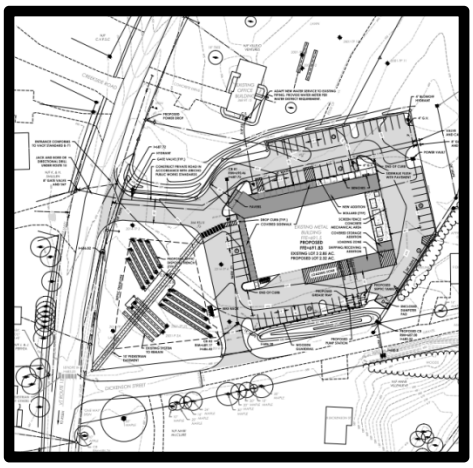

TRAFFIC IMPACT STUDY

TCE# 14-139| JERICHO MARKET
JERICHO, VERMONT

Date:
January 22, 2015

Prepared For:
41 WTC, LLC

Prepared By:
Abigail Dery, P.E.

TRUDELL CONSULTING ENGINEERS

478 BLAIR PARK ROAD, WILLISTON, VT 05495 | 802 879 6331 | WWW.TCEVT.COM

TABLE OF CONTENTS

Appendices

I. Introduction

David Villeneuve and 41 WTC, LLC are proposing the construction of a +/- 17,700 SF retail general merchandise store, with an accessory use of deli and food service, to be located on a lot within the Saw Mill (Villeneuve) subdivision in Jericho, Vermont. The project address is 364 Vermont Route 15 (VT 15), which is located on the east side the highway, just north of Dickinson Street. The following Traffic Impact Study has been prepared to identify the impact of project-generated traffic on the adjacent roadway network, in accordance with Vermont Agency of Transportation (VTrans) guidelines and methodology. The study area encompasses two intersections – the VT 15/Raceway Road/Project Driveway intersection and the VT 15/Dickenson Street intersection.

II. Existing Conditions

A. Geometrics and Speed Limit

The proposed project is located on the northeast corner of the intersection of VT Route 15 and Dickenson Street. The site contains a gravel parking area with a large metal garage and a smaller wooden garage, currently used for storage. Access to the existing parking area is via wide, undefined curb cuts on both VT 15 and Dickenson Street.

Raceway Road intersects VT 15 approximately 230 ft north of Dickenson Street. VT 15 is classified as a Rural Minor Arterial under the jurisdiction of VTrans and has a posted speed of 35 mph. The highway has a single lane for each the north and southbound direction of travel. Dickenson Street is a local gravel road open to travel only in the eastbound direction, connecting to River Road (also called Steam Mill Road) on the east end. Raceway Road is a local road open to two-way travel, serving mainly residential properties. A Location Map and Existing Conditions Plan is located in the Appendix.

B. Committed VTrans or Town Highway Improvements

There are currently no immediate VTrans plans for highway improvements in the study area. The Town of Jericho has had several studies done in conjunction with the Chittenden County Regional Planning Commission (CCRPC) relating to Dickenson Street, the most recent being a study identifying potential VT 15 Park and Ride locations by Lamoureux & Dickinson Consulting Engineers in January 2014. This study identifies the existing gravel parking area on subject parcel as a preferred location for a 45-space Park & Ride.

A comprehensive *Scoping Report for Dickenson Street Improvements*, dated June 2011 by Stantec, explored the impacts and benefits of widening Dickenson Street to create two-way travel. This study included the full build-out of the Sawmill PUD and contemplated improvements for the Underhill Flats Area to improve overall safety and circulation. In 2011, the Selectboard voted to approve the design alternative that provided two-way travel on Dickenson with an unsignalized VT 15/Dickenson intersection, while acknowledging that future Jericho growth may require signalization of the intersection at some point. A copy of this study is located in the Appendix.

Other prior studies include:

- Dickenson Street Alternatives Analysis dated October 2007 by RSG, Inc.
- Route 15 Corridor Study for the Chittenden County Metropolitan Planning Organization (CCMPO) and VTrans by BFJ planning and RSG, Inc. dated August 2008
- VT 15 Corridor Management Plan for the Lamoille County Planning Commission and the CCMPO dated November 2004.

C. Other Planned Development

There is a sketch level master plan for the build-out potential of the Saw Mill property, its impacts which have been studied conceptually in the Scoping Report. For the purpose of this impact analysis, traffic from those future projects has not been included in any build scenarios, as it is still conceptual in nature. Specific impacts from these developments will be analyzed as they are permitted.

D. Public Transportation

An existing temporary Park & Ride, as identified in the VT 15 Park and Ride Study, is located on the subject property and will be removed during construction of the proposed project. Traffic from the Park & Ride was counted during the turning movement short counts conducted in December 2014; however, a very low volume of vehicles was recorded as utilizing this facility at this time. The landowner has indicated that the parking area can be relocated on a separate lot under his ownership within the subdivision, but the final location has yet to be determined.

The project is located on Chittenden County Transportation Authority's (CCTA) commuter bus route "The Jeffersonville Commuter". There is a bus stop located off of VT 15 within the Park & Ride, which will be relocated along with the parking facility. Until which time the Park & Ride is relocated, the bus stop could be located directly on VT 15 near Dickenson Street.

E. Bicycle & Pedestrian Facilities

An existing sidewalk is located on the west side of VT Route 15. Paved shoulders on VT 15 are between 3 and 4 ft in width, which are often used for bicycle travel, most frequently during the summer months.

III. Proposed Project

A. General Description

The project consists of an approximately 17,700 sq. ft. retail market with 69 paved parking spaces to be located on a 2.32 acre corner lot within the Saw Mill subdivision. The store will partially utilize the existing metal building with constructed addition and the existing wooden garage on the parcel will be removed.

B. Layout/Circulation

Access will be provided on the east side of VT Route 15 at an existing curb cut directly across from Raceway Road. The driveway is approximately 30 ft wide at the throat, with one lane for ingress and one lane for egress. There is a secondary 24 ft wide driveway onto Dickinson Street. Because Dickinson is currently limited to one-way travel, this driveway will be posted to prohibit a right-turn exit.

C. Project-Generated Traffic

Based on ITE Trip Generation, 9th Edition, the proposed market is estimated to generate 169 PM peak hour trips. The ITE use most resembling the project is 850 – Supermarket, which is described as "free-standing retail stores selling a complete assortment of food, food preparation, and household cleaning items. Supermarkets may also contain ATMs, auto supplies, bakeries, etc…" A percentage (36%) of those trips are "pass-by" trips, which are not new trips on the highway, rather existing vehicles that alter their travel pattern to make a stop at the store. The table below provides the calculation for weekday, morning peak and evening peak hour project traffic volume.

Table 1: Project-Generated Traffic Volume

	Building Size (sq. ft.)	Average Rate	Trips	Pass-By	Non Pass-By
Weekday	17,770	102.24/1000 sq. ft.*	1817		
Peak Hour of Adjacent Street Traffic One Hour Between 7 and 9 AM		3.4 trips/1000 sq. ft.	61		
Peak Hour of Adjacent Street Traffic One Hour Between 4 and 6 PM		9.48 trips/1000 sq. ft.	169	61	108

**Caution – very small sample size and varying hours of operation for daily estimate, do not use.*

Distribution of vehicle trips from project-generated traffic was determined using analogy to the short count and commuting patterns. The diagrams below illustrate the estimated turning movement distribution at the study intersections. Negative trips denote a pass-by movement. Vehicles will have full access via the VT 15 driveway, but the Dickenson Street driveway will be limited to ingress from the west and egress toward the east only.

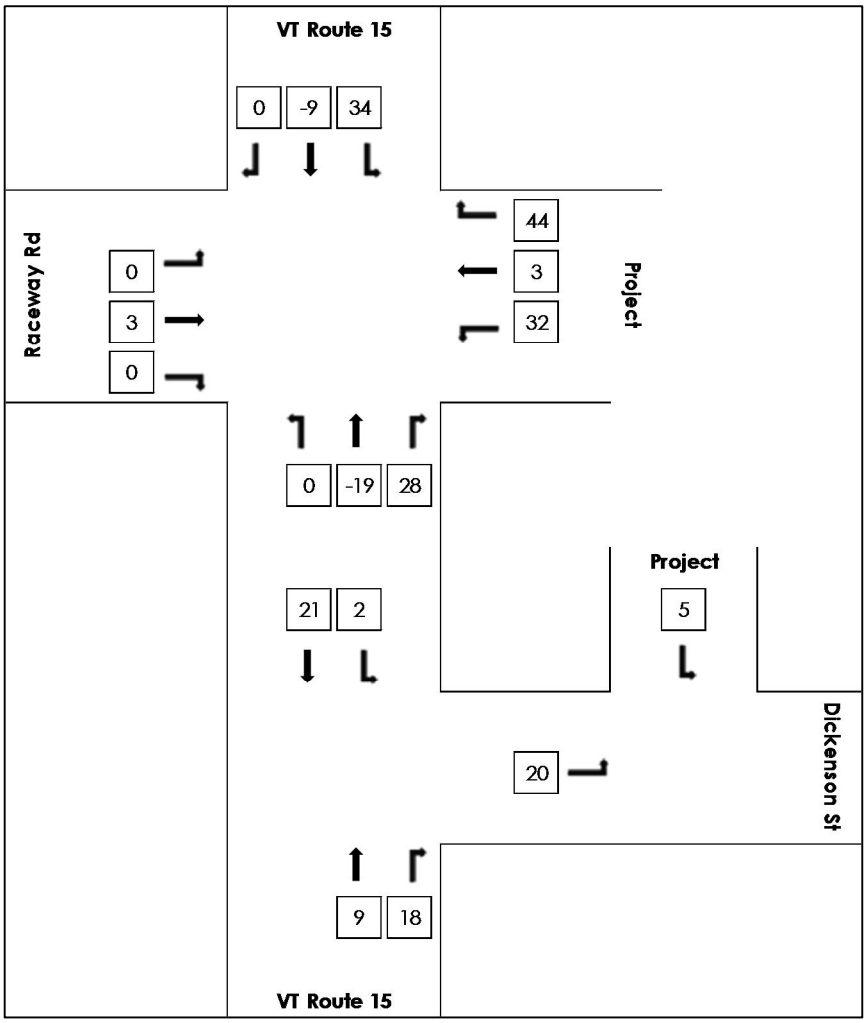

Figure 1: Peak Hour Project-Generated Traffic (PM)

D. Proposed Public Transportation and Pedestrian Facilities

While there are currently no facilities on the east side of VT 15, the Town has requested an easement for future development of a sidewalk or shared-use path to run parallel to VT 15. Additionally, there will be sidewalks either planned or constructed, to provide connection for pedestrians between both VT 15 and Dickenson Street and the

proposed market. The Town is currently seeking proposals to design crosswalks to traverse VT 15, one of which will be located just north of Dickenson Street.

IV. Traffic Volume

A. Existing Traffic Data (AADT and DHV)

According to a recent corridor study, VT Route 15 has an Average Annual Daily Traffic (AADT) volume of 9500 vehicles per day (vpd) in the study area and Dickenson Street has an AADT of 100 vpd. An AADT of 660 vpd was recorded on Raceway Road in 2010. A VT 15 Design Hour Volume (DHV) of 1070 was calculated using the "k" value from VTrans' *DHV Determination Based on AADTs and Highway Class-General Highway* for a "Rural" roadway.

B. Growth Factors

Rural highways in Vermont have not experienced significant growth over the past 10 years, according to the VTrans Continuous Traffic Counter Grouping Study and Regression Analysis (2013). A growth factor of 1.01 was applied to the 2015 DHV to project future traffic for a 2020 horizon year.

C. Traffic Projection Scenarios

Traffic impact was analyzed for four scenarios at the two intersections within the study area. The design hour in the study area occurs during the afternoon peak, generally between 4:15-5:15 PM. Morning peak traffic volume is slightly lower that afternoon peak, and AM project-generated traffic is much lower than PM project-generated traffic; therefore, the morning volumes were not included in the analysis.

- 2015 No-Build – Background traffic
- 2015 Build – Background traffic plus project-generated traffic
- 2020 No-Build – Background traffic with growth factor plus expanded Park & Ride
- 2020 Build – Background traffic with growth factor plus project-generated traffic

Each scenario assumes the existing intersection geometry will be in place. As previously discussed, the Town is currently exploring creating a two-way Dickenson Street, which would change the configuration of the VT 15/Dickenson Street intersection. The impact of project traffic on this scenario has been studied and presented in the 2011 *Scoping Report for Dickenson Street Improvements*. These improvements are not currently scheduled for construction.

While the existing Park & Ride does currently have high usage, a future No-Build scenario could see the Park & Ride being utilized to its full potential. Additional trips were added to the 2020 No-Build scenario to account for this.

D. Traffic Counts & Calculations

Trudell Consulting Engineers performed a manual Turning Movement Count (TMC) at the VT 15/Raceway Road/Project Driveway intersection and the VT 15/Dickenson Street intersection on 12/16/2014 to determine background traffic distribution. The overall PM peak hour for the study is from 4:15 to 5:15PM. Turning movement short counts were adjusted to correspond to the DHV for each intersection.

