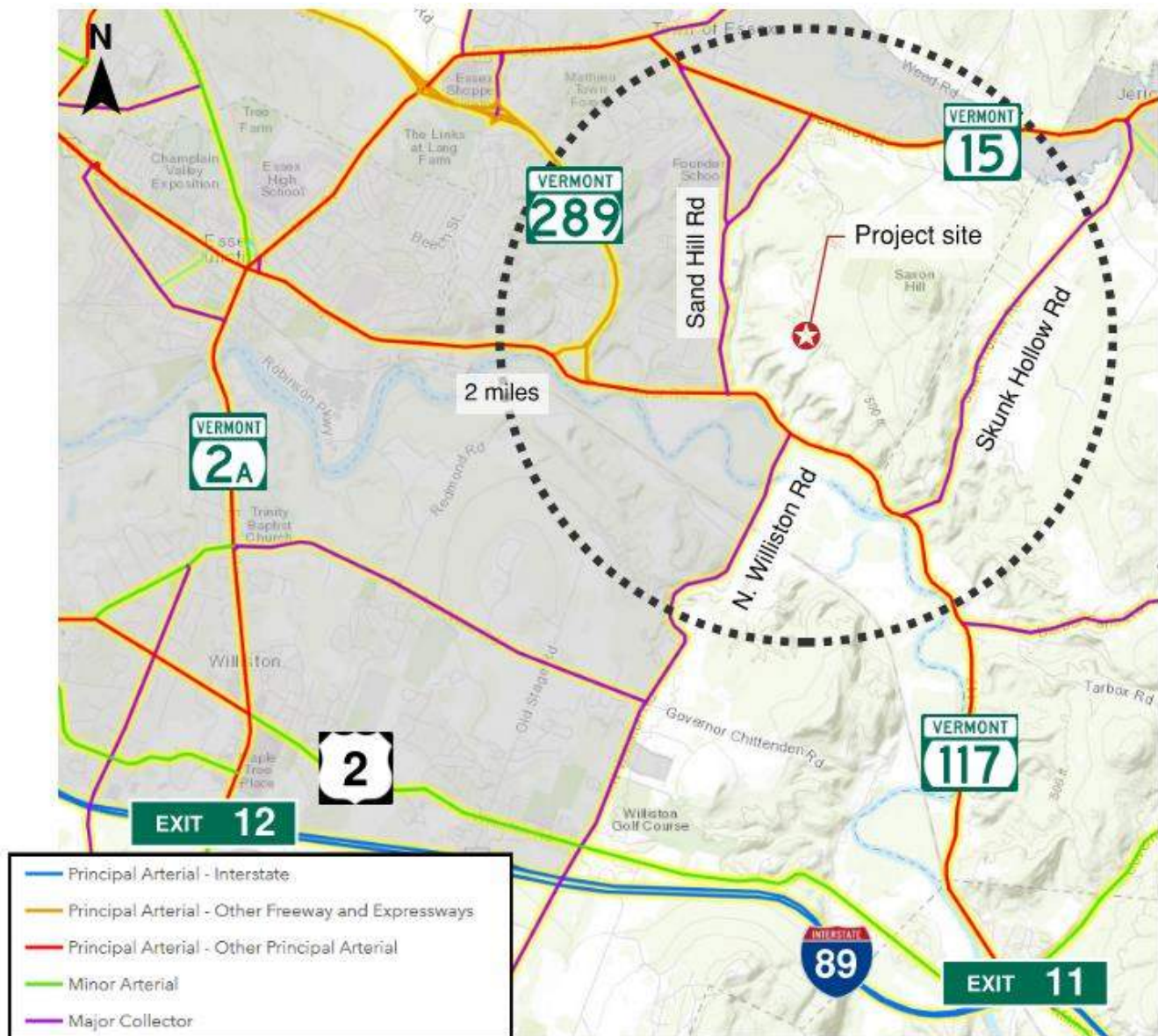
For comparison, WCG observed the AM and PM peak hours of traffic at the nearby Allen Martin Drive & Thompson Drive intersection serving 7 industrial park parcels and a popular mountain biking trail network trailhead. After removing traffic associated with the trailhead, the observed AM and PM peak hour trip generation rate of the existing industrial park along Thompson Drive is roughly 20% lower than the ITE estimated trip generation rate for LUC 130: Industrial Park.

VTrans guidelines specify that a traffic study should be considered if the proposed development will generate 75 or more new peak hour trips.¹

EXISTING ROADWAY CONTEXT

The proposed project is located within a 41-acre portion of a larger parcel in Essex Vermont, north of VT-117, south of Thompson Drive, east of Sand Hill Road, and west of Skunk Hollow Road. The site proposes initial access via a proposed new public road along the existing driveway serving two residential properties and a haul road for the existing solar array. The proposed new public road may be extended to Thompson Drive in a future phase of development. Figure 2 illustrates the location of the proposed site relative to the local roadway network.

¹ Vermont Agency of Transportation, Policy and Planning Division, Development Review and Permitting Services, *Traffic Impact Study Guidelines* (April 2019).

FIGURE 2: PUBLIC ROAD NETWORK RELATIVE TO THE PROPOSED PROJECT SITE

The project is located within the RPD-1 Resource Preservation District – Industrial zoning district, with adjacent land uses primarily undeveloped. The purpose of the RPD-1 district is defined:

The objective of the RPD-1... is to protect such natural attributes for public enjoyment, and, to carry out development activities in harmony with the natural surroundings... Residential uses are not allowed in this district.

The proposed industrial park land use is a permitted land use within the zoning district subject to limitations to retail sales.

Existing Transportation Network

Access to the site is from a proposed new public road along the existing driveway / haul road with an intersection on VT-117 at mile marker Essex 3.40. VT-117 (River Road) is a state highway classified as a principal arterial. Near the site driveway / haul road, VT-117 is 30-feet wide consisting of an 11-foot travel lane and 4-foot shoulder in each direction. The roadway is uncurbed and there are no dedicated bicycle or pedestrian facilities. The posted speed limit of VT-117 is 40 MPH, increasing to 45 MPH approximately 600-feet east of the existing driveway / haul road.

There is no automatic traffic recorder (ATR) site along VT-117 near the existing driveway / haul road. WCG deployed a traffic counter for three weekdays in June 2024 to observe daily traffic volumes. The average daily traffic volume over these three days was 10,886 vehicles per day (vpd). The highest observed hourly volume was 1,107 vehicles per hour (vph) from 4:30 PM – 5:30 PM on Thursday 13 June 2024. The observed 85th percentile speed was 52 MPH and 57 MPH in the eastbound and westbound directions, respectively.

Transit Service

There is no fixed route transit service along VT-117 at the existing site driveway / haul road. The nearest fixed route transit stop is at VT-117 & Sand Hill Road, roughly 500-feet west of the existing site driveway / haul road. The stop services Green Mountain Transit Route 10 Williston Essex Combo, offering a clockwise loop route along Sand Hill Road southbound to VT-117 westbound with 75-minute headways from 7 AM to 6 PM and reduced service on the weekend.

Future Road Network

Future phases of development within the SHIP may include extension of the proposed new public road to the current terminus at Thompson Drive. This roadway connection is not included in this phase of the project.

The **Essex Junction Crescent Connector**, approximately 3 miles west of the project, is nearing completion. This new roadway connection may improve travel times to Williston and points south along VT-2A.

The **VT-117 & North Williston Road intersection** is planned to be reconstructed as a signalized intersection with a westbound left turn lane, eastbound right turn lane, and separate northbound left and right turn lanes. The project is scheduled to be completed by the end of 2027.

From the online project description²:

The project includes the addition of a traffic signal at the intersection of VT Route 117 and North Williston Road in Essex. VT Route 117 will be widened to accommodate a dedicated left turn lane for westbound traffic turning left onto North Williston Road and a dedicated right turn lane for eastbound traffic turning right onto North Williston Road. The project also includes enhancements to drainage and signage.

² <https://resources.vtrans.vermont.gov/FactSheet/default.aspx?pin=14T211>

Crash Review

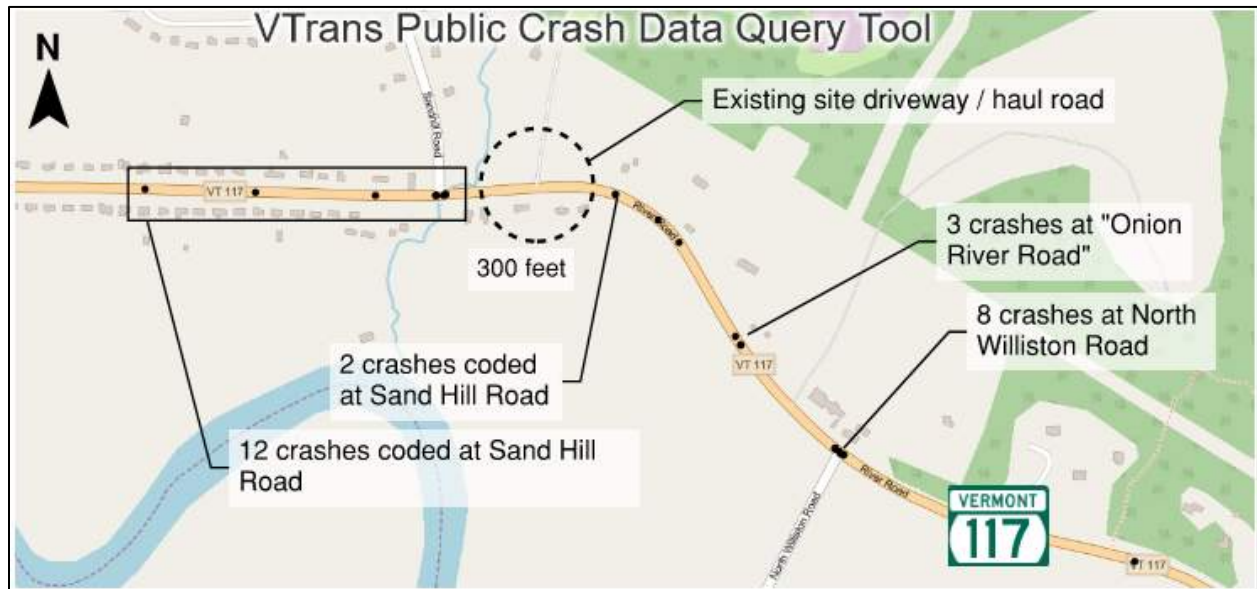
WCG reviewed the most recent high crash location (HCL) report prepared by VTrans using 2012-2016 crash data. According to the HCL report, there are no HCL segments or intersections within 1 mile of the project location.

WCG reviewed reported crashes from January 1, 2019 through December 31, 2023 on VT-117 within the stopping sight distance of the existing site driveway / haul road (305 feet). In this most recent five-year period, there were no reported crashes within 305 feet of the existing site driveway / haul road.

The nearest reported crashes in this period include:

- A cluster of 14 crashes at the signalized VT-117 & Sand Hill Road intersection approximately 500-feet west of the existing site driveway / haul road:
 - The estimated crash rate of the intersection is 0.629 crashes per million vehicles
 - 4 crashes resulted in injury
 - 6 crashes recorded freezing precipitation
 - Crash types included:
 - 5 turn related or broadside crashes
 - 2 rear end crashes
 - 3 single vehicle crashes
 - 1 head on crash
 - 3 “other” or unidentified crash types
- 2 crashes approximately 500 feet east of the project:
 - One crash involved a deer
 - One crash involved alcohol
- A cluster of 8 crashes at the VT-117 & North Williston Road intersection approximately ½-mile east of the existing site driveway / haul road:
 - The estimated crash rate of the intersection is 0.420 crashes per million vehicles
 - 2 crashes resulted in injury
 - Crash types included:
 - 3 rear end crashes
 - 2 turn related or broadside crashes
 - 1 head on crash
 - 2 “other” or unidentified crash types

- The current crash pattern is likely to change following the upcoming intersection construction project which includes signalization and the addition of turn lanes

FIGURE 3: REPORTED CRASHES FROM 1/1/19 THROUGH 12/31/23

Sight Distance

As defined in the 2018 publication *A Policy on Geometric Design of Highways and Streets*, from the American Association of State Highway and Transportation Officials (AASHTO), sight distance is the “the length of roadway ahead that is visible to the driver.”³ Sight distances of sufficient length are necessary at all points along a roadway to ensure vehicles can safely stop or avoid colliding with potential obstructions or other vehicles on the roadway.

Standard practice in assessing intersection safety and operations involves measuring two separate sight distances – **stopping sight distance** and **intersection sight distance**.

Stopping sight distance (SSD) is the visible distance along a roadway between an advancing motorist and a potential obstacle in the roadway. It is measured from a point representing the approaching driver’s eye and a point representing an obstacle in the roadway.⁴ Stopping sight distances of adequate length are needed along all roadways, both at and away from intersections, so that drivers travelling at design speeds can react to potential obstacles and safely brake to avoid collisions. Design minimum stopping sight distances are calculated based on factors such

³ American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, Seventh Edition (Washington D.C.: American Association of State Highway and Transportation Officials, 2018). Page 3-2.

⁴ As noted in the 2018 Policy on Geometric Design of Highways and Streets (page 3-15), the height of the driver’s eye is assumed to be 3.5’ above the road surface and the height of a potential obstacle is 2.0’ above the road surface.

as design speed, response times, and grades as reported in the *2018 Policy on Geometric Design of Highways and Streets*.⁵

Intersection sight distance (ISD) is the distance available along the major road travelled way corresponding with the maximum visibility between an advancing motorist on the major road and an entering motorist on an intersecting minor road. It is measured between a point representing the advancing driver's eye above the major road and a point representing the entering driver's eye above the intersecting road.⁶

The *2018 Policy on Geometric Design of Highways and Streets* states that the available intersection sight distance should be at least equal to the required stopping sight distance along the major road.

“Sight distance is also provided at intersections to allow the drivers of stopped vehicles a sufficient view of the intersecting highway to decide when to enter the intersecting highway or to cross it. If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions.”

However, when possible, it is desirable to have intersection sight distances that exceed the design minimum stopping sight distances to offer improved operations, such that major road traffic need not decelerate to accommodate entering traffic.

“However, in some cases a major-road vehicle may need to stop or slow to accommodate the maneuver by a minor road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road.”

Based on the posted speed limit of 40 MPH, the design minimum stopping sight distance is 305 feet. The target minimum intersection sight distance for turning traffic is 385 feet to the left and 445 feet to the right. Although truck operating characteristics are generally slower than passenger vehicles, the stopping and intersection sight distances are not adjusted to account for a large proportion of truck traffic expected at a industrial park due to the higher driver's sitting position and larger vehicle profile.

Sight distances at the existing site driveways were measured. The intersection sight distance views to the left and right at the site driveways are shown in the following figures, and the measured intersection and stopping sight distances are presented in the accompanying tables.

⁵ American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, Seventh Edition (Washington D.C.: American Association of State Highway and Transportation Officials, 2018). Page 3-5 to 3-6.

⁶ As noted in the *2018 Policy on Geometric Design of Highways and Streets* (page 3-16), the height of the driver's eye of the approaching vehicle is assumed to be 3.5' above the road surface of the major road and the height of the driver's eye of the entering vehicle is assumed to 3.5' above the minor road surface. The decision point offset from the travel way varies with sight conditions (page 9-38); in this case we assume the decision point is 15-feet from the travel way.

FIGURE 4: DRIVER'S PERSPECTIVE 15-FEET FROM THE EDGE OF TRAVEL WAY AT THE EXISTING SITE DRIVEWAY / HAUL ROAD TO THE EAST (LEFT) AND WEST (RIGHT)**TABLE 3: MEASURED STOPPING SIGHT DISTANCE AND INTERSECTION SIGHT DISTANCE AT THE EXISTING SITE DRIVEWAY / HAUL ROAD**

	Required Minimum	Design Target	Measured
Stopping Sight Distance	305'	n/a	>500' WB (met) >500' EB (met)
Intersection Sight Distance	left, to east: 305' right, to west: 305'	left, to east: 385' right, to west: 445'	left, to east: >500' (met) right, to west: >500' (met)

Sight distances to the west extended well beyond the signalized intersection over 500-feet west of the existing site driveway / haul road. Sight distances to the east were noted to be limited by a guardrail on the south side of VT-117. Regardless, the stopping and intersection sight distances were measured over 500-feet, above the required minimum and design target distances.

As the site plans develop, the site design team should avoid low growing shrubs, plantings, signs, or other features that may impact sight lines at the stop-controlled intersection on VT-117 and at intersections along the new public roadway.

TRAFFIC PROJECTIONS

This study relies upon design standards and analysis procedures documented in the Highway Capacity Manual 7th Edition,⁷ Trip Generation,⁸ A Policy on Geometric Design of Highways and

⁷ National Academies of Sciences, Engineering, and Medicine. 2022. *Highway Capacity Manual 7th Edition: A Guide for Multimodal Mobility Analysis*. (Washington, DC: The National Academies Press, 2022).

⁸ Institute of Transportation Engineers, *Trip Generation 11th Edition* (Washington, D.C.: Institute of Transportation Engineers, 2021).

Streets,⁹ Manual on Uniform Traffic Control Devices (MUTCD),¹⁰ and the Vermont Agency of Transportation Traffic Impact Study Guidelines,¹¹ which are the generally accepted traffic analysis references relied upon by traffic engineering professionals and VTrans for projects of this type in Vermont.

The study area includes three intersections, from west to east: VT-117 & Sand Hill Road; VT-117 & Existing Site Driveway / Haul Road; and VT-117 & North Williston Road.

Traffic Volumes

Traffic volumes were documented from the following sources:

TABLE 4: TRAFFIC DATA SOURCES AND COLLECTION DATES

Data	Source	Date
VT-117 & Sand Hill Road Turning Movement Count (TMC)	VTrans MS2 System intersection ID 30406886	Tuesday 26 September 2023
VT-117 & Site Driveway / Haul Road TMC	WCG count	Thursday 13 June 2024
VT-117 & North Williston Road TMC	WCG count	Thursday 13 June 2024
VT-117 Automatic Traffic Recorder east of the site driveway	WCG count	Tuesday 11 June 2024 – Thursday 13 June 2024

Adjustments to Observed Volumes

WCG applied the following adjustments to the observed traffic volumes:

- 1. Design Hour Volume (DHV) Adjustment.** Consistent with VTrans Guidelines, traffic analysis will be conducted with traffic volumes representing the 30th highest hour. From the VTrans TIS Guidelines:

Since it is impractical to design a highway for the highest volume encountered during the year, highway engineers have sought a compromise between capacity and cost. Thus, a highway is designed for the 30th highest hourly volume of the year, commonly known as the "Design Hour Volume" (DHV).

WCG estimated the AADT along VT-117 from the ATR count. WCG used the estimated AADT to estimate the DHV following Redbook Method 2, documented in the attachments.

⁹ American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition (Washington DC: AASHTO, 2018).

¹⁰ U.S. Department of Transportation Federal Highway Administration, *Manual on Uniform Traffic Control Devices for Streets and Highways*, 11th Edition, December 2023 (Washington, D.C.: FHWA, 2023).

¹¹ Vermont Agency of Transportation *Traffic Impact Study Guidelines*, Policy and Planning Division, Development Review and Permitting Services (Revised April 2019)

The total adjustment factor to the raw volumes was calculated at 0.98, resulting in a reduction in the observed volumes to the DHV. To be conservative, the DHV adjustment was set at 1.0.

2. **Annual Adjustment.** Consistent with VTrans Guidelines, traffic analyses should consider the base year (year in which the project is completed) and the planning year (base year plus five years). For this project, the base year is 2026 and the planning year is 2031. VTrans recommends a growth rate of 8% over 20 years at sites across the state, or roughly 0.4% per year.

Other Development Volumes

No other development volumes were identified as permitted or planned but not yet constructed traffic volumes to include in the analysis. The regional background growth projection is assumed to capture the ongoing development potential along VT-117.

No Build Scenario Volumes

The 2026 and 2031 adjusted design hour volumes are presented in the attachments. These figures represent the No Build scenario volumes.

Project Trip Generation, Classification, and Distribution

The estimated trip generation documented in Table 2 was classified as passenger vehicle trips representing staff, employee, and service vehicles, or heavy vehicles. Observations of the existing industrial park at Allen Martin Drive & Thompson Drive indicated that heavy vehicles make up approximately 6% of the traffic volume in the peak hours.

The project-generated passenger vehicle trips were distributed proportionally to the existing traffic patterns; the heavy vehicle trips were distributed evenly between VT-117 westbound towards VT-289 and eastbound towards I-89 Exit 11. The trip distribution of passenger vehicles and heavy vehicles is illustrated in the attachments.

Build Scenario Volumes

The distributed trip generation volumes were added to the 2026 and 2031 No Build Scenario volumes to represent the build condition traffic volumes, illustrated in the attachments.

CAPACITY ANALYSIS

Intersection capacity analyses were performed at the study area intersections. Analyses evaluated average control delay, level of service (LOS), and volume to capacity (v/c) ratios consistent with methodologies documented in the Highway Capacity Manual 7th Edition: A Guide for Multimodal Mobility Analysis (HCM7).

Level of Service Definition

Level of service (LOS) is a qualitative measure describing the operating conditions as perceived by motorists driving in a traffic stream. LOS is calculated using the procedures outlined in the

HCM7. In addition to traffic volumes, key inputs include the number of lanes at each intersection, traffic control type (signalized or unsignalized), and the traffic signal timing plans, if applicable.

The HCM7 defines six qualitative grades to describe the level of service at an intersection. Level-of-service is based on the average control delay per vehicle; average control delay is a function of a gap acceptance model. Table 5 shows the various LOS grades and descriptions for signalized and unsignalized intersections. According to HCM procedures, an overall LOS cannot be calculated for two-way stop-controlled intersections because not all movements experience delay.

