

## CHAPTER 3 – EXISTING CONDITIONS

The following section includes a description of the existing roadway geometry, traffic volume development, congestion analysis, crash analysis, mobility analysis, truck traffic on local roads analysis, and alternative transportation for the current conditions within the Project Area.

### 3.1 Overview of Project Study Area

The bulk of the Project Area includes the Towns of Williston and Essex and the Village of Essex Junction. In the west/east direction, the boundaries of the Project Area extend from just to the west of the border between Williston/Essex and South Burlington and just east of the border between Williston/Essex and Richmond. In the north-south direction, the boundaries of the Project Area extend from just north of VT 289 and VT 15 to just south of I-89. The Winooski River traverses the Project Area from southeast to northwest. The major east-west corridors in the Project Area include I-89, US 2, VT 117, VT 15, Industrial Road/Mountain View Road and the major north-south corridors in the Project Area include VT 2A, Brownell Road, VT 289, and North Williston Road. A map of the Project Area is provided in Figure 3-1.

At-grade rail crossings are located at five locations within the Project Area. One is located on VT 15 just north of Five Corners, one is located on VT 117 just east of Five Corners, two are located on VT 2A just south of Five Corners, and one is located on North Williston Road south of VT 117. Each of these crossings is controlled by a gate that is activated by an approaching train. Overall, eight trains on weekdays and four trains on weekend days usually travel across the at-grade crossings in the vicinity of Five Corners. These trains cause delays for vehicles and pedestrians attempting to travel through the Five Corners intersection creating in some cases significant delays and causing severe congestion.

The Winooski River traverses the Project Area from southeast to northwest. Currently, there are only four locations to cross the Winooski River within the Project Area. These locations include VT 2A, North Williston Road, US 2, and I-89. There is a considerable distance between the VT 2A and North Williston Road crossings and the North Williston Road and US 2 crossings. Furthermore, the flooding of the approach to the North Williston Road Bridge from seasonal snowmelt and rain creates additional vehicle access difficulties.

### 3.2 Description of the Corridors and Major Intersections

#### 3.2.1 VT 2A Corridor

VT 2A is classified as a State Highway for most of the Project Area, which includes the section from the I-89 Exit 12 Ramps in Williston to the VT 289 Exit 7 ramps in Essex. The section of VT 2A through the Village of Essex Junction is a Class I town highway. The cross section of the roadway varies from four lanes in the vicinity of I-89 and Marshall Avenue to two lanes north of Industrial Avenue. The speed limit in the corridor varies from 25 mph to 50 mph. Land uses vary along the corridor. Between I-89 and US 2, land use consists primarily of commercial retail uses. North of US 2, the uses are a mix of commercial and residential.

The intersection of the I-89 Exit 12 southbound ramps and VT 2A is a fully-actuated signalized intersection that is part of an interconnected, coordinated signal system along VT 2A. The intersection has four legs, and the eastern leg is one-way leaving the intersection to provide access to I-89 South. The I-89 ramp eastbound approach provides one exclusive left-turn lane and one exclusive right turn lane. The VT 2A northbound approach provides two lanes. The VT 2A southbound approach provides one exclusive left-turn lane and one through lane. The signal phasing provides an advance green phase for the VT 2A southbound left-turn, a combined phase for all movements on VT 2A, and an exclusive phase for the I-89 ramp movements.

The intersection of the I-89 Exit 12 northbound ramps and VT 2A is a four-legged intersection controlled by a fully-actuated traffic signal. The western leg of the intersection is configured for one-way travel leaving the intersection and provides access to I-89 North. The I-89 ramp westbound approach provides one exclusive left-turn lane and one exclusive right-turn lane. The VT 2A northbound approach provides one combined lane for left-turn and through movements and one through lane. The VT 2A southbound approach provides one through lane and one exclusive right-turn lane. The signal is interconnected with the signal at the I-89 southbound ramps and the signal at Marshall Avenue/Maple Tree Place. The signal phasing provides a short advance phase for the VT 2A northbound approach, a combined phase for all VT 2A northbound and southbound movements, and a separate phase for the I-89 ramp westbound approach.

The intersection of Marshall Avenue/Maple Tree Place and VT 2A is a four-legged intersection and is controlled by a fully-actuated coordinated traffic signal. The Marshall Avenue eastbound approach provides one exclusive left-turn lane, one through lane, and one exclusive right-turn lane. A raised landscaped median separates the approaching and departing lanes on Marshall Avenue. The posted speed limit on Marshall Avenue is 30 mph. The Maple Tree Place westbound approach provides two exclusive left-turn lanes and one combined through and right-turn lane. A raised landscaped median separates the approaching and departing lanes on Maple Tree Place. The VT 2A northbound approach provides one exclusive left-turn lane, one through lane and one exclusive right-turn lane. The right-turning traffic is channelized by a small delta-shaped concrete island. The VT 2A southbound approach provides one exclusive left-turn lane, one through lane, and one combined through and right-turn lane. The posted speed limit on VT 2A is 35 mph near the intersection.

The traffic signal at the Marshall Avenue/Maple Tree Place/VT 2A intersection is coordinated with the intersections to the north and south along VT 2A as well as the signal on Marshall Avenue at Hannaford Brothers driveway/Trader Lane. The signal phasing provides an advance phase for the VT 2A northbound approach, followed by a phase combining the through movements on VT 2A. During the combined phase, the VT 2A northbound left-turn movement is not permitted, but the VT 2A southbound left-turn movement is allowed. During the third phase, the Marshall Avenue eastbound and Maple Tree Place westbound left-turn movements are protected, as is the VT 2A northbound right-turn movement. The fourth phase at the intersection permits the Marshall Avenue eastbound and the Maple Tree Place westbound through and right-turn movements to proceed.