V. Capacity and Warrant Analysis

A. Level of Service

Vehicle delay, level of service (LOS), volume to capacity ratio (v/c ratio), and 95th percentile queue length were calculated at the intersections using Synchro8 w/ 2010 HCM methodology. A peak hour factor of 1.0 with a 60 minute analysis period was used, as recommended by VTrans. Level of service grades correspond directly to a range of vehicular delay at intersection approaches. The following table describes the delay range, in seconds per vehicle, for each grade of LOS.

Table 2: Level of Service Descriptions

Level of Service	Control Delay (s)
A	≤ 10
B	>10 and ≤ 15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

The tables below show the results of the analysis for each intersection. As indicated in the tables, the intersections have adequate capacity for the addition of project-generated traffic. Level of service on the stop controlled project driveway remains a D under "Build" conditions and there will be no change to delay on VT 15. VTrans LOS Policy for two-way stop controlled intersections is to maintain a D or better for side roads with volumes exceeding 100 vehicles/hour for a single lane approach. No LOS criteria are in effect for volumes less than 100 vph.

Table 3: Peak Hour Intersection Analysis – VT 15/ Raceway/ Project

	2015 No-Build				2015 Build			
	Delay (s)	*LOS*	*v/c ratio*	*Queue (veh)*	*Delay (s)*	*LOS*	*v/c ratio*	*Queue (veh)*
Northbound (VT 15)	8	A	0.042	0.1	8	A	0.042	0.1
Eastbound (Raceway Rd)	12.1	B	0.086	0.3	13.8	B	0.111	0.4
Westbound (Access)	0	A	0	0	27	D	0.326	1.4

Table 4: Peak Hour Intersection Analysis – VT 15/ Dickenson Street

	2015 No-Build				2015 Build			
	Approach Delay (s)	*LOS*	*v/c ratio*	*Queue (veh)*	*Approach Delay (s)*	*LOS*	*v/c ratio*	*Queue (veh)*
Southbound (VT 15)	9.1	A	0.003	0	9.2	A	0.006	0
Northbound (VT 15)	0	A	0	0	0	A	0	0

Table 5: Peak Hour Intersection Analysis – VT 15/ Raceway/ Project

	2020 No-Build				2020 Build			
	Delay (s)	*LOS*	*v/c ratio*	*Queue (veh)*	*Delay (s)*	*LOS*	*v/c ratio*	*Queue (veh)*
Northbound (VT 15)	8	A	0.043	0.1	8	A	0.043	0.1
Eastbound (Raceway Rd)	12.7	B	0.097	0.3	14.3	B	0.12	0.4
Westbound (Access)	19.7	C	0.155	0.5	27.6	D	0.332	1.5

Table 6: Peak Hour Intersection Analysis – VT 15/ Dickenson Street

	2020 No-Build				2020 Build			
	Approach Delay (s)	*LOS*	*v/c ratio*	*Queue (veh)*	*Approach Delay (s)*	*LOS*	*v/c ratio*	*Queue (veh)*
Southbound (VT 15)	9.1	A	0.003	0	9.2	A	0.006	0
Northbound (VT 15)	0	A	0	0	0	A	0	0

B. Auxiliary Turn Lanes

According to the ITE Guidelines for Left-Turn Lanes, August 2000, which uses the Harmelink model, the projected volume of project-generated traffic during the peak hour exceeds the warrant threshold for an exclusive left-turn lane in the southbound direction at the project access intersection. In the 2015 Build scenario, opposing volume is projected to be 662 vehicles during the peak hour, advancing volume is 348 vph, total number of left turns is 34, and the left turn percentage is 9.8%. The guideline graphs are located in the Appendix.

A right-turn lane warrant analysis was performed using VTrans Warrant for Right Turn Auxiliary Lanes at Unsignalized Intersections. The need for a right turn lane is not met for the project access intersection, as the calculated volume exceeds the proposed advancing volume. Calculations are located in the Appendix.

VI. Safety Analysis

A. VTrans High Crash Locations

A review of the *2008-2012 General Yearly Summaries – Crash Listing* for both State and Town highways shows two crashes occurring at the VT 15/Raceway Rd intersection during the 5-year period. Two additional crashes were reported on VT 15 within the study area. The VTrans *High Crash Location Report: Sections and Intersections 2008-2012* does not list any intersections on VT 15 in Jericho or Underhill as High Crash Locations. Additionally, no segments of VT 15 in Jericho or Underhill are listed as High Crash Locations.

B. Sight Distance

The sight distance for the project driveway on VT 15 is 695 feet southerly (towards Essex) and 616 feet northerly (towards Underhill). The minimum recommended intersection sight distances for the project access are 390 feet for a left-turn and 335 feet for a right turn. Measured sight distance is greater than minimum recommended sight distance.

VII. Summary of Findings

Based on review and analysis of the existing and proposed traffic conditions, the following conclusions are presented:

1. The proposed Jericho Market project located on the northeast corner of the intersection of VT Route 15 and Dickenson Street will have both direct access on VT 15 and a driveway on Dickenson Street.

2. AADT on VT 15 within the study area is approximately 9500 vpd, with a DHV of 1070 vph. Based on turning movement counts performed by TCE, the peak hour of traffic on VT 15 occurs from 4:15 to 5:15 PM.

3. According to ITE, the project is expected to generate approximately 169 total peak hour (PM) trips. 61 of those trips will be considered "Pass-by" and 108 will be new trips. The new trips added to VT 15 during the peak hour represent 9% of overall peak hour traffic.

4. Level of Service on VT 15 will remain an A through 2020. LOS on Raceway Road is currently a B, and will remain a B through the 2020 Build scenario. Project Access (westbound) Level of Service at the VT 15 intersection is expected to be a D, with 27 seconds of delay and a queue of less than 2 vehicles. VTrans LOS Policy for two-way stop controlled intersections is to maintain or D or better for side roads with volumes exceeding 100 vehicles/hour.

5. Review of crash data on VT 15 show 4 crashes recorded within the study area during the five-year period between 2008 and 2012. Two of those crashes occurred at the VT 15/ Raceway Road intersection. No segments of VT 15 or intersections along VT 15 in Jericho or Underhill are listed as High Crash Locations.

6. Available sight distance at the project access will exceed minimum recommendations for intersection sight distance.

7. The proposed project will not have an undue adverse impact on traffic on roads and highways within the study area.

VIII. Impact Mitigation Recommendations

A. Access Management Improvements

Access management improvements include the narrowing of wide, undefined curb cuts on VT 15 and Dickenson Street. The existing 127 ft wide curb cut on VT 15 will be reduced to 41 ft at the property line. Additionally, the existing 280 ft wide gravel access along Dickenson Street will be narrowed to 34 ft at the property line and paved.

B. Public Transportation, Pedestrian, and Bicycle Facilities

Easements may be provided along both the property's VT 15 and Dickenson Street frontages for future pedestrian facilities. A sidewalk connection will be provided from the southwest corner of the property to the proposed market.

C. Monitoring Conditions

An analysis of projected left-turning volume identified that, according to the Harmelink model, a left-turn lane may be warranted on southbound VT 15 at the project access during the peak hour. It is recommended that the traffic volume be monitored six months to one year after the project has been in operation to determine if the volumes are as projected. If it is determined that the volumes are above the warrant threshold at that time, the applicant should work with VTrans to determine if a turn lane is appropriate in this location.

D. Future Improvements

A proportional share contribution or other funding mechanism consistent with the new Act 250 policy should be developed to partially fund future transportation improvements at Dickenson Street or elsewhere within the Jericho/Underhill flats area should the Town proceed with capacity improvements outlined in previous scoping studies.

Similarly, funds can be contributed for the warranted left-turn lane at the project access so that this improvement can be constructed in association with the Dickenson Street widening in order to minimize overall cost and traffic disruption. Should the larger project be postponed for a period of greater than 3 years, the funds can be returned to the applicant for the construction of the left-turn lane.

Appendix A - Location Maps

TRUDELL Environmental Services

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Project Location

Legend

Project Parcel

Notes

Sources: USGS 24k Topographic Map (2013); Project Area by TCE (2014).

Disclaimer: The accuracy of information presented is determined by its sources.TCE is not responsible for any errors or omissions that may exist. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not a replacement for surveyed information or engineering studies.

Jericho Market
Route 15
Jericho, VT

Location Map

Project: 14-139
Prepared By: LMJ
09/30/2014
1 inch = 1000 feet

Soil Key	Ag Value	Forest Group	Hydric	Hydrogroup	Prime
StA	3	1	N	A	Prime

N

DdA: Duane-Deerfield
LH: Livingston
ScA: Scantic
Le: Limerick
StA: Stetson
MyB: Munson-R
StC: Stetson
LyD: Lyman-Marlow
BlA: Belgrade-Eldridge
CsE: Colton-Stetson
Harvest Run
Clark St
Maple Ridge Rd
Creekside Dr
Jori Ln
Hf: Hadley
Brookside Dr
Raceway Rd
StA: Stetson
BlA: Belgrade-Eldridge
River Rd
Dickinson St
EwA: Enosburg-Whately
StB: Stetson
StA: Stetson
Wo: Winooski
Valley's Edge
StB: Stetson
CsD: Colton-Stetson
Wo: Winooski
W: Water
Brown's River
MyB: Munson-Raynham
Le: Limerick
StA: Stetson
StB: Stetson
CsD: Colton-Stetson
Le: Limerick
Hf: Hadley
Green Mountains
Appalachian Mountains
CsE: Colton-Stetson

0 150 300 600 900 1,200 Feet

TRUDELL Environmental Services
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Project Location

Legend

- Project Area
- Tax Parcel Boundary
- Contours (20')
- VT Significant Wetland
- Stream
- Deer Wintering Area
- VT Class 3 Wetland
- Significant Natural Communities
- Soil
- Natural Areas
- Rare, Threatened and Endangered Species

Notes

Sources: Bing Aerial Photography (2012); Streams by ANR (2012); Project Area by TCE (2014); Deer Wintering Area by ANR (2011); VT E911 Roads (2011); VT Significant Wetland and VT Class III by ANR (2012); Soils by NRCS (2011); 20 ft Contours by VCGI (2012); RTE Species and Significant Natural Communities by VT Fish & Wildlife (2013); Natural Areas by ANR (2011).

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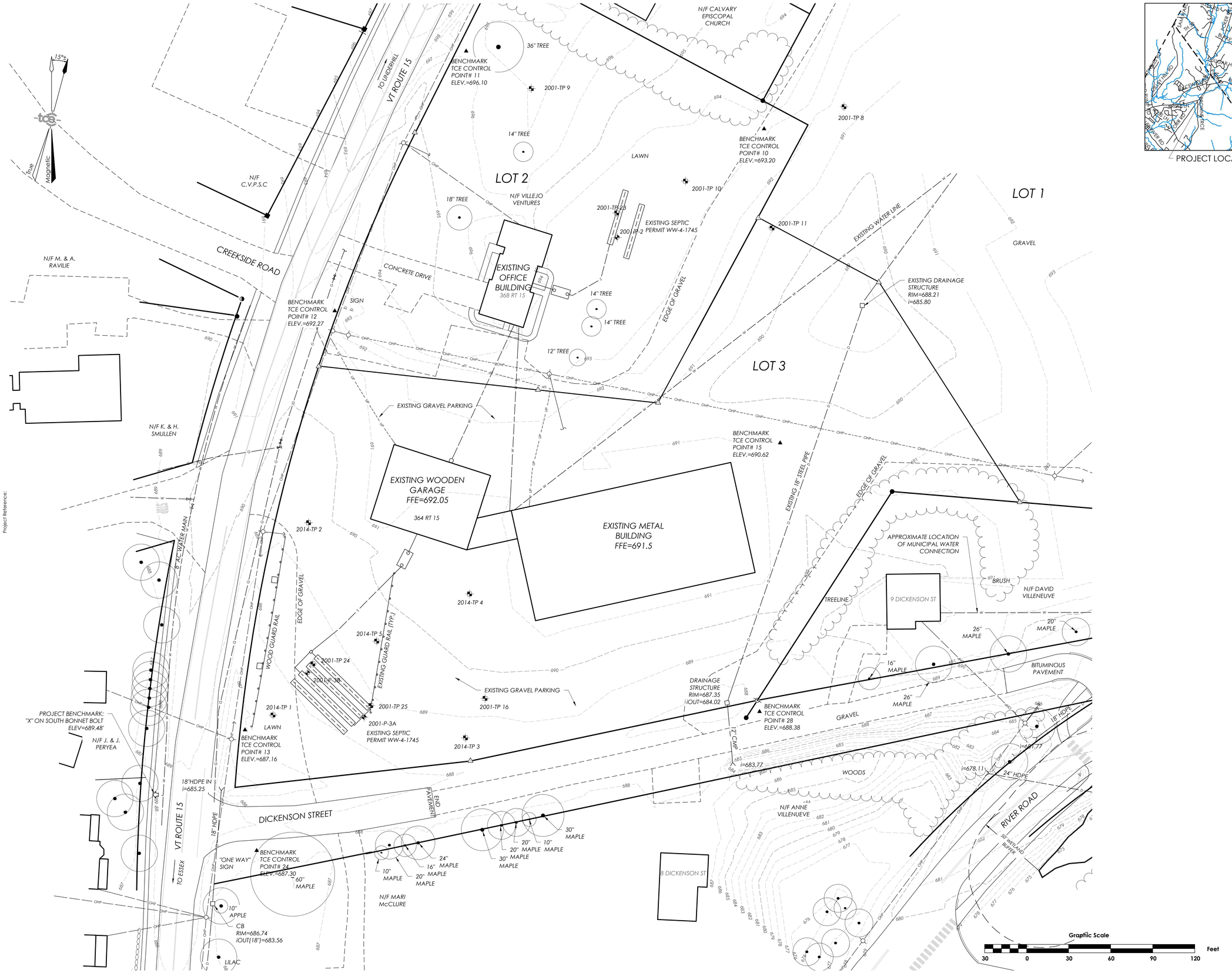
Jericho Market
Route 15
Jericho, VT

Natural Resource Map

Project: 14-139
Prepared By: LMJ
10/3/2014
1 inch = 300 feet

Appendix B - Existing Conditions and Site Plans



Project Reference:

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Revisions

No.	Description	Date	By
1	Final Plan Review	01/23/15	NTH

Use of These Drawings

1. Unless otherwise noted, these Drawings are intended for preliminary planning, coordination with other disciplines or utilities, and/or approval from the regulatory authorities. They are not intended as construction drawings unless noted as such.

