# *Colchester/Essex Network Transportation Study (CENTS)*

## Final Report

June 2014

CHITTENDEN COUNTY RPC
*Communities Planning Together*

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**Disclaimer:**

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## APPENDICIES

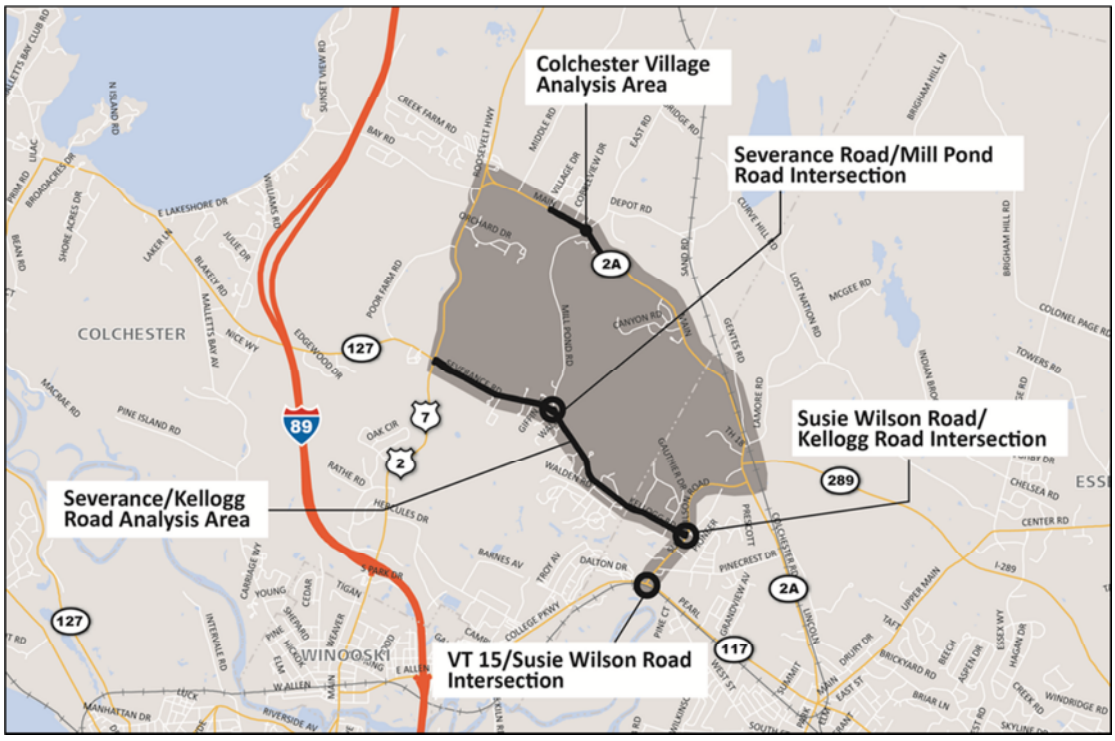
# 1.0 INTRODUCTION

With the announcement in 2011 that the Chittenden County Circumferential (Circ) Highway, as originally conceived to provide a limited access highway from I-89 in Williston to I-89 in Colchester, would not be constructed, the Chittenden County Regional Planning Commission (CCRPC) – in coordination with the towns of Colchester and Essex—initiated the Colchester-Essex Network Transportation Study (CENTS) to understand how this decision would impact transportation in the adjacent areas.

The CENTS project area, shown below in Figure 1, is located in the area bounded by Roosevelt Highway (US 2/7) on the west, Main Street (VT 2A) on the north, Susie Wilson Road on the east, and Severance Road/Kellogg Road along the south. One of the primary goals of this study is to develop a better understanding of current and future travel demands along the VT 2A, Susie Wilson Road, and Severance/Kellogg corridors and develop specific improvement recommendations in response to identified issues and stakeholder input. The following five specific locations were identified for a more detailed, scoping-level assessment:

1. Main Street (VT 2A) through Colchester Village
2. Severance Road/Mill Pond Road intersection
3. Severance Road/Kellogg Road corridor
4. Susie Wilson Road/Kellogg Road intersection
5. VT 15/Susie Wilson Road intersection

**FIGURE 1: CENTS STUDY AREA CONTEXT**



# 2.0 PROJECT BACKGROUND

VT 289 was part of the original Chittenden County Circumferential (Circ) Highway, a proposed beltway that would connect the northern and eastern suburbs of Burlington to I-89. A 3.94 mile segment in Essex opened to traffic in October 1993, but, after many years of planning and permitting, Governor Shumlin formally announced in 2011 that the remainder of the highway would not be constructed. As part of the analysis to understand the effects of not completing the Circ Highway in Colchester and Essex, this transportation study will analyze existing plans, transportation data, land use and environmental context, and the operation and geometry of existing roadways and intersections.

## 2.1 | EXISTING PLAN AND STUDY REVIEW

Nine relevant studies of note shown below in Table 1 have been reviewed to establish a comprehensive background for this transportation study. A brief summary of the key findings and recommendations of each of these studies is provided below.

**TABLE 1: EXISTING PLAN AND STUDY REVIEW**

| | DATE | REPORT TITLE | AUTHOR | SPONSOR |
|---|---|---|---|---|
| **1** | 2012 | VT 2A – VT 289 Interchange Scoping Study | Stantec | Town of Essex, VTrans |
| **2** | 2012 | A&C Realty Recreational Facilities Traffic Impact Assessment | Lamoureaux & Dickinson | |
| **3** | 2010 | Susie Wilson Road Corridor Improvement Plan and Financing Options | VHB | Town of Essex |
| **4** | 2008 | Route 15 Corridor Study Final Report | BFJ Planning, RSG | CCMPO, VTrans |
| **5** | 2007 | Severance Corners Bicycle and Pedestrian Circulation System Plan | Wilbur Smith Associates | CCMPO |
| **6** | 2005 | Final Report on the Susie Wilson-VT 15 Jughandle | Smart Mobility | CCMPO and Village of Essex Junction |
| **7** | 2005 | Susie Wilson Road Planning Study: Analysis of Opportunities and Constraints for Transit-Friendly Development | DMJM Harris | CCMPO, Town of Essex |
| **8** | 2004 | Susie Wilson Road Committee Report | Susie Wilson Road Committee | Town of Essex |
| **9** | 2000 | Chittenden County Metropolitan Planning Organization Initial Scoping Report for VT Route 2A | Lamoureaux & Dickinson | Towns of Colchester and Essex |

## VT 2A-VT 289 INTERCHANGE SCOPING STUDY (STANTEC, TOWN OF ESSEX, VTRANS, 2012)

The project area includes an approximately 2,000 foot long section of VT 2A from Susie Wilson Road on the southern end to Landfill Lane on the north. The on- and off-ramps to VT 289 are included within the project area of this study. The outcome of the Scoping Study was two alternatives:

- Phase I: Presumes actuated signal timings to improve intersection traffic capacity without geometric changes to the roadway
- Phase II – Geometric Improvements (Preferred Alternative): Additional left-turn lane on VT 289 off-ramp; additional through lane on VT 2A southbound approach; additional receiving lane on VT 2A on the south side of the intersection

Traffic counts were conducted on August 2, 2012 and the AM peak hours were found to be from 7:00 to 9:30 AM, and the PM peak hours were from 3:00 to 6:00 PM. The highest volume of turning movements in the morning were right-turns from VT 2A to westbound Susie Wilson Road (940 vehicles) and left-turns from the VT 289 off-ramp onto VT 2A (836 vehicles). The PM peak traffic was more balanced, with the highest number of vehicles continuing from Susie Wilson Road through the intersection directly onto the VT 289 eastbound on-ramp. A background traffic growth rate of 5% over 20 years was used to develop future year traffic volumes.

## A&C REALTY RECREATIONAL FACILITIES TRAFFIC IMPACT ASSESSMENT (LAMOUREAUX & DICKINSON, 2012)

The project area consisted of a 23 acre parcel west of Lowe's at 6A Susie Wilson Road and proposes the development of two commercial buildings that will provide multiple indoor recreational uses:

- Building A: 58,500 square feet total with 25,000 square foot indoor roller skating rink and 33,500 square foot indoor go-kart track
- Building B: 15,000 square foot indoor climbing wall

The primary access would share the Lowe's signalized access drive onto Susie Wilson Road, opposite Joshua Way.

The study analyzed both No Build and Build capacity at the Susie Wilson Road/Lowe's/Joshua Way intersection and the VT 15/Susie Wilson Road intersection. As of the drafting of this report, the project was proceeding through the land use permitting process and specific off-site traffic mitigation measures were still being defined.

## SUSIE WILSON ROAD CORRIDOR IMPROVEMENT PLAN AND FINANCING OPTIONS (VHB, TOWN OF ESSEX, 2010)

This study looked at improvements to Susie Wilson Road from VT 15 to Susie Wilson Bypass that would improve access management and create capacity for new development in the area. The study also evaluated options for financing these improvements. CCMPO

analysis indicated that approximately 45 percent of traffic in the area is local trips that start or end in the area. It was estimated that a total of 250 additional PM peak hour vehicle trip ends would be generated between 2010 and 2020, with the additional build-out trip estimates generated by Lamoureux & Dickinson.

Seven roadway projects were identified, costing a total of $550,000, excluding costs of any right-of-way acquisition. They include:

- VT 15/Susie Wilson Road jug-handle removal
- Signal coordination and interconnect
- Kellogg Road/Susie Wilson Road intersection upgrade
- Bank/Recycling Center/Fort Ethan Allen Gate Connector
- David Drive/Morse Drive Connector
- Bagel Market/David Drive Connector
- Ewing Drive/Lowe's Connector

However, the study noted that only a small portion of these expenditures would actually create additional capacity to accommodate traffic from future development.

The study determined that the Susie Wilson Road and associated roadway improvements would not satisfy Vermont's criteria for a Tax Increment Financing district, and therefore looked into several variations using a Development Impact Fee approach, combined with a Special Assessment District (SAD). By establishing a SAD, the properties within the contained area would benefit from the specified set of public improvements, with funds allocated by the municipality to satisfy the specific conditions and needs of the area.

## ROUTE 15 CORRIDOR STUDY (BFJ PLANNING, RSG, CCMPO, VTRANS, 2008)

VT 15 and Susie Wilson Road/VT 289 were the primary study areas for this report, concentrating on the existing conditions for the VT 15 and Susie Wilson Road corridors, and modeling future conditions by altering various land use and highway network scenarios.

In general, the congestion and intersection delays were higher in the PM peak hour, although during the AM peak hour, Susie Wilson Road had an overall Level of Service (LOS) D, with 35.2 second delays and the worst approach being the southbound right movement onto VT 15. (See Section 3.5 for additional information on LOS.) The most congested movement in the PM peak hour was the movement between VT 2A and Susie Wilson Road Bypass/VT 289, where the eastbound approach had an overall delay of 62.2 seconds and LOS E. The study identifies the Lowe's development and adjacent properties south of Kellogg Road along Susie Wilson Road as underutilized and potential future transit oriented development sites.

The study identified the following recommendations:

- Short term: Consolidate driveways and minimize their widths with defined curb cuts, and offer parcel access through side roads and allow for greater interconnectivity.

- Medium term: Zoning and permitting incentives for developers to build larger, higher-density projects in exchange for pedestrian and bicycle amenities, landscaping and roadway improvements.
- Long term: The VT 15 Corridor Plan recommends a mixed-use infill development opportunity for Fort Ethan Allen that will preserve the historic character of the site. The Towns of Colchester and Essex will necessarily be involved with technical support and land assembly to encourage infill development in the study area.

## SEVERANCE CORNERS BICYCLE AND PEDESTRIAN CIRCULATION SYSTEM PLAN (WILBUR SMITH ASSOCIATES, CCMPO, 2007)

This study analyzed and developed an overall pedestrian and bicyclist master plan for the public areas of Severance Corners and to assist the Town in its plans to finance the proposed improvements. The final recommended master plan included both a shared use path system and a sidewalk system, interlinked with crosswalks. Shared-use paths are proposed for the southwest quadrant, both sides of Severance Road east of Roosevelt Highway, and along the western edge of Roosevelt Highway. New sidewalks are proposed along the eastern edge of Roosevelt Highway, both north and south of the intersection with Severance Road, as well as on the northern edge of Blakely Road and Severance Road.