The Wright Street/Connor Way and VT 2A intersection is controlled by a fully-actuated traffic signal. The Wright Street eastbound and Connor Way westbound approaches both provide one general lane for all movements. The VT 2A northbound approach provides an exclusive left-turn lane and one through and right-turn lane. The VT 2A southbound approach provides one exclusive left-turn lane, one through lane, and one combined through and right-turn lane. The signal is coordinated with those at Marshall Avenue/Maple Tree Place to the south and US 2 to

the north. The phasing provides a short advance phase for the VT 2A northbound movements, including the left-turns, after which a combined phase for all VT 2A movements is provided. The Wright Street and Connor Way movements are then provided a combined phase.

The intersection of US 2 and VT 2A is a skewed four-legged intersection controlled by a fully-actuated coordinated traffic signal. Both the US 2 eastbound and US 2 westbound approaches provide one exclusive left-turn lane, one through lane and one exclusive right-turn lane. The VT 2A northbound approach provides one exclusive left-turn lane, one through lane, and one channelized right-turn lane. The VT 2A southbound approach provides one exclusive left-turn lane, one exclusive through lane and one combined through and right-turn lane. This signal is the master controller for the VT 2A signal system as well as the US 2 coordinated signal system. The signal phasing provides an advance phase for the VT 2A left-turn movements, followed by a phase for all movements in both directions on VT 2A. The next phase provides protection for the US 2 left-turn movements in both directions, followed by a phase during which all movements on US 2 operate.

As of 2005, the intersection of Paul Street/Zephyr Road and VT 2A is a four-legged unsignalized intersection. The Paul Street eastbound and Zephyr Road westbound approaches provide one combined left-turn and through lane and one exclusive right-turn lane. The VT 2A northbound and southbound approaches both provide one exclusive left-turn lane and one through and right-turn lane. The intersection is STOP controlled on the Paul Street eastbound and Zephyr Lane westbound approaches. The speed limit on VT 2A in the vicinity of the intersection is 35 mph. This intersection was signalized in 2006.

The intersection of Industrial Avenue/Mountain View Road and VT 2A is a four-legged signalized intersection. The Industrial Avenue eastbound approach provides one exclusive left-turn lane and one combined through and right-turn lane. The Mountain View Road westbound approach provides one lane for all movements. The VT 2A northbound approach provides one exclusive left-turn lane, one combined through and right-turn lane. The VT 2A southbound approach provides one exclusive left-turn lane, one through lane, and one exclusive right-turn lane.

The signal at Industrial Avenue/Mountain View Road and VT 2A operates under independent fully-actuated control. The signal provides a protected left-turn phase for the VT 2A northbound and southbound left-turn movements, followed by a combined phase for all VT 2A movements. There is an advance phase provided for the Industrial Avenue eastbound movements, followed by a combined phase for all movements on Industrial Avenue and Mountain View Road.

The intersection of South Street/River Road and VT 2A is a four-legged intersection. The South Street eastbound and River Road westbound approaches provide one lane for all movements during the AM peak hour. During the PM peak period (3:00-6:00), the River Road approach is configured for one-way westbound operation. VT 2A northbound right turns and southbound left turns as well as South Street eastbound through movements are not allowed. The VT 2A northbound and southbound approaches each provide one exclusive left-turn lane and one shared through and right-turn lane. The signal phasing provides a combined phase for all movements on VT 2A, a lagging protected phase for the VT 2A northbound left-turn movements, and a combined phase for all movements from South Street and River Road.

At the Five Corners (VT 15/VT 117/VT 2A) intersection in Essex Junction, the VT 15 eastbound approach provides one lane for left-turn and "bear left" movements and one shared through and right-turn lane. The VT 117 westbound approach provides one left-turn lane and one combined through and right-turn lane. The VT 2A northbound approach provides one exclusive left-turn lane, one through lane, and one lane for "bear right" and right-turn movements. The VT 2A

southbound approach provides one left-turn lane and one combined lane for through and right-turn movements. The VT 15 southwest-bound approach provides one through lane and one combined through and right-turn lane. The signal phasing provides a protected phase for the VT 2A northbound and southbound left-turn movements, followed by a phase in which the VT 2A northbound and southbound through and right-turn movements proceed. These phases are followed by separate phases for the VT 15 southwest-bound, VT 117 westbound, and VT 15 eastbound approaches, respectively.

### **3.2.2 North Williston Road Corridor**

North Williston Road is considered a Class II Town Highway. North Williston Road extends from I-89 to VT 117 within the Project Area. South of US 2, North Williston Road is called Oak Hill Road. The speed limit along North Williston Road varies from 30 mph to 45 mph. The land uses along North Williston Road is primarily rural residential and agricultural, with commercial uses interspersed, particularly near US 2.

The intersection of US 2 and Oak Hill/North Williston Road is a four-legged intersection currently operating under All-Way Stop Control (AWSC). Each approach provides one lane for all movements.

The intersection of Mountain View Road/Governor Chittenden Road and North Williston Road is controlled by STOP signs on the Mountain View Road and Governor Chittenden Road approaches. All approaches provide one lane for all movements.

The intersection of VT 117 and North Williston Road is a T intersection controlled by a STOP sign on the North Williston Road northbound approach. The VT 117 eastbound and westbound approaches each provide one lane. The North Williston Road northbound approach provides one left-turn lane and one right-turn lane.

## **3.3 Traffic Volumes**

### **3.3.1 Traffic Data Collection**

Available transportation data from VTrans, CCMPO, and previous studies (e.g., traffic studies, transit studies, EIS documents for other developments, and agency planning documents) pertaining to the proposed Project Area were utilized to the greatest extent possible for the intersections selected for traffic analysis in the Project Area. For key locations where data was not available, traffic counts were conducted in May 2005 and February 2006 to supplement the available data. At locations where multiple data were available, the most recent counts were used. Physical intersection inventory data including roadway configurations, lane widths, signal timing, etc. were collected in the field and were supplemented by data provided by VTrans.