2. Only drawings specifically marked "For Construction" are intended to be used in conjunction with contract documents, specifications, owner/contractor agreements and to be fully coordinated with other disciplines, including but not limited to, the Architect, if applicable. These Drawings shall not be used for construction layout. Contact TCE for any construction surveying services or to obtain electronic data suitable for construction layout.

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5. It is the User's responsibility to ensure this copy contains the most current revisions.

STATE OF VERMONT
LEVENT M. MATOFF
No. 7637
CIVIL
REGISTERED PROFESSIONAL ENGINEER

For Local Permitting Only

Project Title

Jericho Market

364 VT Route 15 Jericho, VT

Sheet Title

Existing Conditions

Date:	10/10/14
Scale:	1" = 30'
Project Number:	14-139
Drawn By:	NPC
Project Engineer:	NTH
Approved By:	
Field Book:	

C1-04

GENERAL NOTES:

1) OWNER OF RECORD: DAVID VILLENUEVE
P.O. BOX 360
UNDERHILL, VT 05489

2) APPLICANT: DAVID VILLENUEVE
P.O. BOX 360
UNDERHILL, VT 05489

3) CO-APPLICANT: 41 WTC, LLC
JERRY DAVIS
450 WEAVER ST, SUITE #3
WINOOSKI, VT 05404

4) LOCATION: 364 VT ROUTE 15
JERICHO, VT 05465

5) DEED: VOLUME 247 PAGE 365

6) TAX MAP: VT364A & VT364B

7) LOT SIZE: EXISTING: 2.85 AC.
PROPOSED: 2.32 AC.

8) ZONING DISTRICT: VILLAGE CENTER (VCTR)

9) P.U.D. SETBACKS: FRONT: 10 FT (ON RT 15)
FRONT: 0 FT (OTHER ROADS)
SIDE: 5 FT
REAR: 10 FT

10) PARKING: REQUIRED - 3.6 SP/1000 SQ. FT. GFA = 62 SPACES
PROVIDED - 69 SPACES INCLUDING 2 ACCESSIBLE SPACES
BICYCLE PARKING = 62/5 = 13 REQUIRED, 14 PROVIDED

11) TRAFFIC: ITE 8th EDITION, LAND USE 850 "SUPERMARKET"
AM - 3.4 TRIPS/1000 SQ. FT. = 61 TRIPS (38 IN/23 OUT)
PM - 9.48 TRIPS/1000 SQ. FT. = 169 TRIPS (87 IN/82 OUT)

15°±
True
Magnetic

PROPOSED JERICHO MARKET 18,000 S.F.± LOT 3
LOT 1
LOT 2 N/F VILLEJO VENTURES
LOT 4
EXISTING OFFICE BUILDING
LAWN
CONCRETE DRIVE
EDGE OF GRAVEL
GRAVEL
SAW MILL
TOOL SHOP
POLE SHED
DUST BUNKER
EXISTING GRAVEL LOG YARD
MEADOW
DAYCARE FACILITY
BITUMINOUS PAVEMENT
ONE WAY
CLASS 2 WETLAND
50' WETLAND BUFFER
TO CAMBRIDGE
TO ESSEX
VT ROUTE 15
CREEKSIDE ROAD
DICKENSON STREET
RIVER ROAD
PARK STREET
TOWN OF UNDERHILL
TOWN OF JERICHO
N/F P. & C. JACOBS
N/F J. & S. CARTER
N/F W. & P. MYOTT
N/F L. & D. ST. CYR
N/F T. & K. CUMMINGS
N/F DEUTSCHE BANK
N/F CALVARY EPISCOPAL CHURCH
N/F G. ALLEN
N/F C.V.P.S.C
N/F K. & H. SMULLEN
N/F MARI McCLURE
N/F ANNE VILLENUEVE
N/F DAVID VILLENUEVE
N/F DAVID VILLENUEVE
N/F D. & R. WHEELER
N/F R. MARTELLE & DAVARIS
N/F VERIZON
N/F R. PRIM Y. ONG
N/F D. & D. GIRARD
N/F ROBIN & PATRICIA BARTLETT, ET AL
N/F KIM THURSTOM
BELL SYSTEM MONUMENT
N/F SEAN REILLY PATRICIA FITZGERALD
N/F JAMES & DONNA McGONAGLE
N/F MT. MANSFIELD UNION SCHOOL DISTRICT # 17
10' REAR SETBACK
10' FRONT SETBACK
5' SIDE SETBACK
OHP

Graphic Scale
60 0 60 120 180 240 Feet

Project Reference:

S:_TCE DRAWINGS\2014\139 - Jericho Market\ - Jericho\2014139 - Site.dwg, 1/22/2015 11:32:33 AM

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STATE OF VERMONT
JEREMY M. MALOTT
No. 7637
CIVIL
LICENSED PROFESSIONAL ENGINEER

For Local Permitting Only

Project Title

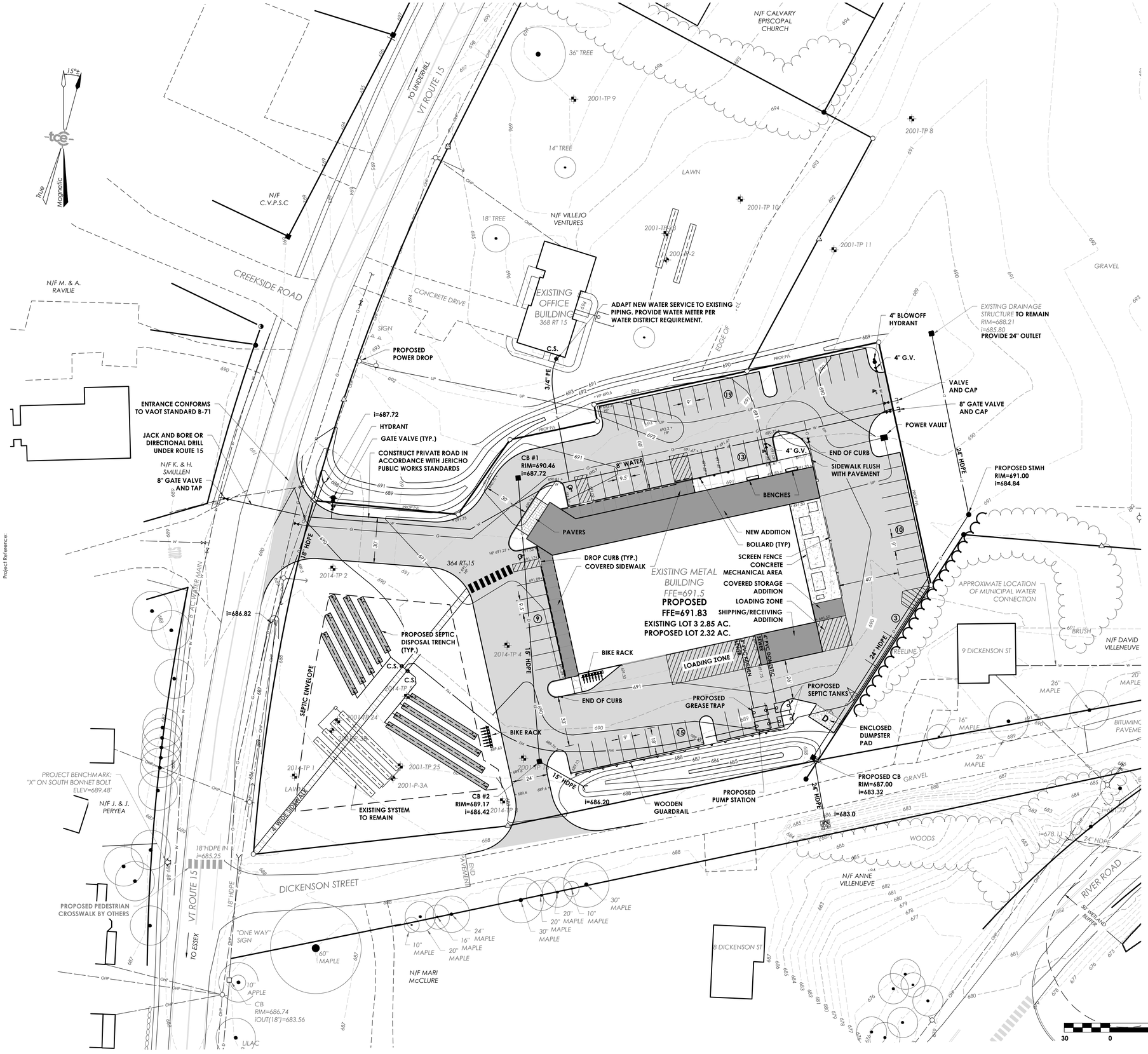
Jericho Market
364 VT Route 15 Jericho, VT

Sheet Title

Overall Site Plan

Date:	10/10/14
Scale:	1" = 60'
Project Number:	14-139
Drawn By:	NPC
Project Engineer:	NTH
Approved By:	
Field Book:	

C2-01



Project Reference:

S:_TCE DRAWINGS\2014\139 - Jericho Market - Jericho\2014139 - Site.dwg, 1/22/2015 1:03:15 PM

TRUDELL CONSULTING ENGINEERS
478 BLAIR PARK ROAD | WILLISTON, VERMONT 05495
802 879 6331 | WWW.TCEVT.COM

Revisions

No.	Description	Date	By
1	Final Plan Review	01/23/15	NTH

Use of These Drawings

1. Unless otherwise noted, these Drawings are intended for preliminary planning, coordination with other disciplines or utilities, and/or approval from the regulatory authorities. They are not intended as construction drawings unless noted as such.

2. Only drawings specifically marked "For Construction" are intended to be used in conjunction with contract documents, specifications, owner/contractor agreements and to be fully coordinated with other disciplines, including but not limited to, the Architect, if applicable. These Drawings shall not be used for construction layout. Contact TCE for any construction surveying services or to obtain electronic data suitable for construction layout.

3. These Drawings are specific to the Project and are not transferable. As instruments of service, these drawings, and copies thereof, furnished by TCE are its exclusive property. Changes to the drawings may only be made by TCE. If errors or omissions are discovered, they shall be brought to the attention of TCE immediately.

4. By use of these drawings for construction of the Project, the Owner represents that they have reviewed, approved, and accepted the drawings and have met with all applicable parties/disciplines to insure these plans are properly coordinated with other aspects of the Project. The Owner and Architect, are responsible for any buildings shown, including an area measured a minimum five (5) feet around any building.