## FINAL REPORT ON THE SUSIE WILSON-VT 15 JUGHANDLE (SMART MOBILITY, CCMPO, VILLAGE OF ESSEX JUNCTION, 2005)

Currently, the jughandle at VT 15-Susie Wilson Road allows for direction reversal for vehicles exiting residences and businesses on Route 15 between West Street and Susie Wilson Road. However, the jughandle is not a standard design and only accommodates two vehicles before blocking the right turn lane from VT 15 and creates awkward turning movements for drivers entering Susie Wilson Road.

The study recommended that the Rite-Aid entrance and connection to Pinecrest would be designated as the U-turn option for Route 15 traffic in the short/medium term. For the long term, the study recommends project scoping for the intersection and that the jughandle would be replaced with a safer alternative, such as a modern two-lane roundabout.

## SUSIE WILSON ROAD PLANNING STUDY: ANALYSIS OF OPPORTUNITIES AND CONSTRAINTS FOR TRANSIT-FRIENDLY DEVELOPMENT (DMJM HARRIS, CCMPO, TOWN OF ESSEX, 2005)

The study area includes the Susie Wilson Road commercial corridor, as well as the industrial/commercial area along Kellogg Road, New England Drive, and Gaulthier Drive, and the portion of Fort Ethan Allen within the Town of Essex. This transit oriented development study stems from the original Route 15 Corridor Implementation Plan, which presented options for alternative land use options for three planning areas – Winooski, St. Michaels College/Fort Ethan Allen, and Essex Junction. The proposed land use changes would support transit along the Route 15 corridor.

Essex is one of the fastest growing communities in the state and the market analysis suggests that conditions favor multi-family residential development due to limited supply and the high cost of housing. From a traffic and transit operations standpoint, this study recommends a regional intermodal transit center/parking facility at the northwest corner of VT 15 and Susie Wilson Road. Due to the increase in traffic volumes along Susie Wilson Road, this location could allow commuters, particularly those traveling to major employers such as University of Vermont and Fletcher Allen Health Center, to park and transfer to a shuttle or feeder route.

### SUSIE WILSON ROAD COMMITTEE REPORT (SUSIE WILSON ROAD COMMITTEE, TOWN OF ESSEX, 2004)

The study recommends re-zoning the area along Susie Wilson Road as a mixed-use district (MXD) that includes retail-commercial (B1) uses as well as medium- to high-density (R2/R3) residential uses. Higher density than any current zoning in Essex is encouraged, with clustered development and lot dimensional requirements that promote large blocks of green spaces.

Pedestrian crosswalks with safety zones in the median are recommended for Kellogg Road, David Drive, Pinecrest Drive, and VT 15. To prevent accidents, high volume activities should only be allowed with controlled access to Susie Wilson Road. Bike and recreation paths should also be incorporated into the plan for the Susie Wilson Road corridor area. Reduce existing curb cuts on Susie Wilson Road to discourage congestion and facilitate its use as a thoroughfare.

The study also found that infrastructure funding for a regional parking structure, expanded water and sewer capacities, and roadway improvements would be necessary to support the compact development envisioned in the 2001 Town Plan.

### CHITTENDEN COUNTY METROPOLITAN PLANNING ORGANIZATION INITIAL SCOPING REPORT FOR VT ROUTE 2A (LAMOUREAUX & DICKINSON, TOWNS OF COLCHESTER AND ESSEX, 2000)

The study analyzed the road conditions along Route 2A through the Towns of Colchester and Essex and examined different alternatives for the rural sections as well as the village sections throughout the changing nature of this state road. The purpose of the study was to improve safety for all users of Route 2A and minimize conflicts between the use of the road by local residents and through traffic.

After reviewing various alternatives and their implications, and evaluating input from Alternatives Presentation Meetings, the MPO, the Town of Colchester, and the consulting engineers mutually agreed on a section design for the Village section that left existing utilities in their current position and the sidewalks on the north side of the road at the outside edge of the public right-of-way. For the rural sections of VT 2A, the recommendation was to lower the speed limit to 40 miles per hour and continue the 11 foot travel lane and 5 foot paved shoulders to accommodate bicyclists through the intersection with VT 289.

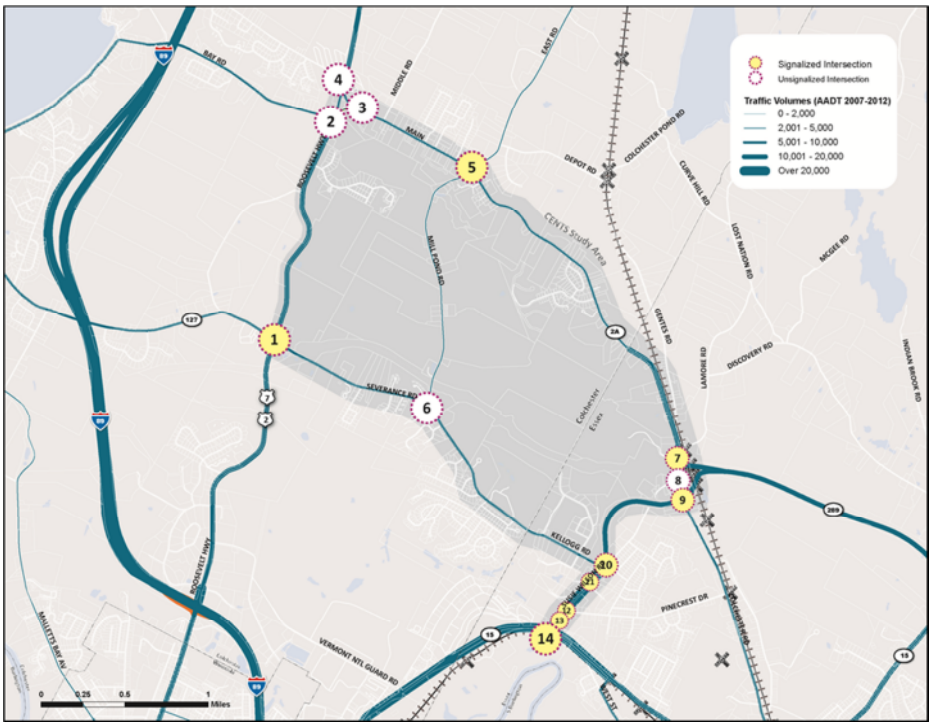
# 3.0 EXISTING CONDITIONS

## 3.1 | PROJECT STUDY AREA

The CENTS project area, shown below in Figure 2, is located in the area bounded by Roosevelt Highway (US 2/7) on the west, Main Street (VT 2A) on the north, Susie Wilson Road on the east, and Severance Road/Kellogg Road along the south. There are a total of 14 intersections within the study area identified for evaluation in this study:

1. US 2/7 & Blakely/Severance Road (signalized, VTrans jurisdiction)
2. US 2/7 & VT2A/Bay Road (stop-controlled)
3. VT 2A & Main Street (stop-controlled)
4. US 2/7 & Main Street (stop-controlled)
5. VT2A & Mill Pond/East Road (signalized, VTrans jurisdiction)
6. Severance Road & Mill Pond Road (stop-controlled)
7. VT 2A & VT 289 (signalized, VTrans jurisdiction)
8. VT 2A & Gardenside Lane (stop-controlled)
9. VT 2A & Susie Wilson Bypass/VT 289 (signalized, VTrans jurisdiction)
10. Susie Wilson Road & Kellogg Road (signalized, Essex Town jurisdiction)
11. Susie Wilson Road & David Drive (signalized, Essex Town jurisdiction)
12. Susie Wilson Road & Pinecrest Drive (signalized, Essex Town jurisdiction)
13. Susie Wilson Road & Joshua Way (signalized, Essex Town jurisdiction)
14. Susie Wilson Road & VT 15 (signalized, VTrans jurisdiction)

**FIGURE 2: STUDY INTERSECTIONS AND TRAFFIC CONTROL**



## 3.2 | ROADWAY CHARACTERISTICS

To understand the character and condition of the roadway corridors and intersections in the CENTS study area, RSG staff conducted a drive-through site visit of the area, focusing in particular on Main Street (VT 2A) in Colchester Village, the Severance/Kellogg Road corridor, and the Susie Wilson Road corridor.

### US 7/US 2 (ROOSEVELT HIGHWAY)

US 7/US 2 is a State route that runs northeast-southwest through Colchester and is comprised of two travel lanes north of Severance Road, one in each direction, with wide shoulders for the majority of this segment. The speed limit along this length is 35 miles per hour, with few intersecting streets or destinations between Severance Road and VT 2A.

**FIGURE 3: US 7/US 2, LOOKING NORTH**

### MAIN STREET/VT 2A

Main Street (VT 2A) through Colchester Village is a State-maintained route that runs from US 7/2 on the west through Essex Junction and Williston to VT 116 in St. George. The speed limit along this segment is 35 miles per hour, with two 11 foot lanes and narrow shoulders on both sides. A curbed sidewalk runs along the northern edge of Main Street through Colchester Village and the street is predominantly lined with residential housing, setback behind lawns, and occasional neighborhood retail amenities. Near the intersection of Mill Pond Road on Main Street is a series of community buildings, including the Colchester Meeting House and Historical Society.

**FIGURE 4: MAIN STREET (VT 2A) IN COLCHESTER VILLAGE, LOOKING WEST**

## SUSIE WILSON ROAD/SUSIE WILSON BYPASS

Susie Wilson Road runs for approximately 1.5 miles from VT 289 south to VT 15. The northern half of the corridor, north of Kellogg Road, Susie Wilson Bypass is essentially a limited-access roadway with one lane in each direction and 6-8 foot shoulders. South of Kellogg Road, Susie Wilson Road is characterized by significant commercial and retail development, with multiple signals and turning lanes. This segment generally maintains a five lane cross-section with two lanes in each direction and a center turning lane.

**FIGURE 5: SUSIE WILSON ROAD, AT KELLOGG ROAD, LOOKING SOUTH**

## SEVERANCE ROAD/KELLOGG ROAD

The Severance Road/Kellogg Road corridor runs approximately 2.5 miles from the eastern terminus of VT 127 at Severance Corners in Colchester east to Susie Wilson Road in Essex. Severance Road in Colchester is a two-lane collector roadway with 2-4 foot shoulders surrounded by generally low-density residential land uses. At the western end of Severance Road is Severance Corners, a 278-acre Growth Center, with 417 dwelling units and 141,000 square feet (sf) of commercial space planned or already constructed.[1] In Essex, Kellogg Road continues as a two-lane collector road, however the surrounding land uses change pretty significantly to mix of commercial and light-industrial.

[1] Severance Corners Planning Study Presentation. <http://www.colchestervt.gov/PlanningZ/studies/GrowthCtr/PresentationFinal.pdf>

**FIGURE 6: KELLOGG ROAD, LOOKING EAST**

## 3.3 | VT 2A AND SEVERANCE ROAD TRIPS

To better understand the trips currently using VT 2A and Severance Road the CCRPC regional TransCAD model was used to identify the origins and destinations for all vehicles that traveled along VT 2A or Severance Road during the AM and PM peak hour. The goal was to focus on commuting trip patterns, and so trips heading towards Essex Junction were observed during the weekday morning peak hour and trips heading away from Essex Junction were observed during the afternoon peak hour.

The results of this assessment are presented in Figure 7 through Figure 10 below, where the thickness of the line represents the flow of trips that travel through the identified roadway section. As can be seen in Figure 7 and Figure 8, a significant portion of the trips using VT 2A during the weekday morning peak hours travel along US 2 from the I-89 exit 17 area, then pass along VT 2A towards Essex Junction. During the afternoon peak similar trips, but in the reverse direction, are observed with a slight increase in the amount of trips using VT 289.

As can be seen in Figure 9 and Figure 10, a significant portion of the trips using Severance Road during the weekday morning peak hours travel along Blakely Road from the Malletts Bay area, then pass along Severance Road towards either VT 15 or VT 289. During the midweek afternoon peak similar trips, but in the reverse direction, are observed.