Manual turning movement counts, including three vehicle classification categories (autos, medium vehicles and heavy vehicles) were conducted at 18 intersections on mid-week days (Tuesday, Wednesday, or Thursday) in May 2005 and February 2006 during the AM (7:00 to 9:00) and PM (4:00 to 6:00) peak periods. The peak hour factors and heavy vehicle percentages for each of the intersection approaches were calculated for the weekday peak hours. The manual traffic counts were recorded in 15-minute intervals during each peak period. The manual turning movement count data are summarized in Appendix D.

ATR machine count data were provided by VTrans for 27 locations within the Project Area. ATR data collected between the years 2000 and 2005 was used to validate the turning

movement count data at key intersections. The ATR count data are summarized in 15-minute intervals in Appendix B of the Alternative Screening Technical Report.

### **3.3.2 Traffic Volume Development**

The ATR and turning movement volumes collected were used to define the critical peak hours within the Project Area. The AM and PM peak hours were determined by summing the cumulative total of the four highest consecutive 15-minute intervals for all key intersections and ATR locations. Based upon the data, the AM and PM peak hours for the Project Area were identified as 7:15 AM to 8:15 AM and 4:30 PM to 5:30 PM. The ATR traffic volumes and adjacent critical intersection volumes were utilized to balance the traffic volume network within the Project Area during the AM and PM peak hours. The balanced existing condition traffic volumes developed for the weekday AM and PM peak hours are presented in Volume II of this Transportation Technical Report (Figures 1A and 1B).

## **3.4 Analysis**

### **3.4.1 Congestion Analysis**

#### **Intersections**

A total of 70 intersections (37 signalized and 33 unsignalized) identified in the Project Area were analyzed for daily peak operating conditions. The traffic analysis locations in the Project Area are identified in Table 3-1. Of these 70 intersections, 20 intersections (10 signalized and 10 unsignalized) are located along the VT 2A corridor. The 2005 existing conditions were analyzed using Synchro 6.0, which utilizes the methodologies of the 2000 HCM for signalized and unsignalized intersections. The detailed results of the capacity analyses are shown in Appendix E.

The overall intersection LOS results for the 37 signalized intersections within the Project Area (including the VT 2A corridor) are summarized in Table 3-2. Under the existing conditions, a total of two signalized intersections (VT 2A at South Street/River Road and VT 2A at Five Corners) during the AM peak hour and one signalized intersection (VT 2A at Susie Wilson Road) during the PM peak hour operate under severely congested conditions (LOS F). In addition, two signalized intersections (VT 2A at Industrial Avenue/Mountain View Road and VT 2A at Five Corners) are currently operating at an overall LOS E during the PM peak hour. Each of these intersections is within the VT 2A corridor. One of the signalized intersections analyzed within the Project Area and outside of the VT 2A corridor (VT 289 Westbound Ramps at VT 15) is currently operating at an overall LOS E during the AM and PM peak hours.

**Table 3-1  
Traffic Analysis Locations**

No.	Intersections	No.	Intersections
1	S: I-89 Exit 12 SB Ramps & VT 2A	36	S: VT 289 WB Ramps & VT 15
2	S: I-89 Exit 12 NB Ramps & VT 2A	37	S: VT 15 & Susie Wilson Road
3	S: Marshall Avenue/Maple Tree Place & VT 2A	38	S: US 2 & Boxwood Street
4	S: Wright Street/Connor Way & VT 2A	39	S: VT 117 & IBM Driveway
5	S: Taft Corners - US 2 & VT 2A	40	U: Sand Hill Road & Allen Martin Parkway
6	U: Helena Drive & VT 2A	41	U: VT 15 & Allen Martin Parkway
7	U: Paul Street/Zephyr Road & VT 2A	42	U: VT 15 & Sand Hill Road
8	U: Knight Lane & VT 2A	43	S: VT 15/VT 128 & Towers Road
9	U: Meadow Run Road & VT 2A	44	S: VT 15 & Essex Way
10	S: Industrial Avenue/Mountain View Road & VT 2A	45	S: Old Stage Road & VT 15
11	U: River Cove Road & VT 2A	46	S: Lang Farm Drive & VT 15
12	U: James Brown Drive & VT 2A	47	S: VT 289 WB Off-Ramp & Essex Way
13	S: South Street/River Road & VT 2A	48	S: VT 289 EB Off-Ramp & Essex Way
14	S: Five Corners - VT 2A/VT 15/VT 117	49	U: VT 15 & Plains Road
15	S: VT 289/Susie Wilson Road & VT 2A	50	U: Pinecrest Drive & VT 2A
16	S: VT 289 Off-Ramp & VT 2A	51	S: VT 15 & West Street Extension
17	S: VT 117 & VT 289 EB Off-Ramp	52	S: Kellogg Road/Blair Road & Susie Wilson Road
18	U: VT 117 & VT 289 WB On-Ramp	53	S: Pinecrest Drive & Susie Wilson Road
19	U: VT 117 & Sand Hill Road	54	S: Grand Union Shopping Center Driveway & Susie Wilson Road
20	U: VT 117 & North Williston Road	55	U: Iroquois Avenue & VT 2A
21	U: VT 117 & Skunk Hollow Road	56	U: Cascade Street & VT 2A
22	U: VT 117 & US 2	57	U: Hickory Hill Road & VT 2A
23	U: US 2 & I-89 Exit 11 NB Off-Ramp	58	U: US 2 & Taft Corners Shopping Center Driveway
24	U: US 2 & Oak Hill/North Williston Road	59	U: US 2 & Talcott Road West
25	U: US 2 & Old Stage Road	60	U: US 2 & Talcott Road East
26	S: US 2 & Maple Tree Place	61	S: Marshall Avenue & Trader Lane
27	S: US 2 & Harvest Lane	62	S: Marshall Avenue & Harvest Lane East
28	S: US 2 & Brownell Road	63	S: Marshall Avenue & Harvest Lane West
29	S: US 2 & Industrial Avenue	64	S: Kellogg Road & Morse Drive/Gauthier Drive
30	U: Industrial Avenue & North Brownell Road	65	S: Kellogg Road & New England Business Drive
31	S: Marshall Avenue & South Brownell Road	66	U: Educational Drive & VT 15
32	U: Mountain View Road/Governor Chittenden Road & North Williston Road	67	S: Brickyard Drive & VT 15
33	U: Mountain View Road & Old Stage Road	68	U: US 2 & South Ridge Road
34	U: Mountain View Road & Redmond Road	69	U: Mill Road & VT 2A
35	S: VT 289 EB Ramps & VT 15	70	U: US 2 & I-89 Exit 11 SB Off-Ramp