5. It is the User's responsibility to ensure this copy contains the most current revisions.

STATE OF VERMONT
JEREMY M. MATOS
No. 7637
CIVIL
REGISTERED PROFESSIONAL ENGINEER

For Local Permitting Only

Project Title

Jericho Market

364 VT Route 15 Jericho, VT

Sheet Title

Site Plan

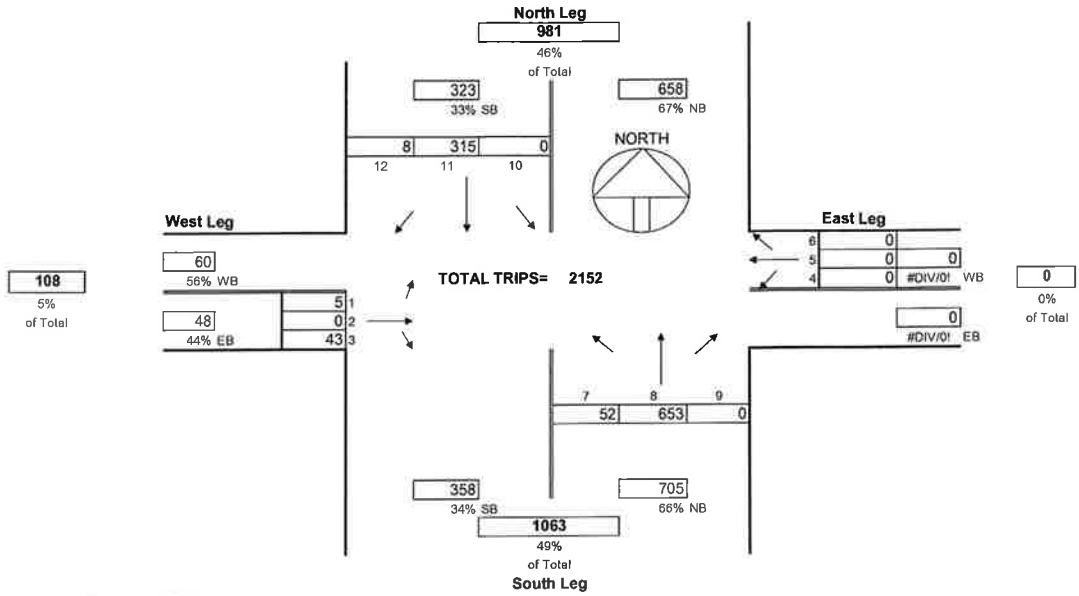
Date:	10/10/14
Scale:	1" = 30'
Project Number:	14-139
Drawn By:	NPC
Project Engineer:	NTH
Approved By:	
Field Book:	

C2-02

Appendix C - Turning Movement Diagrams

Intersection: VT 15/ Raceway/ Project Access
Time: 4:15-5:15 PM

2015 NO BUILD SCENARIO



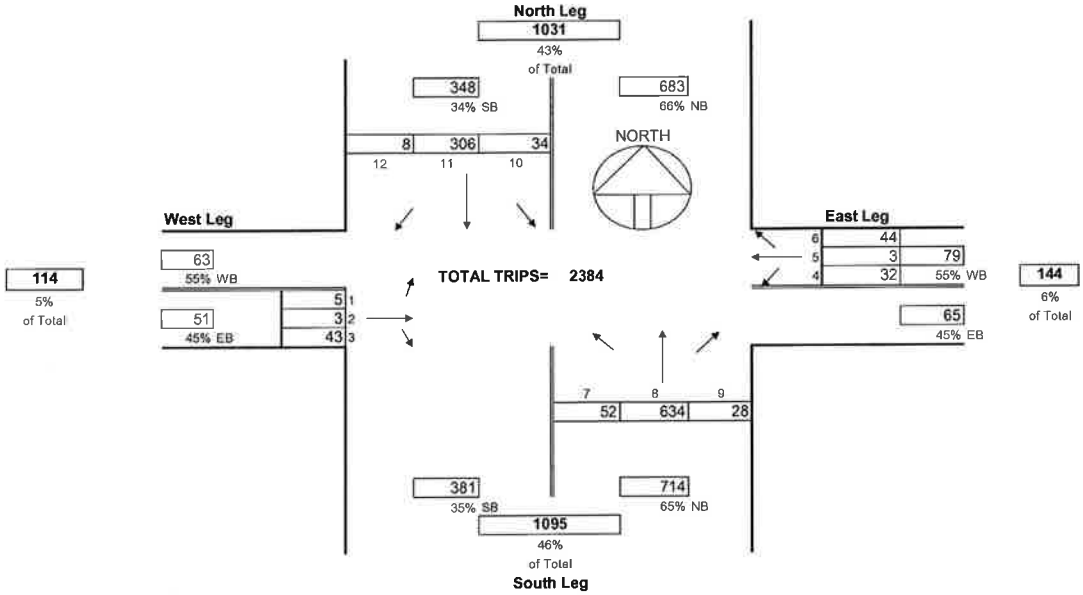
Summary of Volumes

EB L	EB T	EB R	WB L	WB T	WB R	NB L	NB T	NB R	SB L	SB T	SB R
1	2	3	4	5	6	7	8	9	10	11	12
5	0	43	0	0	0	52	653	0	0	315	8

NOTE DISTRIBUTION PATTERN BASED ON ANALOGY TO SHORT COUNT

Intersection: VT 15/ Raceway/ Project Access
Time: 4:15-5:15 PM

2015 BUILD SCENARIO



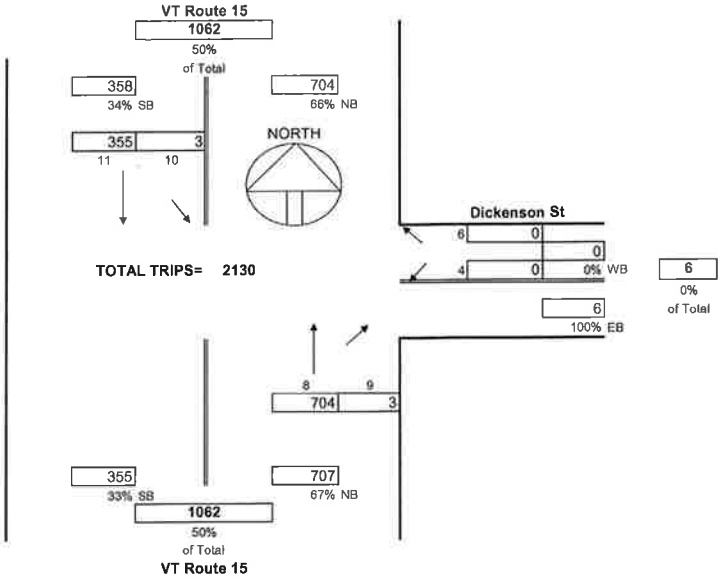
Summary of Volumes

EB L	EB T	EB R	WB L	WB T	WB R	NB L	NB T	NB R	SB L	SB T	SB R
1	2	3	4	5	6	7	8	9	10	11	12
5	3	43	32	3	44	52	634	28	34	306	8

NOTE DISTRIBUTION PATTERN BASED ON ANALOGY TO SHORT COUNT

Intersection: VT Route 15 & Dickenson Street
Time: 4:15-5:15 PM

2015 NO BUILD SCENARIO



Summary of Volumes

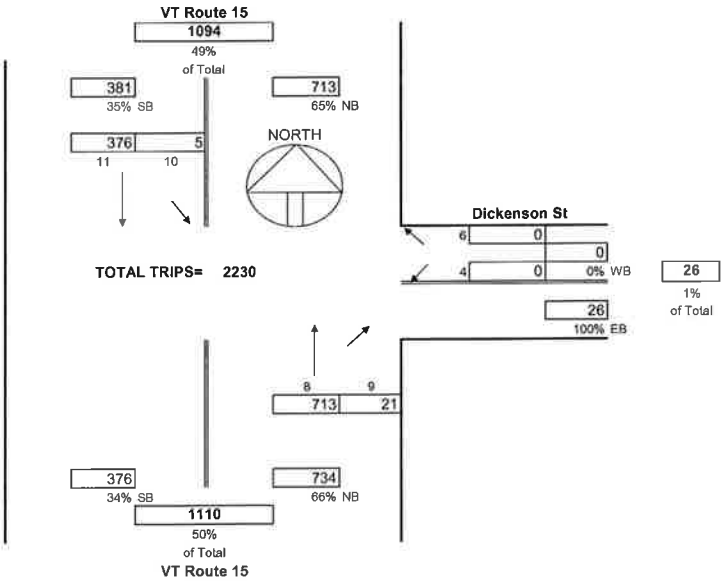
WB L	WB R	NB T	NB R	SB L	SB T
4	6	8	9	10	11
0	0	704	3	3	355

NOTE DISTRIBUTION PATTERN BASED ON ANALOGY TO SHORT COUNT

TM_15 & Dickenson St.xlsx

Intersection: VT Route 15 & Dickenson Street
Time: 4:15-5:15 PM

2015 BUILD SCENARIO
TOTAL TRAFFIC



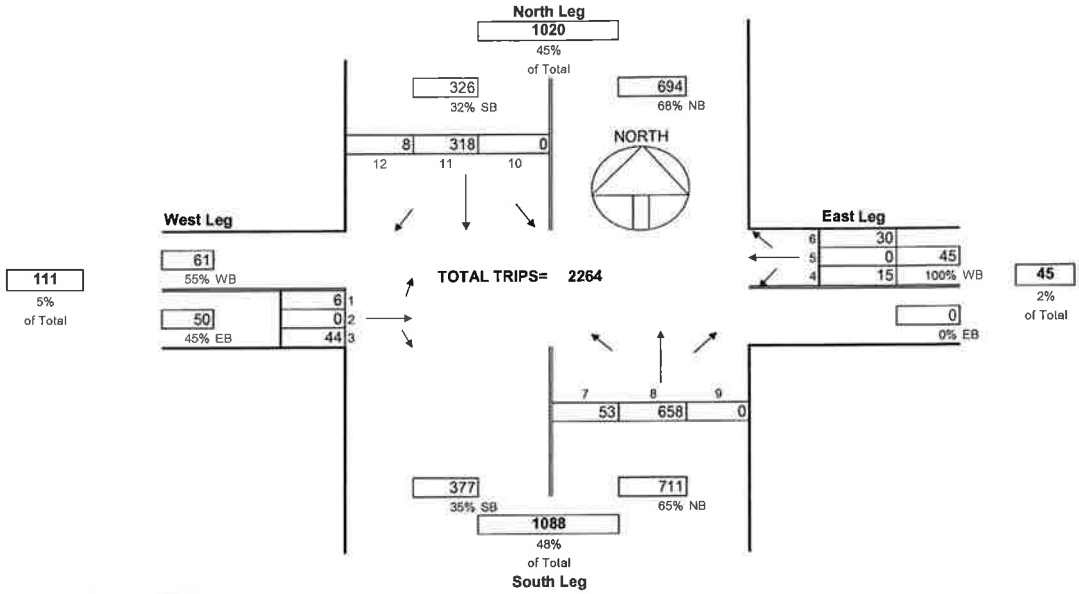
Summary of Volumes

WB L	WB R	NB T	NB R	SB L	SB T
4	6	8	9	10	11
0	0	713	21	5	376

NOTE DISTRIBUTION PATTERN BASED ON ANALOGY TO SHORT COUNT

Intersection: VT 15/ Raceway/ Project Access
Time: 4:15-5:15 PM

2020 NO BUILD SCENARIO



Summary of Volumes

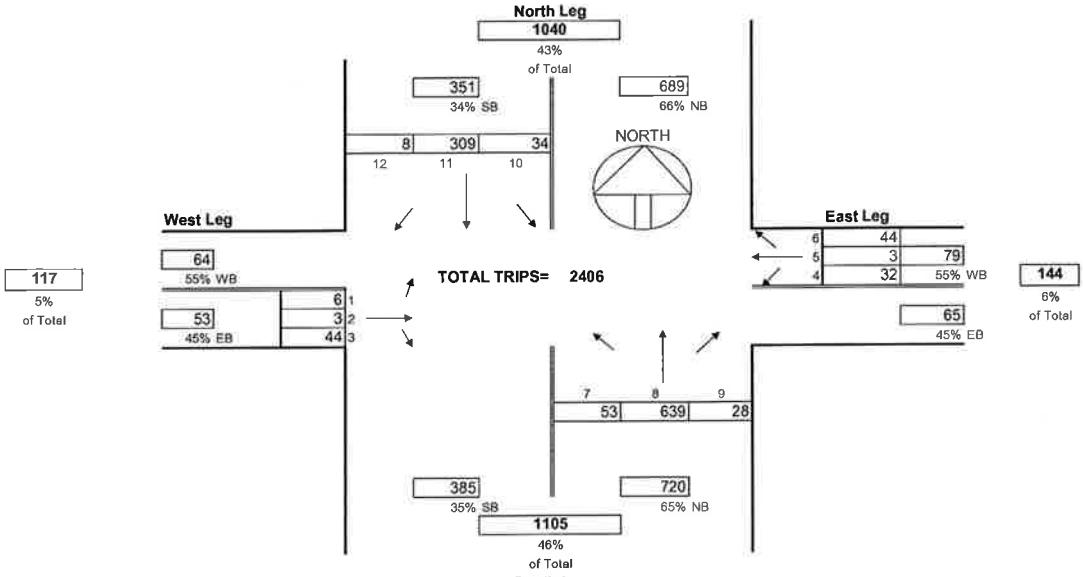
EB L	EB T	EB R	WB L	WB T	WB R	NB L	NB T	NB R	SB L	SB T	SB R
1	2	3	4	5	6	7	8	9	10	11	12
6	0	44	15	0	30	53	658	0	0	318	8