**FIGURE 7: TRAFFIC ORIGINS AND DESTINATIONS THAT TRAVEL THROUGH VT 2A (AM PEAK)**

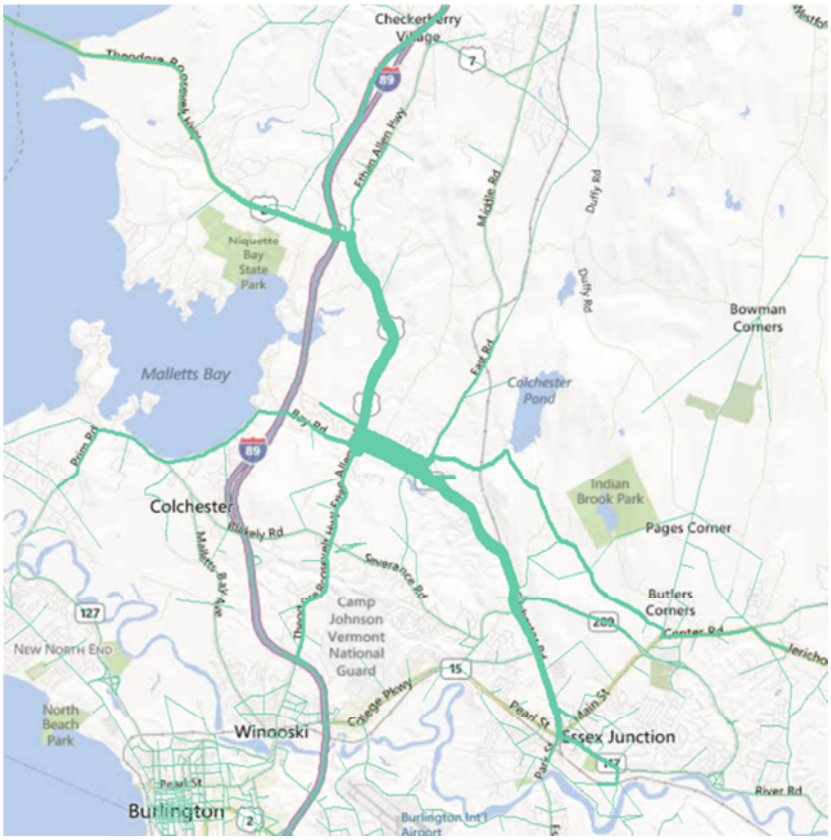



**FIGURE 8: TRAFFIC ORIGINS AND DESTINATIONS THAT TRAVEL THROUGH VT 2A (PM PEAK)**

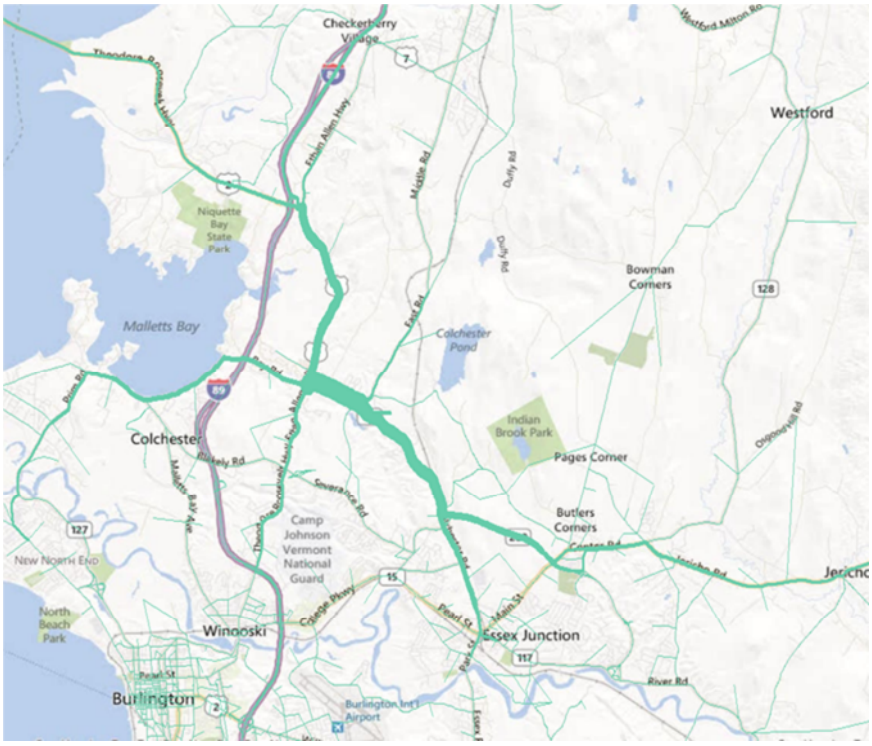


**FIGURE 9: TRAFFIC ORIGINS AND DESTINATIONS THAT TRAVEL THROUGH SEVERANCE ROAD (AM PEAK)**

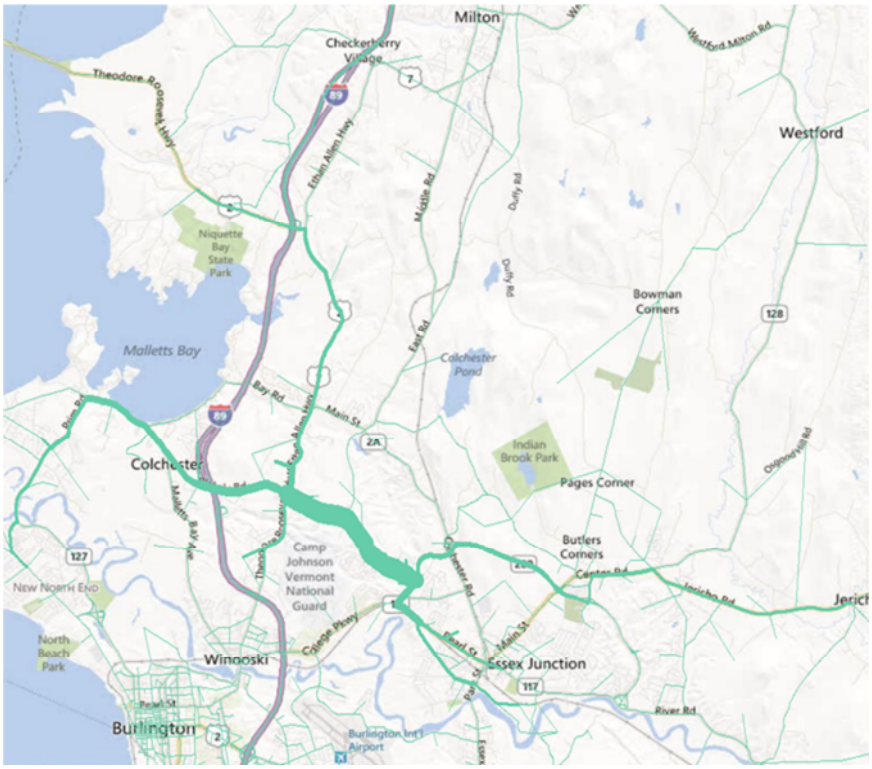
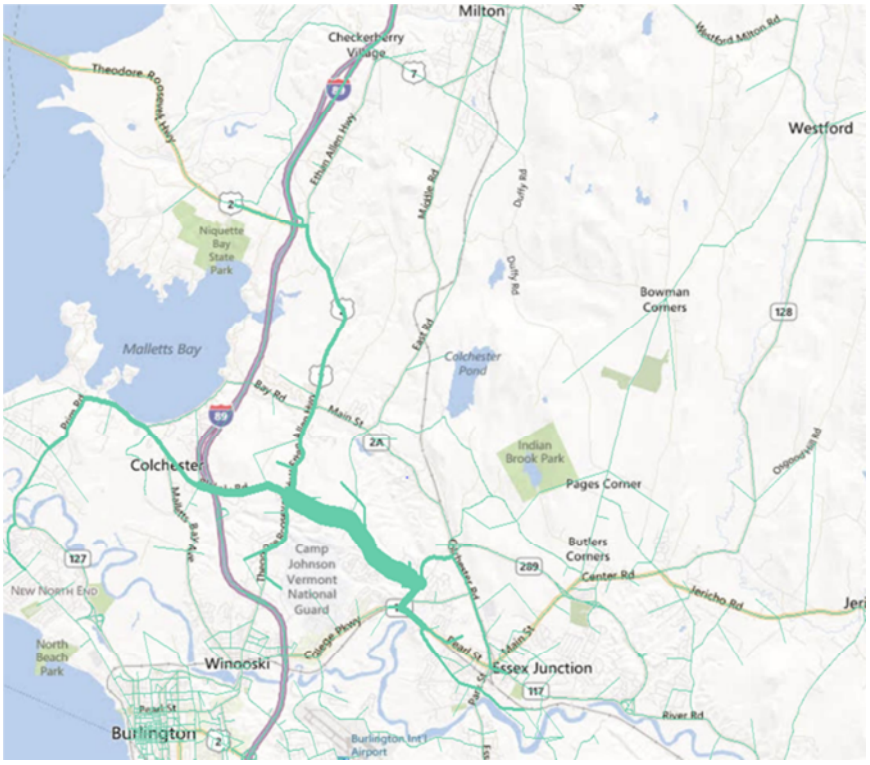



**FIGURE 10: TRAFFIC ORIGINS AND DESTINATIONS THAT TRAVEL THROUGH SEVERANCE ROAD (PM PEAK)**



## 3.4 | TRAFFIC VOLUMES

### EXISTING TRAFFIC VOLUMES

The most recent VTrans Automatic Traffic Recorder (ATR) data is presented below in

Table 2 and shows that Susie Wilson Road carries by far the highest traffic volumes of the roadways in the study area. The Susie Wilson Bypass leading to and from VT 289 and Kellogg Road experiences the second highest level of traffic in the study area, with 14,200 vehicles counted in 2007.

**TABLE 2: TRAFFIC VOLUMES (ATR)**

| LOCATION | AADT | COUNT YEAR | SOURCE |
|---|---|---|---|
| Susie Wilson Road (Essex) | 24,100 | 2012 | VTrans ATR |
| Susie Wilson Bypass (Essex) | 14,200 | 2007 | VTrans ATR |
| VT 2A (Essex) | 10,900 | 2012 | VTrans ATR |
| Kellogg Road (Essex) | 9,800 | 2009 | VTrans ATR |
| Main Street (Colchester) | 9,700 | 2010 | VTrans ATR |
| Severance Road (Colchester) | 8,000 | 2009 | VTrans ATR |
| US 7/ US 7/Roosevelt Highway (Colchester) | 8,000 | 2010 | VTrans ATR |
| Mill Pond Road (Colchester) | 2,300 | 2009 | VTrans ATR |

## TURNING MOVEMENT COUNTS

The most recent weekday morning and afternoon turning movement count data was compiled for the study intersections and is summarized in Table 3 below.

**TABLE 3: TRAFFIC VOLUMES (COUNT YEAR AND SOURCE)**

| LOCATION | COUNT YEAR | SOURCE |
|---|---|---|
| US 7 and US 2/Blakely Road and Severance Road | 2012 | VTrans |
| US 7 and US 2/VT 2A and Bay Road | 2012 | VTrans |
| VT 2A/Main Street | 2012 | VTrans |
| US 7 and US 2/Main Street | 2012 | VTrans |
| VT 2A/Mill Pond Road | 2012 | VTrans |
| Severance Road/Mill Pond Road | 2009 | VTrans |
| VT 2A/VT 289 | 2011 | CCRPC |
| VT2A/Gardenside Lane | 2011 | CCRPC |
| VT 2A/Susie Wilson Road and VT 289 | 2011 | CCRPC |
| Susie Wilson Road/Kellogg Road | 2011 | RSG |
| Susie Wilson Road/David Drive | 2011 | RSG |
| Susie Wilson Road/Pinecrest Drive | 2011 | RSG |
| Susie Wilson Road/Joshua Way | 2011 | RSG |
| Susie Wilson Road/VT 15 | 2011 | RSG |

## TRAFFIC ADJUSTMENTS

Following VTrans traffic study guidelines, raw peak hour traffic volumes were adjusted to represent the design hour volume (DHV)[2] in 2015 using two adjustment factors:

1. Design hour adjustment factors are based on VTrans count station P6D040 (located approximately 1 mile southwest of the study area on US 7 and US 2). The 2012 DHV at P6D040 was compared to the peak hour volume on the date of the turning movement count to formulate a DHV adjustment.
2. An annual adjustment factor, which represents general background traffic growth, is based on historic count data at VTrans permanent count station P6D040 (located approximately 1 mile southeast of the study area on US 7 and US 2), as presented in the 2012 VTrans Red Book. The annual adjustment increases volumes by 3% from 2012 to 2015.
3. The future year (2030) traffic growth rates were developed based on growth rates obtained from the CCRPC regional TransCAD model for each study intersection.