Source: The Louis Berger Group, Inc. (2006)

Notes: S: - Signalized Intersections

U: - Unsignalized Intersections

**Table 3-2**  
**2005 Existing Capacity Analysis Results**  
**Overall LOS Results for Signalized Intersections**

Overall Intersection Level of Service	AM Peak Hour		PM Peak Hour	
	Entire Project Area	VT 2A Corridor Only	Entire Project Area	VT 2A Corridor Only
A	15	1	7	2
B	8	1	14	1
C	8	4	9	2
D	3	2	3	2
E	1	0	3	2
F	2	2	1	1
<b>Total</b>	<b>37</b>	<b>10</b>	<b>37</b>	<b>10</b>

Source: The Louis Berger Group, Inc. (2006)

### Roadway Segments

V/C ratios were calculated for mainline roadway segments using the traffic volumes and the theoretical capacities used as part of the CCMPO travel demand model. A total of 181 roadway links were analyzed within the Project Area. The data were summarized and totaled for roadway links into three categories: V/C ratio below 1.00; V/C ratio equal to or above 1.00 and below 1.32; and V/C ratio at or above 1.32.

The V/C summary tables for each of the analyzed corridors within the entire Project Area are provided in Table 3-3 for the AM and PM peak hours. A total of 181 links were analyzed within the Project Area with 42 links located along VT 2A corridor. Of these 181 links analyzed within the entire Project Area during the AM peak hour, the V/C ratios for 158 links are less than 1.00, 20 links are between 1.00 and 1.32, and 3 links are greater than 1.32. During the PM peak hour, the V/C ratios for 134 links are less than 1.00, 39 links are between 1.00 and 1.32, and 8 links are greater than 1.32.

**Table 3-3**  
**2005 Existing Link V/C Ratios**  
**AM and PM Peak Hours**

Corridor	Total # of Links	AM Peak Hour			PM Peak Hour		
		V/C Ratio (<1.00)	V/C Ratio (≥ 1.00 & < 1.32)	V/C Ratio (≥ 1.32)	V/C Ratio (<1.00)	V/C Ratio (≥ 1.00 & < 1.32)	V/C Ratio (≥ 1.32)
VT 2A	42	35	6	1	28	10	4
VT 15	26	23	3	0	20	6	0
Industrial Avenue	16	11	4	1	7	7	2
US 2	22	19	3	0	16	5	1
VT 117	18	15	2	1	13	4	1
North Williston Road	8	8	0	0	8	0	0
North/South Brownell Road	6	6	0	0	3	3	0
VT 289	23	22	1	0	22	1	0
I-89	20	19	1	0	17	3	0
<b>Total</b>	<b>181</b>	<b>158</b>	<b>20</b>	<b>3</b>	<b>134</b>	<b>39</b>	<b>8</b>

Source: The Louis Berger Group, Inc. (2006)

Of the 42 links analyzed along VT 2A during the AM peak hour, the V/C ratios for 35 links are less than 1.00, six links are between 1.00 and 1.32, and one link is greater than 1.32. During the PM peak hour, the V/C ratios for 28 links are less than 1.00, 10 links are between 1.00 and 1.32, and four links are greater than 1.32.

### **3.4.2 Safety Analysis**

#### **Crash Data Collection**

Available crash statistics were obtained for the five-year period from January 1, 1999 to December 31, 2003 from the VTrans *General Yearly Summaries—Crash List for State Highways and All Federal Aid Highway Systems* (see Appendix C). Mainline section crash statistics were used to analyze VT 2A and North Williston Road and intersection crash statistics were used to analyze 11 intersections within the Project Area. A detailed description for each of the analyzed corridors and intersections in terms of town, milepost, roadway functional classification, and corresponding statewide average rate are summarized in Table 3-4 for corridors and in Table 3-5 for intersections. The statewide crash rates used in the analysis were based upon crash data collected by VTrans for the five year period between 1998 and 2002.

#### **Mainline Corridor Crash Analysis**

A breakdown of the types of collisions encountered on the VT 2A and North Williston Road corridors over the five-year period is summarized in Table 3-6. Based upon the data, VT 2A had 270 crashes (200 in Williston and 70 in Essex) and North Williston Road had 25 crashes (24 in Williston and 1 in Essex). The most frequent crash types identified within these corridors were Rear-End.

**Table 3-4  
Mainline Crash Statistics  
Existing Condition (1999 to 2003)**

Corridors	Town	Milepost		Segment Length (mile)	Cross Street		Functional Classification	Statewide Crash Rates (MVM)
		From	To		From	To		
VT 2A	Williston	0.36	3.00	2.46	County Line	I-89 NB ramps	Minor Arterial	1.4338
VT 2A	Williston	3.00	3.70	0.70	County Line	US 2	Principal Arterial	1.7787
VT 2A	Williston	3.70	6.00	2.23	US 2	County Line	Minor Arterial	1.4338
VT 2A	Essex	0.00	3.50	3.50	County Line	County Line	Minor Arterial	1.4338
North Williston Road	Williston	0.00	2.84	2.84	US 2	County Line	Urban Collector	1.4265
North Williston Road	Essex	0.00	0.34	0.34	County Line	VT 117	Urban Collector	1.4265

Sources: VTTrans (2006)

The Louis Berger Group, Inc. (2006)