NOTE DISTRIBUTION PATTERN BASED ON ANALOGY TO SHORT COUNT

TM_15 & Raceway & Access.xlsx

Intersection: VT 15/ Raceway/ Project Access
Time: 4:15-5:15 PM

2020 BUILD SCENARIO



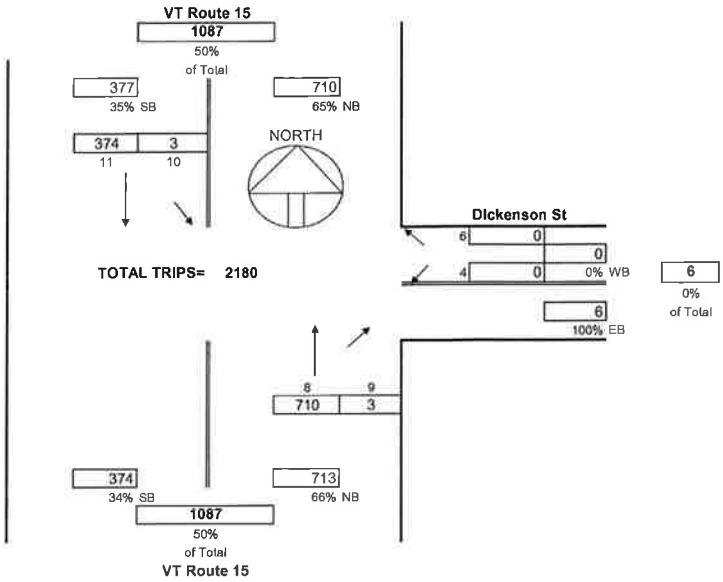
Summary of Volumes

EB L	EB T	EB R	WB L	WB T	WB R	NB L	NB T	NB R	SB L	SB T	SB R
1	2	3	4	5	6	7	8	9	10	11	12
6	3	44	32	3	44	53	639	28	34	309	8

NOTE DISTRIBUTION PATTERN BASED ON ANALOGY TO SHORT COUNT

Intersection: VT Route 15 & Dickenson Street
Time: 4:15-5:15 PM

2020 NO BUILD SCENARIO



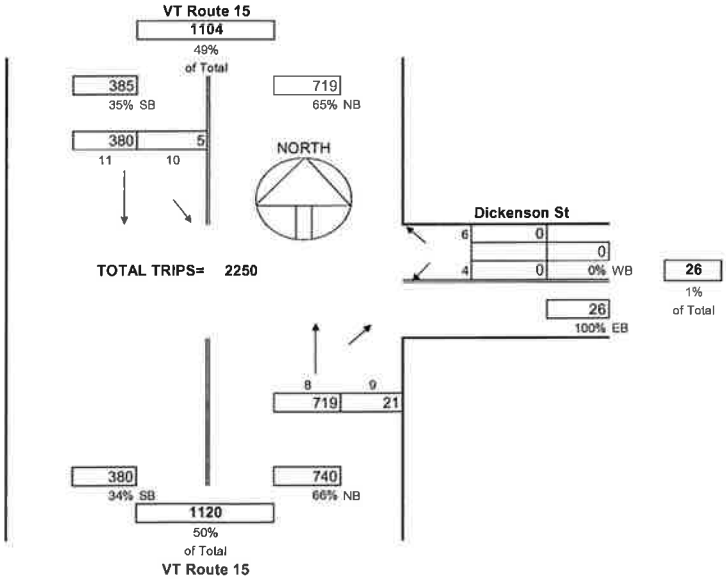
Summary of Volumes

WB L	WB R	NB T	NB R	SB L	SB T
4	6	8	9	10	11
0	0	710	3	3	374

NOTE DISTRIBUTION PATTERN BASED ON ANALOGY TO SHORT COUNT

Intersection: VT Route 15 & Dickenson Street
Time: 4:15-5:15 PM

2020 BUILD SCENARIO
TOTAL TRAFFIC



Summary of Volumes

WB L	WB R	NB T	NB R	SB L	SB T
4	6	8	9	10	11
0	0	719	21	5	380

NOTE DISTRIBUTION PATTERN BASED ON ANALOGY TO SHORT COUNT

Appendix D - HCM 2010 Analysis

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	5	0	43	0	0	0	52	653	0	0	315	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	43	0	0	0	52	653	0	0	315	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1076	1076	319	1098	1080	653	323	0	0	653	0	0
Stage 1	319	319	-	757	757	-	-	-	-	-	-	-
Stage 2	757	757	-	341	323	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	197	219	722	190	218	467	1237	-	-	934	-	-
Stage 1	693	653	-	400	416	-	-	-	-	-	-	-
Stage 2	400	416	-	674	650	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	187	205	722	170	204	467	1237	-	-	934	-	-
Mov Cap-2 Maneuver	187	205	-	170	204	-	-	-	-	-	-	-
Stage 1	647	653	-	374	389	-	-	-	-	-	-	-
Stage 2	374	389	-	634	650	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	0	0.6	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1237	-	-	556	-	934	-	-
HCM Lane V/C Ratio	0.042	-	-	0.086	-	-	-	-
HCM Control Delay (s)	8	0	-	12.1	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	-	0	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	0	704	3	3	355
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	704	3	3	355

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1067	706	0	0	707	0
Stage 1	706	-	-	-	-	-
Stage 2	361	-	-	-	-	-
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	246	436	-	-	891	-
Stage 1	489	-	-	-	-	-
Stage 2	705	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	245	436	-	-	891	-
Mov Cap-2 Maneuver	245	-	-	-	-	-
Stage 1	489	-	-	-	-	-
Stage 2	702	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	891	-
HCM Lane V/C Ratio	-	-	-	0.003	-
HCM Control Delay (s)	-	-	0	9.1	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	5	3	43	32	3	44	52	634	28	34	306	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	3	43	32	3	44	52	634	28	34	306	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1154	1144	310	1153	1134	648	314	0	0	662	0	0
Stage 1	378	378	-	752	752	-	-	-	-	-	-	-
Stage 2	776	766	-	401	382	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	174	200	730	174	203	470	1246	-	-	927	-	-
Stage 1	644	615	-	402	418	-	-	-	-	-	-	-
Stage 2	390	412	-	626	613	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	143	179	730	148	181	470	1246	-	-	927	-	-
Mov Cap-2 Maneuver	143	179	-	148	181	-	-	-	-	-	-	-
Stage 1	601	588	-	375	390	-	-	-	-	-	-	-
Stage 2	328	385	-	560	586	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	27	0.6	0.9
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1246	-	-	461	242	927	-	-
HCM Lane V/C Ratio	0.042	-	-	0.111	0.326	0.037	-	-
HCM Control Delay (s)	8	0	-	13.8	27	9	0	-
HCM Lane LOS	A	A	-	B	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	1.4	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	0	713	21	5	376
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	713	21	5	376

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1110	724	0	0	734	0
Stage 1	724	-	-	-	-	-
Stage 2	386	-	-	-	-	-
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	232	426	-	-	871	-
Stage 1	480	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	230	426	-	-	871	-
Mov Cap-2 Maneuver	230	-	-	-	-	-
Stage 1	480	-	-	-	-	-
Stage 2	682	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	871	-
HCM Lane V/C Ratio	-	-	-	0.006	-
HCM Control Delay (s)	-	-	0	9.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	0	44	15	0	30	53	658	0	0	318	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	0	44	15	0	30	53	658	0	0	318	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1101	1086	322	1108	1090	658	326	0	0	658	0	0
Stage 1	322	322	-	764	764	-	-	-	-	-	-	-
Stage 2	779	764	-	344	326	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	189	216	719	187	215	464	1234	-	-	930	-	-
Stage 1	690	651	-	396	413	-	-	-	-	-	-	-
Stage 2	389	413	-	671	648	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	168	201	719	166	200	464	1234	-	-	930	-	-
Mov Cap-2 Maneuver	168	201	-	166	200	-	-	-	-	-	-	-
Stage 1	643	651	-	369	385	-	-	-	-	-	-	-
Stage 2	339	385	-	630	648	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.7	19.7	0.6	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1234	-	-	516	290	930	-	-
HCM Lane V/C Ratio	0.043	-	-	0.097	0.155	-	-	-
HCM Control Delay (s)	8	0	-	12.7	19.7	0	-	-
HCM Lane LOS	A	A	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.5	0	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	0	710	3	3	374
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	710	3	3	374

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1092	712	0	0	713	0
Stage 1	712	-	-	-	-	-
Stage 2	380	-	-	-	-	-
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	237	432	-	-	887	-
Stage 1	486	-	-	-	-	-
Stage 2	691	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	236	432	-	-	887	-
Mov Cap-2 Maneuver	236	-	-	-	-	-
Stage 1	486	-	-	-	-	-
Stage 2	688	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	887	-
HCM Lane V/C Ratio	-	-	-	0.003	-
HCM Control Delay (s)	-	-	0	9.1	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	3	44	32	3	44	53	639	28	34	309	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	3	44	32	3	44	53	639	28	34	309	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1164	1154	313	1164	1144	653	317	0	0	667	0	0
Stage 1	381	381	-	759	759	-	-	-	-	-	-	-
Stage 2	783	773	-	405	385	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	171	197	727	171	200	467	1243	-	-	923	-	-
Stage 1	641	613	-	399	415	-	-	-	-	-	-	-
Stage 2	387	409	-	622	611	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	140	175	727	145	178	467	1243	-	-	923	-	-
Mov Cap-2 Maneuver	140	175	-	145	178	-	-	-	-	-	-	-
Stage 1	597	585	-	372	387	-	-	-	-	-	-	-
Stage 2	324	381	-	555	584	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.3	27.6	0.6	0.9
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1243	-	-	440	238	923	-	-
HCM Lane V/C Ratio	0.043	-	-	0.12	0.332	0.037	-	-
HCM Control Delay (s)	8	0	-	14.3	27.6	9	0	-
HCM Lane LOS	A	A	-	B	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	1.5	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	0	719	21	5	380
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	719	21	5	380

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1120	730	0	0	740	0
Stage 1	730	-	-	-	-	-
Stage 2	390	-	-	-	-	-
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	228	422	-	-	867	-
Stage 1	477	-	-	-	-	-
Stage 2	684	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	226	422	-	-	867	-
Mov Cap-2 Maneuver	226	-	-	-	-	-
Stage 1	477	-	-	-	-	-
Stage 2	679	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	867	-
HCM Lane V/C Ratio	-	-	-	0.006	-
HCM Control Delay (s)	-	-	0	9.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Appendix E - Crash Data

Vermont Agency of Transportation

General Yearly Summaries - Crash Listing: State Highways and All Federal Aid Highway Systems

From 01/01/08 To 12/31/12 General Yearly Summaries Information

*	Reporting Agency/ Number	Town	Mile Marker	Date MM/DD/YY	Time	Weather	Contributing Circumstances	Direction Of Collision	Number Of Injuries	Number Of Fatalities	Number Of Untimely Deaths	Direction	Road Group
Route: VT-15 Continued ...													
	VT0040200/12ES0 0973	Essex	7.88	02/20/2012	16:00	Cloudy		Rear End	0	0	0	E	SH
	VT0040200/09ES0 9399	Essex	7.89	12/13/2009	18:40	Clear	No improper driving, Failed to yield right of way	Left Turn and Thru, Angle Broadside -->v--	0	0	0	E	SH
	VT0040200/11ES0 4303	Essex	7.89	06/24/2011	10:09	Cloudy	Followed too closely, No improper driving	Rear End	0	0	0	E	SH
	VT0040200/08ES0 2478	Essex	7.92	04/21/2008	04:55	Clear	Failure to keep in proper lane	Single Vehicle Crash	0	0	0		SH
	VT0040200/11ES0 3814	Essex	7.92	06/06/2011	17:31	Clear	Unknown	Single Vehicle Crash	1	0	0		SH
	VT0040200/12ES0 1275	Essex	7.98	03/10/2012	09:09	Clear	Followed too closely, No improper driving	Rear End	0	0	0		SH
	VT0040200/12ES0 6991	Essex	8.04	11/26/2012	07:20	Snow	Driving too fast for conditions	Other - Explain in Narrative	0	0	0		SH
	VT0040200/08ES0 311	Essex	8.08	01/14/2008	16:09	Unknown	Unknown	Other - Explain in Narrative	0	0	0		SH
	VT0040200/09ES0 5928	Essex	UNK	08/10/2009	15:14	Not Reported	Unknown, No improper driving	Rear End	0	0	0		SH
	VT0040200/09ES0 9492	Essex	UNK	12/16/2009	23:00	Snow	No improper driving, Driving too fast for conditions	Rear End	0	0	0		SH
	VT0040200/10ES0 1333	Essex	UNK	02/25/2010	14:02	Cloudy		Rear End	0	0	0	E	SH
	VT0040200/10ES0 5874	Essex	UNK	08/07/2010	11:23	Clear	Followed too closely, No improper driving	Rear End	0	0	0		SH
	VT0040200/10ES0 8096	Essex	UNK	10/12/2010	09:24	Clear	Inattention, No improper driving	Rear End	0	0	0	E	SH
	VT0040200/10ES0 8540	Essex	UNK	10/28/2010	14:33	Clear		Rear End	0	0	0	W	SH
	VT0040200/11ES0 4745	Essex	UNK	07/11/2011	12:58	Cloudy		Rear End	0	0	0	W	SH
	VT0040200/12ES0 7396	Essex	UNK	12/13/2012	09:58	Clear		Other - Explain in Narrative	0	0	0	E	SH
	VTVSP0100/09A10 5156	Jericho	0.25	12/23/2009	18:41	Snow	No improper driving, Driving too fast for conditions, Failure to keep in proper lane	Opp Direction Sideswipe	0	0	0	E	SH
	VTVSP0100/12A10 4606	Jericho	0.29	11/25/2012	09:45	Clear	Followed too closely, No improper driving	Rear End	0	0	0	E	SH
	VTVSP0100/09A10 3948	Jericho	0.36	09/28/2009	07:52	Clear	Inattention, Followed too closely, No improper driving	Rear End	0	0	0	W	SH
	VTVSP0100/11A10 1156	Jericho	0.43	03/12/2011	07:25	Snow	No improper driving, Driving too fast for conditions, Failure to keep in proper lane	Opp Direction Sideswipe	0	0	0	E	SH
	VTVSP0100/09A10 2037	Jericho	0.45	05/15/2009	17:32	Clear	No improper driving, Failed to yield right of way	No Turns, Thru moves only, Broadside ^<	0	0	0	E	SH
	VTVSP0100/12A10 1962	Jericho	0.45	05/31/2012	17:30	Cloudy	Failure to keep in proper lane, Visibility obstructed	Single Vehicle Crash	2	0	0	E	SH
	VTVSP0100/09A10 3957	Jericho	0.49	09/28/2009	19:58	Rain	Driving too fast for conditions, Failure to keep in proper lane	Single Vehicle Crash	0	0	0	W	SH
	VTVSP0100/11A10 2300	Jericho	0.49	06/06/2011	06:36	Clear	Driving too fast for conditions	Single Vehicle Crash	0	0	0		SH
	VTVSP0100/10A10 3224	Jericho	0.56	08/10/2010	15:15	Clear	No improper driving, Driving too fast for conditions, Technology Related Distraction	Rear End	1	0	0	E	SH
	VTVSP0100/08A10 2055	Jericho	0.57	05/01/2008	11:14	Clear	Failure to keep in proper lane, Inattention, No improper driving	Opp Direction Sideswipe	1	0	0	E	SH
	VTVSP0100/10A10 3873	Jericho	0.75	09/19/2010	14:35	Cloudy	No improper driving, Followed too closely, Inattention	Rear End	0	0	0	E	SH
	VTVSP0700/12A10 4693	Jericho	0.78	11/29/2012	19:16	Snow	Driving too fast for conditions	Single Vehicle Crash	0	0	0	E	SH
	VTVSP0100/09A10 1486	Jericho	0.81	04/02/2009	13:08	Clear	Failed to yield right of way	Opp Direction Sideswipe	0	0	0	E	SH