[2] The DHV is the 30th highest hour of traffic for the year and is used as the design standard in Vermont.

The growth rates varied largely as a result of the projected land use changes proximate to each intersection. Table 4 below presents the 2015 to 2030 growth rates applied to each intersection the CENTS study area.

**TABLE 4: 2015 TO 2030 GROWTH FOR INDIVIDUAL INTERSECTIONS**

| # | INTERSECTION | % GROWTH |
|---|---|---|
| 1 | US7/US2 and Blakely Road/Severance Road | 30% |
| 2 | US7/US2 and VT2A/Bay Road | 20% |
| 3 | VT2A and Main Street | 20% |
| 4 | US7/US2 and Main Street | 20% |
| 5 | VT2A and Mill Pond Road/East Road | 25% |
| 6 | Severance Road and Mill Pond Road | 17% |
| 7 | VT 2A and VT289 | 20% |
| 8 | VT 2A and Gardenside Lane | 20% |
| 9 | VT 2A and Susie Wilson Bypass/VT 289 | 20% |
| 10 | Susie Wilson Road and Kellogg Road | 16% |
| 11 | Susie Wilson Road and David Drive | 14% |
| 12 | Susie Wilson Road and Pinecrest Drive | 14% |
| 13 | Susie Wilson Road and Joshua Way | 14% |
| 14 | Susie Wilson Road and VT 15 | 13% |

## 3.5 | CONGESTION ANALYSIS

Level-of-service (LOS) is a qualitative measure describing the operating conditions as perceived by motorists driving in a traffic stream. LOS is estimated using the procedures outlined in the 2010 Highway Capacity Manual (HCM). In addition to traffic volumes, key inputs include the number of lanes at each intersection and the traffic signal timing plans. The LOS results are based on the existing lane configurations and control types (signalized or unsignalized) at each study intersection.

The 2010 HCM defines six qualitative grades to describe the level of service at an intersection. Level-of-Service is based on the average control delay per vehicle. Table 5 shows the various LOS grades and descriptions for unsignalized and signalized intersections.

**TABLE 5: LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED AND UNSIGNALIZED INTERSECTIONS**

| LOS | Characteristics | Unsignalized Total Delay (sec) | Signalized Total Delay (sec) |
|---|---|---|---|
| A | Little or no delay | ≤ 10.0 | ≤ 10.0 |
| B | Short delays | 10.1-15.0 | 10.1-20.0 |
| C | Average delays | 15.1-25.0 | 20.1-35.0 |
| D | Long delays | 25.1-35.0 | 35.1-55.0 |
| E | Very long delays | 35.1-50.0 | 55.1-80.0 |
| F | Extreme delays | > 50.0 | > 80.0 |

The delay thresholds for LOS at signalized and unsignalized intersections differ because of the driver's expectations of the operating efficiency for the respective traffic control conditions. According to HCM procedures, an overall LOS cannot be calculated for two-way stop-controlled intersections because not all movements experience delay. In signalized and all-way stop-controlled intersections, all movements experience delay and an overall LOS can be calculated.

The VTrans policy on level of service is:

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

The HCM congestion reports from Synchro (v8), a traffic analysis software package from Trafficware, were used to assess congestion at the study intersections. In general, existing intersection geometries, traffic control, and signal timings were used for the congestion analysis. However, the intersections at the US 2/7 & VT 2A and VT 2A/Main Street were modeled as signalized intersections with revised geometries based on the current VTrans plans for this area, which are anticipated to be constructed by 2015. Additionally, an adaptive signal control system has recently been installed at the VT 2A/Susie Wilson Road and VT 2A/VT 289 intersections. This system continually optimizes signal timings and phasings based on real-time traffic demands and cannot be modeled using conventional traffic simulation software. For this analysis we have assumed these two intersections operate in coordination and have assumed optimized timings for the analysis hours.

The congestion analysis results, including intersection LOS, average vehicle delay (in seconds) and the volume to capacity ratio (v/c), are presented below for signalized intersections (Table 6) and unsignalized intersections (Table 7).

**TABLE 6: 2015 & 2030 LEVEL-OF-SERVICE RESULTS (SIGNALIZED INTERSECTIONS)**

| | AM Peak Hour | | | | | | PM Peak Hour | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015 | | | 2030 | | | 2015 | | | 2030 | | |
| Signalized Intersections | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c |
| US 7 and US 2/Blakely Road and Severance Road | | | | | | | | | | | | |
| Overall | C | 32 | 0.73 | C | 28 | 0.69 | C | 30 | 0.83 | C | 28 | 0.79 |
| EB, VT 127 | C | 34 | - | C | 30 | - | C | 20 | - | C | 23 | - |
| WB, exiting Severance Rd | C | 23 | - | B | 18 | - | D | 36 | - | C | 35 | - |
| NB, along US 2/7 | C | 21 | - | C | 25 | - | C | 31 | - | C | 28 | - |
| SB, along US 2/7 | D | 43 | - | C | 34 | - | C | 32 | - | C | 26 | - |
| US 7/Bay Road | | | | | | | | | | | | |
| Overall | C | 31 | 0.79 | D | 51 | 0.91 | C | 29 | 0.78 | D | 48 | 0.92 |
| EB, exiting Bay Rd | D | 44 | - | F | >100 | - | D | 39 | - | E | 65 | - |
| WB, exiting VT 2A | D | 38 | - | E | 59 | - | D | 39 | - | E | 64 | - |
| NB, along US 2/7 | B | 14 | - | B | 14 | - | C | 28 | - | D | 53 | - |
| SB, along US 2/7 | C | 32 | - | D | 47 | - | C | 21 | - | C | 23 | - |
| VT 2A/Mill Pond Road | | | | | | | | | | | | |
| Overall | B | 17 | 0.74 | D | 50 | 0.88 | B | 16 | 0.74 | E | 57 | 0.91 |
| EB, exiting Mill Pond Rd | B | 12 | - | B | 14 | - | C | 21 | - | C | 26 | - |
| WB, exiting East Rd | C | 23 | - | F | >100 | - | B | 17 | - | B | 20 | - |
| NB, along VT 2A | B | 14 | - | B | 15 | - | B | 17 | - | F | 92 | - |
| SB, along VT 2A | B | 16 | - | B | 18 | - | B | 11 | - | C | 28 | - |
| VT 2A/VT 289 | | | | | | | | | | | | |
| Overall | E | 59 | 0.97 | F | >100 | 1.17 | C | 25 | 0.68 | C | 29 | 0.80 |
| WB, exiting VT 289 | E | 62 | - | F | >100 | - | D | 45 | - | D | 48 | - |
| NB, along VT 2A | B | 16 | - | B | 17 | - | A | 7 | - | A | 10 | - |
| SB, along VT 2A | E | 69 | - | F | >100 | - | B | 19 | - | C | 26 | - |
| VT 2A/Susie Wilson Rd/VT 289 | | | | | | | | | | | | |
| Overall | C | 31 | 0.82 | E | 79 | 1.03 | F | >100 | 1.04 | F | >100 | 1.21 |
| EB, exiting Susie Wilson Bypass | E | 65 | - | F | >100 | - | F | >100 | - | F | >100 | - |
| NB, along VT 2A | C | 30 | - | D | 36 | - | F | >100 | - | F | >100 | - |
| SB, along VT 2A | C | 22 | - | E | 74 | - | E | 77 | - | F | >100 | - |
| Susie Wilson Rd/Kellogg Rd | | | | | | | | | | | | |
| Overall | B | 18 | 0.73 | C | 31 | 0.98 | F | 88 | 1.06 | F | >100 | 1.23 |
| EB, exiting Kellogg Rd | B | 18 | - | D | 41 | - | F | >100 | - | F | >100 | - |
| WB, exiting Blair Rd | C | 26 | - | C | 28 | - | D | 35 | - | D | 55 | - |
| NB, along Susie Wilson Rd | B | 17 | - | D | 43 | - | C | 30 | - | F | >100 | - |
| SB, along Susie Wilson Rd | B | 17 | - | B | 19 | - | C | 29 | - | C | 32 | - |
| Susie Wilson Rd/David Dr | | | | | | | | | | | | |
| Overall | A | 8 | 0.53 | A | 9 | 0.65 | A | 10 | 0.57 | B | 10 | 0.64 |
| EB, exiting David Dr | D | 41 | - | D | 41 | - | E | 58 | - | E | 61 | - |
| WB, exiting Market Pl | D | 41 | - | D | 41 | - | E | 57 | - | E | 58 | - |
| NB, along Susie Wilson Rd | B | 12 | - | B | 13 | - | A | 2 | - | A | 2 | - |
| SB, along Susie Wilson Rd | A | 6 | - | A | 7 | - | B | 14 | - | B | 15 | - |
| Susie Wilson Rd/Pinecrest Dr | | | | | | | | | | | | |
| Overall | A | 6 | 0.60 | B | 11 | 0.72 | B | 12 | 0.72 | B | 15 | 0.82 |
| EB, exiting Lowes | D | 35 | - | D | 35 | - | D | 50 | - | D | 50 | - |
| WB, exiting Pinecrest Dr | D | 52 | - | F | 87 | - | E | 73 | - | F | 87 | - |
| NB, along Susie Wilson Rd | A | 1 | - | A | 1 | - | A | 5 | - | A | 8 | - |
| SB, along Susie Wilson Rd | A | 4 | - | A | 9 | - | B | 12 | - | B | 14 | - |
| Susie Wilson Rd/Joshua Way | | | | | | | | | | | | |
| Overall | B | 11 | 0.63 | B | 19 | 0.77 | A | 10 | 0.69 | B | 12 | 0.78 |
| EB, exiting Lowes | D | 35 | - | D | 35 | - | D | 53 | - | D | 55 | - |
| WB, exiting Joshua Way | F | 88 | - | F | >100 | - | D | 55 | - | E | 59 | - |
| NB, along Susie Wilson Rd | A | 8 | - | A | 8 | - | A | 5 | - | A | 9 | - |
| SB, along Susie Wilson Rd | A | 5 | - | A | 7 | - | A | 6 | - | A | 6 | - |
| Susie Wilson Rd/VT 15 | | | | | | | | | | | | |
| Overall | C | 23 | 0.77 | C | 29 | 0.93 | F | >100 | 1.04 | F | >100 | 1.17 |
| EB, along US 15 | C | 25 | - | C | 31 | - | F | >100 | - | F | >100 | - |
| WB, along US 16 | C | 27 | - | D | 36 | - | C | 27 | - | C | 31 | - |
| SB, exiting Susie Wilson Rd | B | 20 | - | C | 24 | - | F | >100 | - | F | >100 | - |