Note: Statewide Crash Rates in Million Vehicle Miles (MVM)

**Table 3-5  
Intersection Crash Statistics  
Existing Condition (1999 to 2003)**

No.	Intersections	Town	Functional Classification	Statewide Crash Rates (MEV)
1	VT 2A/I-89 SB Of- Ramp	Williston	Interstate, Urban /Principal Arterial, Urban	0.205
2	VT 2A/I-89 NB Of- Ramp	Williston	Interstate, Urban /Principal Arterial, Urban	0.205
3	VT 2A/Marshall Avenue/Maple Tree Place	Williston	Principal Arterial, Urban /Urban Collector	0.232
4	VT 2A/US 2	Williston	Principal Arterial, Urban /Principal Arterial, Urban	0.258
5	VT 2A/Industrial Avenue/Mountain View Road	Williston	Minor Arterial, Urban /Urban Collector	0.240
6	VT 2A/South Street	Essex	Minor Arterial, Urban /Urban Collector	0.240
7	VT 2A/VT 15/VT 117	Essex	Minor Arterial, Urban /Principal Arterial, Urban	0.418
8	VT 2A/VT 289/Susie Wilson Road	Essex	Minor Arterial, Urban /Urban Collector	0.240
9	VT 2A/VT 289 WB Off-Ramp	Essex	Freeway/Expressway /Minor Arterial, Urban	0.285
10	US 2/North Williston Road./Oak Hill Road	Williston	Minor Arterial, Urban /Urban Collector	0.240
11	VT 117/North Williston Road	Essex	Principal Arterial, Urban /Urban Collector	0.232

Sources: VTrans (2006)

The Louis Berger Group, Inc. (2006)

Note: Statewide Crash Rates in Million Entering Vehicles (MEV)

**Table 3-6  
Mainline Crash Summary – By Collision Type  
Existing Condition (1999 to 2003)**

Corridors	Town	Collision Type								Total Mainline Crashes
		Rear-End	Left Turn	Right Turn	No Turns (Right Angle)	Side-swipe	Head On	Single Vehicle Crash	Other	
VT 2A	Williston	98	19	6	7	13	7	14	36	<b>200</b>
VT 2A	Essex	22	4	1	7	0	4	1	31	<b>70</b>
N. Williston Road	Williston	4	1	0	3	1	2	4	9	<b>24</b>
N. Williston Road	Essex	1	0	0	0	0	0	0	0	<b>1</b>

Sources: VTrans (2006)

The Louis Berger Group, Inc. (2006)

As shown on Table 3-7, the distribution of mainline crashes was identified by severity as: one Fatal, 98 with Injuries, and 196 Property Damage Only/Non-Reportable.

**Table 3-7  
Mainline Crash Summary – By Severity  
Existing Condition (1999 to 2003)**

Corridors	Town	Severity			Total Mainline Crashes
		Non-Reportable/Property Damage Only	Injury	Fatality	
VT 2A	Williston	139	60	1	<b>200</b>
VT 2A	Essex	42	28	0	<b>70</b>
North Williston Road	Williston	15	9	0	<b>24</b>
North Williston Road	Essex	0	1	0	<b>1</b>

Sources: VTrans (2006)

The Louis Berger Group, Inc. (2006)

Crash rates were calculated for the VT 2A and North Williston Road corridors and were compared to statewide crash rates (based upon data from 1998 through 2002) for the corresponding functional classification. Detailed crash analysis was performed on a sliding 0.3-mile section at 0.1 mile increments for each of the corridors as prescribed by VTrans. Detailed crash analysis for each of the VT 2A and North Williston Road corridors are summarized in Appendix C and includes the following data for each corridor segment: start and end mileposts, intersection locations, number of crashes (based upon 1999 through 2003 data), average annual daily traffic (AADT), calculated actual crash rates, statewide crash rates, critical crash rates, and actual/critical crash rate ratios.

The crash analysis results indicate that segments on both the VT 2A and North Williston Road corridors are above the statewide average rates and segments along VT 2A are defined as high crash locations (HCL). Crash information for segments that are above the statewide average rates or defined as a high crash location is summarized in Table 3-8. Crash information is summarized by corridor and includes the start and end mileposts, intersection locations, number of crashes, average annual daily traffic (AADT), calculated actual crash rates, statewide crash rates, critical crash rates, and actual/critical crash rate ratios. A detailed description of the crash analysis results (including actual crash rates, critical crash rates, actual/critical ratio, and HCL) for these corridors are provided in the following sections.

#### ***VT 2A in Williston and Essex Junction***

The actual crash rates computed for the VT 2A segments were compared with the statewide crash rates to determine the relative severity of crash occurrences at these locations. Of the segments reviewed on VT 2A in Williston and Essex, the majority of the 91 segments (58 in Williston and 33 in Essex Junction) were below the statewide average. A total of 18 segments within Williston and 11 segments within Essex Junction are higher than the statewide crash rate. In addition, these segments have also experienced five or more crashes over the five year reporting period. Based on the two criteria used to define an HCL, a total of nine segments on VT 2A were identified as HCLs: eight segments within Williston and one segment within Essex Junction.

For VT 2A within Williston, the actual crash rates for the 11 segments range from 1.4719 MVM to 4.6000 MVM, which are higher than the corresponding statewide average rates (1.4338 or 1.7787 MVM). The highest crash rate (4.6000 MVM) computed for the 0.3-mile segment of VT 2A in the vicinity of the Marshall Avenue/Maple Tree Place intersection. This rate is more than double the statewide average crash rate. Three consecutive segments between the Marshall Avenue/Maple Tree Place and Conner Way intersections are also identified as HCLs with actual/critical crash rate ratios ranging from 1.19 to 1.66. The 0.3-mile segment in the vicinity of the Marshall Avenue/Maple Tree Place intersection has the highest actual/critical ratio (1.66) with an actual crash rate of 4.600 MVM and critical rate of 2.7670 MVM. This segment is also the highest crash location on VT 2A within the project study area with 51 crashes over the five year period. Other high crash segments along VT 2A within Williston include: between I-89 Northbound off-ramp and Marshall Avenue/Maple Tree Place (mile posts 2.9 to 3.2), between Helena Drive and Paul Street/Zephyr Road (mile posts from 3.6 to 4.0), in the vicinity of the Industrial Avenue/Mountain View Road intersection (mile posts from 4.5 to 4.8), and in the vicinity of the Sharon Drive intersection (mile posts from 4.7 to 5.0).