**Crash occurred prior to the last Highway Improvement Project. This data should not be used in a crash analysis. UNK indicates the Mile Marker is Unknown.*

Vermont Agency of Transportation

General Yearly Summaries - Crash Listing: State Highways and All Federal Aid Highway Systems

From 01/01/08 To 12/31/12 General Yearly Summaries Information

*	Reporting Agency/ Number	Town	Mile Marker	Date MM/DD/YY	Time	Weather	Contributing Circumstances	Direction Of Collision	Number Of Injuries	Number Of Fatalities	Number Of Untimely Deaths	Direction	Road Group
Route: VT-15 Continued ...													
	VTVSP0100/10A10 0098	Jericho	0.81	01/04/2010	08:10	Cloudy	Failure to keep in proper lane, No improper driving	Head On	0	0	0	E	SH
	VTVSP0100/10A10 0405	Jericho	0.81	01/25/2010	16:45	Rain	Failed to yield right of way, No improper driving	Left Turn and Thru, Angle Broadside -->v--	0	0	0		SH
	VTVSP0100/11A10 1993	Jericho	0.81	05/14/2011	18:45	Rain	No improper driving	Same Direction Sideswipe	0	0	0		SH
	VTVSP0100/08A10 2518	Jericho	0.84	06/03/2008	06:35	Clear	Failure to keep in proper lane, Inattention, No improper driving	Head On	2	0	0		SH
	VTVSP0100/09A10 1091	Jericho	0.87	03/02/2009	12:15	Cloudy	Other improper action	Other - Explain in Narrative	2	0	0	E	SH
	VTVSP0100/08A10 1878	Jericho	0.91	04/19/2008	18:15	Clear	Failure to keep in proper lane	Single Vehicle Crash	1	0	0		SH
	VTVSP0100/10A10 1787	Jericho	1.06	05/06/2010	12:57	Cloudy	Followed too closely, Inattention, No improper driving	Rear End	0	0	0		SH
	VTVSP0100/10A10 4854	Jericho	1.07	11/24/2010	14:57	Clear	No improper driving, Followed too closely	Rear End	1	0	0	W	SH
	VTVSP0100/08A10 3630	Jericho	1.16	08/09/2008	17:44	Clear	Followed too closely	Rear End	0	0	0	E	SH
	VTVSP0100/10A10 4026	Jericho	1.32	09/29/2010	20:18	Clear	Followed too closely, Distracted, No improper driving	Rear End	0	0	0	W	SH
	VTVSP0100/11A10 3947	Jericho	1.34	09/22/2011	15:00	Cloudy	Fatigued, asleep, Unknown	Head On	0	0	0	E	SH
	VTVSP0100/10A10 2509	Jericho	1.67	06/25/2010	12:11	Clear	No improper driving, Failure to keep in proper lane, Distracted	Opp Direction Sideswipe	0	0	0		SH
	VTVSP0100/08A10 0743	Jericho	1.8	02/04/2008	15:20	Cloudy	Followed too closely, No improper driving	Rear End	0	0	0	W	SH
	VTVSP0100/09A10 1130	Jericho	1.8	03/03/2009	17:30	Clear	No improper driving, Followed too closely, Inattention	Rear End	0	0	0		SH
	VTVSP0100/10A10 3889	Jericho	1.8	09/20/2010	16:05	Clear	No improper driving, Driving too fast for conditions, Distracted	Rear End	1	0	0		SH
	VTVSP0100/10A10 4943	Jericho	1.8	11/30/2010	15:11	Rain	No improper driving, Failure to keep in proper lane, Fatigued, asleep	Head On	1	0	0	E	SH
	VTVSP0100/12A10 0508	Jericho	1.8	02/10/2012	14:27	Clear	No improper driving, Followed too closely, Inattention	Rear End	0	0	0	W	SH
	VTVSP0100/12A10 4762	Jericho	1.8	12/04/2012	07:53	Cloudy	Other improper action, Failed to yield right of way	No Turns, Thru moves only, Broadside ^<	0	0	0	E	SH
	VTVSP0100/11A10 0605	Jericho	2.03	02/03/2011	18:21	Clear	Failed to yield right of way, Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0	0		SH
	VTVSP0100/12A10 2284	Jericho	2.14	06/21/2012	22:14	Clear	Failed to yield right of way, No improper driving	Rear End	0	0	0	W	SH
	VTVSP0100/09A10 4481	Jericho	2.16	11/09/2009	09:38	Clear	No improper driving, Other improper action, Inattention	Rear End	1	0	0	W	SH
	VTVSP0100/11A10 0364	Jericho	2.42	01/21/2011	15:55	Clear	Failure to keep in proper lane, Wrong side or wrong way, No improper driving	Head On	2	0	0	E	SH
	VTVSP0100/08A10 4552	Jericho	2.51	10/06/2008	20:03	Clear	No improper driving, Under the influence of medication/drugs/alcohol, Wrong side or wrong way, Failed to yield right of way	Left Turn and Thru, Broadside v<--	0	0	0		SH
	VTVSP0100/11A10 4613	Jericho	2.54	11/09/2011	14:26	Clear	Unknown	Single Vehicle Crash	1	0	0	E	SH
	VTVSP0100/12A10 0470	Jericho	2.61	02/07/2012	16:46	Clear	Followed too closely, Inattention	Rear End	1	0	0	W	SH
	VTVSP0100/08A10 1479	Jericho	2.71	03/18/2008	16:50	Clear	No improper driving, Inattention, Followed too closely	Rear End	0	0	0	W	SH
	VTVSP0100/08A10 1665	Jericho	2.71	04/02/2008	08:00	Cloudy	Failure to keep in proper lane, Failed to yield right of way	Left Turn and Thru, Angle Broadside -->v--	0	0	0	E	SH

**Crash occurred prior to the last Highway Improvement Project. This data should not be used in a crash analysis. UNK indicates the Mile Marker is Unknown.*

Vermont Agency of Transportation

General Yearly Summaries - Crash Listing: State Highways and All Federal Aid Highway Systems

From 01/01/08 To 12/31/12 General Yearly Summaries Information

*	Reporting Agency/ Number	Town	Mile Marker	Date MM/DD/YY	Time	Weather	Contributing Circumstances	Direction Of Collision	Number Of Injuries	Number Of Fatalities	Number Of Untimely Deaths	Direction	Road Group
Route: VT-15 Continued ...													
	VTVSP0100/08A10 5052	Jericho	2.71	11/09/2008	09:13	Cloudy	Failed to yield right of way, No improper driving	Left Turn and Thru, Angle Broadside -->v--	1	0	0	E	SH
	VTVSP0100/10A10 5131	Jericho	2.71	12/10/2010	15:09	Cloudy	No improper driving, Inattention, Other improper action	Rear End	0	0	0	W	SH
	VTVSP0100/11A10 2840	Jericho	2.71	07/09/2011	16:12	Clear	No improper driving, Followed too closely	Rear End	4	0	0	E	SH
	VTVSP0100/12A10 0100	Jericho	2.71	01/09/2012	16:02	Cloudy	No improper driving, Followed too closely, Inattention	Rear End	2	0	0	N	SH
	VTVSP0100/08A10 2071	Jericho	2.75	05/02/2008	10:45	Cloudy	Followed too closely, Inattention, No improper driving	Rear End	0	0	0	E	SH
	VTVSP0100/12A10 1846	Jericho	3.12	05/24/2012	08:04	Clear	Followed too closely, No improper driving	Rear End	0	0	0	S	SH
	VTVSP0100/11A10 2347	Jericho	3.17	06/08/2011	11:29	Clear	No improper driving, Failure to keep in proper lane, Fatigued, asleep	Same Direction Sideswipe	1	0	0	E	SH
	VTVSP0100/08A10 1669	Jericho	3.22	04/02/2008	14:30	Clear	No improper driving, Failure to keep in proper lane, Unknown	Opp Direction Sideswipe	2	0	0		SH
	VTVSP0100/09A10 2410	Jericho	3.22	06/10/2009	20:41	Clear	Failed to yield right of way, Made an improper turn, No improper driving	Left Turn and Thru, Angle Broadside -->v--	0	0	0		SH
	VTVSP0100/11A10 0414	Jericho	3.24	01/24/2011	09:21	Clear	Failed to yield right of way, No improper driving	Left Turn and Thru, Angle Broadside -->v--	1	0	0	E	SH
	VTVSP0100/10A10 3839	Jericho	3.46	09/17/2010	13:40	Cloudy	Driving too fast for conditions, Followed too closely	Rear End	0	0	0		SH
	VTVSP0100/12A10 4527	Jericho	3.53	11/19/2012	13:27	Clear	Driving too fast for conditions, Inattention	Rear End	1	0	0	W	SH
	VTVSP0100/08A10 5059	Jericho	3.64	11/10/2008	02:59	Rain	Failure to keep in proper lane	Single Vehicle Crash	0	0	0	W	SH
	VTVSP0700/12A10 4359	Underhill	0.04	11/05/2012	07:32	Cloudy	No improper driving, Failed to yield right of way	Left Turn and Thru, Angle Broadside -->v--	0	0	0	E	SH
	VTVSP0100/09A10 2783	Underhill	0.18	07/07/2009	17:19	Cloudy	Fatigued, asleep	Single Vehicle Crash	0	0	0		SH
	VTVSP0100/08A10 4466	Underhill	0.25	09/30/2008	16:42	Clear	No improper driving, Followed too closely, Inattention	Rear End	0	0	0	E	SH
	VTVSP0100/10A10 1213	Underhill	0.25	03/21/2010	12:01	Snow	Fatigued, asleep	Single Vehicle Crash	1	0	0		SH
	VTVSP0100/12A10 0011	Underhill	0.37	01/01/2012	15:15	Cloudy	Fatigued, asleep, Other improper action	Single Vehicle Crash	1	0	0	N	SH
	VTVSP0100/08A10 0982	Underhill	0.72	02/15/2008	15:30	Cloudy	Fatigued, asleep	Single Vehicle Crash	0	0	0	W	SH
	VTVSP0100/08A10 2502	Underhill	0.78	06/01/2008	22:33	Cloudy	Under the influence of medication/drugs/alcohol, Failure to keep in proper lane	Single Vehicle Crash	0	0	0		SH
	VTVSP0100/12A10 3379	Underhill	0.81	09/01/2012	02:00	Clear	Failure to keep in proper lane, Driving too fast for conditions	Single Vehicle Crash	1	0	0		SH
	VTVSP0100/09A10 1485	Underhill	1.2	04/02/2009	08:20	Clear	Failure to keep in proper lane	Single Vehicle Crash	0	0	0	W	SH
	VTVSP0100/12A10 4639	Underhill	1.31	11/26/2012	12:58	Clear		No Turns, Thru moves only, Broadside ^<	0	0	0		SH
	VTVSP0100/08A10 1994	Underhill	1.44	04/26/2008	21:15	Clear	No improper driving	Single Vehicle Crash	0	0	0	W	SH
	VTVSP0100/09A10 4320	Underhill	1.44	10/27/2009	06:45	Clear	Failure to keep in proper lane	Single Vehicle Crash	1	0	0	W	SH
	VTVSP0100/08A10 0968	Underhill	2.35	02/15/2008	08:26	Cloudy	Driving too fast for conditions, Failure to keep in proper lane	Single Vehicle Crash	0	0	0	W	SH
	VTVSP0100/11A10 0564	Underhill	2.41	02/01/2011	19:55	Snow	Failure to keep in proper lane	Single Vehicle Crash	0	0	0	N	SH
	VTVSP0100/11A10 1629	Underhill	2.48	04/16/2011	20:03	Sleet, Hail (Freezing Rain or Drizzle)		Single Vehicle Crash	1	0	0	S	SH