**TABLE 7: 2015 & 2030 LEVEL-OF-SERVICE RESULTS (UNSIGNALIZED INTERSECTIONS)**

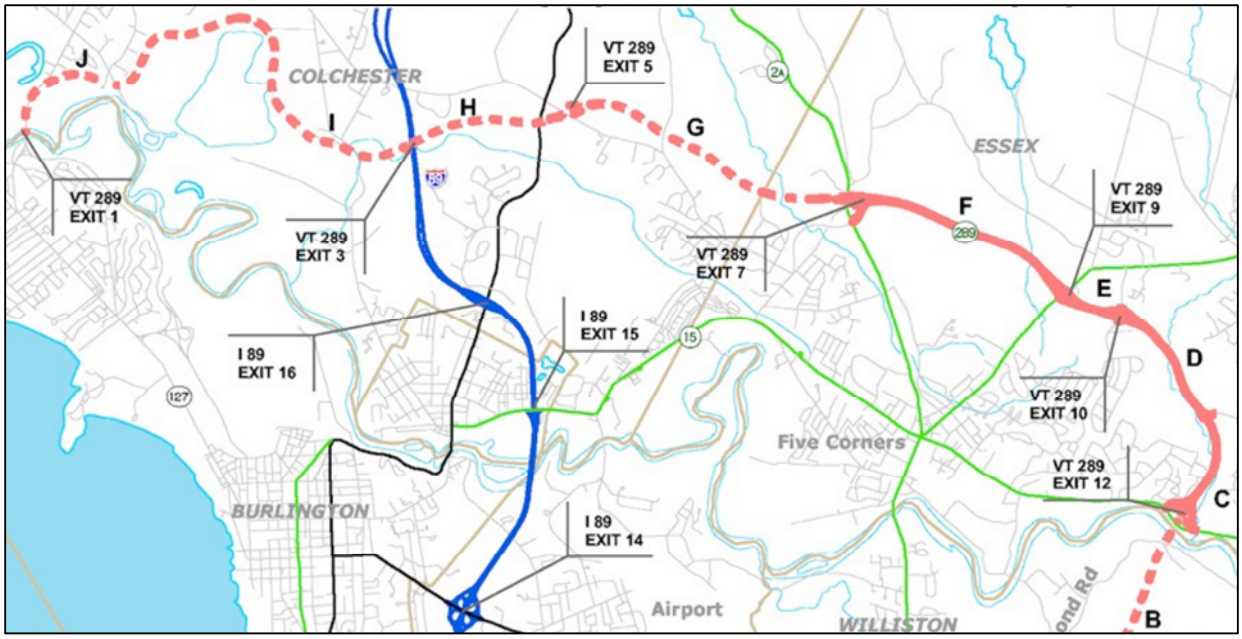
| Unsignalized Intersections | AM Peak Hour | | | | | | PM Peak Hour | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015 | | | 2030 | | | 2015 | | | 2030 | | |
| | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c |
| VT 2A/Main Street | | | | | | | | | | | | |
| EB, from VT 127 | B | 12 | 0.18 | B | 14 | 0.25 | B | 13 | 0.33 | C | 15 | 0.44 |
| WB, from Greenhouse | A | 10 | 0.00 | B | 10 | 0.00 | B | 14 | 0.01 | C | 15 | 0.02 |
| NB, along Main St | A | 6 | 0.23 | A | 7 | 0.30 | A | 4 | 0.14 | A | 4 | 0.18 |
| SB, along Main St | A | <1 | 0.00 | A | <1 | 0.00 | A | <1 | 0.00 | A | <1 | 0.00 |
| US 7 and US 2/Main Street | | | | | | | | | | | | |
| WB, exiting Main St | B | 13 | 0.37 | C | 15 | 0.48 | F | 54 | 0.88 | F | >100 | 1.25 |
| NB, along US 2/7 | A | <1 | 0.15 | A | <1 | 0.18 | A | <1 | 0.36 | A | <1 | 0.43 |
| SB Left, exiting US 2/7 | A | 9 | 0.33 | A | 10 | 0.42 | B | 10 | 0.27 | B | 12 | 0.38 |
| SB Through, along US 2/7 | A | <1 | 0.34 | A | <1 | 0.41 | A | <1 | 0.25 | A | <1 | 0.31 |
| Severance Road/Mill Pond Road | | | | | | | | | | | | |
| EB, along Severance Rd | A | <1 | 0.02 | A | <1 | 0.02 | A | 2 | 0.07 | A | 2 | 0.09 |
| WB, along Severance Rd | A | <1 | 0.21 | A | <1 | 0.26 | A | <1 | 0.31 | A | <1 | 0.37 |
| SB, exiting Mill Pond Rd | C | 20 | 0.48 | E | 48 | 0.80 | C | 17 | 0.17 | C | 21 | 0.25 |
| VT2A/Gardenside Lane | | | | | | | | | | | | |
| EB, exiting Gardenside Ln | F | 82 | 0.45 | F | >100 | 1.15 | D | 27 | 0.21 | E | 46 | 0.38 |
| NB Left, exiting VT 2A | C | 18 | 0.02 | D | 26 | 0.04 | B | 12 | 0.04 | B | 14 | 0.06 |
| NB Through, along VT 2A | A | <1 | 0.13 | A | <1 | 0.16 | A | <1 | 0.32 | A | <1 | 0.38 |
| SB, along VT 2A | A | <1 | 0.88 | A | <1 | 1.07 | A | <1 | 0.64 | A | <1 | 0.75 |

As shown in the congestion analysis results above, it is estimated that overall congestion levels will continue to increase at all study intersections in 2030, with seven intersections projected to experience LOS F conditions and v/c ratios greater than 1.0 in the 2030 scenario.

## 3.6 | IMPACT OF THE PARTIAL CIRC CONSTRUCTION ON THE CENTS STUDY AREA

As noted previously, the completion of the Circ Highway would have provided a new high-speed, limited-access routing option between Williston, Essex, and Colchester and would likely have changed travel patterns on a regional level. However, with the announcement in 2011 that no additional segments of the Circ would be constructed, Town officials in Colchester and Essex wanted to know whether the now permanent termination of VT 289 at VT 2A will have a lasting adverse impact on traffic levels on VT 2A and Severance/Kellogg Road.

**FIGURE 11: FORMER CHITTENDEN COUNTY CIRCUMFERENTIAL HIGHWAY PROPOSED ALIGNMENT (SOURCE: VTRANS)**




To better understand the implications of not completing the Circ Highway, the following items were examined:

- Historic Traffic Volume Trend Comparison
- Origins and Destinations of VT 289 Travelers

Each of these items is described in more detail below.

## HISTORIC TRAFFIC VOLUME TRENDS

To investigate whether the partial construction of the Circ Highway has contributed to higher than anticipated traffic volume growth on the VT 2A and the Severance/Kellogg Road corridors, traffic volume growth rates on VT 2A and Severance Road were compared with traffic growth rates during a similar time period on US 7 in Shelburne. This location in Shelburne was selected for estimating what the corresponding traffic growth rate was on a facility approximately the same distance from downtown Burlington as VT 2A and Severance/Kellogg Road but not directly affected by the partial construction of the Circ Highway. Figure 12 below shows the locations of the three counters used for comparison. The two orange points are located within the CENTS study area and the blue counter is located on US 7 in Shelburne.

**FIGURE 12: HISTORIC AADT COMPARISON LOCATIONS**

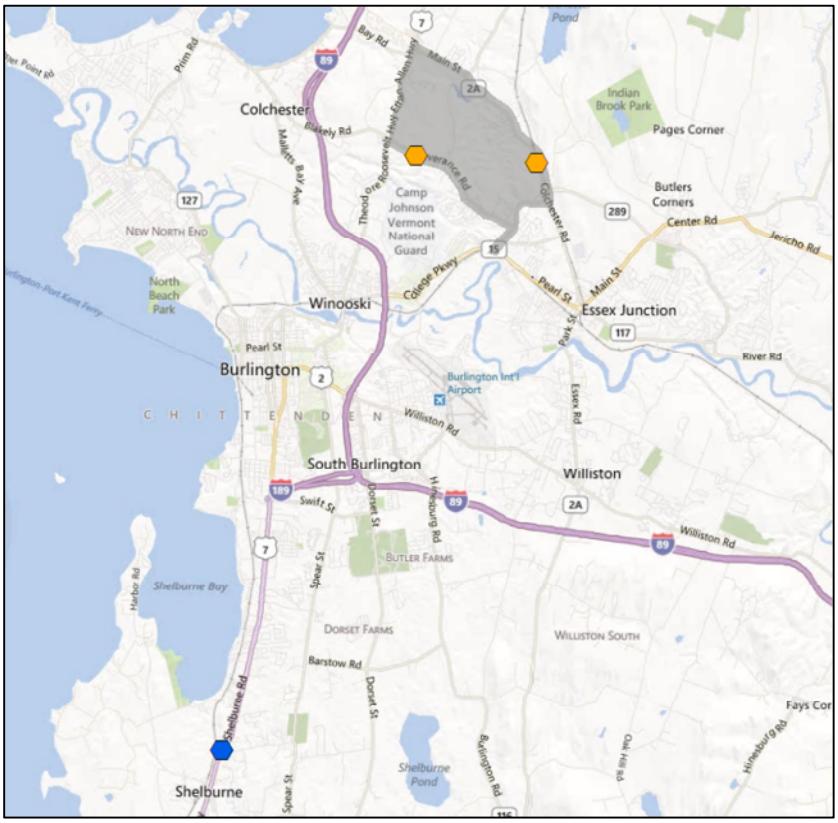
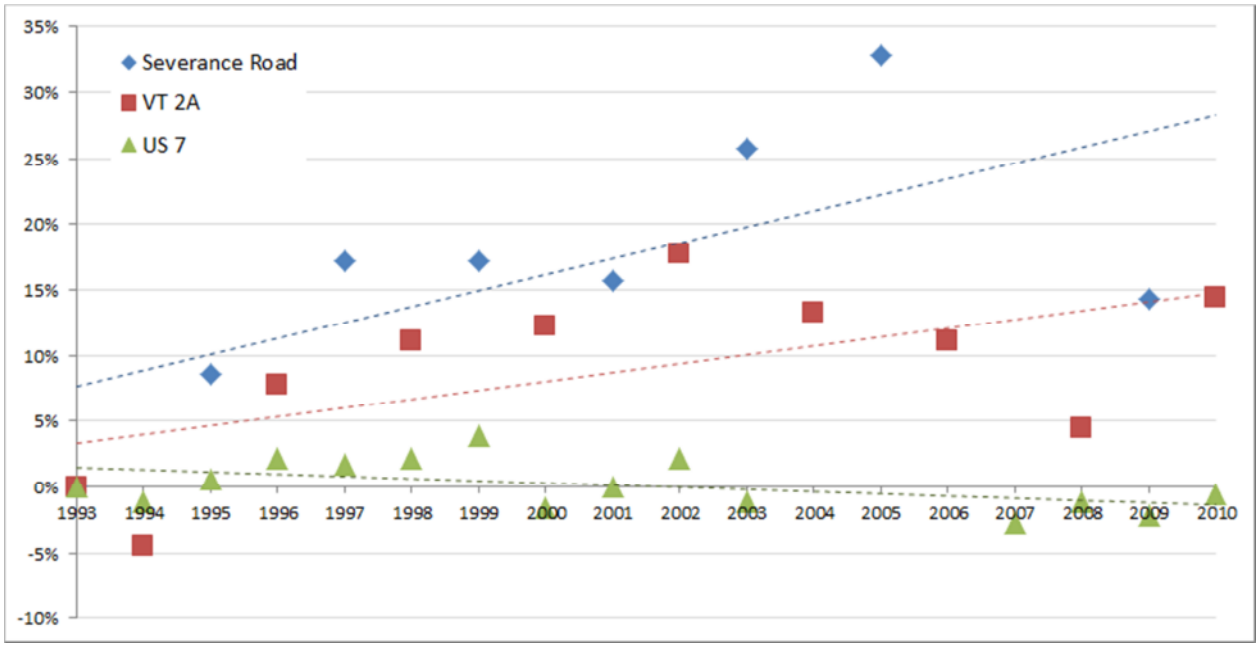



Figure 12 presents the AADT from the time the partial Circ Highway was opened (1993) through 2010. The diamonds and squares represent traffic counters within the CENTS study area and the triangles represent the traffic counts on US 7 in Shelburne. The figure also shows best-fit linear growth trends for each of the counter locations.

The figure shows that volumes on VT 2A and Severance/Kellogg Road have shown a generally positive growth trend between 1993 and 2010 (approximately 1% per year), while volumes on US 7 in Shelburne have remained relatively flat over this same period. While the growth in traffic along VT 2A and Severance/Kellogg Road could be a result of the partial construction of the Circ Highway in 1993, it could also be reflective of a higher rate of land use growth that has occurred within the CENTS study area during this period, particularly around Severance Corners and along Susie Wilson Road.