TABLE 5: LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LOS	CHARACTERISTICS	SIGNALIZED AVG. CONTROL DELAY (SEC)	UNSIGNALIZED AVG. CONTROL DELAY (SEC)
A	Little or no delay	≤ 10.0	≤ 10.0
B	Short delays	10.1-20.0	10.1-15.0
C	Average delays	20.1-35.0	15.1-25.0
D	Long delays	35.1-55.0	25.1-35.0
E	Very long delays	55.1-80.0	35.1-50.0
F	Extreme delays	> 80.0	> 50.0

The VTrans policy on level of service is:

- Overall LOS C should be maintained for state-maintained highways and other streets accessing the state's facilities.
- Reduced LOS may be acceptable on a case-by-case basis when considering, at a minimum, current and future traffic volumes, delays, volume to capacity ratios, crash rates, and negative impacts resulting from improvements necessary to achieve LOS C.
- LOS D should be maintained for side roads with volumes exceeding 100 vehicles/hour for a single lane approach (150 vehicles/hour for a two-lane approach) at two-way stop-controlled intersections.

Volume to Capacity Ratio Definition

The volume to capacity ratio (v/c) represents the sufficiency of an approach leg to accommodate the vehicular demand. According to FHWA:

“As the v/c ratio approaches 1.0, traffic flow may become unstable, and delay and queuing conditions may occur. Once the demand exceeds the capacity (a v/c ratio greater than 1.0), traffic flow is unstable and excessive delay and queuing is expected.”¹²

VTrans does not have a v/c policy. Typically, v/c is used as an alternative indicator of performance, with preferred values below 0.95.

Capacity and Performance Analysis

WCG built a traffic model using Synchro version 12 for the 2026 and 2031 adjusted intersection volumes for the AM and PM peak hours in the No Build and Build scenarios. The 2026 analysis year evaluated VT-117 & North Williston Road as a stop-controlled intersection; the 2031 analysis year modeled the future signalized intersection with turn lanes.

The resulting performance measures are presented in Table 6 and Table 7.

TABLE 6: RESULTS OF INTERSECTION CAPACITY ANALYSIS USING THE 2026 NO BUILD AND BUILD SCENARIO VOLUMES

2026 Scenarios												
Intersections	Weekday AM Peak Hour						Weekday PM Peak Hour					
	LOS	No Build Delay	v/c	LOS	Build Delay	v/c	LOS	No Build Delay	v/c	LOS	Build Delay	v/c
 VT-117 & Sand Hill Road												
Overall	B	20		C	21		C	26		C	30	
EB, along VT-117	B	12	0.32	B	13	0.36	B	13	0.32	B	13	0.32
WB, along VT-117	C	29	0.84	C	32	0.85	D	37	0.92	D	45	0.96
SB, along Sand Hill Road	B	18	0.48	B	19	0.48	C	24	0.32	C	27	0.34
 VT-117 & Site Access												
EB Left, along VT-117	-	-	-	A	9	0.08	A	9	0.001	A	9	0.02
SB, along Site Access	C	17	0.01	C	21	0.14	-	-	-	D	31	0.51
 VT-117 & North Willston Road												
WB Left, along VT-117	A	9	0.21	A	10	0.21	A	9	0.09	A	9	0.09
NB, along North Williston Road	E	42	0.66	F	66	0.83	F	66	1.04	F	96	1.19

"LOS" is the level of service; "Delay" is the average control delay in seconds per vehicle; "v/c" is the volume to capacity ratio

¹² Federal Highway Administration (FHWA), *Signalized Intersections: Informational Guide*, 2004

TABLE 7: RESULTS OF INTERSECTION CAPACITY ANALYSIS USING THE 2031 NO BUILD AND BUILD SCENARIO VOLUMES

2031 Scenarios												
Intersections	Weekday AM Peak Hour						Weekday PM Peak Hour					
	LOS	No Build Delay	v/c	LOS	Build Delay	v/c	LOS	No Build Delay	v/c	LOS	Build Delay	v/c
 VT-117 & Sand Hill Road												
Overall	B	20		C	21		C	30		C	31	
EB, along VT-117	B	12	0.32	B	13	0.37	B	14	0.34	B	14	0.33
WB, along VT-117	C	30	0.85	C	31	0.85	D	46	0.95	D	46	0.96
SB, along Sand Hill Road	B	18	0.49	B	19	0.50	C	24	0.33	C	28	0.36
 VT-117 & Site Access												
EB, Left along VT-117	-	-	-	A	9	0.08	A	9	0.001	A	9	0.02
SB, along Site Access	C	17	0.01	C	22	0.15	-	-	-	D	33	0.53
 VT-117 & North Williston Road												
Overall	A	8		A	8		B	10		B	11	
EB, along VT-117	A	6	0.38	A	6	0.38	A	9	0.41	A	9	0.43
WB, along VT-117	A	8	0.42	A	8	0.42	A	10	0.22	A	10	0.23
NB, along North Williston Road	B	14	0.46	B	14	0.54	B	12	0.64	B	13	0.66

"LOS" is the level of service; "Delay" is the average control delay in seconds per vehicle; "v/c" is the volume to capacity ratio

The results of the traffic capacity and performance analysis indicate:

- The VT-117 & Sand Hill Road and VT-117 & Site Access future road intersections is expected to operate acceptably in all scenarios
- The existing VT-117 & North Williston Road does not meet VTrans LOS standards in the no build or build scenario in the stop-controlled 2026 analysis scenarios.
- The 2031 future signalized VT-117 & North Williston Road intersection, scheduled to be constructed by the end of 2027, is expected to operate acceptably in both no build and build scenarios.

Turn Lane Analysis

WCG conducted left- and right-turn lane warrant evaluations for the 2031 No Build and Build scenarios in the AM and PM peak hours for the VT-117 & site driveway / haul road intersection. The warrant evaluations were conducted following standard practice outlined in the VTrans Transportation Impact Study Guidelines. The results of the 2031 turn lane warrant evaluation are summarized in Table 8. In the no-build condition, very few turns were recorded into or out of the existing site driveway / haul road, and turn lanes were not warranted. In the AM peak hour build condition, an eastbound left turn lane is warranted by volume.

TABLE 8: 2031 TURN LANE WARRANT EVALUATION AT VT-117 & SITE ACCESS

	2031 AM No Build	2031 AM Build	2031 PM No Build	2031 PM Build
Left Turn Lane Warrant Met?	No	Yes	No	No
Right Turn Lane Warrant Met?	No	No	No	No

WCG performed a sensitivity test of the warranting volume. The left turn lane is warranted by volume at 38 peak hour eastbound left turns, or approximately the 44% build threshold (roughly 225,000 SF of occupied industrial park GFA).

The warranting volume is one consideration when evaluating to install a left and or right turn lane at a particular site. Other considerations should include the potential impacts a turn lane may have on bicycle and pedestrian travel, transit operations, crash history, and roadway context. A turn lane results in a wider roadway which increases pedestrian crossing distances and may increase vehicle traveling speeds. There are currently turn lanes at the VT-117 & Sand Hill Road intersection and the planned VT-117 & North Williston Road intersection.

Given the warranting volume, observed 85th percentile speed, high proportion of turning heavy vehicles, low bicycle and pedestrian volumes, lack of fixed route transit service, low expected pedestrian crossing volume across VT-117 at this location, and presence of turn lanes at adjacent intersections, an eastbound left turn lane is recommended when warranted by volume. The left turn lane is expected to be warranted by volume with 38 peak hour eastbound left turns, or approximately 225,000 SF of industrial park GFA. The warranting volume and criteria may be reevaluated as the individual lots are constructed.

BICYCLE, PEDESTRIAN, AND TRANSIT ACCESS

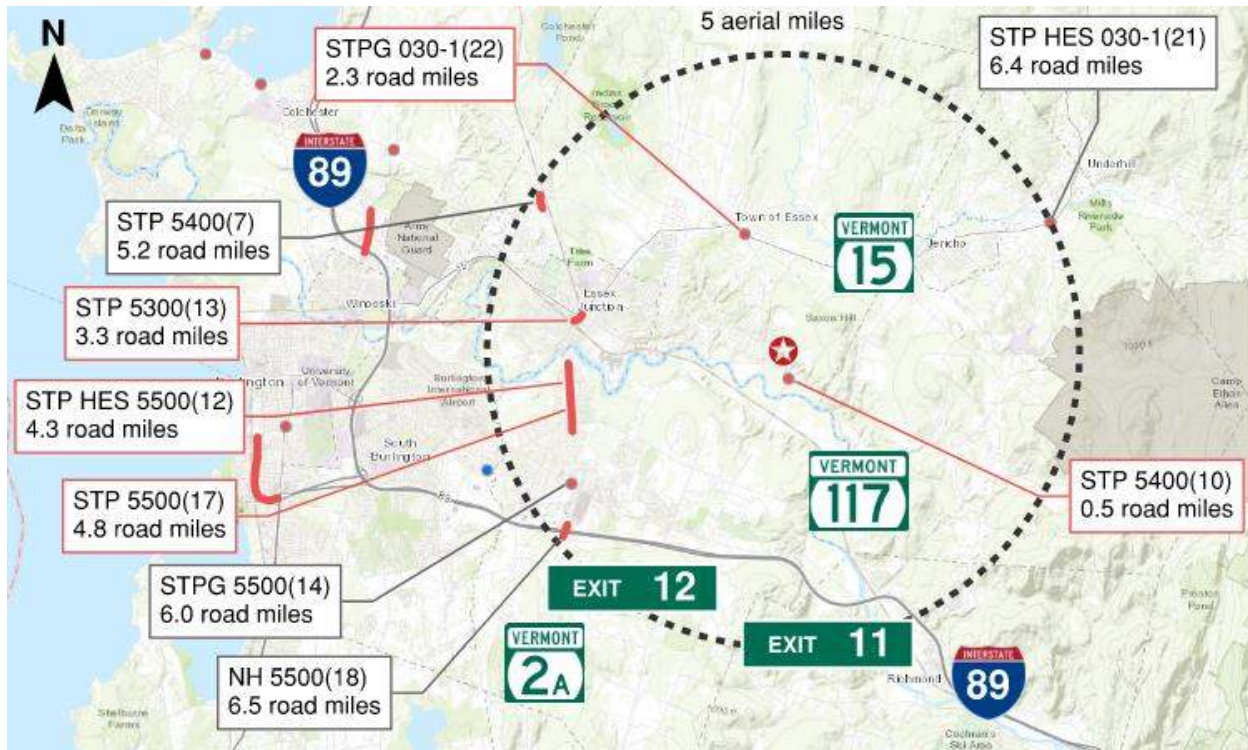
The project proposes the construction of industrial space in a relatively remote location. Bicycle and pedestrian access to the site is expected to be uncommon. However, future phases of the project may extend the proposed public road through to Thompson Drive and the Saxon Hill trailhead. The Saxon Hill trailhead serves a popular and well-developed mountain biking trail network, and portions of Thompson Drive include a shared use path. The proposed public road should include an off-road shared use path of similar design, or it should secure the rights of way for future construction of an off-road shared use path of similar design.

With no fixed route transit service, transit access to the proposed site is not feasible.

POTENTIAL MITIGATION CONSIDERATIONS

Act 145 Transportation Impact Fee

With more than 75 new peak hour trips, the project is expected to be assessed Act 145 impact fees from established fees within five (5) road miles. There are five Act 145 Transportation Impact Fee generating projects within five road miles of the proposed project (Figure 5).

FIGURE 5: ACT 145 IMPACT FEE GENERATING PROJECTS WITHIN FIVE MILES OF THE PROJECT SITE

The estimated impact fee trip distribution is illustrated in the attachments and summarized in Table 9.

TABLE 9: ESTIMATED ACT 145 IMPACT FEE

Project	Fee Rate (\$ / PM Peak Hour Trip Ends)	PM Peak Hour per Trip Ends	Project Impact Fee
STP 5400(10): VT-117 & North Williston Road	\$917	85	\$77,945
STPG 030-1(22) VT-15 & Sand Hill Road	\$415	17	\$7,055
STP 5300(13): Crescent Connector	\$2,788	28	\$78,064
STP HES 5500(12): VT-2A Two Way Left Turn Lane & Signal at James Brown Dr	\$189	10	\$1,890
STP 5500(17): VT-2A & Industrial Ave / Mountain View	\$252	10	\$2,520
Total Act 145 Impact Fee:			\$167,474

Roadway Infrastructure Mitigation

As demonstrated in the capacity analysis, the proposed project is not expected to result in a significant change in the relative operating characteristics of the study area intersections. An eastbound left turn lane at the proposed public road site access from VT-117 is recommended.

The proposed public road should include an off-road shared use path of similar design to the existing path along Thompson Drive, or at least secure the rights of way for future construction of an off-road shared use path of similar design.

ATTACHMENTS

Attachment A – Traffic Data Documentation

Attachment B – Crash Query Documentation

Attachment C – Scenario Traffic Volumes

Attachment D – Traffic Volume Worksheets

Attachment E – Synchro Capacity Analysis Worksheets

Attachment F – Turn Lane Warrant Worksheets

Attachment G – Impact Fee Trip Distribution

VT-117 / Sand Hill Rd
Essex, VT
9/26/2023
4th Tuesday

note:

Source: VTrans MS2

	Eastbound						Westbound						Northbound						Southbound						Pedestrians				15 Min Total	Hour Total		
	VT-117						VT-117												Sand Hill Rd						PNWR							
	EBL	EBL	EBT	EBT	EBR	EBR	WBL	WBL	WBT	WBT	WBR	WBR	NBL	NBL	NBT	NBT	NBR	NBR	SBL	SBL	SBT	SBT	SBR	SBR	PSWL	PSWL	PSEL	PSEL			PNWR	PNWL
	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck			Car	Truck
6:00 AM	7	0	11	0	0	0	0	0	19	0	6	0	0	0	0	0	0	0	18	0	0	0	17	0	0	0	0	0	0	0	78	
6:15 AM	8	0	32	0	0	0	0	0	32	0	22	0	0	0	0	0	0	0	37	0	0	0	23	0	0	0	0	0	0	0	154	
6:30 AM	15	0	28	0	0	0	0	0	38	0	19	0	0	0	0	0	0	0	38	0	0	0	29	0	0	0	0	0	0	0	161	
6:45 AM	22	0	41	0	0	0	0	0	49	0	25	0	0	0	0	0	0	0	39	0	0	0	23	0	0	0	0	0	0	0	199	
7:00 AM	20	0	56	0	0	0	0	0	45	0	26	0	0	0	0	0	0	0	52	0	0	0	35	0	0	0	0	0	0	0	234	
7:15 AM	32	0	67	0	0	0	0	0	53	0	31	0	0	0	0	0	0	0	80	0	0	0	72	0	0	0	0	0	0	0	335	
7:30 AM	12	0	55	0	0	0	0	0	89	0	35	0	0	0	0	0	0	0	78	0	0	0	77	0	0	0	0	0	0	0	346	
7:45 AM	30	0	69	0	0	0	0	0	70	0	47	0	0	0	0	0	0	0	82	0	0	0	68	0	0	0	0	0	0	0	366	
8:00 AM	17	0	47	0	0	0	0	0	61	0	37	0	0	0	0	0	0	0	54	0	0	0	46	0	0	0	0	0	0	0	262	
8:15 AM	26	0	49	0	0	0	0	0	50	0	43	0	0	0	0	0	0	0	46	0	0	0	48	0	0	0	0	0	0	0	262	
8:30 AM	21	0	54	0	0	0	0	0	50	0	23	0	0	0	0	0	0	0	69	0	0	0	48	0	0	0	0	0	0	0	265	
8:45 AM	11	0	49	0	0	0	0	0	51	0	30	0	0	0	0	0	0	0	30	0	0	0	24	0	0	0	0	0	0	0	195	
9:00 AM	11	0	42	0	0	0	0	0	45	0	26	0	0	0	0	0	0	0	30	0	0	0	19	0	0	0	0	0	0	0	173	
9:15 AM	8	0	38	0	0	0	0	0	29	0	24	0	0	0	0	0	0	0	29	0	0	0	15	0	0	0	0	0	0	0	143	
9:30 AM	10	0	35	0	0	0	0	0	43	0	14	0	0	0	0	0	0	0	31	0	0	0	21	0	0	0	0	0	0	0	154	
9:45 AM	9	0	46	0	0	0	0	0	50	0	16	0	0	0	0	0	0	0	33	0	0	0	8	0	0	0	0	0	0	0	162	
10:00 AM	15	0	41	0	0	0	0	0	31	0	19	0	0	0	0	0	0	0	25	0	0	0	13	0	0	0	0	0	0	0	144	
10:15 AM	14	0	45	0	0	0	0	0	52	0	10	0	0	0	0	0	0	0	24	0	0	0	15	0	0	0	0	0	0	0	160	
10:30 AM	10	0	40	0	0	0	0	0	45	0	14	0	0	0	0	0	0	0	31	0	0	0	18	0	0	0	0	0	0	0	158	
10:45 AM	13	0	42	0	0	0	0	0	42	0	15	0	0	0	0	0	0	0	28	0	0	0	16	0	0	0	0	0	0	0	156	
11:00 AM	10	0	34	0	0	0	0	0	43	0	18	0	0	0	0	0	0	0	27	0	0	0	9	0	0	0	0	0	0	0	141	
11:15 AM	13	0	48	0	0	0	0	0	36	0	24	0	0	0	0	0	0	0	29	0	0	0	13	0	0	0	0	0	0	0	163	
11:30 AM	17	0	47	0	0	0	0	0	48	0	25	0	0	0	0	0	0	0	31	0	0	0	19	0	0	0	0	0	0	0	187	
11:45 AM	11	0	49	0	0	0	0	0	46	0	27	0	0	0	0	0	0	0	18	0	0	0	15	0	0	0	0	0	0	0	166	
12:00 PM	11	0	49	0	0	0	0	0	39	0	17	0	0	0	0	0	0	0	23	0	0	0	17	0	0	0	0	0	0	0	156	
12:15 PM	9	0	48	0	0	0	0	0	48	0	16	0	0	0	0	0	0	0	26	0	0	0	10	0	0	0	0	0	0	0	157	
12:30 PM	22	0	54	0	0	0	0	0	42	0	29	0	0	0	0	0	0	0	21	0	0	0	14	0	0	0	0	0	0	0	182	
12:45 PM	19	0	41	0	0	0	0	0	39	0	28	0	0	0	0	0	0	0	19	0	0	0	19	0	0	0	0	0	0	0	165	
1:00 PM	15	0	43	0	0	0	0	0	41	0	24	0	0	0	0	0	0	0	26	0	0	0	17	0	0	0	0	0	0	0	166	
1:15 PM	11	0	45	0	0	0	0	0	39	0	21	0	0	0	0	0	0	0	30	0	0	0	14	0	0	0	0	0	0	0	160	
1:30 PM	15	0	53	0	0	0	0	0	50	0	30	0	0	0	0	0	0	0	22	0	0	0	11	0	0	0	0	0	0	0	181	
1:45 PM	13	0	41	0	0	0	0	0	43	0	23	0	0	0	0	0	0	0	34	0	0	0	18	0	0	0	0	0	0	0	172	
2:00 PM	21	0	55	0	0	0	0	0	46	0	32	0	0	0	0	0	0	0	36	0	0	0	15	0	0	0	0	0	2	0	205	
2:15 PM	20	0	53	0	0	0	0	0	54	0	32	0	0	0	0	0	0	0	29	0	0	0	18	0	0	0	0	0	0	0	206	
2:30 PM	20	0	45	0	0	0	0	0	67	0	37	0	0	0	0	0	0	0	43	0	0	0	35	0	0	0	0	0	0	0	247	
2:45 PM	27	0	50	0	0	0	0	0	52	0	36	0	0	0	0	0	0	0	31	0	0	0	34	0	0	0	0	0	0	0	230	
3:00 PM	22	0	56	0	0	0	0	0	56	0	33	0	0	0	0	0	0	0	35	0	0	0	29	0	0	0	0	1	0	0	231	
3:15 PM	42	0	69	0	0	0	0	0	70	0	41	0	0	0	0	0	0	0	35	0	0	0	20	0	0	0	0	0	0	0	277	
3:30 PM	40	0	67	0	0	0	0	0	73	0	34	0	0	0	0	0	0	0	68	0	0	0	56	0	0	0	0	0	0	0	338	
3:45 PM	44	0	90	0	0	0	0	0	90	0	51	0	0	0	0	0	0	0	49	0	0	0	41	0	0	0	0	0	0	0	368	
4:00 PM	41	0	64	0	0	0	0	0	64	0	64	0	0	0	0	0	0	0	56	0	0	0	41	0	0	0	0	0	1	0	327	
4:15 PM	33	0	52	0	0	0	0	0	83	0	57	0	0	0	0	0	0	0	59	0	0	0	36	0	0	0	0	0	0	0	320	
4:30 PM	33	0	83	0	0	0	0	0	73	0	61	0	0	0	0	0	0	0	46	0	0	0	41	0	0	0	0	0	0	0	337	
4:45 PM	35	0	66	0	0	0	0	0	80	0	51	0	0	0	0	0	0	0	54	0	0	0	33	0	0	0	0	2	0	0	319	
5:00 PM	49	0	92	0	0	0	0	0	95	0	63	0	0	0	0	0	0	0	45	0	0	0	42	0	0	0	0	0	0	0	386	
5:15 PM	40	0	80	0	0	0	0	0	84	0	63	0	0	0	0	0	0	0	40	0	0	0	34	0	0	0	0	0	0	0	341	
5:30 PM	38	0	64	0	0	0	0	0	69	0	76	0	0	0	0	0	0	0	37	0	0	0	29	0	0	0	0	0	0	0	313	
5:45 PM	25	0	53	0	0	0	0	0	72	0	41	0	0	0	0	0	0	0	47	0	0	0	30	0	0	0	0	0	0	0	268	
6:00 PM	31	0	44	0	0	0	0	0	57	0	40	0	0	0	0	0	0	0	27	0	0	0	20	0	0	0	0	0	0	0	219	
6:15 PM	24	0	35	0	0	0	0	0	50	0	18	0	0	0	0	0	0	0	18	0	0	0	15	0	0	0	0	0	0	0	183	
6:30 PM	26	0	45	0	0	0	0	0	46	0	27	0	0	0	0	0	0	0	35	0	0	0	12	0	0	0	0	0	1	0	191	
6:45 PM	17	0	34	0	0	0	0	0	36	0	32	0	0	0	0	0	0	0	21	0	0	0	20	0	0	0	0	0	0	0	160	
AM (6AM-12PM) Peak																											1309					
PM (12PM-6PM) Peak																											1383					