**Table 3-8  
Mainline Crash Rates  
Williston and Essex Junction Corridors (Segments Higher than the Statewide Rate)  
Existing Condition (1999 to 2003)**

Mile Post Start	Mile Post End	Intersection	Total Mainline Crashes	2001 Mainline AADT	Actual Crash Rates (MVM)	Statewide Crash Rates (MVM)	Critical Crash Rates	Actual/Critical Ratio	High Crash Location ?
<b>VT 2A in Williston</b>									
2.7	3.0	I 89 NB Off-Ramp	11	11,617	1.7295	1.4338	2.5802	0.67	-
2.8	3.1		17	12,558	2.4725	1.7787	3.0182	0.82	-
2.9	3.2		25	14,750	3.0957	1.7787	2.9276	1.06	HCL
3.0	3.3		23	17,250	2.4353	1.7787	2.8454	0.86	-
3.1	3.4	Marshall Avenue/Maple Tree Place	51	20,250	4.6000	1.7787	2.7670	1.66	HCL
3.2	3.5	Bishop Avenue	43	22,000	3.5699	1.7787	2.7286	1.31	HCL
3.3	3.6	Conner Way	40	22,500	3.2471	1.7787	2.7185	1.19	HCL
3.5	3.8	US 2	26	22,500	2.1106	1.4338	2.2734	0.93	-
3.6	3.9	Helena Drive	32	21,025	2.7799	1.4338	2.3009	1.21	HCL
3.7	4.0	Paul St/Zephyr Road	32	19,550	2.9896	1.4338	2.3314	1.28	HCL
4.3	4.6		11	13,650	1.4719	1.4338	2.4970	0.59	-
4.4	4.7	Meadowrun Road/Country Lane	12	13,650	1.6057	1.4338	2.4970	0.64	-
4.5	4.8	Industrial Avenue/Mountain View Road	21	13,650	2.8100	1.4338	2.4970	1.13	HCL
4.6	4.9		16	13,650	2.1409	1.4338	2.4970	0.86	-
4.7	5.0	Sharon Drive	19	13,650	2.5424	1.4338	2.4970	1.02	HCL
5.3	5.6	James Brown Drive	19	17,017	2.0394	1.4338	2.3923	0.85	-
5.4	5.7	Eastview Circle	20	17,858	2.0455	1.4338	2.3706	0.86	-
5.5	5.8		16	18,700	1.5628	1.4338	2.3505	0.66	-
<b>VT 2A in Essex</b>									
0.3	0.6	Railroad crossing	14	17,400	1.4696	1.4338	2.3822	0.62	-
0.4	0.7	Park Terrace/Five Corners	22	16,700	2.4061	1.4338	2.4008	1.00	HCL
0.5	0.8		18	15,192	2.1641	1.4338	2.4449	0.89	-
0.6	0.9	Central Street	15	12,175	2.2503	1.4338	2.5554	0.88	-
1.6	1.9	Pinecrest Drive	8	7,400	1.9746	1.4338	2.8452	0.69	-
1.7	2.0		8	7,400	1.9746	1.4338	2.8452	0.69	-
1.8	2.1		8	7,400	1.9746	1.4338	2.8452	0.69	-
2.2	2.5	VT 289/Susie Wilson Road	7	6,983	1.8308	1.4338	2.8830	0.64	-
2.3	2.6		8	8,292	1.7622	1.4338	2.7736	0.64	-
2.4	2.7	VT 289 WB Off-Ramp	12	11,075	1.9790	1.4338	2.6059	0.76	-
2.5	2.8		11	13,042	1.5405	1.4338	2.5199	0.61	-
<b>North Williston Road in Williston</b>									
0.8	1.1		6	4,367	2.5097	1.4265	3.2103	0.78	-
0.9	1.2		6	4,400	2.4907	1.4265	3.2043	0.78	-
1.0	1.3		6	4,400	2.4907	1.4265	3.2043	0.78	-
1.3	1.6		4	4,300	1.6991	1.4265	3.2224	0.53	-
1.4	1.7		4	4,250	1.7190	1.4265	3.2317	0.53	-
1.6	1.9		4	4,250	1.7190	1.4265	3.2317	0.53	-
1.7	2.0		4	4,200	1.7395	1.4265	3.2411	0.54	-
1.8	2.1	Fontaine Lane	4	4,150	1.7605	1.4265	3.2507	0.54	-

Sources: VTrans (2006)

The Louis Berger Group, Inc. (2006)

Note: Statewide Crash Rates in Million Vehicle Miles (MVM)

For VT 2A within Essex Junction, a total of 11 segments are higher than the statewide crash rate. In addition, these segments also have experienced five or more crashes over the five year reporting period. The actual crash rates for these 11 segments range from 1.4696 MVM to 2.4061 MVM. The 0.3 mile segments in the vicinity of the Five Corners intersection is identified as a HCL with an actual/critical crash rate ratio of 1.00.

### ***North Williston Road in Williston***

The actual crash rates computed for the North Williston Road segments were compared with the statewide crash rates to determine the relative severity of crash occurrences at these locations. Of the 22 segments reviewed on North Williston Road in Williston, the majority of these segments were below the statewide average. The actual crash rates for these three segments range from 1.6991 MVM to 2.5097 MVM, which are higher than the statewide average rate of 1.4265 MVM. A total of eight segments within Williston are higher than the statewide crash rate. In addition, three of these eight segments also have experienced five or more crashes over the five-year reporting period. Based on the two criteria used to define an HCL, no HCLs were identified on Industrial Avenue within Williston.