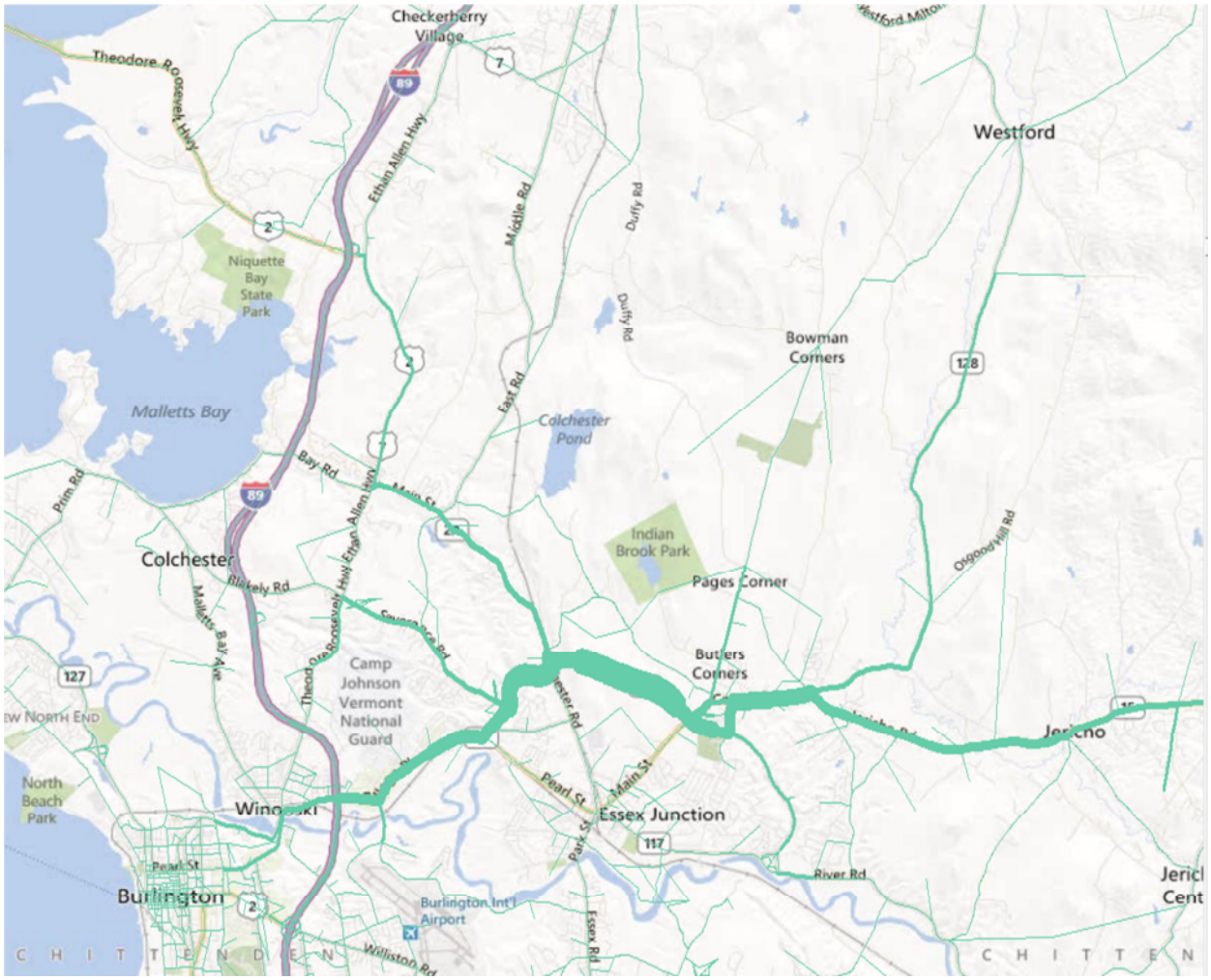
**FIGURE 13: AADT CHANGES (1993 TO 2010) ON SEVERANCE ROAD, VT 2A, AND US 7**




## ORIGINS AND DESTINATIONS OF VT 289 TRAVELERS

To better understand the trips currently using VT 289, the CCRPC regional TransCAD model was used to identify the origins and destinations for all vehicles that traveled along VT 289 during the PM peak hour. The results of this assessment are presented in Figure 14 below, where the thickness of the turquoise line represents the flow of trips that travel through VT 289. As can be seen in the figure below, a significant portion of the trips using VT 289 during the weekday evening peak hour travel along VT 15 and Susie Wilson Road from Burlington, then pass along VT 289 to VT 15 to Essex Center and points east. This figure also shows that only a small portion of VT 289 trips travel along either VT 2A or Severance/Kellogg Roads, likely due to the lack of any significant origins or destinations that could be reached by traveling on either VT 2A or Severance/Kellogg Road and VT 289.

**FIGURE 14: TRAFFIC ORIGINS AND DESTINATIONS THAT TRAVEL THROUGH VT 289**

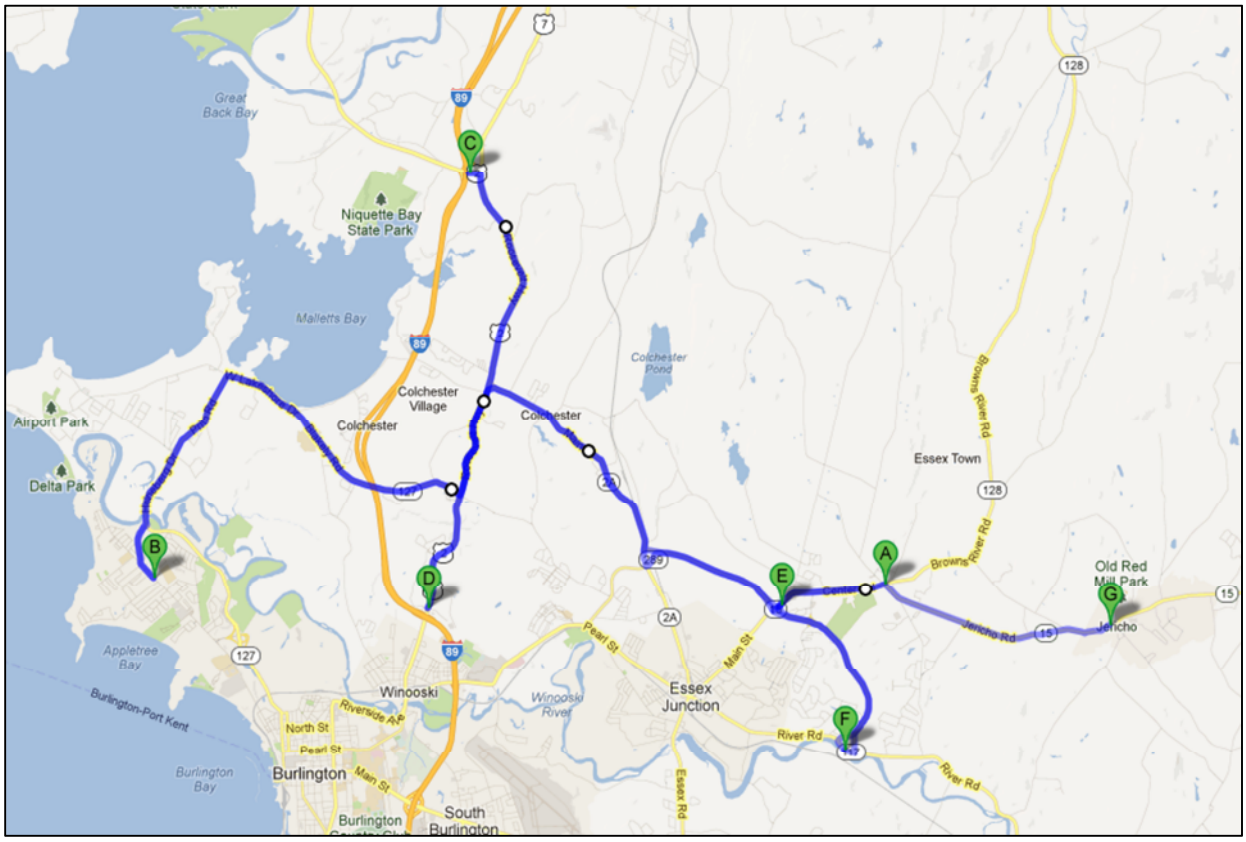



To supplement the TransCAD assessment, Google Maps was also used to estimate which origin/destination combinations result in the use of both VT 2A and VT 289. The shortest travel time was used exclusively to estimate the routing decisions of drivers. Figure 15 below shows several potential origins and destinations of trips that would result in the use of both VT 2A and VT 289. These locations include the following:

- Essex Center (A)
- New North End (B)
- I-89 Exit 17 (C)
- I-89 Exit 16 (D)
- Essex Outlets (E)
- VT 289/VT 117 (F)
- Jericho (G)

While each of the origins and destinations identified above would likely utilize VT 289 as part of their trip, these end points do not represent particularly large trip generators.

**FIGURE 15: GOOGLE MAPS ORIGIN AND DESTINATIONS**




The findings of the assessment presented above leads us to conclude that the majority of traffic on VT 289 continues onto Susie Wilson Road to VT 15 and is not directed along either the VT 2A or Severance/Kellogg Road corridors in large numbers. This finding also points to the importance of Susie Wilson Road as both a connection to local commercial and retail destinations as well as a critical thoroughfare for regional traffic.

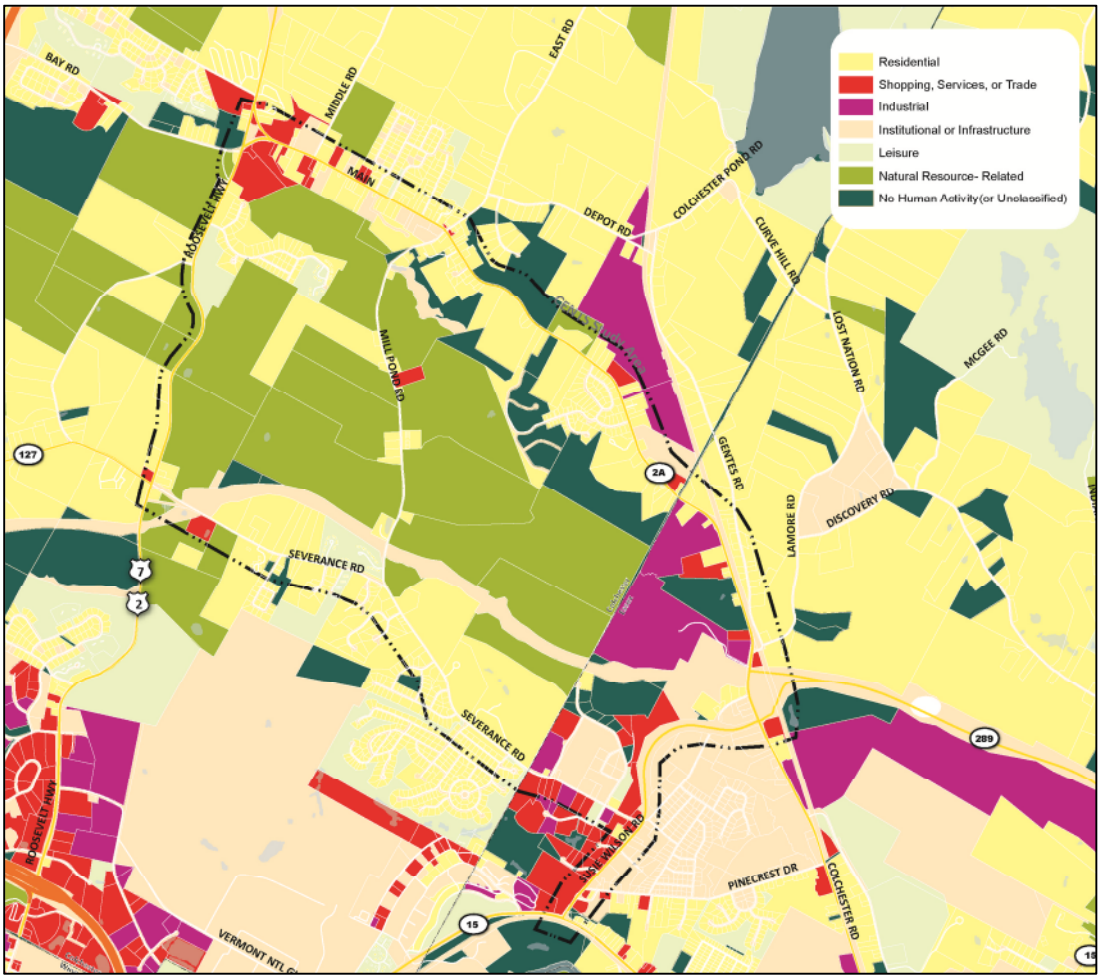
## 3.7 | LAND USE

According to the most recent CCRPC existing land use map (Figure 16), much of the study area falls within the Natural Resource-Related land use category. Within the Town of Essex, the land use is primarily industrial and retail, with the Chittenden Solid Waste District and some smaller auto and trucking businesses located off of VT 2A and Kellogg Road.