AM Peak Hour

VT-117 / Sand Hill Rd
Essex, VT
9/26/2023
4th Tuesday

Volumes

VT-117 / Site Driveway
Essex, VT
6/13/2024
2nd Thursday

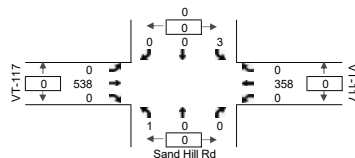
note:																			Source:		CountCloud									
	Eastbound VT-117						Westbound VT-117						Northbound Sand Hill Rd						Southbound						Pedestrians					
	EBL	EBL	EBT	EBT	EBR	EBR	WBL	WBL	WBT	WBT	WBR	WBR	NBL	NBL	NBT	NBT	NBR	NBR	SBL	SBL	SBT	SBT	SBR	SBR	PNWR	PNEL	PSWR	PNWL	15 Min	Hour
	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	EB	WB	NB	SB	Total	Total
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	73	5	0	0	0	0	55	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	137	0
	0	0	83	3	1	0	0	0	64	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	159	296
	0	0	101	1	0	0	0	0	68	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	175	471
	0	0	137	8	0	0	0	0	70	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	218	689
	0	0	154	4	0	0	0	0	100	6	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	266	818
	0	0	116	9	0	0	0	0	88	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	218	877
	0	0	102	8	0	0	0	0	85	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	198	900
	0	0	112	5	0	0	0	0	85	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	212	894
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	628	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	410	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	212	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0																			

AM Peak Hour

VT-117 / Site Driveway
Essex, VT
6/13/2024
2nd Thursday

Volumes

	EB	WB	NB	SB
L	0	0	1	3
T	538	358	0	0
R	0	0	0	0
Enter	538	358	1	3
Exit	541	359	0	0
Heavy	5.4%	4.2%	0.0%	0.0%
Peds	0	0	0	0
Peak Hour	7:15 AM - 8:15 AM	0.85		



PHF

	EB	WB	NB	SB
L	1.00	1.00	0.25	0.75
T	0.85	0.84	1.00	1.00
R	1.00	1.00	1.00	1.00
Appr	0.85	0.84	0.25	0.75
Int	0.85			

		Heavy			
		EB	WB	NB	SB
L T R				0.0%	0.0%
		5.4%	4.2%		
	Appr	5.4%	4.2%	0.0%	0.0%
Int		4.9%			

Allen Martin Dr & Thompson Dr
Essex VT
6/13/2024
2nd Thursday

note:

Source: CountCloud

	Eastbound r/a						Westbound Thompson Dr						Northbound Allen Martin Dr						Southbound Allen Martin Dr						Pedestrians				15 Min Total	Hour Total
	EBL	EBL	EBT	EBT	EBR	EBR	WBL	WBL	WBT	WBT	WBR	WBR	NBL	NBL	NBT	NBT	NBR	NBR	SBL	SBL	SBT	SBT	SBR	SBR	PNWR	PNEL	PSWR	PNWL		
	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	EB	WB	NB	SB		
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	3	0	0	0	5	0	0	0	13	0	18	1	22	1	30	2	0	0	0	2	0	0	95	0
6:45 AM	0	0	0	0	0	0	4	0	0	0	5	0	0	0	15	0	19	0	20	1	34	2	0	0	0	0	0	0	100	195
7:00 AM	0	0	0	0	0	0	14	1	0	0	16	0	0	0	12	2	5	1	15	0	48	0	0	0	0	3	0	0	114	309
7:15 AM	0	0	0	0	0	0	1	0	0	0	9	0	0	0	38	0	7	2	9	0	57	0	0	0	0	0	0	0	123	432
7:30 AM	0	0	0	0	0	0	1	1	0	0	1	0	0	0	25	0	15	0	13	0	60	1	0	0	0	2	0	0	117	454
7:45 AM	0	0	0	0	0	0	1	1	0	0	5	0	0	0	25	3	12	0	19	1	41	3	0	0	0	1	0	0	111	465
8:00 AM	0	0	0	0	0	0	2	0	0	0	1	0	0	0	18	1	13	0	18	1	55	2	0	0	0	1	0	0	111	462
8:15 AM	0	0	0	0	0	0	1	1	0	0	1	0	0	0	20	2	8	2	9	0	43	2	0	0	0	1	0	0	89	428
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	311
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	89
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	11	0	0	0	12	0	0	0	49	4	6	0	4	1	33	0	0	0	0	0	0	0	120	120
4:15 PM	0	0	0	0	0	0	14	1	0	0	14	0	0	0	47	0	3	0	4	3	26	0	0	0	0	4	0	0	112	232
4:30 PM	0	0	0	0	0	0	15	0	0	0	11	0	0	0	46	1	6	0	4	0	39	0	0	0	0	0	0	0	122	354
4:45 PM	0	0	0	0	0	0	13	0	0	0	17	0	0	0	41	0	4	0	6	0	42	2	0	0	0	0	0	0	125	479
5:00 PM	0	0	0	0	0	0	15	0	0	0	25	0	0	0	45	0	11	1	6	1	34	0	0	0	0	0	0	0	138	497
5:15 PM	0	0	0	0	0	0	12	0	0	0	5	0	0	0	41	1	3	0	5	0	29	0	0	0	0	0	0	0	96	481
5:30 PM	0	0	0	0	0	0	11	1	0	0	14	0	0	0	33	0	2	1	6	0	29	0	0	0	0	0	0	0	97	456
5:45 PM	0	0	0	0	0	0	5	0	0	0	10	1	0	0	30	0	11	0	4	0	22	0	0	0	0	0	0	0	83	414
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	276
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
															AM (6AM-12PM) Peak														465	
															PM (12PM-6PM) Peak														497	

AM Peak Hour

Allen Martin Dr & Thompson
Essex VT
6/13/2024
2nd Thursday

Volumes				
	EB	WB	NB	SB
L	0	20	0	57
T	0	0	105	210
R	0	31	42	0
Enter	0	51	147	267
Exit	99	0	136	230
Heavy	5.9%	5.4%	1.9%	3.4%
Peds	0	6	0	0
Peak Hour	7:00 AM - 8:00 AM			

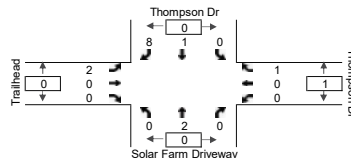
Allen Martin Dr & Thompson Dr
Essex VT
6/13/2024
2nd Thursday

note:																									Source:				CountCloud		
	Eastbound Trailhead						Westbound Thompson Dr						Northbound Solar Farm Driveway						Southbound Thompson Dr						Pedestrians						
	EBL	EBL	EBT	EBT	EBR	EBR	WBL	WBL	WBT	WBT	WBR	WBR	NBL	NBL	NBT	NBT	NBR	NBR	SBL	SBL	SBT	SBT	SBR	SBR	PNWR	PNEL	PSWR	PNWL	15 Min	Hour	
Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	PSWL	PSER	PSEL	PNER	Total	Total
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	1	0	0	0	4	6
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	8
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	14
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	6	10
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

AM Peak Hour

Allen Martin Dr & Thompson
Essex VT
6/13/2024
2nd Thursday

Volumes					
L	EB	WB	NB	SB	
T	2	0	0	0	
R	0	0	2	1	
R	0	1	0	8	14
Enter	2	1	2	9	14
Exit	0	8	5	1	14
Heavy	0.0%	0.0%	0.0%	11.1%	7.1%
Peds	0	1	0	0	PHF
Peak Hour	6:30 AM - 7:30 AM				0.58



Date	DT	Day of Week	Adjustment	Adjusted
6/10/2024				
6/11/2024	10,692	Tuesday	0.915	9,783
6/12/2024	10,891	Wednesday	0.895	9,747
6/13/2024	11,074	Thursday	0.879	9,734
6/14/2024				

Average AADT DHV
9,755 1100

2021 Redbook DHV Chart

Predicted DHV by Seasonal Factor Group by AADT						
AADT	Rural Interstate SF1	Rural Non-Interstate SF2	Urban SF3	Summer Recreational SF4	Summer/Winter Recreational SF5	Summer/Winter Recreational TH SF6
6800	830	750	810	950	1000	1300
6900	840	760	820	960	1000	
7000	850	770	830	960	1100	
7100	860	790	840	960	1100	
7200	870	800	850	960	1100	
7300	870	810	860	970	1100	
7400	880	820	870	970	1100	
7500	890	840	880	970	1100	
7600	900	850	890	970	1100	
7700	910	860	900	970	1100	
7800	920	880	910	970	1100	
7900	930	890	920	980	1100	
8000	940	900	930	980	1100	
8100	950	920	940	990	1100	
8200	960	930	950	990	1100	
8300	970	950	960	1000	1100	
8400	980	960	970	1000	1100	
8500	990	980	980	1000	1100	
8600	1000	990	990	1000	1100	
8700	1000	1000	1000	1000	1100	
8800	1000	1000	1000	1000	1100	
8900	1000	1000	1000	1100	1100	
9000	1000	1000	1000	1100	1100	
9100	1100	1100	1000	1100	1100	
9200	1100	1100	1100	1100	1100	
9300	1100	1100	1100	1100	1100	
9400	1100	1100	1100	1100	1200	
9500	1100	1100	1100	1100	1200	
9600	1100	1100	1100	1100	1200	
9700	1100	1100	1100	1100	1200	
9800	1100	1100	1100	1100	1200	
9900	1200	1100	1100	1100	1200	
10000	1200	1200	1100	1200	1200	
10100	1200	1200	1100	1200	1300	
10200	1200	1200	1200		1300	
10300	1200	1200	1200		1300	
10400	1200	1200	1200		1300	
10500	1200	1200	1200		1300	
10600	1300	1200	1200		1300	
10700	1300	1200	1200		1400	
10800	1300	1200	1200		1400	
10900	1300	1200	1200		1400	

2024 DHV 1100 vph
growth rate 1.004 %/year
2026 DHV 1108 vph
2031 DHV 1130 vph

Monthly DOW Factors

Group 2 Rural Non-Interstate								
From Year:	2022		To Year:		2022			
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	AVG
Jan	1.661	1.2	1.131	1.091	1.051	1.011	1.452	1.228
Feb	1.411	1.067	1.061	1.002	1.027	1.266	1.198	1.147
Mar	1.439	1.094	1.057	1.026	1.016	0.912	1.324	1.124
Apr	1.408	1.009	1.049	0.994	0.992	0.905	1.106	1.066
May	1.132	0.993	0.917	0.911	0.887	0.817	0.971	0.947
Jun	1.089	0.921	0.915	0.895	0.879	0.805	0.955	0.923
Jul	1.055	0.987	0.893	0.864	0.852	0.773	0.933	0.908
Aug	1.043	0.91	0.91	0.876	0.861	0.794	0.932	0.904
Sep	1.144	1.019	0.954	0.912	0.884	0.789	0.93	0.947
Oct	1.124	0.95	0.91	0.9	0.879	0.811	0.925	0.928
Nov	1.372	1.023	0.98	1.015	1.061	0.943	1.121	1.074
Dec	1.507	1.087	1.009	0.979	0.937	1.067	1.251	1.120

FROM CURRENT YEAR		
TO FUTURE YEAR	2022	2023
2022	1.000	
2023	1.004	1.000
2024	1.008	1.004
2025	1.012	1.008
2026	1.017	1.012
2027	1.021	1.017
2028	1.025	1.021
2029	1.029	1.025
2030	1.033	1.029
2031	1.037	1.033
2032	1.041	1.037
2033	1.046	1.041
2034	1.050	1.046
2035	1.054	1.050
2036	1.058	1.054
2037	1.062	1.058
2038	1.066	1.062
2039	1.070	1.066
2040	1.075	1.070
2041	1.079	1.075
2042	1.083	1.079
2043	1.087	1.083
2044	1.091	1.087
2045	1.095	1.091
2046	1.099	1.095

Installed on utility pole east of site driveway: https://maps.app.goo.gl/eJQ4PYUkHkhTaNa67

Study Start: 6/10/2024 13:07 America/New_York

Study End: 6/15/2024 10:43 America/New_York

Duration: 117 hours

Total Vehicles: 48691

Study Location: https://www.google.com/maps/search/?api=1&query=44.478989167,-73.0457795&z=15

Distance to Centerli	39	SPEEDS: 1-15 MPH 16-20 MPH 21-25 MPH 26-30 MPH 31-35 MPH 36-40 MPH 41-45 MPH 46-50 MPH 51-55 MPH 56-60 MPH 61-65 MPH 66-70 MPH 71-75 MPH 76+ MPH														
EB Average Speed:	47	EB	17	43	36	61	337	1515	5189	8907	5757	1433	216	42	10	2
WB Average Speed:	53	WB	36	19	36	57	88	184	756	4105	10587	7015	1266	121	11	4
EB 85th %ile Speed:	52															
WB 85th %ile Speed	57															
Overall Average Sp	50															
Overall 85th %ile Sp	56															

UNK: 830

		EB Speed Detail															WB Speed Detail																	Peak hour	1107	
		1-15 MPH	16-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-65 MPH	66-70 MPH	71-75 MPH	76+ MPH	UNKNOWN															15-min	Hour				
DATE	TIME America/New_York	EB Volume	WB Volume																															Totta Volume		
6/10/2024	13:15	137	123	7	17	13	12	11	9	14	23	14	5	3	5	1	1	24	10	15	5	14	8	11	11	12	9	2	1	1	0	0	260	706		
6/10/2024	13:30	59	71	2	1	0	0	1	5	18	18	6	6	1	0	0	0	2	0	0	0	0	2	6	17	29	13	1	1	0	0	1	130	590		
6/10/2024	13:45	73	86	0	0	1	2	4	3	16	32	10	2	1	0	0	0	1	0	0	1	0	0	3	21	32	24	4	0	0	0	2	159	640		
6/10/2024	14:00	94	63	1	0	0	0	1	3	21	43	21	2	0	1	0	0	0	0	0	0	0	1	3	31	25	3	0	0	0	1	157	643			
6/10/2024	14:15	73	71	0	0	0	0	1	8	17	25	18	1	1	0	0	0	0	0	0	0	1	1	11	29	19	10	0	0	0	2	144	682			
6/10/2024	14:30	98	82	0	0	0	1	2	12	25	34	15	3	1	1	0	0	0	0	0	0	0	9	43	27	3	0	0	0	0	4	180	733			
6/10/2024	14:45	79	83	0	0	0	0	0	2	21	36	16	3	0	1	0	0	0	0	0	0	0	2	10	36	29	4	2	0	0	0	162	783			
6/10/2024	15:00	90	106	0	0	0	0	3	7	17	30	25	5	0	0	0	0	0	0	0	0	0	2	14	42	40	7	0	0	0	4	196	860			
6/10/2024	15:15	89	106	0	0	0	1	1	5	18	42	17	5	0	0	0	0	0	0	0	0	0	2	7	48	44	4	0	0	0	1	195	886			
6/10/2024	15:30	122	108	0	0	0	0	0	9	32	50	23	7	0	0	0	0	0	0	0	0	0	2	15	48	38	5	0	0	0	1	230	906			
6/10/2024	15:45	124	115	0	0	0	0	3	7	33	54	24	1	0	0	0	0	0	0	0	0	0	1	9	54	41	9	1	0	0	2	239	916			
6/10/2024	16:00	112	110	0	0	0	0	1	6	16	51	32	6	0	0	0	0	0	0	0	0	0	0	16	51	36	7	0	0	0	0	222	899			
6/10/2024	16:15	92	123	0	0	1	0	1	1	22	31	24	8	0	1	0	0	0	0	0	0	0	3	18	61	36	5	0	0	0	3	215	920			
6/10/2024	16:30	107	133	0	0	0	0	3	6	19	46	28	3	0	0	0	0	0	0	0	0	0	0	14	74	38	7	0	0	0	2	240	971			
6/10/2024	16:45	107	115	0	0	0	0	2	0	19	51	27	6	0	0	0	0	0	0	0	0	0	2	16	54	36	6	0	0	0	3	222	932			
6/10/2024	17:00	115	128	0	0	0	0	1	3	18	42	43	7	0	0	0	0	0	0	0	0	0	9	69	41	9	0	0	0	0	1	243	909			
6/10/2024	17:15	111	155	0	0	0	0	0	2	23	41	33	7	1	0	0	0	0	0	0	0	0	0	10	94	47	3	0	0	0	5	266	838			
6/10/2024	17:30	70	131	0	0	0	0	0	4	18	19	19	7	0	0	0	0	0	0	0	0	0	0	23	68	32	7	0	0	0	3	201	703			
6/10/2024	17:45	83	116	0	0	0	0	0	5	19	36	16	3	0	1	0	0	0	0	0	0	0	0	16	65	33	1	1	0	0	3	199	622			
6/10/2024	18:00	72	100	0	0	0	0	0	3	15	20	23	9	1	0	0	0	0	0	0	0	1	9	32	50	8	0	0	0	1	172	515				
6/10/2024	18:15	50	81	0	0	0	0	0	1	3	17	20	7	1	0	0	0	0	0	0	0	0	1	4	39	28	8	1	0	0	1	131	452			
6/10/2024	18:30	61	59	0	0	0	1	1	7	12	19	15	3	1	1	0	0	0	0	0	0	0	0	10	13	23	13	0	0	0	1	120	398			
6/10/2024	18:45	46	46	0	0	0	1	0	2	10	17	13	2	0	0	0	0	0	0	0	0	1	2	11	17	10	4	1	0	0	1	92	348			
6/10/2024	19:00	57	52	0	0	0	0	0	4	9	31	11	2	0	0	0	0	0	0	0	0	1	2	4	26	14	5	0	0	0	0	109	313			
6/10/2024	19:15	36	41	0	0	0	0	0	3	4	14	12	3	0	0	0	0	0	0	0	0	0	0	11	13	16	1	0	0	0	0	77	267			
6/10/2024	19:30	35	35	0	0	0	0	0	5	10	11	8	1	0	0	0	0	0	0	0	0	0	0	2	20	10	3	0	0	0	0	70	249			
6/10/2024	19:45	26	31	0	0	0	0	2	0	4	11	6	3	0	0	0	0	0	0	0	0	1	2	2	18	8	0	0	0	0	0	57	229			
6/10/2024	20:00	38	25	0	0	0	0	0	3	4	15	12	4	0	0	0	0	0	0	0	0	0	0	2	12	9	2	0	0	0	0	63	202			
6/10/2024	20:15	32	27	0	0	0	0	0	1	7	14	10	0	0	0	0	0	0	0	0	0	0	2	8	11	5	1	0	0	0	0	59	186			
6/10/2024	20:30	29	21	0	0	1	0	1	2	8	14	1	2	0	0	0	0	0	0	0	0	0	1	11	6	3	0	0	0	0	0	50	176			
6/10/2024	20:45	13	17	0	0	0	0	1	2	4	3	1	0	0	0	0	0	0	0	0	0	0	2	4	7	4	0	0	0	0	2	30	150			
6/10/2024	21:00	24	23	0	0	0	0	0	0	9	8	1	1	0	0	0	0	0	0	0	0	1	3	5	6	5	1	0	0	0	7	47	164			
6/10/2024	21:15	23	26	0	0	0	0	1	4	7	7	2	0	0	0	0	0	0	0	0	0	0	1	10	8	7	0	0	0	0	2	49	145			
6/10/2024	21:30	9	15	0	0	0	0	0	3	1	2	1	0	0	0	0	0	0	0	0	0	0	2	5	5	0	3	0	0	0	2	24	107			
6/10/2024	21:45	19	25	0	0	0	0	1	2	6	4	1	1	0	0	0	0	0	0	0	0	1	1	7	7	5	0	1	0	0	7	44	112			
6/10/2024	22:00	17	11	0	0	0	0	1	2	4	6	1	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	0	0	0	4	28	102			
6/10/2024	22:15	8	3	0	0	0	0	0	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	1	11	91			
6/10/2024	22:30	24	5	0	0	0	0	0	4	8	2	2	0	0	1	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	7	29	96			
6/10/2024	22:45	29	5	0	0	0	0	0	3	12	6	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	9	34	85			
6/10/2024	23:00	8	9	0	0	0	0	0	4	0	2	0	0	0	0	0	0	0	0	0	0	0	1	3	1	2	1	0	0	0	3	17	61			
6/10/2024	23:15	9	7	0	0	0	0	0	1	4	1	2	0	0	0	0	0	0	0	0	0	1	0	2	1	1	1	0	0	0	2	16	57			
6/10/2024	23:30	4	14	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	4	4	1	1	0	0	0	4	18	49			
6/10/2024	23:45	5	5	0	0	0	0	1	1	0	1	0	0	0	0																					