### ***Intersection Crash Analysis***

A breakdown of the types of collisions encountered on each of the main intersections on VT 2A and North Williston Road over the five-year period is summarized in Table 3-9. The highest crash locations identified were the VT 2A and US 2 intersection with 41 crashes, followed by the VT 2A and Marshall Avenue/Maple Tree Place intersection with 31 crashes, and the VT 2A and I-89 Southbound Ramps intersection with 16 crashes. The most frequent crash types identified within these corridors were Rear-End. As shown on Table 3-9, the distribution of crashes was identified by severity as: no Fatal, 44 with Injuries, and 112 Property Damage Only/Non-Reportable.

Crash rates were also calculated for the 11 main intersections on VT 2A and North Williston Road and were compared to the statewide crash rates (based upon data from 1998 through 2002) for the corresponding intersection functional classification. Crash information for each of the intersections is summarized in Table 3-10 and includes the following data: location, number of crashes, entering average annual daily traffic (AADT), calculated actual crash rates, statewide crash rates, critical crash rates, and actual/critical crash rate ratios.

The actual crash rates computed for the 11 intersections were compared with the statewide crash rates to determine the relative severity of crash occurrences at these locations. Of the 11 intersections reviewed, eight were above the statewide average. As shown in Table 3-10, all of the intersections within Williston and Essex that were over the statewide average experienced eight or more crashes over the five year reporting period. Based on the two criteria used to define an HCL, a total of four intersections (all in Williston) were identified as HCLs. A detailed description of the crash analysis results (including actual crash rates, critical crash rates, actual/critical ratio, and HCL) for the four HCLs are provided.

**Table 3-9  
Intersection Crash Summary  
Existing Condition (1999 to 2003)**

No.	Intersection	Town	Collision Type						By Severity			Total Intersection Crashes			
			Rear End	Left Turn	Right Turn	No Turns (Right Angle)	Side-swipe	Head On	Single Vehicle Crash	Other	NR/PDO		Injury	Fatality	
1	VT 2A/I-89 SB Off-Ramp	Williston	11	3	1	0	0	0	0	0	0	13	3	0	16
2	VT 2A/I-89 NB Off-Ramp	Williston	2	1	0	0	2	0	0	2	0	6	2	0	8
3	VT 2A/Marshall Avenue/Maple Tree Place	Williston	15	6	0	0	3	3	0	0	4	26	5	0	31
4	VT 2A/US 2	Williston	13	2	1	2	5	0	1	17	30	30	11	0	41
5	VT 2A/Industrial Avenue/Mountain View Road	Williston	8	2	0	0	0	0	0	3	10	10	3	0	13
6	VT 2A/South Street	Essex	0	0	0	0	0	0	0	1	1	1	0	0	1
7	VT 2A/VT 15/VT 117	Essex	3	0	0	0	0	1	0	5	6	6	3	0	9
8	VT 2A/VT 289/Susie Wilson Road	Essex	5	0	0	0	0	1	0	7	9	9	4	0	13
9	VT 2A/VT 289 WB Off-Ramp	Essex	2	0	0	1	0	0	0	1	2	2	2	0	4
10	US 2/N. Williston Road/Oak Hill Road	Williston	2	1	0	4	1	0	0	6	9	9	5	0	14
11	VT 117/North Williston Road	Essex	2	0	0	0	1	0	0	3	0	0	6	0	6

Sources: VTTrans (2006)

The Louis Berger Group, Inc. (2006)

Notes: Statewide Crash Rates in Million Entering Vehicles (MEV)  
Non-Reportable/Property Damage Only (NR/PDO)

**Table 3-10  
Intersection Crash Rates  
Existing Condition (1999 to 2003)**

No.	Intersection	Town	Total Intersection Crashes	2001 AADT (Entering Intersection)	Actual Crash Rates (MEV)	Statewide Rates (MEV)	Relation to Statewide Rate	Critical Crash Rates	Actual Critical Ratio	High Crash Location ?
1	VT 2A/I-89 SB Off-Ramp	Williston	16	19,275	0.455	0.205	ABOVE	0.388	1.17	HCL
2	VT 2A/I-89 NB Off-Ramp	Williston	8	21,050	0.208	0.205	ABOVE	0.380	0.55	-
3	VT 2A/Marshall Avenue/Maple Tree Place	Williston	31	30,150	0.563	0.232	ABOVE	0.390	1.44	HCL
4	VT 2A/US 2	Williston	41	27,800	0.808	0.258	ABOVE	0.432	1.87	HCL
5	VT 2A/Industrial Avenue/Mountain View Road	Williston	13	25,325	0.281	0.240	ABOVE	0.415	0.68	-
6	VT 2A/South Street	Essex	1	23,600	0.023	0.240	BELOW	0.421	0.06	-
7	VT 2AVT 15/VT 117	Essex	9	29,100	0.169	0.418	BELOW	0.637	0.27	-
8	VT 2AVT 289/Susie Wilson Road	Essex	13	21,575	0.330	0.240	ABOVE	0.429	0.77	-
9	VT 2AVT 289 WB Off-Ramp	Essex	4	19,600	0.112	0.285	BELOW	0.501	0.22	-
10	US 2/North Williston Road/Oak Hill Road	Williston	14	11,325	0.677	0.240	ABOVE	0.494	1.37	HCL
11	VT 117/North Williston Road	Essex	6	8,850	0.371	0.232	ABOVE	0.510	0.73	-

Sources: VTTrans (2006)

The Louis Berger Group, Inc. (2006)

Notes: Statewide Crash Rates in Million Entering Vehicles (MEV)

Intersection Crash Rates above the Statewide Average are highlighted

**VT 2A and Southbound I-89 Exit 12 Ramps**

A total of 16 crashes were reported at this intersection over the five-year period. The actual crash rate for this intersection is 0.455 MVM, which is more than double the statewide average rate for an Urban Interstate/Principle Arterial intersection (0.205 MVM). This intersection is also identified as a HCL with an actual/critical crash rate ratio of 1.17.