**Crash occurred prior to the last Highway Improvement Project. This data should not be used in a crash analysis. UNK indicates the Mile Marker is Unknown.*

Vermont Agency of Transportation

General Yearly Summaries - Town Highway Crash Listing: Non-Federal Aid Highways-Local

From 01/01/08 To 12/31/12 General Yearly Summaries Information

Reporting Agency/ Number	County	Town	Route	Date MM/DD/YY	Time	Weather	Contributing Circumstances	Direction Of Collision	Number Of Injuries	Number Of Fatalities	Number Of Untimely Deaths	Location
VTVSP0100/12 A102676	Chittenden	Huntington	T0030	07/18/2012	07:45	Clear	Inattention	Single Vehicle Crash	1	0	0	TH-30 (649 Moody Rd) at Main Rd
VTVSP0100/08 A100777	Chittenden	Jericho	T0003	02/06/2008	08:08	Snow	Driving too fast for conditions, Failure to keep in proper lane, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0	0	TH-3 Nashville Road at Tourin Road
VTVSP0100/08 A103545	Chittenden	Jericho	T0003	08/04/2008	12:14	Clear	Driving too fast for conditions	Single Vehicle Crash	0	0	0	TH-3 Nashville Rd; Box 49
VTVSP0100/08 A104745	Chittenden	Jericho	T0003	10/19/2008	01:00	Clear	Failure to keep in proper lane, Under the influence of medication/drugs/alcohol	Single Vehicle Crash	0	0	0	TH-3 Nashville Road at Bentley Lane
VTVSP0100/10 A102534	Chittenden	Jericho	T0003	06/26/2010	11:08	Cloudy	Driving too fast for conditions, Followed too closely, No improper driving	Rear End	3	0	0	TH-3 (Nashville Rd) at Browns Trace
VTVSP0100/12 A102412	Chittenden	Jericho	T0003	07/01/2012	15:23	Clear	Other improper action	Single Vehicle Crash	2	0	0	TH-3 Nashville Rd at Browns Trace
VTVSP0100/08 A100511	Chittenden	Jericho	T0006	01/25/2008	04:34	Clear	Failure to keep in proper lane	Rear End	0	0	0	TH-6 (149 Skunk Hollow) at Driveway To 149 Skunk Hollow
VT0040800/09 RM00044	Chittenden	Jericho	T0006	01/19/2009	23:25	Snow	Driving too fast for conditions	Single Vehicle Crash	0	0	0	TH-6 (Skunk Hollow Road) at Vt Rt 117
VT0040800/09 RM00064	Chittenden	Jericho	T0006	01/25/2009	18:15	Snow	Driving too fast for conditions	Single Vehicle Crash	1	0	0	TH-6 Skunk Hollow Road at VT Rt 117
VTVSP0100/09 A105193	Chittenden	Jericho	T0006	12/27/2009	14:30	Cloudy	Followed too closely, Distracted, No improper driving	Head On	0	0	0	TH-6 (30 Plains Rd) at Skunk Hollow Rd
VTVSP0100/10 A100697	Chittenden	Jericho	T0006	02/14/2010	08:30	Other - Explain in Narrative	Failure to keep in proper lane, Driving too fast for conditions, No improper driving	Head On	0	0	0	TH-6 Skunk Hollow Road at Vermont Route 117
VTVSP0100/10 A101061	Chittenden	Jericho	T0006	03/09/2010	22:52	Clear	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	Single Vehicle Crash	0	0	0	TH-6 (149 Skunk Hollow Road) at Route 15
VTVSP0100/12 A104279	Chittenden	Jericho	T0006	10/30/2012	22:56	Rain	Failure to keep in proper lane, Driving too fast for conditions, No improper driving	Head On	2	0	0	TH-6 Skunk Hollow Rd at White Oak Dr
VTVSP0100/12 A105027	Chittenden	Jericho	T0006	12/21/2012	18:24	Cloudy	Failure to keep in proper lane	Single Vehicle Crash	0	0	0	TH-6 Skunk Hollow Rd at Plains Rd/Box #149
VTVSP0100/12 A105111	Chittenden	Jericho	T0006	12/27/2012	12:20		No improper driving	Opp Direction Sideswipe	0	0	0	TH-6 (87 Skunk Hollow Rd
VTVSP0100/09 A103099	Chittenden	Jericho	T0013	07/28/2009	07:40	Cloudy	Driving too fast for conditions, Failure to keep in proper lane, No improper driving	No Turns, Thru moves only, Broadside ^<	1	0	0	TH-13 Raceway Rd at VT Route 15
VTVSP0100/12 A102886	Chittenden	Jericho	T0013	07/29/2012	19:47	Clear	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	Single Vehicle Crash	0	0	0	TH-13 Raceway Road at VT Route 15
VTVSP0100/12 A100486	Chittenden	Jericho	T0015	02/09/2012	06:16	Clear	Swerving or avoiding due to wind, slippery surface, vehicle, object non-motorist in roadway etc, No improper driving	Single Vehicle Crash	1	0	0	TH-15 Orr Rd at Brown's Trace Rd
VTVSP0100/08 A104337	Chittenden	Jericho	T0019	09/23/2008	15:28	Cloudy	Exceeded authorized speed limit, Driving too fast for conditions	Single Vehicle Crash	2	0	0	TH-19 Plains Rd at Browns Trace
VTVSP0100/12 A104715	Chittenden	Jericho	T0019	12/01/2012	00:56	Clear	Failure to keep in proper lane	Single Vehicle Crash	0	0	0	TH-19 Plains Rd at Browns Trace
VTVSP0100/10 A104194	Chittenden	Jericho	T0029	10/13/2010	12:35	Clear	Failure to keep in proper lane	Single Vehicle Crash	1	0	0	TH-29 Fields Lane at Nashville Road
VT0040000/11 CHC058	Chittenden	Jericho	T0032	09/08/2011	18:45	Cloudy	Other improper action	Right Turn, Same Direction, Rear End ^--^--	0	0	0	TH-32 Tyler Pl./Skunk Hollow at Skunk Hollow
VTVSP0100/09 A105112	Chittenden	Jericho	T0035	12/21/2009	19:33	Cloudy	Failure to keep in proper lane	Single Vehicle Crash	0	0	0	TH-35 (Tarbox Rd) at Barber Farm
VTVSP0100/10 A104554	Chittenden	Jericho	T0059	11/05/2010	05:00	Rain	Failure to keep in proper lane, Under the influence of medication/drugs/alcohol	Single Vehicle Crash	1	0	0	TH-59 at 82 Alpine Dr
VT0040600/08 MT00311	Chittenden	Milton	0000	01/25/2008	08:27	Cloudy		Other - Explain in Narrative	0	0	0	101 West Milton Road at IFO 3rd Entrance

Source: SQL Server VCSG

Appendix F - Left & Right Turn Analysis

Appendix H: Right Turn Lanes at Unsignalized Intersections

VERMONT AGENCY OF TRANSPORTATION
TRAFFIC VOLUME WARRANTS FOR RIGHT TURN AUXILLARY LANES
At Unsignalized Intersections

Problem Statement:

Upon review of current literature, with improved traffic operation and reduced accident experience the principal concerns, the following procedure is recommended based on traffic volume and speed warrants. Where the approach highway speed limit is 25 MPH, or the difference between the speed limit and the intersection design speed for right turning vehicles (reference 1990 AASHTO Publication A Policy on Geometric Design of Highways and Streets, Table III-17, etc.) does not exceed 15 MPH, these criteria are generally exempt.

- The need for a right turn lane shall be met for two-lane highways where the advancing (total approach volume excluding lefts utilizing a separate left turn lane) traffic volume (V) exceeds the relationship

  $$V = 33\sqrt{\frac{80 - S}{R(1 - R)}}\ ;$$

  where S is the highway speed (speed limit assumed), in MPH, and R is the ratio of right turns to the advancing traffic volume for design conditions, expressed as a decimal.

- The need for a right-turn lane shall be met for four-lane highways where the above two-lane warrant is met and a minimum of 50 right turning vehicles is exceeded. Two-lane versus four-lanes highway determination is based on the number of advancing volume lanes used to carry through traffic; e.g. where one approach lane carries through traffic it is considered a two-lane highway.

Specific safety concerns may also be cause for inclusion, on a case by case basis, such as restricted sight distance or other severe geometric conditions. In any event it shall be the Agency's prerogative to determine the implementation of any improvements in considering any impacts or hardships that might result from such improvements.

APPROVED: **Original Signed** DATE: 11/06/89

Arthur Goss
Director of Planning

S = 35
R = 28/714 = 0.039
V = 1150
Advancing Volume = 714
NOT MET

Table 5

GUIDELINES FOR LEFT-TURN LANE AT UNSIGNALIZED INTERSECTION

Operating Speed = 30 mph
Speed Limit = 35 mph
Design Speed = 40 mph

Two-lane Roadway Opposing Volume (vph)	Advancing Volume - vph Left-turn - percent																							
	0.50	0.75	1.00	1.25	1.50	1.75	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	8.0	9.0	10	15	20	30	40	50
50	2224	1818	1576	1412	1290	1196	1120	1005	920	854	800	757	720	688	660	636	615	578	548	523	439	392	342	320	314
100	1958	1601	1388	1243	1136	1053	987	885	810	752	705	666	634	606	582	560	541	509	483	460	387	345	301	282	276
150	1749	1430	1240	1111	1015	941	881	790	723	671	630	595	566	541	520	501	484	455	431	411	346	308	269	252	247
200	1598	1306	1133	1015	927	860	805	722	661	613	575	544	517	494	475	457	442	415	394	376	316	282	246	230	225
250	1436	1174	1018	912	833	772	723	649	594	551	517	489	465	444	426	411	397	373	354	338	284	253	221	207	203
300	1331	1088	944	845	773	716	671	601	550	511	479	453	431	412	395	381	368	346	328	313	263	235	205	192	188
350	1214	992	861	771	704	653	612	548	502	466	437	413	393	376	361	347	336	316	299	285	240	214	187	175	171
400	1118	914	793	710	649	602	564	505	462	429	403	381	362	346	332	320	309	291	276	263	221	197	172	161	158
450	1026	839	728	652	596	552	517	464	424	394	369	349	332	318	305	294	284	267	253	241	203	181	158	148	145
500	937	766	664	595	544	504	472	423	388	360	337	319	303	290	278	268	259	244	231	220	185	165	144	135	132
550	869	711	616	552	504	468	438	393	359	334	313	296	281	269	258	249	240	226	214	204	172	153	134	125	123
600	823	672	583	522	477	442	414	372	340	316	296	280	266	254	244	235	227	214	203	193	162	145	127	118	116
650	759	621	538	482	441	408	382	343	314	291	273	258	246	235	225	217	210	197	187	178	150	134	117	109	107
700	717	586	508	455	416	385	361	324	296	275	258	244	232	222	213	205	198	186	177	168	142	126	110	103	101
750	657	537	466	417	381	353	331	297	272	252	236	223	213	203	195	188	182	171	162	154	130	116	101	95	93
800	598	489	424	380	347	322	301	270	247	230	215	203	194	185	178	171	165	155	147	141	118	105	92	86	84
850	560	458	397	356	325	301	282	253	232	215	202	191	181	173	166	160	155	146	138	132	111	99	86	81	79
900	524	428	371	332	304	282	264	237	217	201	188	178	169	162	156	150	145	136	129	123	103	92	81	75	74
950	488	399	346	310	283	263	246	221	202	187	176	166	158	151	145	140	135	127	120	115	96	86	75	70	69
1000	454	371	322	288	263	244	229	205	188	174	163	154	147	140	135	130	125	118	112	107	90	80	70	65	64
1050	420	343	298	267	244	226	212	190	174	161	151	143	136	130	125	120	116	109	103	99	83	74	65	60	59
1100	365	298	258	231	212	196	184	165	151	140	131	124	118	113	108	104	101	95	90	86	72	64	56	52	51
1150	331	271	235	210	192	178	167	150	137	127	119	113	107	102	98	95	92	86	82	78	65	58	51	48	47
1200	272	222	193	173	158	146	137	123	112	104	98	93	88	84	81	78	75	71	67	64	54	48	42	39	38
1250	236	193	168	150	137	127	119	107	98	91	85	80	76	73	70	68	65	61	58	56	47	42	36	34	33
1300	199	163	141	126	115	107	100	90	82	76	72	68	64	62	59	57	55	52	49	47	39	35	31	29	28