DATE	TIME	America/New_York	EB Speed Detail														WB Speed Detail														UNKNOWN	15-min	Hour	
			1-15 MPH	16-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-65 MPH	66-70 MPH	71-75 MPH	76+ MPH	1-15 MPH	16-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-65 MPH	66-70 MPH	71-75 MPH	76+ MPH		Totla Volume		
6/11/2024	5:45	5:45	37	41	0	0	0	0	0	0	2	5	9	16	5	0	0	0	0	0	0	0	0	4	14	14	7	2	0	0	0	78	370	
6/11/2024	6:00	6:00	38	27	0	0	0	0	0	0	2	8	14	13	0	1	0	0	0	0	0	0	2	2	3	10	5	2	1	0	1	65	438	
6/11/2024	6:15	6:15	61	47	0	0	0	0	0	0	3	12	20	24	1	0	0	0	0	0	0	0	1	5	23	13	5	0	0	0	1	108	555	
6/11/2024	6:30	6:30	55	64	0	0	0	0	1	1	14	15	20	4	0	0	0	0	0	0	0	1	3	11	25	20	1	1	0	0	0	0	119	668
6/11/2024	6:45	6:45	85	61	0	0	0	0	0	0	3	20	39	18	3	1	0	0	0	0	0	1	7	22	20	8	1	0	0	0	2	146	815	
6/11/2024	7:00	7:00	101	81	0	0	0	0	2	4	21	36	32	4	1	0	0	0	0	0	0	1	8	34	33	4	1	0	0	0	1	182	922	
6/11/2024	7:15	7:15	130	91	0	0	0	0	2	9	32	55	26	3	0	0	0	0	0	0	0	1	1	12	43	28	5	0	0	0	3	221	952	
6/11/2024	7:30	7:30	157	109	0	0	0	1	2	7	43	75	26	1	1	0	0	0	0	0	0	5	3	4	15	60	20	0	1	0	0	2	266	943
6/11/2024	7:45	7:45	139	114	0	0	0	1	3	18	43	47	22	4	0	0	0	0	0	0	0	2	21	56	29	6	0	0	0	0	1	253	880	
6/11/2024	8:00	8:00	126	86	0	0	0	0	4	6	35	49	27	2	0	0	0	0	0	0	0	1	19	34	29	2	1	0	0	0	3	212	809	
6/11/2024	8:15	8:15	111	101	0	0	0	0	2	6	25	48	23	6	1	0	0	0	0	0	0	1	9	36	51	3	1	0	0	0	0	212	739	
6/11/2024	8:30	8:30	98	105	0	1	0	0	0	5	19	49	16	5	1	0	0	0	0	0	0	2	14	52	32	4	0	0	1	0	2	203	676	
6/11/2024	8:45	8:45	91	91	0	0	0	0	0	6	25	31	21	6	0	1	0	0	0	0	0	1	8	41	35	4	2	0	0	0	1	182	603	
6/11/2024	9:00	9:00	72	70	0	0	0	0	0	9	15	21	18	7	1	0	0	0	0	0	0	1	6	31	29	2	0	0	0	0	2	142	552	
6/11/2024	9:15	9:15	78	71	0	0	0	1	3	8	22	29	14	0	1	0	0	0	0	0	0	1	3	8	33	19	6	1	0	0	0	0	149	551
6/11/2024	9:30	9:30	56	74	0	0	0	0	0	2	13	22	15	3	0	0	0	0	0	0	0	1	4	11	29	23	5	1	0	0	1	130	513	
6/11/2024	9:45	9:45	72	59	0	0	0	0	0	5	21	29	13	3	0	0	0	0	0	0	0	1	8	17	24	8	1	0	0	0	1	131	505	
6/11/2024	10:00	10:00	76	65	0	0	0	0	0	1	22	31	16	6	0	0	0	0	0	0	0	1	12	31	18	3	0	0	0	0	0	141	530	
6/11/2024	10:15	10:15	59	52	0	0	0	0	2	10	8	23	13	2	1	0	0	0	0	0	0	1	13	25	9	3	0	0	0	0	0	111	512	
6/11/2024	10:30	10:30	62	60	0	0	0	0	0	3	17	19	16	5	0	0	0	0	0	0	0	2	2	6	21	26	3	0	0	0	2	122	531	
6/11/2024	10:45	10:45	90	66	1	0	0	1	1	2	27	29	24	3	0	0	0	0	0	0	0	3	6	23	26	6	1	0	0	0	2	156	549	
6/11/2024	11:00	11:00	62	61	0	0	0	0	2	5	15	16	20	3	0	0	0	0	0	0	0	1	8	31	13	6	0	0	0	0	2	123	517	
6/11/2024	11:15	11:15	57	73	0	0	0	0	0	3	9	25	16	3	1	0	0	0	0	0	0	1	4	20	32	9	6	1	0	0	0	130	521	
6/11/2024	11:30	11:30	77	63	0	0	0	0	0	7	23	29	15	2	0	0	0	0	0	0	0	0	7	29	24	2	0	0	0	0	1	140	514	
6/11/2024	11:45	11:45	67	57	0	0	0	0	0	4	15	29	14	3	2	0	0	0	0	0	0	1	2	8	29	14	3	0	0	0	0	124	522	
6/11/2024	12:00	12:00	62	65	0	0	0	0	0	1	20	21	17	3	0	0	0	0	0	0	0	0	1	11	25	21	7	0	0	0	0	127	542	
6/11/2024	12:15	12:15	59	64	0	3	1	0	1	2	14	13	15	9	0	0	0	0	0	0	0	1	13	23	22	4	0	0	0	0	2	123	569	
6/11/2024	12:30	12:30	73	75	0	0	0	0	1	8	16	29	15	4	0	0	0	0	0	0	1	0	2	7	41	20	4	0	0	0	0	148	585	
6/11/2024	12:45	12:45	62	82	0	1	0	0	2	0	8	23	23	5	0	0	0	0	0	0	0	2	12	23	30	12	2	0	0	0	0	144	580	
6/11/2024	13:00	13:00	80	74	0	0	0	0	0	4	23	23	29	1	0	0	0	0	0	0	0	1	11	12	21	20	7	1	0	0	1	154	600	
6/11/2024	13:15	13:15	63	76	0	2	0	0	3	5	13	20	15	4	0	0	0	0	0	0	0	1	2	12	36									

DATE	TIME America/New_York	EB Volume	WB Volume	EB Speed Detail														WB Speed Detail														UNKNOWN	15-min	Hour
				1-15 MPH	16-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-65 MPH	66-70 MPH	71-75 MPH	76+ MPH	1-15 MPH	16-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-65 MPH	66-70 MPH	71-75 MPH	76+ MPH		Totla Volume	
6/12/2024	1:30	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	32
6/12/2024	1:45	1	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	1	7	36	
6/12/2024	2:00	4	3	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	2	7	39	
6/12/2024	2:15	6	10	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	1	0	0	0	3	16	47	
6/12/2024	2:30	4	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	6	36	
6/12/2024	2:45	4	6	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	2	1	1	2	0	0	0	0	0	10	36	
6/12/2024	3:00	7	8	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4	0	0	0	0	4	15	37	
6/12/2024	3:15	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	2	0	0	0	0	5	32	
6/12/2024	3:30	5	1	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	6	48	
6/12/2024	3:45	6	5	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	1	2	2	0	0	0	0	1	11	51	
6/12/2024	4:00	5	5	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	2	0	0	0	2	10	58
6/12/2024	4:15	9	12	0	0	0	0	0	0	6	1	2	0	0	0	0	0	0	0	0	0	0	3	2	4	1	1	0	0	0	1	21	71	
6/12/2024	4:30	4	5	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	9	100	
6/12/2024	4:45	6	12	0	0	0	0	0	0	2	1	2	0	0	1	0	0	0	0	0	0	0	0	4	8	0	0	0	0	0	0	18	165	
6/12/2024	5:00	11	12	0	0	0	0	0	0	0	1	5	4	1	0	0	0	0	0	0	0	0	0	3	8	1	0	0	0	0	0	23	219	
6/12/2024	5:15	17	33	0	0	0	0	0	0	1	4	5	7	0	0	0	0	0	0	0	0	0	2	9	11	9	1	1	0	0	0	50	256	
6/12/2024	5:30	26	48	0	0	0	0	0	0	1	4	12	7	2	0	0	0	0	0	0	0	0	1	5	25	14	2	1	0	0	0	74	310	
6/12/2024	5:45	36	36	0	0	0	0	0	0	1	5	15	12	3	0	0	0	0	0	0	0	0	0	3	12	13	7	1	0	0	0	72	374	
6/12/2024	6:00	32	28	0	0	0	0	3	1	9	11	8	0	0	0	0	0	0	0	0	0	0	0	0	11	11	4	1	1	0	0	60	451	
6/12/2024	6:15	56	48	0	0	0	0	0	1	11	23	15	6	0	0	0	0	0	0	0	0	0	1	5	22	17	3	0	0	0	0	104	564	
6/12/2024	6:30	79	59	0	0	0	0	1	4	15	31	21	5	1	1	0	0	0	0	0	0	0	2	9	33	11	4	0	0	0	0	138	692	
6/12/2024	6:45	80	69	0	0	0	0	0	2	13	30	20	11	1	0	0	0	0	0	0	0	0	0	8	30	27	4	0	0	0	3	149	820	
6/12/2024	7:00	107	66	0	0	0	1	2	7	20	37	29	11	0	0	0	0	0	0	0	0	0	1	7	30	23	3	1	0	0	1	173	908	
6/12/2024	7:15	149	83	0	0	0	0	0	9	34	64	29	9	2	0	0	0	0	0	0	0	0	2	19	33	25	4	0	0	0	2	232	940	
6/12/2024	7:30	162	104	0	0	0	0	2	11	45	77	21	5	0	0	0	0	0	0	0	0	0	6	24	40	32	2	0	0	0	1	266	929	
6/12/2024	7:45	118	119	0	0	0	1	5	10	18	51	21	9	1	0	0	0	0	0	0	0	0	1	21	62	29	6	0	0	0	2	237	857	
6/12/2024	8:00	117	88	1	0	0	1	2	12	27	49	21	3	0	0	0	0	0	0	0	0	0	1	8	43	31	4	1	0	0	1	205	793	
6/12/2024	8:15	125	96	0	0	0	0	0	6	32	44	32	7	1	0	0	0	0	0	0	0	1	1	6	49	32	7	0	0	0	3	221	739	
6/12/2024	8:30	121	73	0	0	1	1	8	9	26	48	21	7	0	0	0	0	0	0	0	0	0	1	7	48	16	1	0	0	0	0	194	655	
6/12/2024	8:45	92	81	0	0	0	0	0	3	32	28	22	7	0	0	0	0	0	0	0	0	0	3	12	39	25	2	0	0	0	0	173	598	
6/12/2024	9:00	91	60	0	0	1	0	3	7	16	40	20	4	0	0	0	0	0	0	0	0	0	0	5	29	22	4	0	0	0	0	151	560	
6/12/2024	9:15	75	62	1	0	0	0	1	7	19	28	14	3	0	1	0	0	0	0	0	0	0	0	6	28	26	2	0						

DATE	TIME America/New_York	EB Volume	WB Volume	EB Speed Detail														WB Speed Detail														UNKNOWN	15-min	Hour
				1-15 MPH	16-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-65 MPH	66-70 MPH	71-75 MPH	76+ MPH	1-15 MPH	16-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-65 MPH	66-70 MPH	71-75 MPH	76+ MPH		Totla Volume	
6/14/2024	12:45	116	94	0	2	0	1	4	7	23	46	26	2	1	1	0	0	1	2	0	0	0	10	15	41	23	2	0	0	0	3	210	750	
6/14/2024	13:00	101	80	0	0	0	0	0	3	17	42	28	9	1	0	0	0	0	0	0	0	1	4	5	10	32	24	3	1	0	0	1	181	742
6/14/2024	13:15	105	72	0	0	1	0	0	6	25	38	25	6	0	0	0	0	0	0	0	0	0	0	15	31	22	4	0	0	0	0	4	177	738
6/14/2024	13:30	90	92	0	0	0	0	0	0	15	19	32	18	3	0	0	0	0	0	0	0	0	4	24	31	27	6	0	0	0	0	3	182	764
6/14/2024	13:45	105	97	0	1	0	1	0	12	23	36	27	3	0	0	0	0	0	0	0	0	0	0	19	45	26	7	0	0	0	0	2	202	811
6/14/2024	14:00	86	91	0	0	0	2	4	3	15	40	15	3	0	0	0	0	0	0	0	0	3	5	17	35	24	6	1	0	0	0	4	177	813
6/14/2024	14:15	105	98	0	0	1	0	1	8	25	40	22	5	0	0	0	0	0	0	0	0	1	7	23	37	26	4	0	0	0	0	3	203	842
6/14/2024	14:30	130	99	0	0	0	0	3	11	26	49	30	4	2	0	0	0	0	0	0	0	0	5	14	47	27	4	0	0	0	0	5	229	867
6/14/2024	14:45	103	101	0	0	0	0	2	4	33	27	18	9	2	0	0	0	0	0	0	0	0	5	21	46	25	4	0	0	0	0	8	204	914
6/14/2024	15:00	99	107	0	0	0	0	2	12	19	41	16	5	1	0	0	0	0	0	0	0	4	7	20	51	19	4	1	0	0	0	3	206	968
6/14/2024	15:15	95	133	0	0	0	0	0	2	17	26	37	11	1	0	0	0	0	0	0	0	0	7	33	49	40	3	1	0	0	0	1	228	979
6/14/2024	15:30	158	118	0	0	0	0	5	12	49	46	32	6	3	0	0	0	0	0	0	2	4	10	30	47	22	3	0	0	0	0	5	276	1002
6/14/2024	15:45	133	125	0	0	0	0	1	3	26	54	33	10	1	1	0	0	0	0	0	0	0	6	41	50	25	2	0	0	0	0	5	258	960
6/14/2024	16:00	114	103	0	1	0	1	1	7	20	39	30	13	1	0	0	0	0	0	0	0	1	3	12	48	37	2	0	0	0	0	1	217	930
6/14/2024	16:15	120	131	0	0	0	1	3	8	18	50	31	6	1	1	0	0	0	0	0	0	1	6	39	57	22	4	1	0	0	0	2	251	946
6/14/2024	16:30	113	121	0	0	0	0	3	6	14	32	43	11	0	1	0	0	0	0	0	1	1	2	20	53	35	6	0	0	0	0	4	234	950
6/14/2024	16:45	103	125	0	0	0	0	2	3	19	34	26	14	1	1	2	0	0	0	0	0	0	6	27	56	30	6	0	0	0	0	1	228	926
6/14/2024	17:00	116	117	0	0	0	1	2	8	28	45	25	4	2	0	0	0	0	0	0	0	0	1	17	65	27	7	0	0	0	0	1	233	883
6/14/2024	17:15	127	128	0	1	1	0	0	5	31	51	27	6	0	0	0	0	0	0	0	0	2	3	35	59	23	6	0	0	0	0	5	255	805
6/14/2024	17:30	74	136	0	0	0	0	0	1	11	26	30	6	0	0	0	0	0	0	0	0	1	1	13	31	55	34	0	0	0	0	1	210	720
6/14/2024	17:45	90	95	0	0	0	0	2	4	14	35	23	7	3	0	0	0	0	0	0	0	0	2	11	42	33	6	0	0	0	0	3	185	632
6/14/2024	18:00	55	100	1	0	0	0	1	2	8	19	21	3	0	0	0	0	0	0	0	0	1	3	15	52	24	5	0	0	0	0	0	155	576
6/14/2024	18:15	79	91	0	0	0	0	1	3	12	28	24	8	1	0	0	0	0	0	0	0	0	6	18	35	28	2	2	0	0	0	2	170	538
6/14/2024	18:30	58	64	0	0	0	0	0	2	4	29	19	3	0	0	0	0	0	0	0	0	0	2	9	22	25	6	0	0	0	0	1	122	488
6/14/2024	18:45	53	76	0	0	0	0	0	1	8	19	19	3	2	0	0	0	0	0	0	0	0	2	12	38	20	3	1	0	0	0	1	129	453
6/14/2024	19:00	58	59	0	0	0	0	0	7	10	22	12	4	0	2	0	0	0	0	0	0	1	0	10	24	19	5	0	0	0	0	1	117	420
6/14/2024	19:15	56	64	0	0	1	0	0	0	15	19	15	6	0	0	0	0	0	0	0	0	0	2	14	31	17	0	0	0	0	0	0	120	390
6/14/2024	19:30	48	39	0	0	0	1	0	1	12	22	11	1	0	0	0	0	0	0	0	1	0	0	7	15	12	4	0	0	0	0	0	87	341
6/14/2024	19:45	28	68	0	0	0	0	0	1	4	8	15	0	0	0	0	0	0	0	0	0	0	2	18	34	13	1	0	0	0	0	0	96	319
6/14/2024	20:00	40	47	0	0	0	0	0	3	10	16	6	1	1	1	1	0	0	0	0	0	0	0	13	21	10	3	0	0	0	0	1	87	269
6/14/2024	20:15	32	39	0	0	0	0	0	2	7	18	4	1	0	0	0	0	0	0	0	1	0	4	7	15	11	1	0	0	0	0	0	71	236
6/14/2024	20:30	29	36	0	0	0	0	0	0	6	13	7	2	0	0	0	0	0	0	0	0	1	2	7	15	8	2	0	0	0	0	2	65	236
6/14/2024	20:45	16	30	0	0	0	0	0	0	4	10	1	0	0	0	0	0	0	0	0	1	4	9	13	3	0	0	0	0	0	0	1	46	233
6/14/2024	21:00	27	27	0	0	0	0	0	5	3	10	2	0	0	0	0	0	0	0	0	0	2	9	8	5	1	2	0	0	0	0	7	54	226
6/14/2024	21:15	38	33	0	0	0	0	2	6	12	7	6	0	1	0	0	0	0	0	0	0	0	2	10	10	8	3	0	0	0	0	4	71	
6/14/2024	21:30	27	35	0	0	0	0	1	6	4	6	2	1	0	0	0	0	0	0	0	0	0	2	16	10	3	2	0	0	0	0	9	62	
6/14/2024	21:45	14	25	0	0	0	0	0	2	2	3	1	1	0	0	0	0	0	0	0	0	1	2	3	4	7	5	1	0	0	0	7	39	

ObjectID	Crash Date	City/Town	Address	AOT Route	Crash Type	Collision Direction	Weather	Road Group	Report Number	Reporting Agency
4316061	September 4, 2019 at 8:35 AM	Essex	216 VT-117	VT-117	Property Damage Only	Rear End	Cloudy	State Highway numbered route, State owned	19ES04893	Essex PD.
4100060	June 15, 2019 at 11:54 AM	Essex	229 River Rd	VT-117	Injury	Rear End	Cloudy	State Highway numbered route, State owned	19ES03127	Essex PD.
4630480	November 8, 2019 at 4:38 AM	Essex	Sand Hill Road at River Road	VT-117	Property Damage Only	Single Vehicle Crash	Freezing Prec	State Highway numbered route, State owned	19ES06230	Essex PD.
5922949	November 18, 2020 at 5:19 AM	Essex	Sand Hill Road at River Road	VT-117	Property Damage Only	No Turns, Thru moves only, Broadside ^<	Freezing Prec	State Highway numbered route, State owned	20ES06315	Essex PD.
5923137	November 18, 2020 at 5:19 AM	Essex	Sand Hill Road At River Road	VT-117	Property Damage Only	No Turns, Thru moves only, Broadside ^<	Freezing Prec	State Highway numbered route, State owned	20ES06317	Essex PD.
5923342	September 21, 2021 at 7:13 AM	Essex	Sand Hill Road at River Road	VT-117	Property Damage Only	Left Turns, Opposite Directions, Head On/Angle Crash --^v--	Clear	State Highway numbered route, State owned	21ES005944	Essex PD.
6250064	January 14, 2022 at 1:05 AM	Essex	Sand Hill Road at River Road	VT-117	Property Damage Only	Single Vehicle Crash	Freezing Prec	State Highway numbered route, State owned	22ES000267	Essex PD.
6803005	September 4, 2022 at 3:58 PM	Essex	238-258 River Rd	VT-117	Injury	Right Turn and Thru, Broadside ^<--	Clear	State Highway numbered route, State owned	22ES006654	Essex PD.
4741305	November 25, 2019 at 4:18 PM	Essex	Sand Hill Road at River Road	VT-117	Injury		Freezing Prec	State Highway numbered route, State owned	19ES06577	Essex PD.
4774551	December 4, 2019 at 8:16 AM	Essex	River Road	VT-117	Property Damage Only	Left Turn and Thru, Angle Broadside -->v--	Freezing Prec	State Highway numbered route, State owned	19ES06714	Essex PD.
5918751	November 18, 2020 at 6:29 AM	Essex	SAND HILL RD & RIVER RD	VT-117				State Highway numbered route, State owned	20ES06318	Essex PD.
5918753	November 18, 2020 at 5:18 AM	Essex	SAND HILL RD & RIVER RD	VT-117				State Highway numbered route, State owned	20ES06316	Essex PD.
4313886	September 2, 2019 at 12:00 AM	Essex	259 VT-117	VT-117	Injury	Single Vehicle Crash	Rain	State Highway numbered route, State owned	19ES04850	Essex PD.
5925857	March 20, 2021 at 1:22 PM	Essex	255 River Rd	VT-117	Property Damage Only	Head On	Clear	State Highway numbered route, State owned	21ES01289	Essex PD.
3848816	January 7, 2019 at 7:30 AM	Essex	259 RIVER RD	VT-117	Property Damage Only	Opp Direction Sideswipe	Clear	State Highway numbered route, State owned	19ES00095	Essex PD.
5650863	June 30, 2020 at 9:19 PM	Essex	263 River Road	VT-117	Property Damage Only	Single Vehicle Crash	Cloudy	State Highway numbered route, State owned	20ES03522	Essex PD.
5933166	August 29, 2021 at 3:10 AM	Essex	279 River Rd	VT-117	Injury	Single Vehicle Crash	Clear	State Highway numbered route, State owned	21ES005310	Essex PD.
5790332	August 14, 2020 at 3:37 PM	Essex	273 River Road	VT-117	Property Damage Only	Other - Explain in Narrative	Clear	State Highway numbered route, State owned	20ES04518	Essex PD.
6292631	January 24, 2022 at 7:13 AM	Essex	273 River Rd	VT-117	Property Damage Only	Other - Explain in Narrative	Clear	State Highway numbered route, State owned	22ES000492	Essex PD.
3860031	January 22, 2019 at 7:23 AM	Essex	river road @ north	VT-117				State Highway numbered route, State owned	19ES00423	Essex PD.
5869202	October 1, 2020 at 10:15 AM	Essex	289 River Rd	VT-117	Property Damage Only	Left Turn and Thru, Angle Broadside -->v--	Clear	State Highway numbered route, State owned	20ES05482	Essex PD.
5920501	December 13, 2021 at 4:23 PM	Essex	289 River Rd	VT-117	Property Damage Only	Rear End	Freezing Prec	State Highway numbered route, State owned	21ES007868	Essex PD.
5921648	June 24, 2021 at 7:49 AM	Essex	289 River Rd	VT-117	Injury	Left Turn and Thru, Angle Broadside -->v--	Clear	State Highway numbered route, State owned	21ES003557	Essex PD.
5924294	November 28, 2021 at 10:48 AM	Essex	289 River Rd	VT-117	Injury	Head On	Clear	State Highway numbered route, State owned	21ES007659	Essex PD.
6804622	September 9, 2022 at 11:49 AM	Essex	289 River Road	VT-117	Property Damage Only	Rear End	Clear	State Highway numbered route, State owned	22ES006831	Essex PD.
5210056	March 9, 2020 at 8:03 AM	Essex	289 River Rd	VT-117	Property Damage Only	Rear End	Clear	State Highway numbered route, State owned	20ES01309	Essex PD.
6685634	June 18, 2022 at 2:13 PM	Essex	River Road	VT-117	Property Damage Only	Other - Explain in Narrative	Rain	State Highway numbered route, State owned	22ES004421	Essex PD.
6805188	October 22, 2022 at 6:09 PM	Essex	303-383 River Rd	VT-117	Property Damage Only	Head On	Clear	State Highway numbered route, State owned	22ES007915	Essex PD.
4099367	June 16, 2019 at 5:40 AM	Essex	331 VT-117	VT-117	Property Damage Only	Head On	Cloudy	State Highway numbered route, State owned	19ES03141	Essex PD.