**VT 2A and Marshall Avenue/Maple Tree Place**

A total of 31 crashes were reported at this intersection over the five-year period. The actual crash rate for this intersection is 0.563 MVM, which is more than double the statewide average rate for an Urban Principle Arterial/Urban Collector intersection (0.232 MVM). This intersection is also identified as a HCL with an actual/critical crash rate ratio of 1.44.

**VT 2A and US 2**

A total of 41 crashes were reported at this intersection over the five-year period. The actual crash rate for this intersection is 0.808 MVM, which is more than double the statewide average rate for an Urban Principle Arterial/Urban Collector intersection (0.258 MVM). This intersection is also identified as a HCL with an actual/critical crash rate ratio of 1.87.

**US 2/North Williston Road/Oak Hill Road**

A total of 14 crashes were reported at this intersection over the five-year period. The actual crash rate for this intersection is 0.677 MVM, which is more than double the statewide average rate for an Urban Principle Arterial/Urban Collector intersection (0.240 MVM). This intersection is also identified as a HCL with an actual/critical crash rate ratio of 1.37.

**3.4.3 Mobility Analysis**

The weighted average travel time per vehicle was calculated for four routes between the three towns in the Project area, Essex, Essex Junction and Williston. The weighted average travel times are summarized in Table 3-11.

**Table 3-11**  
**2005 Existing Mobility Analysis**  
**Weighted Average Travel Time per Vehicle**

	AM (minutes)	PM (minutes)
<b>Essex to Williston</b>	18.26	17.95
<b>Essex Junction to Williston</b>	12.57	13.33
<b>Williston to Essex</b>	16.10	20.84
<b>Williston to Essex Junction</b>	11.54	14.54

*Source: The Louis Berger Group, Inc. (2006)*

Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT) were calculated as part of output from the CCMPO travel demand model for all vehicles travel in Chittenden County during the PM peak hour. The existing 2005 VMT and VHT results from the model are 460,305 and 14,793, respectively.

**3.4.4 Truck Traffic on Local Roads Analysis**

According to the CCMPO's 2001 *Regional Freight Study and Plan*, the seven highway routes most utilized by commercial trucking within the Project Area based upon truck AADT volumes include I-89, US 2, VT 2A, VT 15, VT 117, VT 128 and VT 289. These highway routes serve an

important role in accommodating the movement of freight within Chittenden County. The *Regional Freight Study and Plan* estimated that over 90 percent of the freight tonnage moving in the County is via truck, while only 6 percent is accounted for by rail.

From a place-based perspective, sections within the Project Area generate some of the largest concentrations of daily heavy truck trips in the county. In fact, the primary truck traffic generator (over 1,000 daily heavy truck trips) is located southeast of Five Corners including the IBM facility. Secondary commercial trucking traffic generators (from 401 to 1,000 daily heavy truck trips) include the Industrial Avenue corridor and along Redmond Road (including the IBM and county landfill facilities). Other notable commercial trucking traffic generators (producing 76 to 400 daily heavy truck trips) include: the area west of VT 2A in the I-89, Marshall Avenue, and US 2 corridors, Maple Tree Place, the northwest of Five Corners along VT 2A and VT 15, the Sand Hill Road corridor, and the area adjacent to Exit 11 (I-89 and US 2).

The highway most impacted by high commercial truck volumes within the Project Area is I-89, which has a total truck AADT ranging from 1,479 to 3,489. In fact, CCMPO has identified I-89 as a key provider of north-south freight service in the county. Two other highways within the Project Area that experience high commercial truck volumes (from 519 to 1,478 Total Truck AADT) include: VT 2A south of Five Corners, and VT 15 between VT 289 and VT 128.

## **3.5 Other Transportation**

### **3.5.1 Transit**

The Chittenden County Transit Authority (CCTA) operates three bus routes within the Project Area, and one bus route that operates as an express service through the Project Area without making any stops. The four routes that currently travel in the Project Area are:

- Route 2 – Essex Junction, local route that operates between Burlington and Essex Junction via Winooski.
- Route 4 – Essex Center, local route that operates in a loop entirely within Essex.
- Route 23 – Williston, local route that operates between the University Mall in South Burlington and Essex Junction via Williston.
- Route 86 – Montpelier LINK Express, express route that operates between Montpelier and Burlington via I-89 with no stops in the Project Area. There is a stop, however, just beyond the southeast boundary of the Project Area (I-89 exit).

Passenger rail service is provided in the Project Area by Amtrak. Amtrak's Vermonter operates between St. Albans and Washington, D.C. and stops at the Essex Junction Station within the Project Area twice per day.

### **3.5.2 Pedestrian**

Essex and Essex Junction contain approximately 69 and 38 miles of sidewalks, respectively. Williston has approximately 25 miles of sidewalks with most located in recently built residential and commercial subdivisions. Some sidewalks are also found along the Main Street in the historic village and along portions of VT 2A and Brownell Road.

### **3.5.3 Bicycle**

Essex Town and Village of Essex Junction have an evolving bicycle path network. Since 2000, the Essex Town Trails Committee that has been prioritizing pathway needs in the area. Many of these bicycle paths are multi-use paths. There are also some bike lanes/wide paved shoulders and bicycle routes/wide curb lanes on existing roadways. In Williston Town, most bicycle paths are multi-use paths. There is a one-mile bike path on Marshall Avenue from South Brownell Road to VT 2A. There are no existing bike lanes/wide paved shoulders, designated bicycle routes, or wide curb lanes in Williston. There are sections of paved shoulders along state highways, most notably along portions of US 2 and VT 2A, for use by bicyclists.



Source: Draft 2025 Chittenden County Metropolitan Transportation Plan, CCMP.