Severance Road and Main Street in Colchester are predominantly residential in character, though there are some small retail (shopping, services, or trade) uses located along Main Street, with housing units that front along the street. This development pattern of more densely located homes in Colchester Village creates a town center feel, compared to the more suburban character along Severance Road, where much of the housing is located off of side streets rather than directly off of the main thoroughfare. VT 2A continues to be mostly residential as it extends southeast towards Essex Junction, but remains fairly low in density.

The primary commercial hub of the study area is located along Susie Wilson Road with several small offices, local retail amenities such as restaurants and pharmacies, and Lowe's serving as a major retail anchor at the northwestern corner of Susie Wilson and VT 15.

**FIGURE 16: CENTS EXISTING LAND USE**

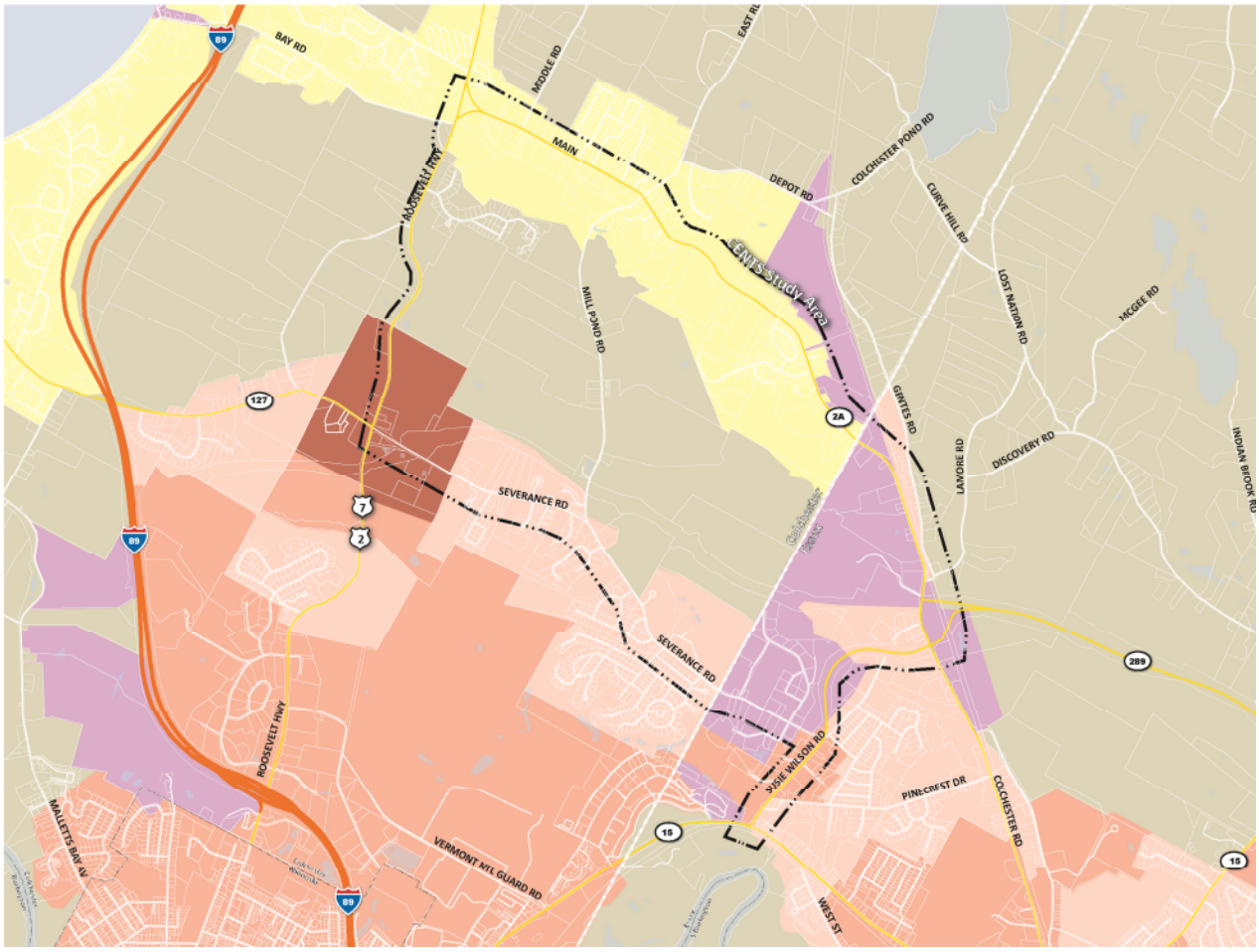



The CCRPC characterizes land use in Chittenden County according to six land use types. According to the 2013 CCRPC Planning Areas map (Figure 17), the predominant land use envisioned within the Colchester portion of the study area will continue to be rural in character, preserving the working landscape and its natural features. Along Main Street/VT 2A in Colchester, the village designation will allow for residential and nonresidential development at densities and scales in keeping with a typical Vermont village, approximately 2 to 12 dwelling units per acre (sewered) or 0.2 and 4 units per acre (not sewered).

Severance Corners, at the intersection between US 7/US2 and Severance Road, is planned to become a Center Planning Area, reflective of its growth center designation. This area is intended to be a regional center of activity that can contain a mix of jobs, housing, and community facilities. The character of the rest of Severance Road will continue to be suburban residential, with densities greater than 1 and less than 4.5 dwelling units per acre.

On the Essex side of the study area, the industrial land uses are primarily designated as enterprise areas, allowing for future concentration of employment uses that attract workers from throughout the County and greater region. Susie Wilson Road will continue to be the main spine that ties several land uses together, including suburban residential, enterprise, and metro south of Kellogg Road. The Susie Wilson commercial corridor is planned to be a place that accommodates both jobs and housing in a compact development pattern where transit and pedestrian activity is encouraged.

**FIGURE 17: FUTURE PLANNING AREAS**




## 3.8 | ALTERNATIVE TRANSPORTATION

### PUBLIC TRANSIT SERVICE

The study area is currently served by one Chittenden County Transportation Authority (CCTA) route, the Jefferson Commuter. This route travels along Susie Wilson Road and provides two round trips in each direction in the morning and evening peak hours on weekdays. In July, 2014 a new service is expected to begin on US Route 7 with a stop at Severance Corners. This service will operate six round trips each weekday. Adjacent to the study area, the CCTA Route 2 Essex Junction route stops at the VT 15/Susie Wilson Road intersection.

### BICYCLE FACILITIES

There is currently a designated bicycle lane along the shoulder of Kellogg Road from Susie Wilson Road to the Colchester Town Line. There are also road signs in place indicating that both Kellogg Road and Susie Wilson Bypass are bike routes. As part of the CCRPC Bicycle and Pedestrian Master Plan, this study area is proposed to be fully bike accessible on all the major perimeter corridors, with on-road facilities that may or may not have signs and designations.

## 3.9 | SAFETY ASSESSMENT

Examining the latest VTrans crash database revealed the presence of two High Crash Location (HCL) road segments and five HCL intersections within the CENTS study area. These crash locations are generally located around areas with commercial use or where there are relatively high traffic volumes. The large majority of crashes are the result of a rear-end incidents, with left-turn broadsides occurring as the second highest cause of accidents.

Figure 18 below shows the location of the HCL intersections and road segments. Figure 19 on the following page shows the location and clusters of crashes, with the contributing causes for each crash location noted and sized according to the number of occurrences of each contributing cause.

Based on our review of the crash data, we find the following locations to have the most acute safety issues:

- **US 2/7 and Severance Road**: This is a wide four-way signalized intersection, with 3 lanes approaching in each direction and relatively heavy turning movement volumes. Drivers are inclined to drive fast on this segment of road and the rear-end incidents are likely due to unexpected stopping caused by the traffic signal.
- **US 2/7 and Main Street**: This is a confusing series of stop-controlled four-way intersections, where drivers may make wide-angle turns in both directions on and off between US 7 and Main Street. Rear end incidents are likely a result of drivers who are distracted by the directional movements and do not stop appropriately at the stop signs.
- **Susie Wilson Road between Kellogg Road and VT 15**: This section of road, and its many signalized intersections with commercial side streets, is the most problematic crash location within the study area. Not only does this corridor experience high traffic volumes, but the congested nature during peak periods prompts drivers to leave inadequate gaps between vehicles, leading to a high number of rear-end incidents.

**FIGURE 18: HIGH CRASH LOCATION SECTIONS AND INTERSECTIONS (2006-2010)**

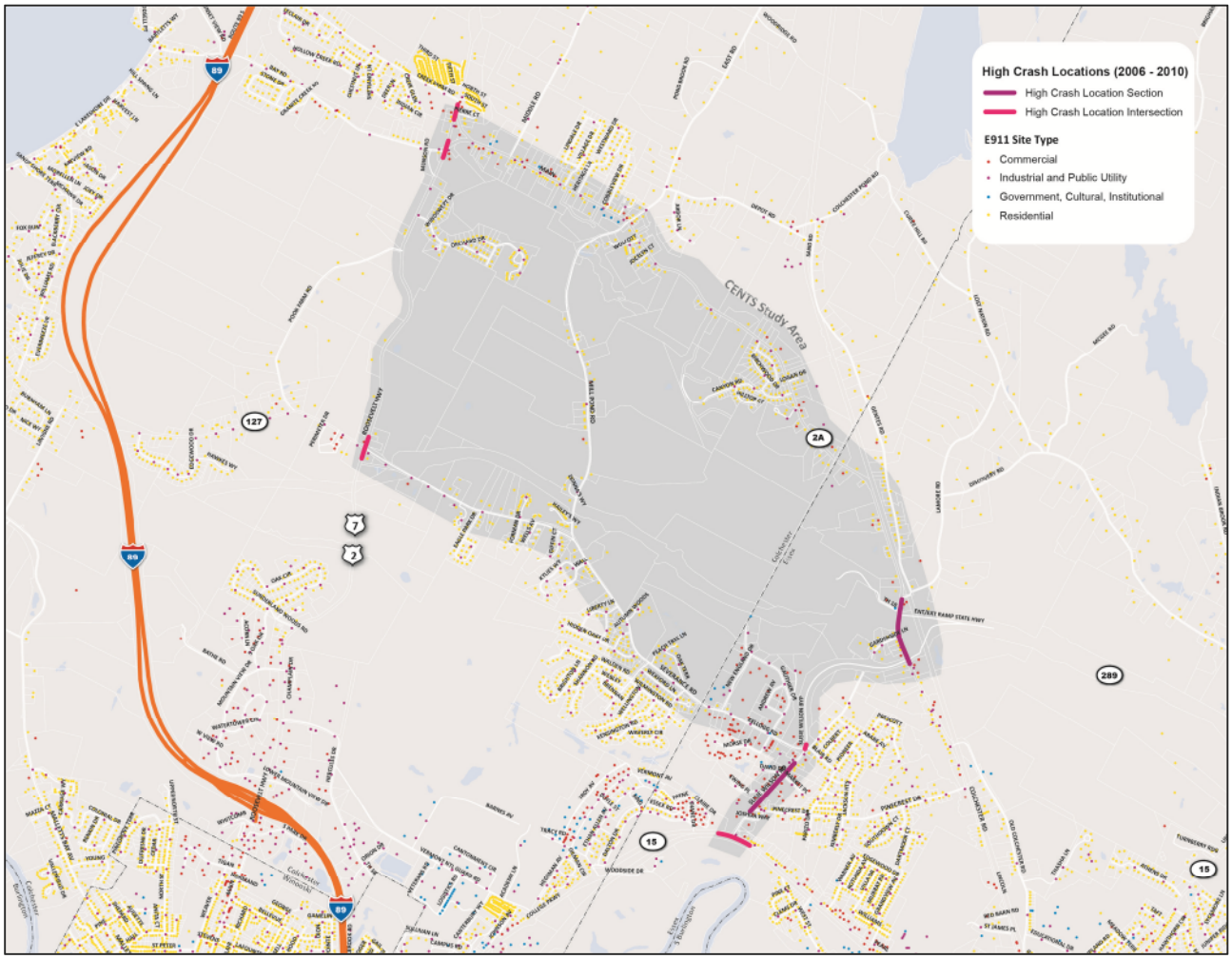
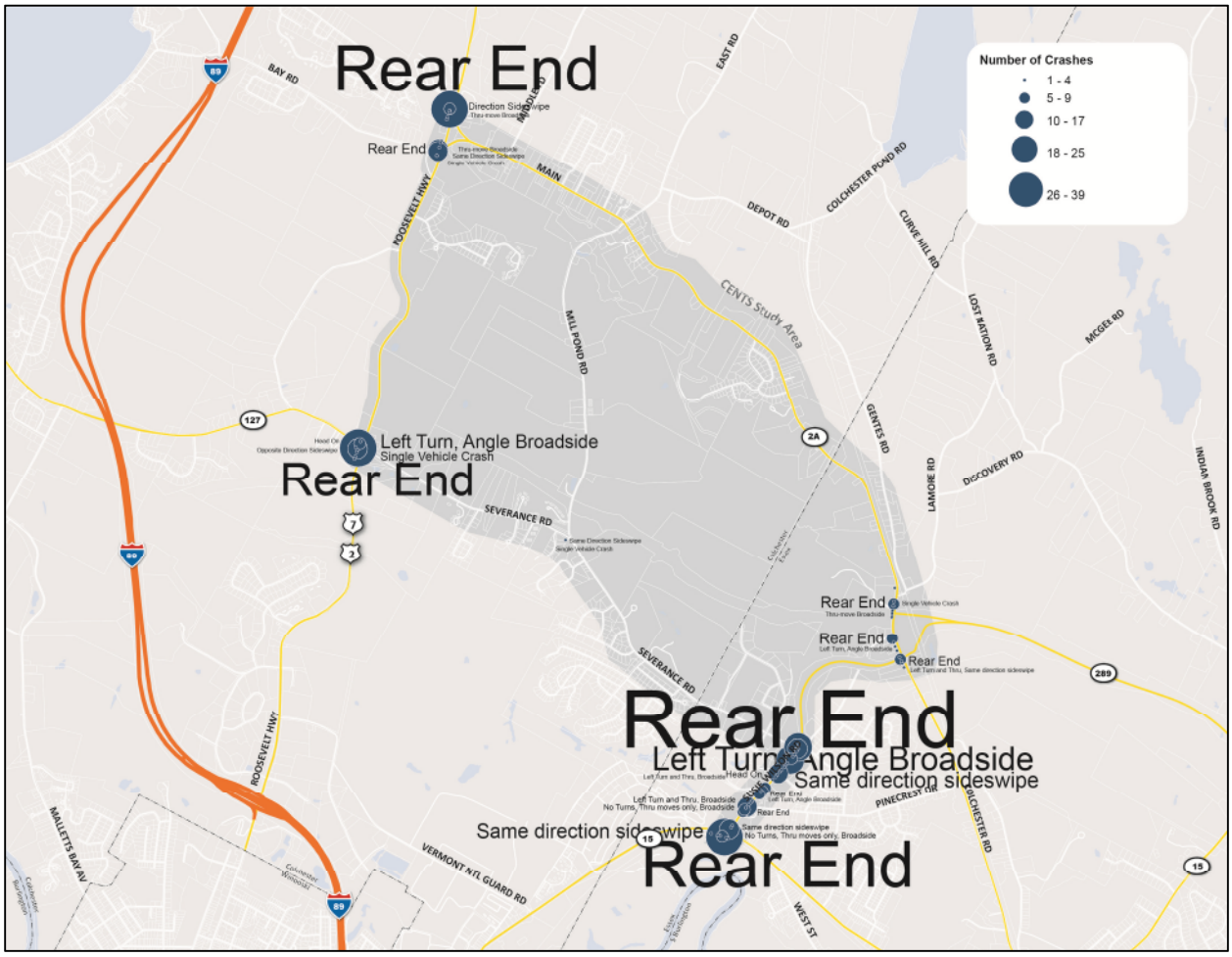