Site Access
mm 3.4

ObjectID	Road Group ID	AOT Actual Milepoint	Animal	Time of Day	Intersection With	Impairment	Involving	Non Reportable Address	Reporting Agency ID	Road Characteristics	Road Condition	Street Address	Surface Condition	AOT Route ID	Coordinates
4316061	10	3.1	None/Other	Day	Sandhill Rd	None	None		VT0040200	Not at a Junction	Work zone (construct	216 VT-117	Dry	1170	44.478994862512955,-73.05297153625875
4100060	10	3.22	None/Other	Day	Sandhill Rd	None	None		VT0040200	Not at a Junction	None	229 River Rd	Dry	1170	44.478952096931046,-73.05054245288834
4630480	10	3.28	None/Other	Night	Sandhill Rd	None	None		VT0040200	T - Intersection	Road Surface Condi	Sand Hill Road at Ri	Snow	1170	44.47895287990921,-73.04932819219361
5922949	10	3.28	None/Other	Night	River Rd	None	None		VT0040200	T - Intersection	Road Surface Condi	Sand Hill Road at Ri	Ice	1170	44.47895287990921,-73.04932819219361
5923137	10	3.28	None/Other	Night	Sandhill Rd	None	None		VT0040200	T - Intersection	Road Surface Condi	Sand Hill Road At Ri	Ice	1170	44.47895287990921,-73.04932819219361
5923342	10	3.28	None/Other	Day	Sandhill Rd	None	Heavy Truck		VT0040200	T - Intersection	None	Sand Hill Road at Ri	Dry	1170	44.47895287990921,-73.04932819219361
6250064	10	3.28	None/Other	Night	Sandhill Rd	None	None		VT0040200	T - Intersection	Road Surface Condi	Sand Hill Road at Ri	Snow	1170	44.47895287990921,-73.04932819219361
6803005	10	3.287	None/Other	Day	Sandhill Road	None	Motorcycle		VT0040200	T - Intersection	None	238-258 River Rd	Dry	1170	44.47895920699383,-73.0491868072377
4741305	10	3.29	None/Other	Day	Sand Hill Road	None	None		VT0040200	T - Intersection	None	Sand Hill Road at Ri	Wet	1170	44.47896183238193,-73.04912625298962
4774551	10	3.29	None/Other	Day	Sand Hill Road	None	None		VT0040200	T - Intersection	None	River Road	Snow	1170	44.47896183238193,-73.04912625298962
5918751	10	3.29		Day				SAND HILL RD & RIVER RD	VT0040200			SAND HILL RD & RIVER RD		1170	44.47896183238193,-73.04912625298962
5918753	10	3.29		Night				SAND HILL RD & RIVER RD	VT0040200			SAND HILL RD & RIVER RD		1170	44.47896183238193,-73.04912625298962
4313886	10	3.46	None/Other		Sandhill Rd	Alcohol	None		VT0040200	Not at a Junction	Road Surface Condi	259 VT-117	Wet	1170	44.478966481043976,-73.04571244962194
5925857	10	3.46	None/Other	Day	Sandhill Rd	None	None		VT0040200	Not at a Junction	None	255 River Rd	Dry	1170	44.478966481043976,-73.04571244962194
3848816	10	3.51	None/Other	Day		None	None		VT0040200	Not at a Junction	None	259 RIVER RD	Wet	1170	44.478608156425416,-73.04484024482936
5650863	10	3.54	Deer	Night		None	None		VT0040200	Not at a Junction	None	263 River Road	Wet	1170	44.47828650768893,-73.04442343683672
5933166	10	3.65	None/Other	Night	Onion River Rd	None	None		VT0040200	Not at a Junction	None	279 River Rd	Dry	1170	44.47692933092911,-73.04327660903331
5790332	10	3.66	None/Other	Day		None	Heavy Truck		VT0040200	Not at a Junction	None	273 River Road	Dry	1170	44.47680722140995,-73.04316797424747
6292631	10	3.66	None/Other	Day	Onion River Rd	None	None		VT0040200	Not at a Junction	None	273 River Rd	Wet	1170	44.47680722140995,-73.04316797424747
3860031	10	3.8		Day	N. Willston Rd.			river road @ north williston roac	VT0040200			river road @ north		1170	44.47532048314556,-73.0412617148842
5869202	10	3.8	None/Other	Day	N Williston Rd	None	None		VT0040200	T - Intersection	None	289 River Rd	Dry	1170	44.47532048314556,-73.0412617148842
5920501	10	3.8	None/Other	Day	Onion River Rd	None	Heavy Truck		VT0040200	T - Intersection		289 River Rd	Wet	1170	44.47532048314556,-73.0412617148842
5921648	10	3.8	None/Other	Day	River Rd	None	None		VT0040200	T - Intersection	None	289 River Rd	Dry	1170	44.47532048314556,-73.0412617148842
5924294	10	3.8	None/Other	Day	North Williston Rd	None	None		VT0040200	T - Intersection	None	289 River Rd	Dry	1170	44.47532048314556,-73.0412617148842
6804622	10	3.805	None/Other	Day	North Williston Road	None	None		VT0040200	Other - Explain in Narrative	None	289 River Road	Dry	1170	44.47527487633587,-73.04118320009381
5210056	10	3.81	None/Other	Day	N Williston Rd	None	None		VT0040200	T - Intersection	None	289 River Rd	Dry	1170	44.47523115805395,-73.04109932174929
6685634	10	3.81	None/Other	Day	North Williston Road	None	None		VT0040200	T - Intersection	Road Surface Condi	River Road	Wet	1170	44.47523115805395,-73.04109932174929
6805188	10	4.115	Deer	Night		None	None		VT0040200	Not at a Junction	None	303-383 River Rd	Dry	1170	44.473708632471514,-73.03520254090843
4099367	10	4.27	Deer	Night	Overlook Ter	None	None		VT0040200	Not at a Junction	Unknown	331 VT-117		1170	44.47261175563332,-73.03240318101246

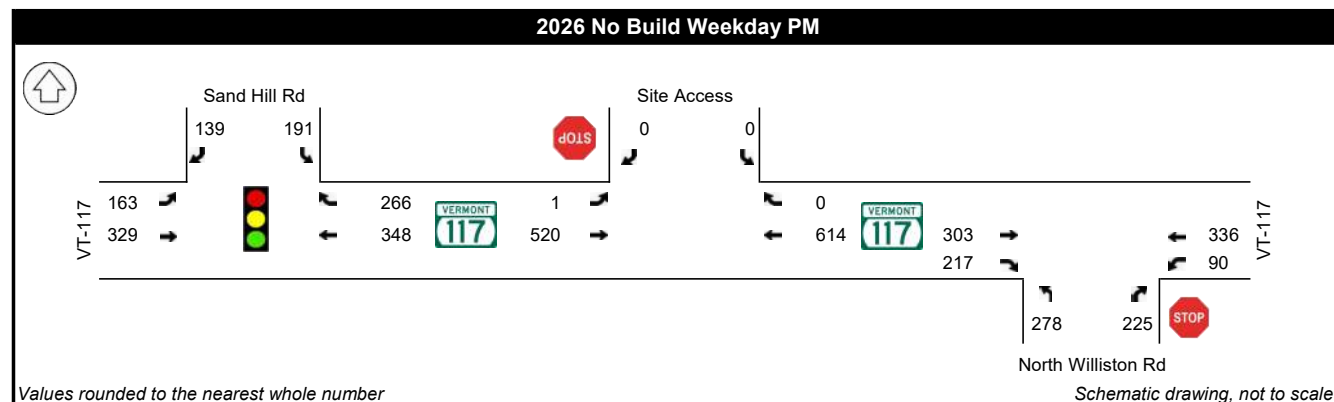
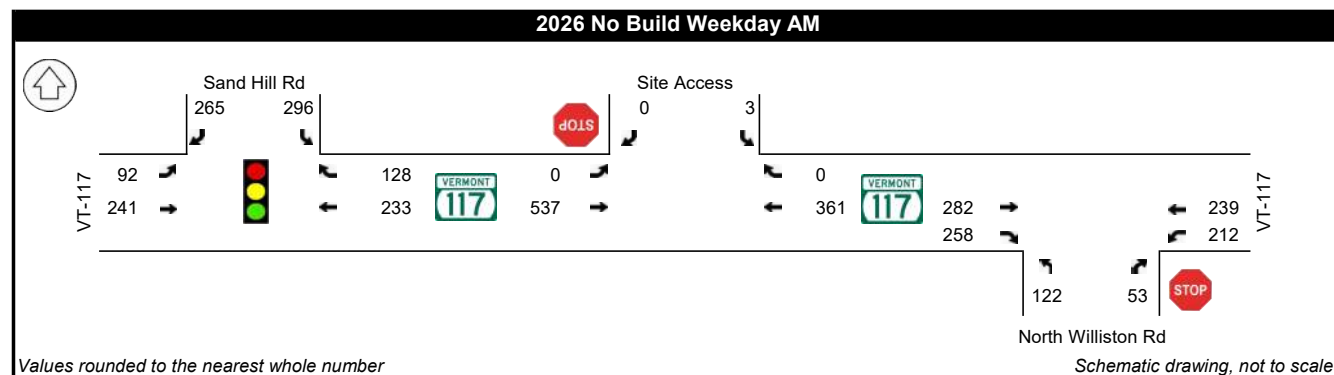
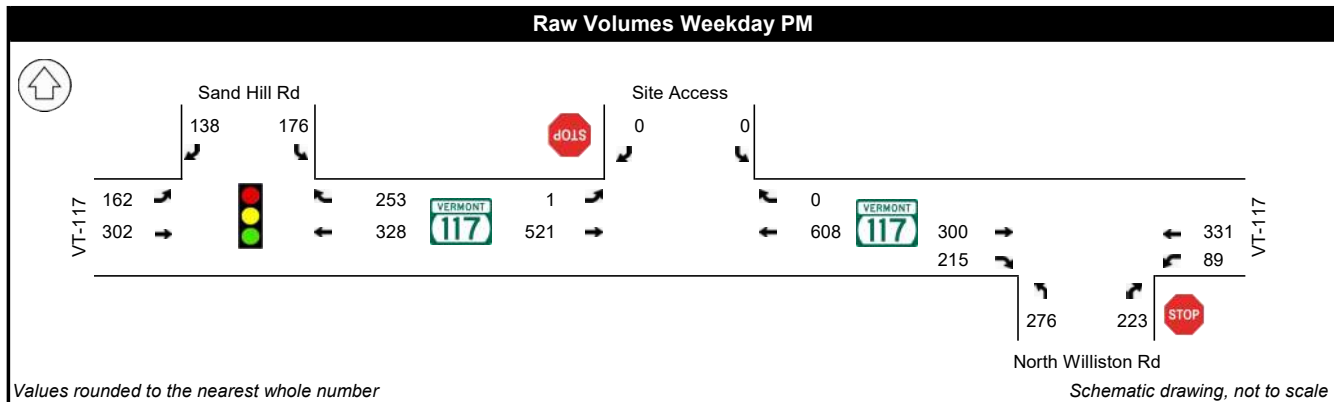
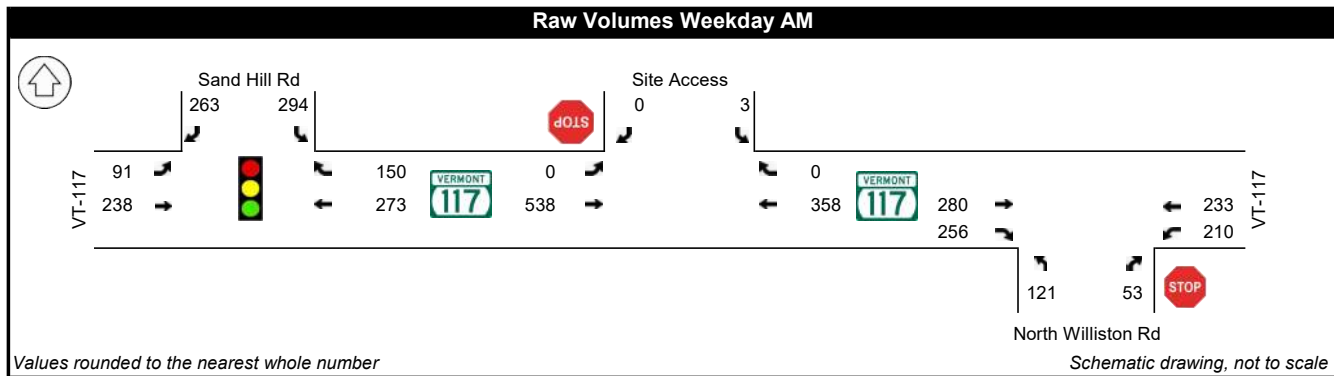
Site Access
mm 3.4



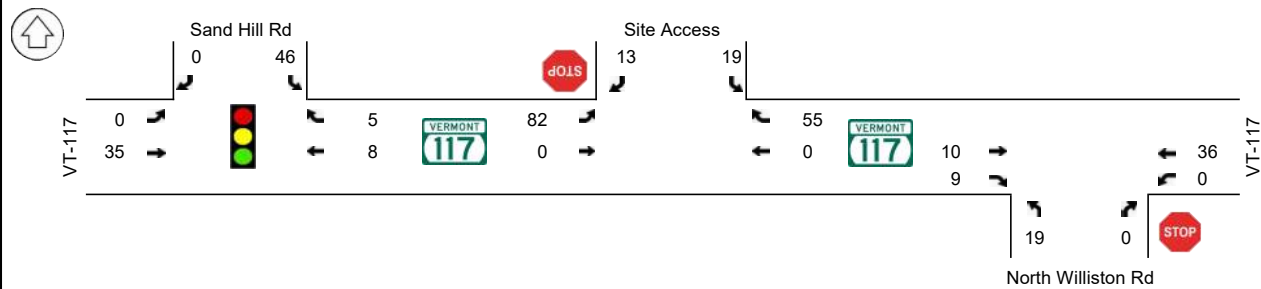
Reported Crashes - VT-117 (River Road) mm 3.1-4.27 - 01/01/2019 through 12/31/2023

SHIP Phase II Essex VT





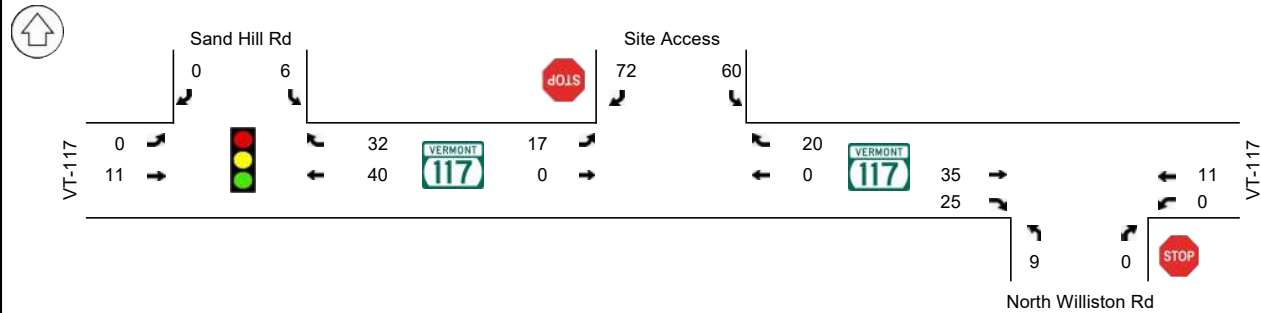
Passenger Vehicle Trip Distribution Weekday AM



Values rounded to the nearest whole number

Schematic drawing, not to scale

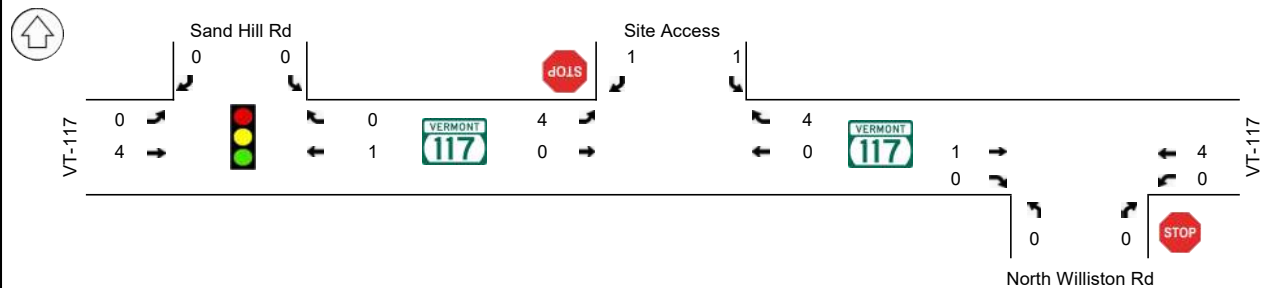
Passenger Vehicle Trip Distribution Weekday PM



Values rounded to the nearest whole number

Schematic drawing, not to scale

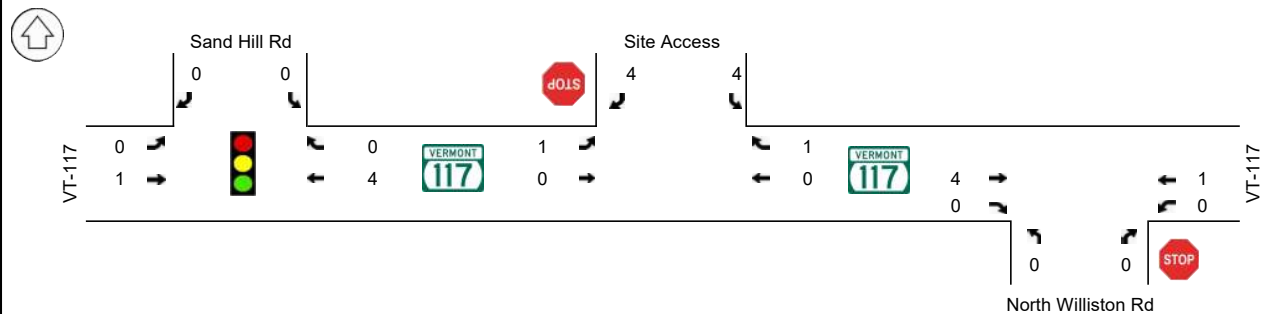
Heavy Vehicle Trip Distribution Weekday AM



Values rounded to the nearest whole number

Schematic drawing, not to scale

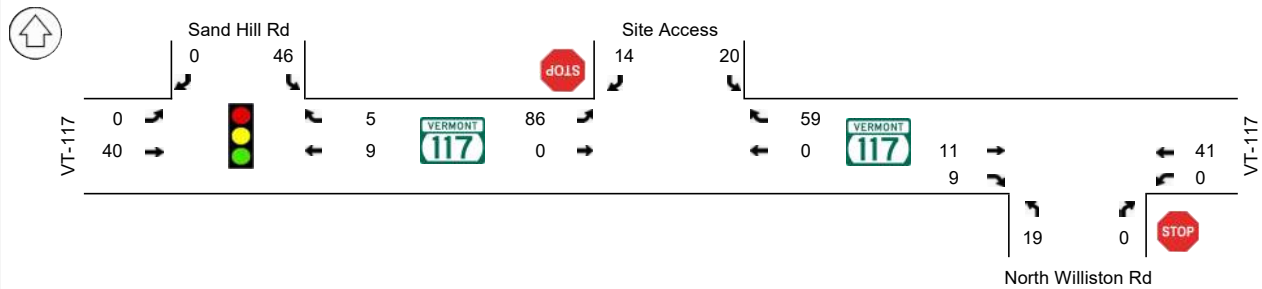
Heavy Vehicle Trip Distribution Weekday PM