Lefts = 34
Opposing = 662
Advancing = 348
% Lefts = 9.8

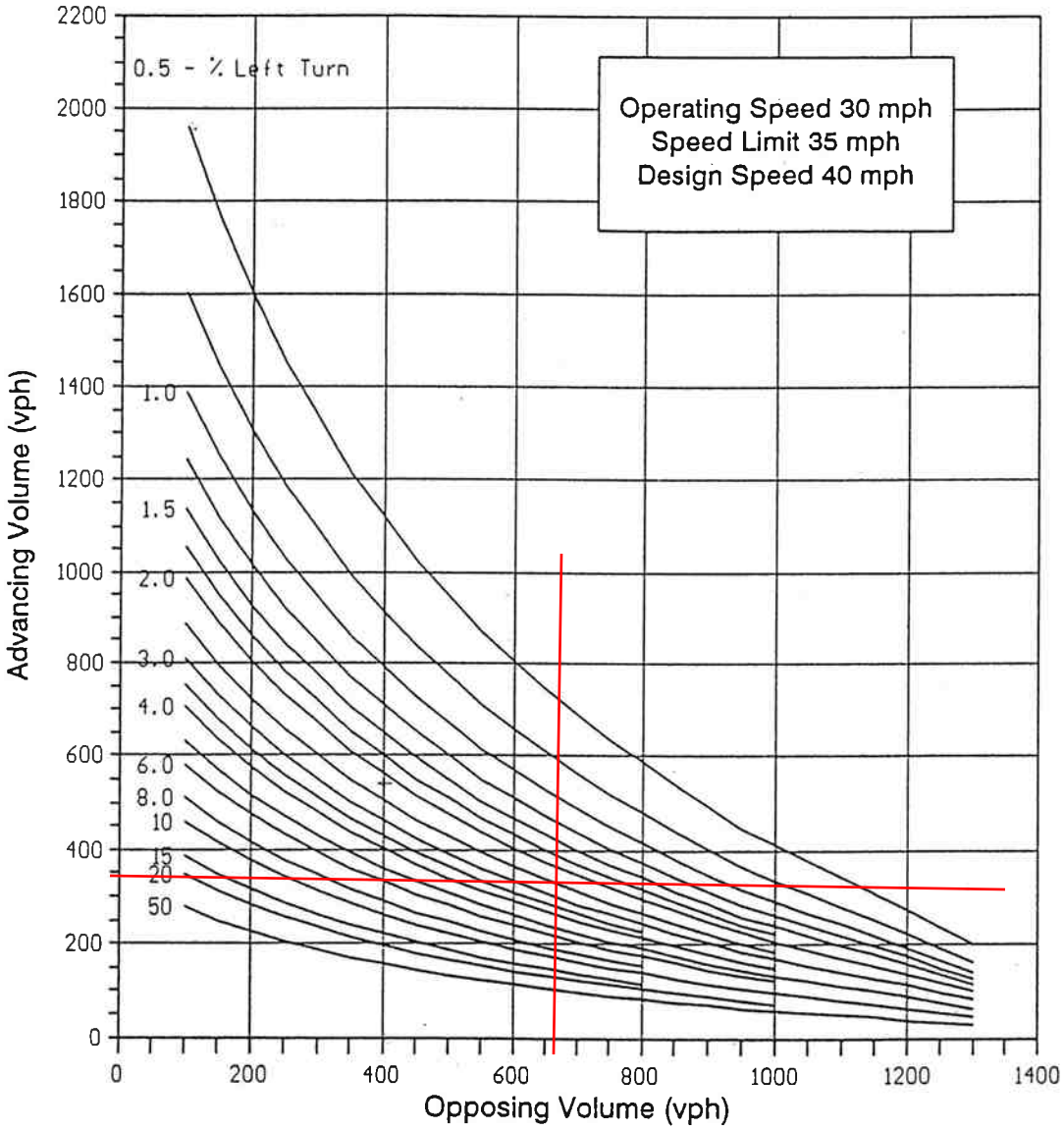


Figure 5 Guidelines for Left-turn Lane at Unsignalized Intersection - Two-lane Roadway

Above curve: warrant met

Lefts=34
Opposing = 662
Advancing = 348
% Lefts = 9.8

Table 6

GUIDELINES FOR LEFT-TURN LANE AT UNSIGNALIZED INTERSECTION

Two-lane Roadway

Operating Speed = 30 mph
Speed Limit = 35 mph
Design Speed = 40 mph

Opposing Volume (vph)	Left-turn Volume - vph Left-turn - percent																								
	0.50	0.75	1.00	1.25	1.50	1.75	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	8.0	9.0	10	15	20	30	40	50
50	11	14	16	18	19	21	22	25	28	30	32	34	36	38	40	41	43	46	49	52	66	78	103	128	157
100	10	12	14	16	17	18	20	22	24	26	28	30	32	33	35	36	38	41	43	46	58	69	90	113	138
150	9	11	12	14	15	16	18	20	22	23	25	27	28	30	31	33	34	36	39	41	52	62	81	101	123
200	8	10	11	13	14	15	16	18	20	21	23	24	26	27	28	30	31	33	35	38	47	56	74	92	113
250	7	9	10	11	12	14	14	16	18	19	21	22	23	24	26	27	28	30	32	34	43	51	66	83	101
300	7	8	9	11	12	13	13	15	17	18	19	20	22	23	24	25	26	28	30	31	39	47	61	77	94
350	6	7	9	10	11	11	12	14	15	16	17	19	20	21	22	23	23	25	27	29	36	43	56	70	86
400	6	7	8	9	10	11	11	13	14	15	16	17	18	19	20	21	22	23	25	26	33	39	52	64	79
450	5	6	7	8	9	10	10	12	13	14	15	16	17	17	18	19	20	21	23	24	30	36	47	59	72
500	5	6	7	7	8	9	9	11	12	13	13	14	15	16	17	17	18	19	21	22	28	33	43	54	66
550	4	5	6	7	8	8	9	10	11	12	13	13	14	15	15	16	17	18	19	20	26	31	40	50	61
600	4	5	6	7	7	8	8	9	10	11	12	13	13	14	15	15	16	17	18	19	24	29	38	47	58
650	4	5	5	6	7	7	8	9	9	10	11	12	12	13	14	14	15	16	17	18	22	27	35	44	54
700	4	4	5	6	6	7	7	8	9	10	10	11	12	12	13	13	14	15	16	17	21	25	33	41	51
750	3	4	5	5	6	6	7	7	8	9	9	10	11	11	12	12	13	14	15	15	19	23	30	38	46
800	3	4	4	5	5	6	6	7	7	8	9	9	10	10	11	11	12	12	13	14	18	21	28	34	42
850	3	3	4	4	5	5	6	6	7	8	8	9	9	10	10	10	11	12	12	13	17	20	26	32	40
900	3	3	4	4	5	5	5	6	6	7	8	8	8	9	9	10	10	11	12	12	16	18	24	30	37
950	2	3	3	4	4	5	5	6	6	7	7	7	8	8	9	9	9	10	11	11	14	17	23	28	34
1000	2	3	3	4	4	4	5	5	6	6	7	7	7	8	8	8	9	9	10	11	13	16	21	26	32
1050	2	3	3	3	4	4	4	5	5	6	6	6	7	7	7	8	8	9	9	10	12	15	19	24	30
1100	2	2	3	3	3	3	4	4	5	5	5	6	6	6	6	7	7	8	8	9	11	13	17	21	26
1150	2	2	2	3	3	3	3	4	4	4	5	5	5	6	6	6	6	7	7	8	10	12	15	19	23
1200	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	8	10	13	16	19
1250	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	6	7	8	11	14	17
1300	1	1	1	2	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	6	7	9	11	14

Lefts = 34
Opposing = 662
Advancing = 348
% Lefts = 9.8

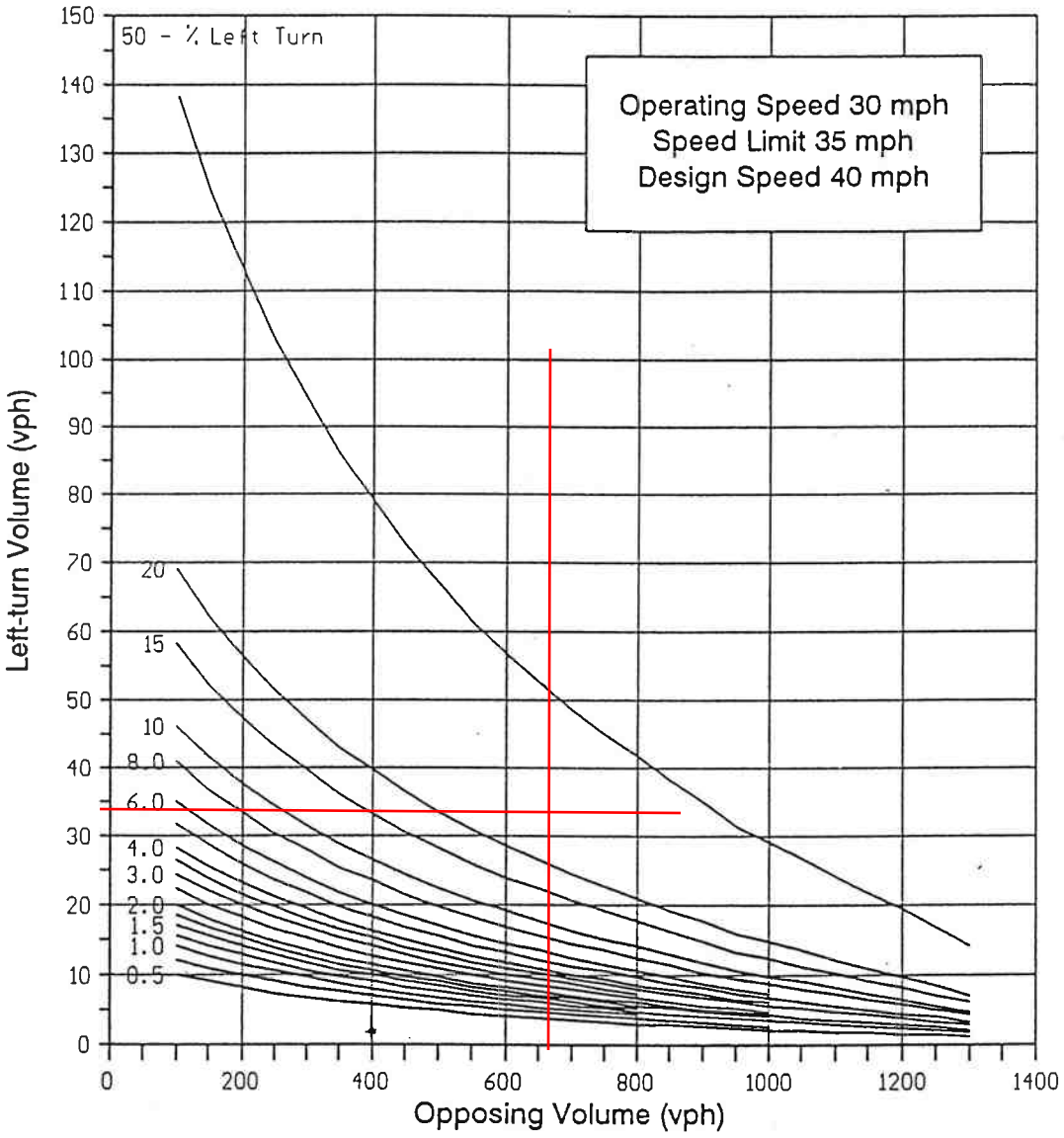


Figure 6 Guidelines for Left-turn Lane at Unsignalized Intersection - Two-lane Roadway

Lefts=34
Opposing = 662
Advancing = 348
% Lefts = 9.8

Above curve: warrant met

From: Clancy, James [mailto:James.Clancy@state.vt.us]
Sent: Tuesday, January 27, 2015 1:04 PM
To: Abby A. Dery, P.E.
Cc: Clancy, James
Subject: Jericho Market Permit

Hello Abby,

As you know VTrans is reviewing the stormwater and traffic for this permit and I have preliminary comments back from Stormwater Management with minor concerns as we discussed earlier. The Traffic review is still out but given that VTrans considers this an improvement to access management I expect this too will be favourable. My boss and I will have a brief meeting with Traffic later this week or early next week to discuss any concerns; but at this time, given the initial comments from our Stormwater people I see no reason that once the reviews are finished, and that the project will be constructed in accordance with the plans I have (save for any minor stormwater comments to address) I feel comfortable in writing that this project will be permitted.

Sincerely,

Jim Clancy

Project Supervisor
Utilities and Permits Unit
Vermont Agency of Transportation
One National Life Drive
Montpelier, Vermont 05633
(802) 828-2486