Values rounded to the nearest whole number

Schematic drawing, not to scale

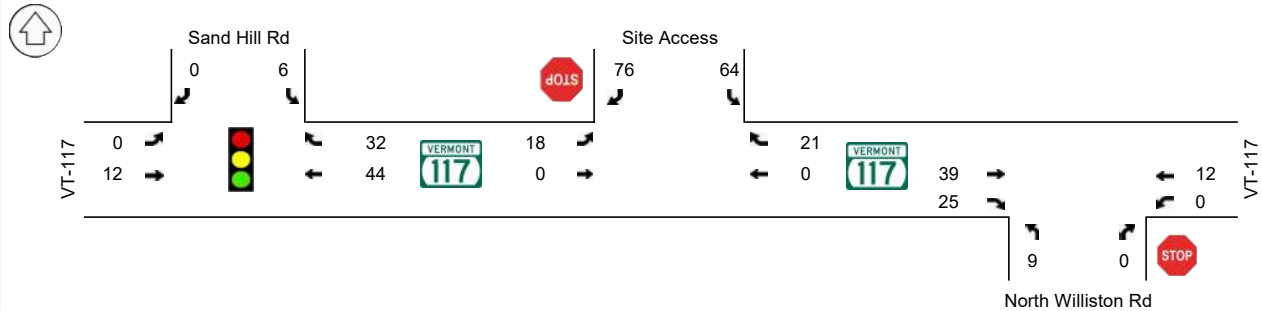
Total Trip Distribution Weekday AM



Values rounded to the nearest whole number

Schematic drawing, not to scale

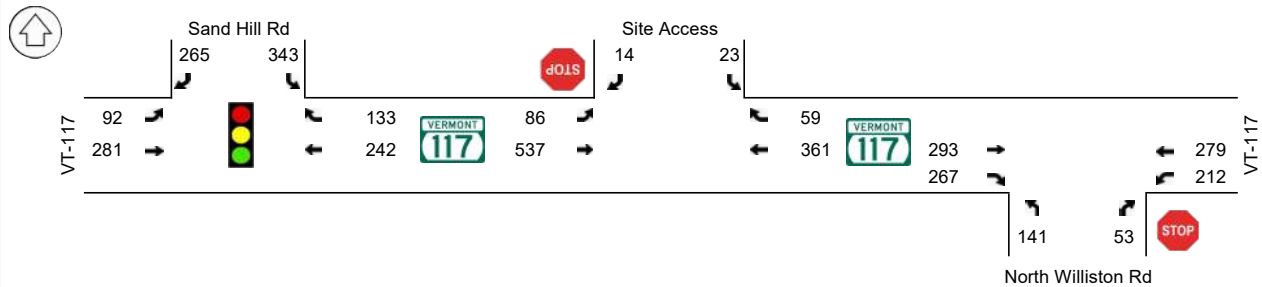
Total Trip Distribution Weekday PM



Values rounded to the nearest whole number

Schematic drawing, not to scale

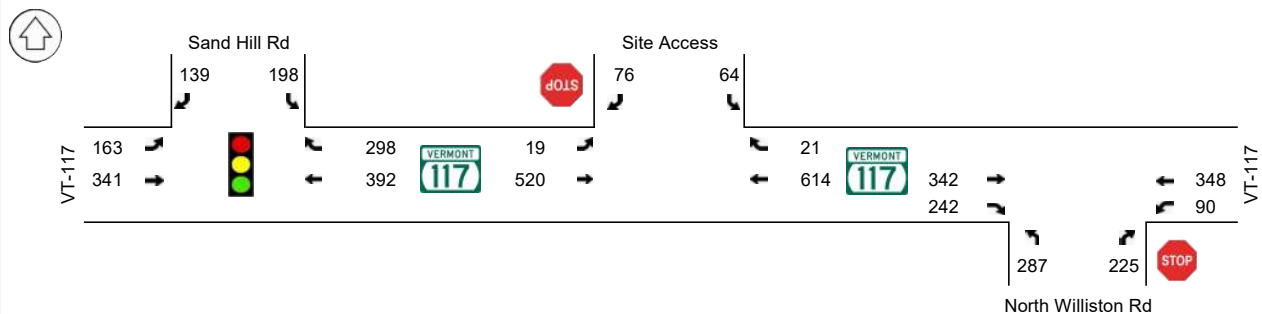
2026 Build Weekday AM



Values rounded to the nearest whole number

Schematic drawing, not to scale

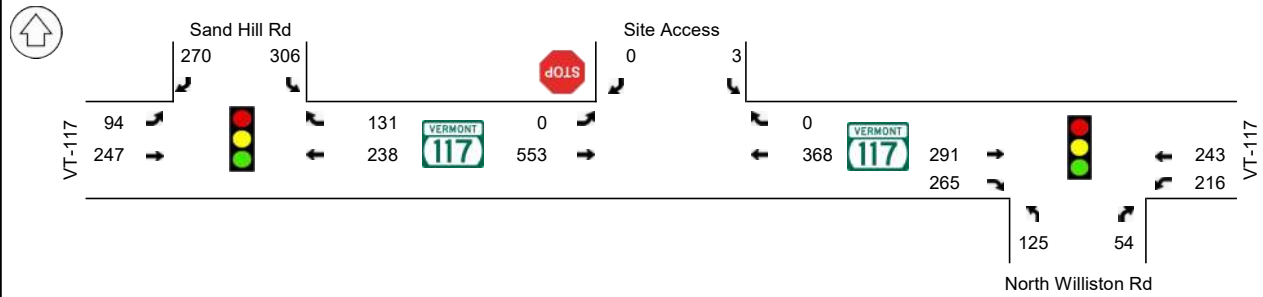
2026 Build Weekday PM



Values rounded to the nearest whole number

Schematic drawing, not to scale

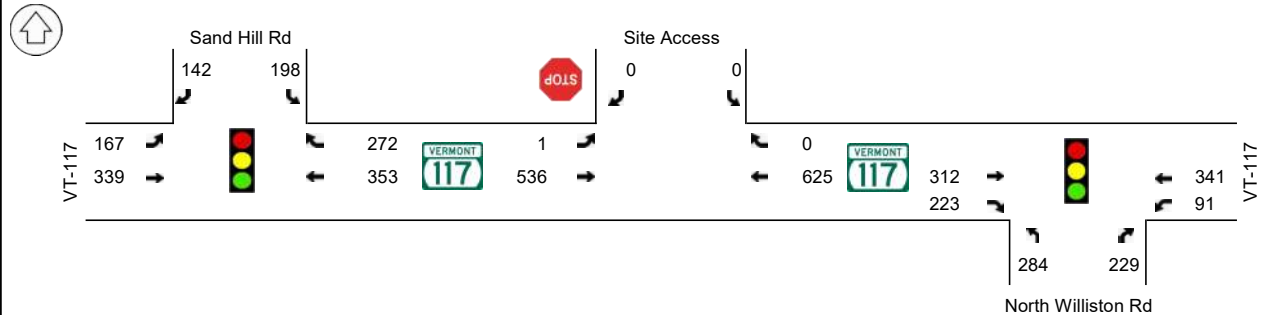
2031 No Build Weekday AM



Values rounded to the nearest whole number

Schematic drawing, not to scale

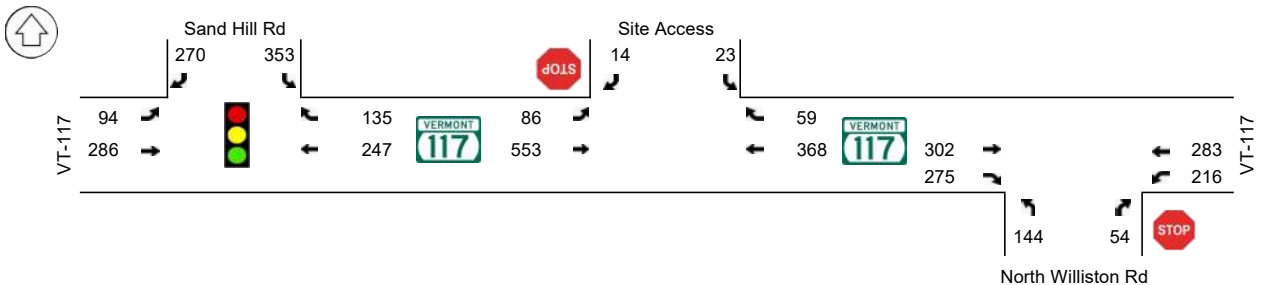
2031 No Build Weekday PM



Values rounded to the nearest whole number

Schematic drawing, not to scale

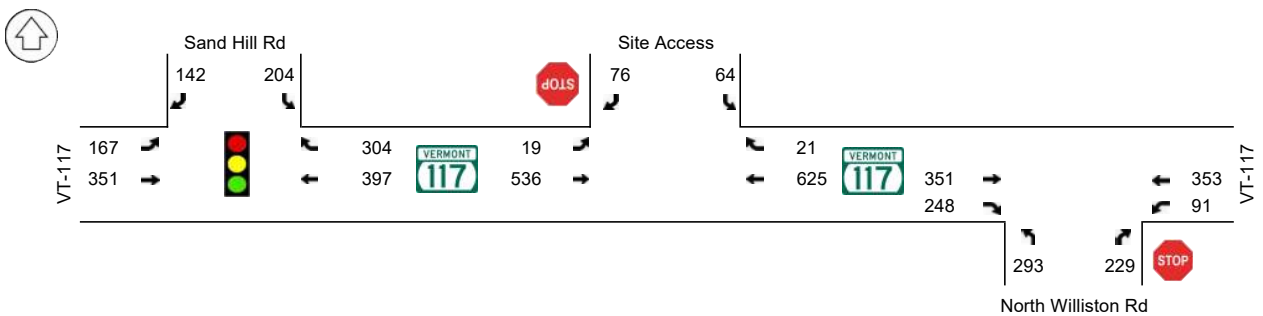
2031 Build Weekday AM



Values rounded to the nearest whole number

Schematic drawing, not to scale

2031 Build Weekday PM



Values rounded to the nearest whole number

Schematic drawing, not to scale

AM Peak Hour

09/05/24 02:51 PM

Raw Count Data

DHV & Annual Adjustments (1) to

2026

DHV & Annual Adjustments (3) to

2026

Apply Adjustments

1 = Apply Adjustment 1
2 = Apply Adjustment 2
3 = Apply Adjustment 3

Adjusted Raw Counts

2026

Balancing

2026

No Build

2026

Synchro

Node

PHF overridden to 1 for Synchro inputs

1

VT-117 / Sand Hill Rd

Essex, VT

9/26/2023

4th Tuesday

VTrans

	EB	WB	NB	SB
LT	91	0	0	294
TH	238	273	0	0
RT	0	150	0	263
Enter	329	423	0	557
Exit	532	536	241	0
% Trucks	6%	5%		2%
Peds	0	0	0	0
PHF				
Peak Hour	7:15 AM - 8:15 AM			0.89

0.99

(From PM Peak)

2

VT-117 / Site Driveway

Essex, VT

6/13/2024

2nd Thursday

VTrans

	EB	WB	NB	SB
LT	0	0	0	3
TH	538	358	0	0
RT	0	0	0	0
Enter	538	358	0	3
Exit	541	358	0	0
% Trucks	5%	4%	0%	0%
Peds	0	0	0	0
PHF				
Peak Hour	7:15 AM - 8:15 AM			0.85

0.97

(From PM Peak)

3

VT-117 / North Williston Rd

Essex, VT

6/13/2024

2nd Thursday

	EB	WB	NB	SB
L	0	210	121	0
T	280	233	0	0
R	256	0	53	0
Enter	286	456	97	72
Exit	304	241	215	151
Heavy	5.4%	3.2%	2.9%	0.0%
Peds	0	0	0	0
PHF				
Peak Hour	7:15 AM - 8:15 AM			0.86

0.99

(From PM Peak)

EB

WB

NB

SB

L	92	0	0	296
T	240	275	0	0
R	0	151	0	265

Enter

332

426

0

561

Exit

536

540

243

0

1319

1319

EB

WB

NB

SB

L	0	0	0	3
T	542	361	0	0
R	0	0	0	0

Enter

542

361

0

3

Exit

545

361

0

0

906

906

EB

WB

NB

SB

L	0	212	122	0
T	282	235	0	0
R	258	0	53	0

Enter

540

446

175

0

Exit

336

357

0

470

1162

1162

EB

WB

NB

SB

L	1	-42		
T		-23		
R				

Enter

-1

Exit

0

-64

-1

EB

WB

NB

SB

L	0	0	0	3
T	537	361	0	0
R	0	0	0	0

Enter

537

361

0

3

Exit

540

361

0

0

901

901

EB

WB

NB

SB

L	0	212	122	0
T	282	239	0	0
R	258	0	53	0

Enter

540

450

175

0

Exit

336

361

0

470

1166

1166

To / From VT-117 W

To / from VT-117 e

To / from Sand Hill Rd no

To / from Williston Rd soi

PM Peak Hour

09/05/24 02:51 PM

Raw Count Data

DHV & Annual Adjustments (1) to

2026

DHV & Annual Adjustments (3) to

2026

Apply Adjustments

1 = Apply Adjustment 1
2 = Apply Adjustment 2
3 = Apply Adjustment 3

Adjusted Raw Counts

2026

Balancing

2026

No Build

2026

Synchro

Node

PHF overridden to 1 for Synchro inputs

1

VT-117 / Sand Hill Rd

Essex, VT

9/26/2023

4th Tuesday

VTrans

	EB	WB	NB	SB
L	162	0	0	176
T	302	328	0	0
R	0	253	0	138
Enter	464	581	0	314
Exit	478	466	415	0
% Trucks	3.3%	3.1%		1.9%
Peds	0	0	0	2
PHF				
Peak Hour	4:45 PM - 5:45 PM Peak			0.88

DHV Calculations

ATR Station

Method

DHV

Corr. Count

DHV Adjustment

Total Adjustment

Growth Rate

DHV Year

Analysis Year

2024-2023 Growth

Growth rate from 2022 Redbook

1.004

2024

2023

1.00

0.99

1.004

2024

2026

1.00

Growth rate from 2022 Redbook

2

VT-117 / Site Driveway

Essex, VT

6/13/2024

2nd Thursday

VTrans

	EB	WB	NB	SB
L	1	0	0	0
T	521	608	0	0
R	0	0	0	0
Enter	522	608	0	0
Exit	521	608	1	0
% Trucks	0.8%	1.5%		0.0%
Peds	0	0	0	0
PHF				
Peak Hour	4:45 PM - 5:45 PM Peak			0.99

DHV Calculations

ATR Station

Method

DHV

Corr. Count

DHV Adjustment

Total Adjustment

Growth Rate

DHV Year

Analysis Year

2026-2023 Growth

Growth rate from 2022 Redbook

1.004

2024

2026

1.00

0.97

1.004

2024

2026

1.00

Growth rate from 2022 Redbook

3

VT-117 / North Williston Rd

Essex, VT

6/13/2024

2nd Thursday

	EB	WB	NB	SB
L	0	89	276	0
T	300	331	0	0
R	215	0	223	0
Enter	515	420	499	0
Exit	523	607	0	304
Heavy	0.8%	2.6%	0.4%	0.0%
Peds	0	0	0	0
PHF				
Peak Hour	4:45 PM - 5:45 PM Peak			0.98

DHV Calculations

ATR Station

Method

DHV

Corr. Count

DHV Adjustment

Total Adjustment

Growth Rate

DHV Year

Analysis Year

2024-2023 Growth

Growth rate from 2022 Redbook

1.004

2024

2026

1.008

0.98

1.004

2024

2026

1.01

Growth rate from 2022 Redbook

EB

WB

NB

SB

L	163	0	0	177
T	304	331	0	0
R	0	255	0	139

Enter

468

585

0

316

Exit

482

470

418

0

1369

1369

EB

WB

NB

SB

L	1	0	0	0
T	525	613	0	0
R	0	0	0	0

Enter

526

613

0

0

Exit

525

613

1

0

1139

1139

EB

WB

NB

SB

L	0	90	278	0
T	302	334	0	0
R	217	0	225	0

Enter

519

423

503

0

Exit

527

612

0

306

1445

1445

EB

WB

NB

SB

L	25	17		
T		11		
R				

Enter

0

Exit

0

67

0

EB

WB

NB

SB

L	1	0	0	0
T	520	614	0	0
R	0	0	0	0

Enter

521

614

0

0

Exit

520

614

1

0

1135

1135

EB

WB

NB

SB

L	0	90	278	0
T	303	336	0	0
R	217	0	225	0

Enter

520

425

503

0

Exit

528

614

0

306

1448

1448

To / From VT-117 W

To / from VT-117 e

To / from Sand Hill Rd no

To / from Williston Rd soi

PM Peak Hour

Traffic Volume Worksheet
SHIP Phase II Essex VT

DATE: 07/22/2024
PROJECT: 24-620
Figure D1

HCM 7th Signalized Intersection Summary

1: VT-117 & Sand Hill Rd

07/19/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	92	241	233	128	296	265	
Future Volume (veh/h)	92	241	233	128	296	265	
Initial Q (Qb), veh	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1781	1811	1856	1870	1870	
Adj Flow Rate, veh/h	92	241	233	128	296	265	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Percent Heavy Veh, %	1	8	6	3	2	2	
Cap, veh/h	294	765	277	152	622	554	
Arrive On Green	0.07	0.43	0.25	0.25	0.35	0.35	
Sat Flow, veh/h	1795	1781	1099	604	1781	1585	
Grp Volume(v), veh/h	92	241	0	361	296	265	
Grp Sat Flow(s),veh/h/ln	1795	1781	0	1702	1781	1585	
Q Serve(g_s), s	2.1	5.2	0.0	11.8	7.6	7.7	
Cycle Q Clear(g_c), s	2.1	5.2	0.0	11.8	7.6	7.7	
Prop In Lane	1.00			0.35	1.00	1.00	
Lane Grp Cap(c), veh/h	294	765	0	430	622	554	
V/C Ratio(X)	0.31	0.32	0.00	0.84	0.48	0.48	
Avail Cap(c_a), veh/h	343	956	0	566	622	554	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	14.8	11.1	0.0	20.8	14.9	14.9	
Incr Delay (d2), s/veh	0.6	0.2	0.0	8.5	2.6	2.9	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.7	1.7	0.0	5.1	3.1	7.6	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	15.4	11.3	0.0	29.4	17.5	17.9	
LnGrp LOS	B	B		C	B	B	
Approach Vol, veh/h		333	361		561		
Approach Delay, s/veh		12.4	29.4		17.7		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				31.7	27.0	10.4	21.3
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				31.5	20.5	5.5	19.5
Max Q Clear Time (g_c+I1), s				7.2	9.7	4.1	13.8
Green Ext Time (p_c), s				1.3	1.4	0.0	1.0
Intersection Summary							
HCM 7th Control Delay, s/veh			19.6				
HCM 7th LOS			B				

Existing (2026) AM Peak 3:16 pm 07/16/2024 Baseline

Synchro 12 Report
Page 1

HCM 7th TWSC
2: VT-117 & Site Access

07/19/2024

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	537	361	0	3	0
Future Vol, veh/h	0	537	361	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	5	4	0	0	0
Mvmt Flow	0	537	361	0	3	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	361	0	898
Stage 1	-	-	361
Stage 2	-	-	537
Critical Hdwy	4.1	-	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	1209	-	312
Stage 1	-	-	710
Stage 2	-	-	590
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1209	-	312
Mov Cap-2 Maneuver	-	-	312
Stage 1	-	-	710
Stage 2	-	-	590

Approach	EB	WB	SB
HCM Control Delay, s/v	0	0	16.63
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1209	-	-	-	312
HCM Lane V/C Ratio	-	-	-	-	0.01
HCM Control Delay (s/veh)	0	-	-	-	16.6
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Existing (2026) AM Peak 3:16 pm 07/16/2024 Baseline

Synchro 12 Report
Page 2

HCM 7th TWSC
3: N Williston Rd & VT-117

07/19/2024

Intersection						
Int Delay, s/veh	8					
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Vol, veh/h	122	53	282	258	212	239
Future Vol, veh/h	122	53	282	258	212	239
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	150	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	3	4	7	4	1	5
Mvmt Flow	122	53	282	258	212	239

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1074	411	0	0	540	0
Stage 1	411	-	-	-	-	-
Stage 2	663	-	-	-	-	-
Critical Hdwy	6.43	6.24	-	-	4.11	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.336	-	-	2.209	-
Pot Cap-1 Maneuver	242	636	-	-	1034	-
Stage 1	667	-	-	-	-	-
Stage 2	511	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	185	636	-	-	1034	-
Mov Cap-2 Maneuver	185	-	-	-	-	-
Stage 1	667	-	-	-	-	-
Stage 2	390	-	-	-	-	-

Approach	NB	SE	NW
HCM Control Delay, s/v	42.24	0	4.41
HCM LOS	E		

Minor Lane/Major Mvmt	NBLn1	NBLn2	NWL	NWT	SET	SER
Capacity (veh/h)	185	636	846	-	-	-
HCM Lane V/C Ratio	0.659	0.083	0.205	-	-	-
HCM Control Delay (s/veh)	55.7	11.2	9.4	0	-	-
HCM Lane LOS	F	B	A	A	-	-
HCM 95th %tile Q(veh)	3.9	0.3	0.8	-	-	-

HCM 7th Signalized Intersection Summary

1: VT-117 & Sand Hill Rd

09/05/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	92	281	242	133	343	265	
Future Volume (veh/h)	92	281	242	133	343	265	
Initial Q (Qb), veh	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1781	1796	1856	1870	1870	
Adj Flow Rate, veh/h	92	281	242	133	343	265	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Percent Heavy Veh, %	1	8	7	3	2	2	
Cap, veh/h	287	773	283	156	622	553	
Arrive On Green	0.07	0.43	0.26	0.26	0.35	0.35	
Sat Flow, veh/h	1795	1781	1090	599	1781	1585	
Grp Volume(v), veh/h	92	281	0	375	343	265	
Grp Sat Flow(s),veh/h/ln	1795	1781	0	1688	1781	1585	
Q Serve(g_s), s	2.1	6.3	0.0	12.7	9.3	7.8	
Cycle Q Clear(g_c), s	2.1	6.3	0.0	12.7	9.3	7.8	
Prop In Lane	1.00			0.35	1.00	1.00	
Lane Grp Cap(c), veh/h	287	773	0	439	622	553	
V/C Ratio(X)	0.32	0.36	0.00	0.85	0.55	0.48	
Avail Cap(c_a), veh/h	323	925	0	550	622	553	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	14.9	11.4	0.0	21.1	15.7	15.2	
Incr Delay (d2), s/veh	0.6	0.3	0.0	10.4	3.5	3.0	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.8	2.1	0.0	5.6	3.9	7.7	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	15.6	11.7	0.0	31.5	19.2	18.2	
LnGrp LOS	B	B		C	B	B	
Approach Vol, veh/h		373	375		608		
Approach Delay, s/veh		12.6	31.5		18.8		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				32.5	27.4	10.4	22.1
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				31.1	20.9	5.1	19.5
Max Q Clear Time (g_c+I1), s				8.3	11.3	4.1	14.7
Green Ext Time (p_c), s				1.5	1.5	0.0	0.9
Intersection Summary							
HCM 7th Control Delay, s/veh			20.6				
HCM 7th LOS			C				

HCM 7th TWSC
2: VT-117 & Site Access

09/05/2024

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	86	537	361	59	23	14
Future Vol, veh/h	86	537	361	59	23	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	20	5	4	20	20	20
Mvmt Flow	86	537	361	59	23	14

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	420	0	0 1100 391
Stage 1	-	-	- - 391 -
Stage 2	-	-	- - 709 -
Critical Hdwy	4.3	-	- - 6.6 6.4
Critical Hdwy Stg 1	-	-	- - 5.6 -
Critical Hdwy Stg 2	-	-	- - 5.6 -
Follow-up Hdwy	2.38	-	- - 3.68 3.48
Pot Cap-1 Maneuver	1049	-	- - 217 620
Stage 1	-	-	- - 646 -
Stage 2	-	-	- - 456 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1049	-	- - 192 620
Mov Cap-2 Maneuver	-	-	- - 192 -
Stage 1	-	-	- - 571 -
Stage 2	-	-	- - 456 -

Approach	EB	WB	SB
HCM Control Delay, s/v	1.21	0	21.17
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	248	-	-	-	259
HCM Lane V/C Ratio	0.082	-	-	-	0.143
HCM Control Delay (s/veh)	8.7	0	-	-	21.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	0.5

HCM 7th TWSC
3: N Williston Rd & VT-117

09/05/2024

Intersection

Int Delay, s/veh 11.8

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Vol, veh/h	141	53	293	267	212	279
Future Vol, veh/h	141	53	293	267	212	279
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	150	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	3	4	7	4	1	5
Mvmt Flow	141	53	293	267	212	279

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1130	427	0
Stage 1	427	-	-
Stage 2	703	-	-
Critical Hdwy	6.43	6.24	-
Critical Hdwy Stg 1	5.43	-	-
Critical Hdwy Stg 2	5.43	-	-
Follow-up Hdwy	3.527	3.336	-
Pot Cap-1 Maneuver	224	624	-
Stage 1	656	-	-
Stage 2	489	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	169	624	-
Mov Cap-2 Maneuver	169	-	-
Stage 1	656	-	-
Stage 2	368	-	-

Approach	NB	SE	NW
HCM Control Delay, s/v65.51		0	4.09
HCM LOS	F		

Minor Lane/Major Mvmt	NBLn1	NBLn2	NWL	NWT	SET	SER
Capacity (veh/h)	169	624	777	-	-	-
HCM Lane V/C Ratio	0.834	0.085	0.209	-	-	-
HCM Control Delay (s/veh)	85.9	11.3	9.5	0	-	-
HCM Lane LOS	F	B	A	A	-	-
HCM 95th %tile Q(veh)	5.7	0.3	0.8	-	-	-

HCM 7th Signalized Intersection Summary

1: VT-117 & Sand Hill Rd

07/19/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	163	329	348	266	191	139	
Future Volume (veh/h)	163	329	348	266	191	139	
Initial Q (Qb), veh	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1841	1841	1870	1870	1870	
Adj Flow Rate, veh/h	163	329	348	266	191	139	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Percent Heavy Veh, %	2	4	4	2	2	2	
Cap, veh/h	271	1019	379	289	486	433	
Arrive On Green	0.08	0.55	0.39	0.39	0.27	0.27	
Sat Flow, veh/h	1781	1841	968	740	1781	1585	
Grp Volume(v), veh/h	163	329	0	614	191	139	
Grp Sat Flow(s),veh/h/ln	1781	1841	0	1708	1781	1585	
Q Serve(g_s), s	3.8	7.3	0.0	25.7	6.6	5.2	
Cycle Q Clear(g_c), s	3.8	7.3	0.0	25.7	6.6	5.2	
Prop In Lane	1.00			0.43	1.00	1.00	
Lane Grp Cap(c), veh/h	271	1019	0	668	486	433	
V/C Ratio(X)	0.60	0.32	0.00	0.92	0.39	0.32	
Avail Cap(c_a), veh/h	314	1140	0	739	486	433	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	16.7	9.1	0.0	21.7	22.2	21.7	
Incr Delay (d2), s/veh	2.4	0.2	0.0	15.7	2.4	2.0	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.5	2.4	0.0	11.9	2.9	5.2	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	19.1	9.3	0.0	37.4	24.6	23.7	
LnGrp LOS	B	A		D	C	C	
Approach Vol, veh/h		492	614		330		
Approach Delay, s/veh		12.5	37.4		24.2		
Approach LOS		B	D		C		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				48.1	27.0	12.2	35.9
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				46.5	20.5	7.5	32.5
Max Q Clear Time (g_c+I1), s				9.3	8.6	5.8	27.7
Green Ext Time (p_c), s				1.9	0.8	0.1	1.7
Intersection Summary							
HCM 7th Control Delay, s/veh			25.9				
HCM 7th LOS			C				

HCM 7th TWSC
2: VT-117 & Site Access

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Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	520	614	0	0	0
Future Vol, veh/h	1	520	614	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	2	2	2	2
Mvmt Flow	1	520	614	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	614	0	0 1136 614
Stage 1	-	-	- 614 -
Stage 2	-	-	- 522 -
Critical Hdwy	4.1	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.2	-	- 3.518 3.318
Pot Cap-1 Maneuver	975	-	- 223 492
Stage 1	-	-	- 540 -
Stage 2	-	-	- 595 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	975	-	- 223 492
Mov Cap-2 Maneuver	-	-	- 223 -
Stage 1	-	-	- 539 -
Stage 2	-	-	- 595 -

Approach	EB	WB	SB
HCM Control Delay, s/v 0.02		0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	3	-	-	-	-
HCM Lane V/C Ratio	0.001	-	-	-	-
HCM Control Delay (s/veh)	8.7	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Existing (2026) PM Peak 3:27 pm 07/17/2024 Baseline

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HCM 7th TWSC
3: N Williston Rd & VT-117

07/19/2024

Intersection						
Int Delay, s/veh	23.6					
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Vol, veh/h	278	225	303	217	90	336
Future Vol, veh/h	278	225	303	217	90	336
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	150	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	278	225	303	217	90	336
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	928	412	0	0	520	0
Stage 1	412	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	298	640	-	-	1046	-
Stage 1	669	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 266	640	-	-	1046	-
Mov Cap-2 Maneuver	~ 266	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Approach	NB	SE	NW			
HCM Control Delay, s/v66.27		0	1.85			
HCM LOS	F					
Minor Lane/Major Mvmt	NBLn1	NBLn2	NWL	NWT	SET	SER
Capacity (veh/h)	266	640	380	-	-	-
HCM Lane V/C Ratio	1.044	0.351	0.086	-	-	-
HCM Control Delay (s/veh)	108.9	13.6	8.8	0	-	-
HCM Lane LOS	F	B	A	A	-	-
HCM 95th %tile Q(veh)	11	1.6	0.3	-	-	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Existing (2026) PM Peak 3:27 pm 07/17/2024 Baseline

Synchro 12 Report
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HCM 7th Signalized Intersection Summary

1: VT-117 & Sand Hill Rd

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Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	163	341	392	298	198	139	
Future Volume (veh/h)	163	341	392	298	198	139	
Initial Q (Qb), veh	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1841	1841	1870	1870	1870	
Adj Flow Rate, veh/h	163	341	392	298	198	139	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Percent Heavy Veh, %	2	4	4	2	2	2	
Cap, veh/h	245	1065	410	312	454	404	
Arrive On Green	0.07	0.58	0.42	0.42	0.25	0.25	
Sat Flow, veh/h	1781	1841	970	738	1781	1585	
Grp Volume(v), veh/h	163	341	0	690	198	139	
Grp Sat Flow(s),veh/h/ln	1781	1841	0	1708	1781	1585	
Q Serve(g_s), s	3.8	7.5	0.0	30.5	7.3	5.6	
Cycle Q Clear(g_c), s	3.8	7.5	0.0	30.5	7.3	5.6	
Prop In Lane	1.00			0.43	1.00	1.00	
Lane Grp Cap(c), veh/h	245	1065	0	722	454	404	
V/C Ratio(X)	0.67	0.32	0.00	0.96	0.44	0.34	
Avail Cap(c_a), veh/h	278	1111	0	733	454	404	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	17.5	8.5	0.0	21.8	24.4	23.7	
Incr Delay (d2), s/veh	5.0	0.2	0.0	22.8	3.0	2.3	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.6	2.5	0.0	15.2	3.3	0.3	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	22.5	8.7	0.0	44.6	27.4	26.1	
LnGrp LOS	C	A		D	C	C	
Approach Vol, veh/h		504	690		337		
Approach Delay, s/veh		13.2	44.6		26.8		
Approach LOS		B	D		C		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				51.6	26.4	12.2	39.5
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				47.1	19.9	7.1	33.5
Max Q Clear Time (g_c+I1), s				9.5	9.3	5.8	32.5
Green Ext Time (p_c), s				2.0	0.8	0.1	0.5
Intersection Summary							
HCM 7th Control Delay, s/veh			30.3				
HCM 7th LOS			C				

HCM 7th TWSC
2: VT-117 & Site Access

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Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	520	614	21	64	76
Future Vol, veh/h	19	520	614	21	64	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	20	2	2	20	20	20
Mvmt Flow	19	520	614	21	64	76

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	635	0	0 1183 625
Stage 1	-	-	- 625 -
Stage 2	-	-	- 558 -
Critical Hdwy	4.3	-	- 6.6 6.4
Critical Hdwy Stg 1	-	-	- 5.6 -
Critical Hdwy Stg 2	-	-	- 5.6 -
Follow-up Hdwy	2.38	-	- 3.68 3.48
Pot Cap-1 Maneuver	868	-	- 193 454
Stage 1	-	-	- 501 -
Stage 2	-	-	- 539 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	868	-	- 187 454
Mov Cap-2 Maneuver	-	-	- 187 -
Stage 1	-	-	- 486 -
Stage 2	-	-	- 539 -

Approach	EB	WB	SB
HCM Control Delay, s/v 0.33		0	30.98
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	63	-	-	-	275
HCM Lane V/C Ratio	0.022	-	-	-	0.51
HCM Control Delay (s/veh)	9.2	0	-	-	31
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	2.7

HCM 7th TWSC
3: N Williston Rd & VT-117

09/05/2024

Intersection						
Int Delay, s/veh	32.6					
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Vol, veh/h	287	225	342	242	90	348
Future Vol, veh/h	287	225	342	242	90	348
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	150	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	287	225	342	242	90	348
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	991	463	0	0	584	0
Stage 1	463	-	-	-	-	-
Stage 2	528	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 273	599	-	-	991	-
Stage 1	634	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 242	599	-	-	991	-
Mov Cap-2 Maneuver	~ 242	-	-	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	525	-	-	-	-	-
Approach	NB	SE	NW			
HCM Control Delay, s/v96.04		0	1.85			
HCM LOS	F					
Minor Lane/Major Mvmt	NBLn1	NBLn2	NWL	NWT	SET	SER
Capacity (veh/h)	242	599	370	-	-	-
HCM Lane V/C Ratio	1.185	0.376	0.091	-	-	-
HCM Control Delay (s/veh)	159.9	14.6	9	0	-	-
HCM Lane LOS	F	B	A	A	-	-
HCM 95th %tile Q(veh)	13.6	1.7	0.3	-	-	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

HCM 7th Signalized Intersection Summary

1: VT-117 & Sand Hill Rd

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Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	94	247	238	131	306	270	
Future Volume (veh/h)	94	247	238	131	306	270	
Initial Q (Qb), veh	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1781	1811	1856	1870	1870	
Adj Flow Rate, veh/h	94	247	238	131	306	270	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Percent Heavy Veh, %	1	8	6	3	2	2	
Cap, veh/h	293	771	281	155	618	550	
Arrive On Green	0.07	0.43	0.26	0.26	0.35	0.35	
Sat Flow, veh/h	1795	1781	1098	604	1781	1585	
Grp Volume(v), veh/h	94	247	0	369	306	270	
Grp Sat Flow(s),veh/h/ln	1795	1781	0	1702	1781	1585	
Q Serve(g_s), s	2.1	5.4	0.0	12.2	8.0	7.9	
Cycle Q Clear(g_c), s	2.1	5.4	0.0	12.2	8.0	7.9	
Prop In Lane	1.00			0.36	1.00	1.00	
Lane Grp Cap(c), veh/h	293	771	0	436	618	550	
V/C Ratio(X)	0.32	0.32	0.00	0.85	0.49	0.49	
Avail Cap(c_a), veh/h	341	950	0	562	618	550	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	14.8	11.0	0.0	20.9	15.2	15.2	
Incr Delay (d2), s/veh	0.6	0.2	0.0	9.2	2.8	3.1	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.8	1.8	0.0	5.3	3.3	7.8	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	15.4	11.3	0.0	30.1	18.0	18.3	
LnGrp LOS	B	B		C	B	B	
Approach Vol, veh/h		341	369		576		
Approach Delay, s/veh		12.4	30.1		18.1		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				32.1	27.0	10.4	21.6
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				31.5	20.5	5.5	19.5
Max Q Clear Time (g_c+I1), s				7.4	10.0	4.1	14.2
Green Ext Time (p_c), s				1.3	1.5	0.0	1.0
Intersection Summary							
HCM 7th Control Delay, s/veh			20.0				
HCM 7th LOS			C				

HCM 7th TWSC
2: VT-117 & Site Access

09/05/2024

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	553	368	0	3	0
Future Vol, veh/h	0	553	368	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	5	4	0	0	0
Mvmt Flow	0	553	368	0	3	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	368	0	0 921 368
Stage 1	-	-	- 368 -
Stage 2	-	-	- 553 -
Critical Hdwy	4.1	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.2	-	- 3.5 3.3
Pot Cap-1 Maneuver	1202	-	- 303 682
Stage 1	-	-	- 704 -
Stage 2	-	-	- 580 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1202	-	- 303 682
Mov Cap-2 Maneuver	-	-	- 303 -
Stage 1	-	-	- 704 -
Stage 2	-	-	- 580 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0	0	17.01
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1202	-	-	-	303
HCM Lane V/C Ratio	-	-	-	-	0.01
HCM Control Delay (s/veh)	0	-	-	-	17
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 7th Signalized Intersection Summary

3: N Williston Rd & VT-117

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Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	125	54	291	265	216	243
Future Volume (veh/h)	125	54	291	265	216	243
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1856	1841	1796	1841	1885	1826
Adj Flow Rate, veh/h	125	54	291	265	216	243
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	4	7	4	1	5
Cap, veh/h	270	238	809	703	516	823
Arrive On Green	0.15	0.15	0.45	0.45	0.45	0.45
Sat Flow, veh/h	1767	1560	1796	1560	860	1826
Grp Volume(v), veh/h	125	54	291	265	216	243
Grp Sat Flow(s),veh/h/ln	1767	1560	1796	1560	860	1826
Q Serve(g_s), s	2.1	1.0	3.5	3.7	7.2	2.8
Cycle Q Clear(g_c), s	2.1	1.0	3.5	3.7	10.7	2.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	270	238	809	703	516	823
V/C Ratio(X)	0.46	0.23	0.36	0.38	0.42	0.30
Avail Cap(c_a), veh/h	1160	1024	1398	1214	797	1421
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	12.2	5.9	6.0	9.4	5.7
Incr Delay (d2), s/veh	1.2	0.5	0.3	0.3	0.5	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.3	0.6	0.5	0.8	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	13.9	12.7	6.2	6.3	9.9	5.9
LnGrp LOS	B	B	A	A	A	A
Approach Vol, veh/h	179		556		459	
Approach Delay, s/veh	13.5		6.2		7.8	
Approach LOS	B		A		A	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	11.5		21.3		21.3	
Change Period (Y+Rc), s	6.5		6.5		6.5	
Max Green Setting (Gmax), s	21.5		25.5		25.5	
Max Q Clear Time (g_c+I1), s	4.1		5.7		12.7	
Green Ext Time (p_c), s	0.4		2.3		2.1	
Intersection Summary						
HCM 7th Control Delay, s/veh			7.9			
HCM 7th LOS			A			

HCM 7th Signalized Intersection Summary

1: VT-117 & Sand Hill Rd

09/05/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	94	286	247	135	353	270	
Future Volume (veh/h)	94	286	247	135	353	270	
Initial Q (Qb), veh	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1781	1811	1856	1870	1870	
Adj Flow Rate, veh/h	94	286	247	135	353	270	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Percent Heavy Veh, %	1	8	6	3	2	2	
Cap, veh/h	289	780	289	158	613	545	
Arrive On Green	0.07	0.44	0.26	0.26	0.34	0.34	
Sat Flow, veh/h	1795	1781	1101	602	1781	1585	
Grp Volume(v), veh/h	94	286	0	382	353	270	
Grp Sat Flow(s),veh/h/ln	1795	1781	0	1703	1781	1585	
Q Serve(g_s), s	2.1	6.4	0.0	12.7	9.7	8.0	
Cycle Q Clear(g_c), s	2.1	6.4	0.0	12.7	9.7	8.0	
Prop In Lane	1.00			0.35	1.00	1.00	
Lane Grp Cap(c), veh/h	289	780	0	447	613	545	
V/C Ratio(X)	0.32	0.37	0.00	0.85	0.58	0.50	
Avail Cap(c_a), veh/h	336	942	0	557	613	545	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	14.8	11.2	0.0	20.9	16.0	15.5	
Incr Delay (d2), s/veh	0.6	0.3	0.0	10.3	3.9	3.2	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.8	2.1	0.0	5.7	4.1	7.9	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	15.4	11.5	0.0	31.2	19.9	18.7	
LnGrp LOS	B	B		C	B	B	
Approach Vol, veh/h		380	382		623		
Approach Delay, s/veh		12.5	31.2		19.4		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				32.6	27.0	10.4	22.2
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				31.5	20.5	5.5	19.5
Max Q Clear Time (g_c+I1), s				8.4	11.7	4.1	14.7
Green Ext Time (p_c), s				1.5	1.5	0.0	0.9
Intersection Summary							
HCM 7th Control Delay, s/veh			20.7				
HCM 7th LOS			C				

HCM 7th TWSC

2: VT-117 & Site Access

09/05/2024

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	86	553	368	59	23	14
Future Vol, veh/h	86	553	368	59	23	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	20	5	4	20	20	20
Mvmt Flow	86	553	368	59	23	14
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	427	0	-	0	1123	398
Stage 1	-	-	-	-	398	-
Stage 2	-	-	-	-	725	-
Critical Hdwy	4.3	-	-	-	6.6	6.4
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	2.38	-	-	-	3.68	3.48
Pot Cap-1 Maneuver	1043	-	-	-	210	615
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	448	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1043	-	-	-	185	615
Mov Cap-2 Maneuver	-	-	-	-	185	-
Stage 1	-	-	-	-	565	-
Stage 2	-	-	-	-	448	-
Approach	EB	WB		SB		
HCM Control Delay, s/v	1.18	0		21.76		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	242	-	-	-	252	
HCM Lane V/C Ratio	0.082	-	-	-	0.147	
HCM Control Delay (s/veh)	8.8	0	-	-	21.8	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.3	-	-	-	0.5	

HCM 7th Signalized Intersection Summary

3: N Williston Rd & VT-117

09/05/2024

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	144	54	302	275	216	283
Future Volume (veh/h)	144	54	302	275	216	283
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1856	1841	1796	1841	1885	1826
Adj Flow Rate, veh/h	144	54	302	275	216	283
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	4	7	4	1	5
Cap, veh/h	265	234	827	718	512	841
Arrive On Green	0.15	0.15	0.46	0.46	0.46	0.46
Sat Flow, veh/h	1767	1560	1796	1560	843	1826
Grp Volume(v), veh/h	144	54	302	275	216	283
Grp Sat Flow(s),veh/h/ln	1767	1560	1796	1560	843	1826
Q Serve(g_s), s	2.5	1.0	3.6	3.9	7.5	3.3
Cycle Q Clear(g_c), s	2.5	1.0	3.6	3.9	11.1	3.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	265	234	827	718	512	841
V/C Ratio(X)	0.54	0.23	0.37	0.38	0.42	0.34
Avail Cap(c_a), veh/h	1139	1005	1373	1192	768	1396
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.1	12.5	5.8	5.9	9.4	5.7
Incr Delay (d2), s/veh	1.7	0.5	0.3	0.3	0.6	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	0.6	0.5	0.8	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	14.9	13.0	6.1	6.2	10.0	6.0
LnGrp LOS	B	B	A	A	A	A
Approach Vol, veh/h	198		577		499	
Approach Delay, s/veh	14.3		6.2		7.7	
Approach LOS	B		A		A	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	11.5		21.9		21.9	
Change Period (Y+Rc), s	6.5		6.5		6.5	
Max Green Setting (Gmax), s	21.5		25.5		25.5	
Max Q Clear Time (g_c+I1), s	4.5		5.9		13.1	
Green Ext Time (p_c), s	0.5		2.4		2.3	
Intersection Summary						
HCM 7th Control Delay, s/veh			8.0			
HCM 7th LOS			A			

HCM 7th Signalized Intersection Summary

1: VT-117 & Sand Hill Rd

09/05/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	167	339	353	272	198	142	
Future Volume (veh/h)	167	339	353	272	198	142	
Initial Q (Qb), veh	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1781	1811	1856	1870	1870	
Adj Flow Rate, veh/h	167	339	353	272	198	142	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Percent Heavy Veh, %	1	8	6	3	2	2	
Cap, veh/h	257	987	371	286	484	431	
Arrive On Green	0.08	0.55	0.39	0.39	0.27	0.27	
Sat Flow, veh/h	1795	1781	949	731	1781	1585	
Grp Volume(v), veh/h	167	339	0	625	198	142	
Grp Sat Flow(s),veh/h/ln	1795	1781	0	1680	1781	1585	
Q Serve(g_s), s	3.9	7.8	0.0	27.0	6.8	5.4	
Cycle Q Clear(g_c), s	3.9	7.8	0.0	27.0	6.8	5.4	
Prop In Lane	1.00			0.44	1.00	1.00	
Lane Grp Cap(c), veh/h	257	987	0	657	484	431	
V/C Ratio(X)	0.65	0.34	0.00	0.95	0.41	0.33	
Avail Cap(c_a), veh/h	258	995	0	663	484	431	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	16.9	9.2	0.0	22.1	22.3	21.8	
Incr Delay (d2), s/veh	5.6	0.2	0.0	23.6	2.5	2.0	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.7	2.5	0.0	13.6	3.0	5.3	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	22.5	9.4	0.0	45.7	24.8	23.8	
LnGrp LOS	C	A		D	C	C	
Approach Vol, veh/h		506	625		340		
Approach Delay, s/veh		13.7	45.7		24.4		
Approach LOS		B	D		C		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				47.9	26.8	12.2	35.7
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				41.7	20.3	5.7	29.5
Max Q Clear Time (g_c+I1), s				9.8	8.8	5.9	29.0
Green Ext Time (p_c), s				2.0	0.8	0.0	0.2
Intersection Summary							
HCM 7th Control Delay, s/veh			29.8				
HCM 7th LOS			C				

HCM 7th TWSC
2: VT-117 & Site Access

09/05/2024

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	536	625	0	0	0
Future Vol, veh/h	1	536	625	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	5	4	0	0	0
Mvmt Flow	1	536	625	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	625	0	0 1163 625
Stage 1	-	-	- 625 -
Stage 2	-	-	- 538 -
Critical Hdwy	4.1	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.2	-	- 3.5 3.3
Pot Cap-1 Maneuver	966	-	- 217 488
Stage 1	-	-	- 537 -
Stage 2	-	-	- 589 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	966	-	- 217 488
Mov Cap-2 Maneuver	-	-	- 217 -
Stage 1	-	-	- 537 -
Stage 2	-	-	- 589 -

Approach	EB	WB	SB
HCM Control Delay, s/v 0.02		0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	3	-	-	-	-
HCM Lane V/C Ratio	0.001	-	-	-	-
HCM Control Delay (s/veh)	8.7	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

HCM 7th Signalized Intersection Summary

3: N Williston Rd & VT-117

09/05/2024

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	284	229	312	223	91	341
Future Volume (veh/h)	284	229	312	223	91	341
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1856	1841	1796	1841	1885	1826
Adj Flow Rate, veh/h	284	229	312	223	91	341
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	4	7	4	1	5
Cap, veh/h	443	391	631	548	409	641
Arrive On Green	0.25	0.25	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1767	1560	1796	1560	876	1826
Grp Volume(v), veh/h	284	229	312	223	91	341
Grp Sat Flow(s),veh/h/ln	1767	1560	1796	1560	876	1826
Q Serve(g_s), s	4.7	4.2	4.5	3.5	3.0	4.9
Cycle Q Clear(g_c), s	4.7	4.2	4.5	3.5	7.4	4.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	443	391	631	548	409	641
V/C Ratio(X)	0.64	0.59	0.49	0.41	0.22	0.53
Avail Cap(c_a), veh/h	1219	1076	1349	1171	759	1371
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.9	10.7	8.3	8.0	11.2	8.4
Incr Delay (d2), s/veh	1.6	1.4	0.6	0.5	0.3	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.1	1.0	0.7	0.4	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	12.5	12.1	8.9	8.5	11.5	9.1
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	513		535		432	
Approach Delay, s/veh	12.3		8.7		9.6	
Approach LOS	B		A		A	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	14.7		18.0		18.0	
Change Period (Y+Rc), s	6.5		6.5		6.5	
Max Green Setting (Gmax), s	22.5		24.5		24.5	
Max Q Clear Time (g_c+I1), s	6.7		6.5		9.4	
Green Ext Time (p_c), s	1.5		2.2		2.0	
Intersection Summary						
HCM 7th Control Delay, s/veh			10.2			
HCM 7th LOS			B			

HCM 7th Signalized Intersection Summary

1: VT-117 & Sand Hill Rd

09/05/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	167	351	397	304	204	142	
Future Volume (veh/h)	167	351	397	304	204	142	
Initial Q (Qb), veh	0	0	0	0	0	0	
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1781	1811	1856	1870	1870	
Adj Flow Rate, veh/h	167	351	397	304	204	142	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Percent Heavy Veh, %	1	8	6	3	2	2	
Cap, veh/h	242	1048	413	316	440	392	
Arrive On Green	0.07	0.59	0.43	0.43	0.25	0.25	
Sat Flow, veh/h	1795	1781	951	729	1781	1585	
Grp Volume(v), veh/h	167	351	0	701	204	142	
Grp Sat Flow(s),veh/h/ln	1795	1781	0	1680	1781	1585	
Q Serve(g_s), s	3.8	8.0	0.0	32.0	7.7	5.8	
Cycle Q Clear(g_c), s	3.8	8.0	0.0	32.0	7.7	5.8	
Prop In Lane	1.00			0.43	1.00	1.00	
Lane Grp Cap(c), veh/h	242	1048	0	729	440	392	
V/C Ratio(X)	0.69	0.33	0.00	0.96	0.46	0.36	
Avail Cap(c_a), veh/h	261	1072	0	734	440	392	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	17.7	8.3	0.0	21.7	25.3	24.6	
Incr Delay (d2), s/veh	6.9	0.2	0.0	24.0	3.5	2.6	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.7	2.5	0.0	15.8	3.5	0.3	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	24.7	8.5	0.0	45.7	28.7	27.2	
LnGrp LOS	C	A		D	C	C	
Approach Vol, veh/h		518	701		346		
Approach Delay, s/veh		13.7	45.7		28.1		
Approach LOS		B	D		C		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				52.9	26.0	12.2	40.7
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				47.5	19.5	6.5	34.5
Max Q Clear Time (g_c+I1), s				10.0	9.7	5.8	34.0
Green Ext Time (p_c), s				2.1	0.8	0.0	0.3
Intersection Summary							
HCM 7th Control Delay, s/veh			31.2				
HCM 7th LOS			C				

HCM 7th TWSC
2: VT-117 & Site Access

09/05/2024

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	536	625	21	64	76
Future Vol, veh/h	19	536	625	21	64	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	20	5	4	20	20	20
Mvmt Flow	19	536	625	21	64	76
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	646	0	-	0	1210	636
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	574	-
Critical Hdwy	4.3	-	-	-	6.6	6.4
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	2.38	-	-	-	3.68	3.48
Pot Cap-1 Maneuver	859	-	-	-	186	447
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	530	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	859	-	-	-	180	447
Mov Cap-2 Maneuver	-	-	-	-	180	-
Stage 1	-	-	-	-	479	-
Stage 2	-	-	-	-	530	-
Approach	EB	WB		SB		
HCM Control Delay, s/v	0.32	0		32.6		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	62	-	-	-	266	
HCM Lane V/C Ratio	0.022	-	-	-	0.526	
HCM Control Delay (s/veh)	9.3	0	-	-	32.6	
HCM Lane LOS	A	A	-	-	D	
HCM 95th %tile Q(veh)	0.1	-	-	-	2.8	

HCM 7th Signalized Intersection Summary

3: N Williston Rd & VT-117

09/05/2024

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	293	229	351	248	91	353
Future Volume (veh/h)	293	229	351	248	91	353
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1856	1841	1796	1841	1885	1826
Adj Flow Rate, veh/h	293	229	351	248	91	353
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	4	7	4	1	5
Cap, veh/h	444	392	663	576	389	674
Arrive On Green	0.25	0.25	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1767	1560	1796	1560	826	1826
Grp Volume(v), veh/h	293	229	351	248	91	353
Grp Sat Flow(s),veh/h/ln	1767	1560	1796	1560	826	1826
Q Serve(g_s), s	5.1	4.4	5.2	4.1	3.3	5.2
Cycle Q Clear(g_c), s	5.1	4.4	5.2	4.1	8.6	5.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	444	392	663	576	389	674
V/C Ratio(X)	0.66	0.58	0.53	0.43	0.23	0.52
Avail Cap(c_a), veh/h	1161	1025	1285	1116	675	1306
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	11.3	8.5	8.1	11.8	8.4
Incr Delay (d2), s/veh	1.7	1.4	0.7	0.5	0.3	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	1.2	1.2	0.8	0.4	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	13.2	12.6	9.1	8.6	12.1	9.1
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	522		599		444	
Approach Delay, s/veh	12.9		8.9		9.7	
Approach LOS	B		A		A	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	15.1		19.1		19.1	
Change Period (Y+Rc), s	6.5		6.5		6.5	
Max Green Setting (Gmax), s	22.5		24.5		24.5	
Max Q Clear Time (g_c+I1), s	7.1		7.2		10.6	
Green Ext Time (p_c), s	1.5		2.5		2.1	
Intersection Summary						
HCM 7th Control Delay, s/veh			10.5			
HCM 7th LOS			B			

BY: CDM
DATE: 22-Jul-24
SCENARIO: 2031 AM No Build

Source: Kikuchi and Chakroorty's "Modified Harmelink/AASHTO Model"
from Method for Prioritizing Intersection Improvements, Washington State
Transportation Center Research Report, January 1997

YEAR: 2031
TIME: AM No Build
SPEED: 40 mph

Exclusive right-turn lane in the Va direction (Y/N)?	N
Exclusive left-turn lane in the Vo direction (Y/N)?	N

AVERAGE HOUR ENTERING TRAFFIC VOLUMES (vph, 85% of DHV):

	Vadv.	Vopp.
Left-Turn =	0	0
Thru =	470	313
Right-Turn =	0	0

Va = 470 vph L = 0.0%
Vo = 313 vph

Left Turn Lane Warrant

$$V_a = \exp(6.9017 - 0.001151 \cdot V_o + (\exp(0.383 - 0.118 \cdot L) - 0.01816 \cdot SP)) \quad (\text{Eq. 3.3})$$

Warranting $V_a =$ 0 vph

$$V_a = 0 \Rightarrow 0$$

THEREFORE, EB LEFT-TURN LANE NOT WARRANTED

Right Turn Lane Warrant

PEAK HOUR ENTERING TRAFFIC VOLUMES (vph, 100% of DHV):

Left-Turn =	0	0
Thru =	553	368
Right-Turn =	0	0

Va = 368 vph R = 0.0%

$$Va = 33 \times \text{squareroot} \left(\frac{(80-S)}{(R \times (1-R))} \right)$$

Warranting Va = #DIV/0! vph

Va = 368 #DIV/0! #DIV/0!

THEREFORE, WB #DIV/0!

BY: CDM
DATE: 22-Jul-24
SCENARIO: 2031 PM No Build

Source: Kikuchi and Chakroorty's "Modified Harmelink/AASHTO Model"
from Method for Prioritizing Intersection Improvements, Washington State
Transportation Center Research Report, January 1997

YEAR: 2031
TIME: PM No Build
SPEED: 40 mph

Exclusive right-turn lane in the Va direction (Y/N)?	N
Exclusive left-turn lane in the Vo direction (Y/N)?	N

AVERAGE HOUR ENTERING TRAFFIC VOLUMES (vph, 85% of DHV):

	Vadv.	Vopp.
Left-Turn =	0	0
Thru =	456	531
Right-Turn =	0	0

Va = 456 vph L = 0.0%
Vo = 531 vph

Left Turn Lane Warrant

$$V_a = \exp(6.9017 - 0.001151 \cdot V_o + (\exp(0.383 - 0.118 \cdot L) - 0.01816 \cdot SP)) \quad (\text{Eq. 3.3})$$

Warranting $V_a =$ 0 vph

$$V_a = 0 \Rightarrow 0$$

THEREFORE, EB LEFT-TURN LANE NOT WARRANTED

Right Turn Lane Warrant

PEAK HOUR ENTERING TRAFFIC VOLUMES (vph, 100% of DHV):

Left-Turn =	1	0
Thru =	536	625
Right-Turn =	0	0

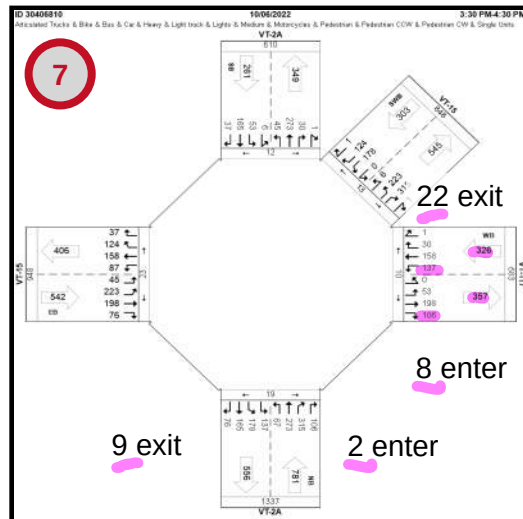
Va = 625 vph R = 0.0%

$$Va = 33 \times \text{squareroot} \left(\frac{(80-S)}{(R \times (1-R))} \right)$$

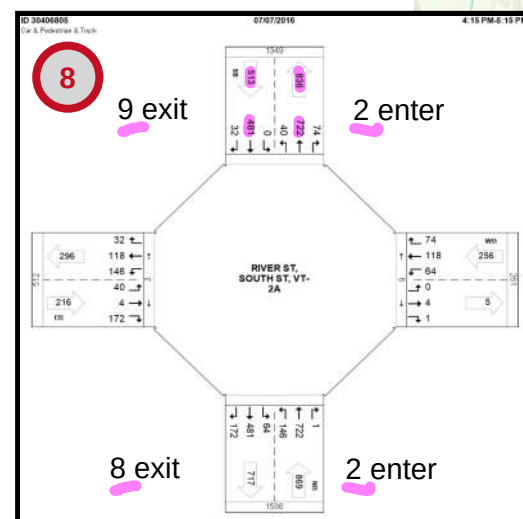
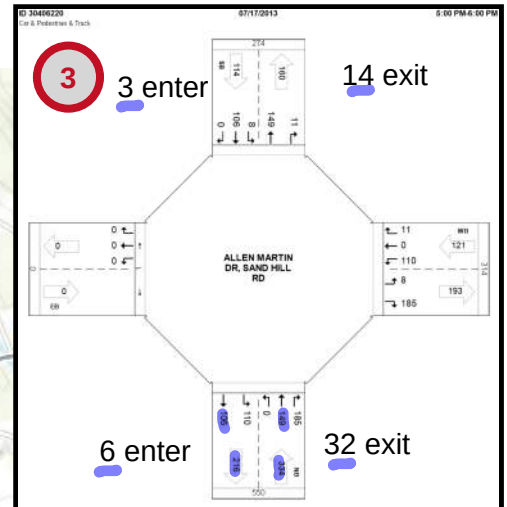
Warranting Va = #DIV/0! vph

Va = 625 #DIV/0! #DIV/0!

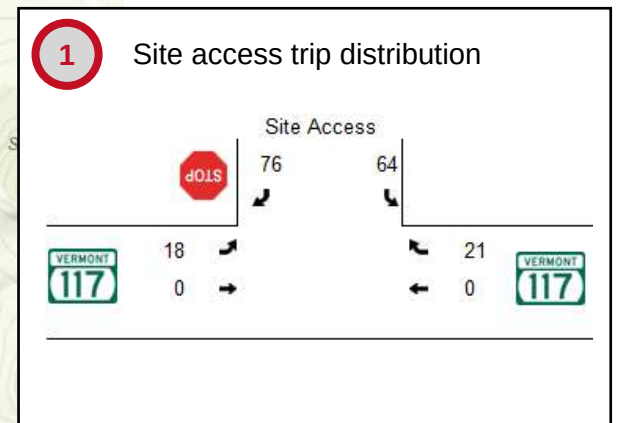
THEREFORE, WB #DIV/0!



STPG 030-1(22)
VT-15 & Sand Hill Road
14 exit + 3 enter = 17 trip ends

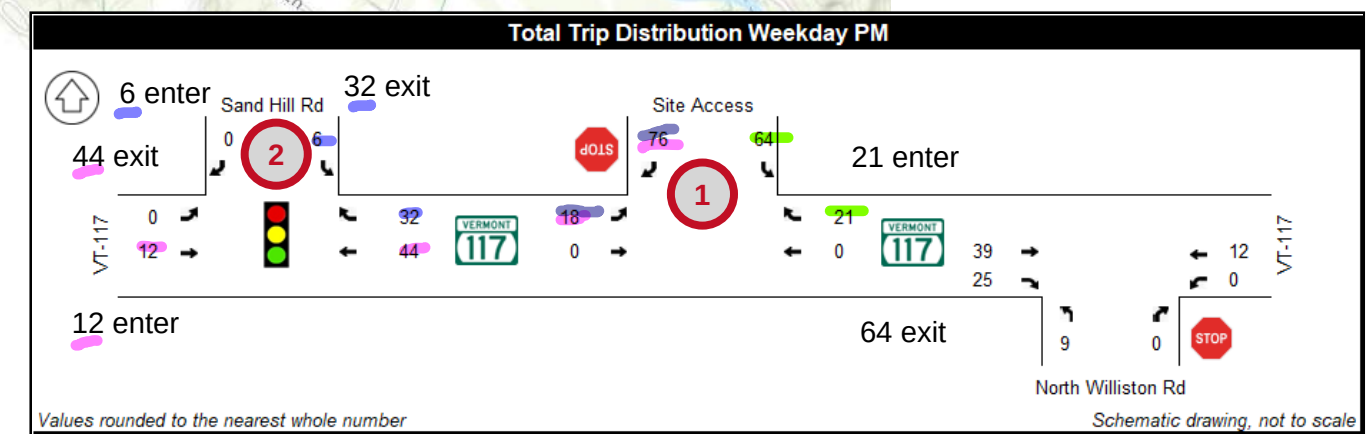
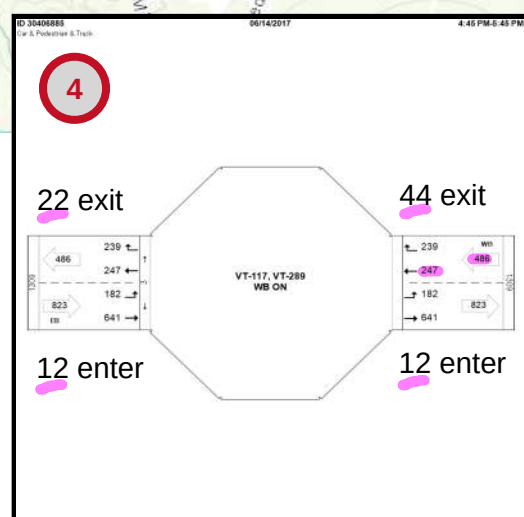
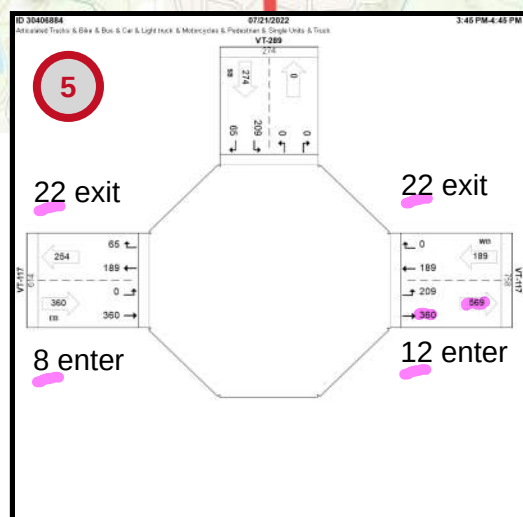
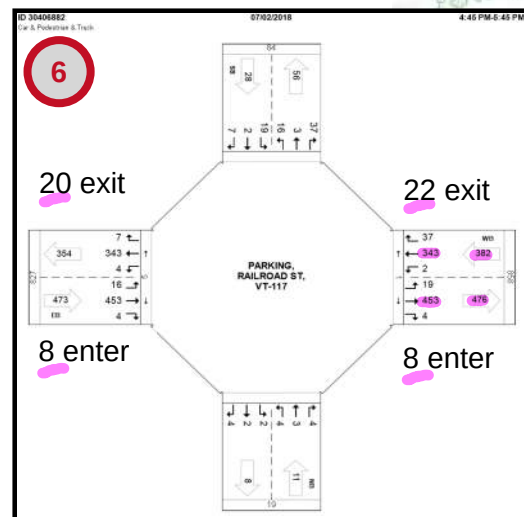


STP 5300(13):
Crescent Connector
20 exit + 8 enter =
28 trip ends



STP 5500(17) & STP HES 5500(12):
VT-2A
8 exit + 2 enter = 10 trip ends

STP 5400(10)
VT-117 & North
Williston Road
64 exit + 21 enter =
85 trip ends



Attachment G - Act 145 Fee Trip Distribution Saxon Hill Industrial Park Phase II



DATE: 07/25/2024
PROJECT: 24-620
Figure G1