**FIGURE 19: HIGH CRASH LOCATIONS: CRASH TYPE**



## 3.10 | NATURAL RESOURCES

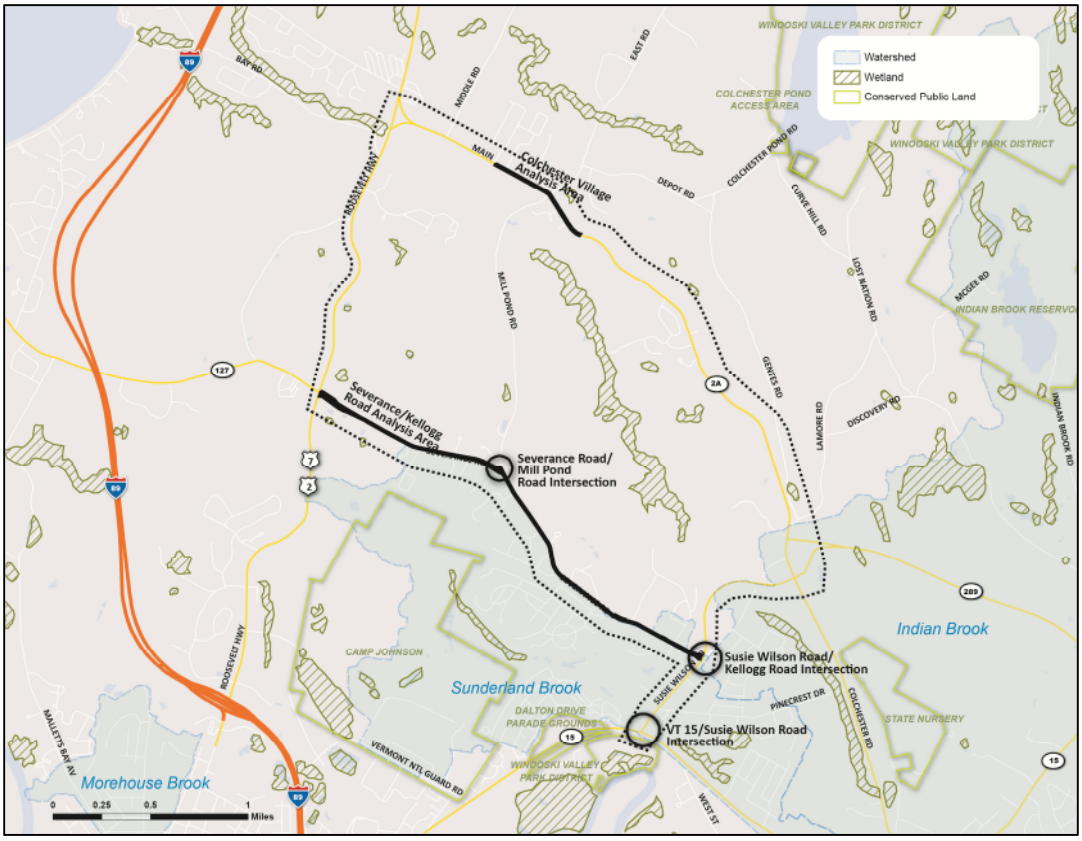
### CONSERVATION AREAS

Severance Road and Susie Wilson Road, with portions of Susie Wilson Bypass, fall into two watershed areas: Sunderland Brook and Indian Brook. These are areas that have been identified by the Vermont Agency of Natural Resources as stormwater impaired watersheds. None of the areas fall within conserved public land.

There is one large wetland that stretches across the eastern half of the study area within the natural resources land use, following the low lying contours. This is a 79 acre wetland that is designated Class 2. In addition, several smaller wetlands are dotted throughout the study area, although none of them are located within 100 feet of an analysis area or intersection. Class II wetlands require a 50 foot buffer zone and , other than allowed uses specified in §6.2 of the Wetland Rules, requires a Wetland Permit from the Agency of Natural Resources.

The Sunderland Brook system impacts the topography of the areas west of Susie Wilson Road, with deep east-west channels approximately 40 feet wide and ten to 15 feet below the surrounding land. This creates a vegetated divide between the Lowe's development site, Morse Road area, and Ewing Place.[3]

**FIGURE 20: WETLAND AND CONSERVATION AREAS**



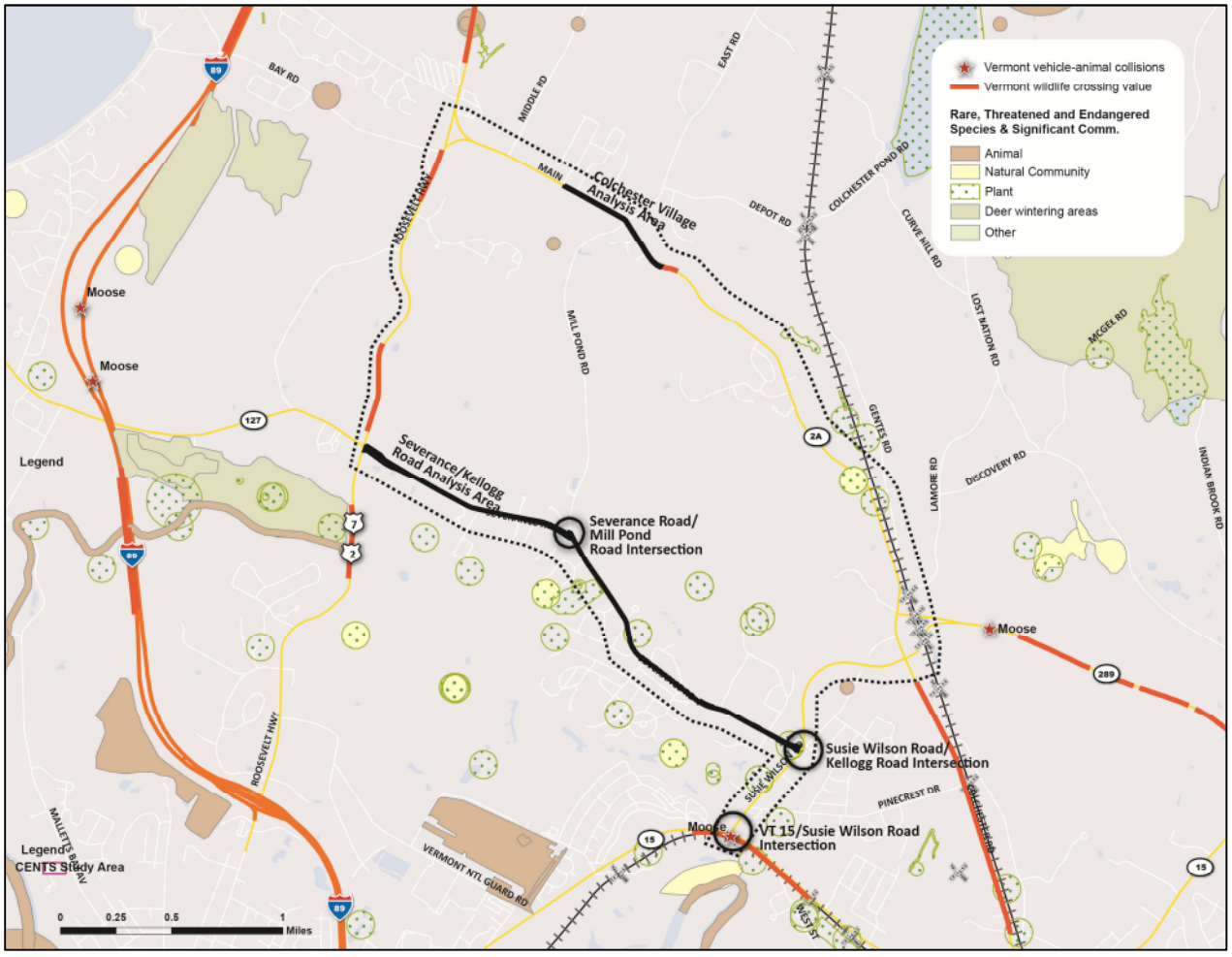

[3] Susie Wilson Road Planning Study: Analysis of Opportunities and Constraints for Transit-Friendly Development. DMJM Harris. June 2005.

## WILDLIFE AND WILDLIFE HABITAT

While there are no deer wintering areas or rare, threatened, or endangered species identified within the study area, there are several road segments which are of notable wildlife crossing value. There are two identified along US 7/US 2 (652 foot and 164 foot in length) and a 326 foot segment along VT 2A, approximately 1,500 foot to the east of Mill Pond Road. VTrans identifies these sections of road where there are likely habitats on both sides of the road and a noted correlation with road kill occurrence.

Due to its predominant natural character, the study area also contains several areas that support rare and protected species of plants. Of note are those identified along VT 2A in Essex, Severance Road near Hidden Oaks Drive, and at the intersection along Susie Wilson Road.

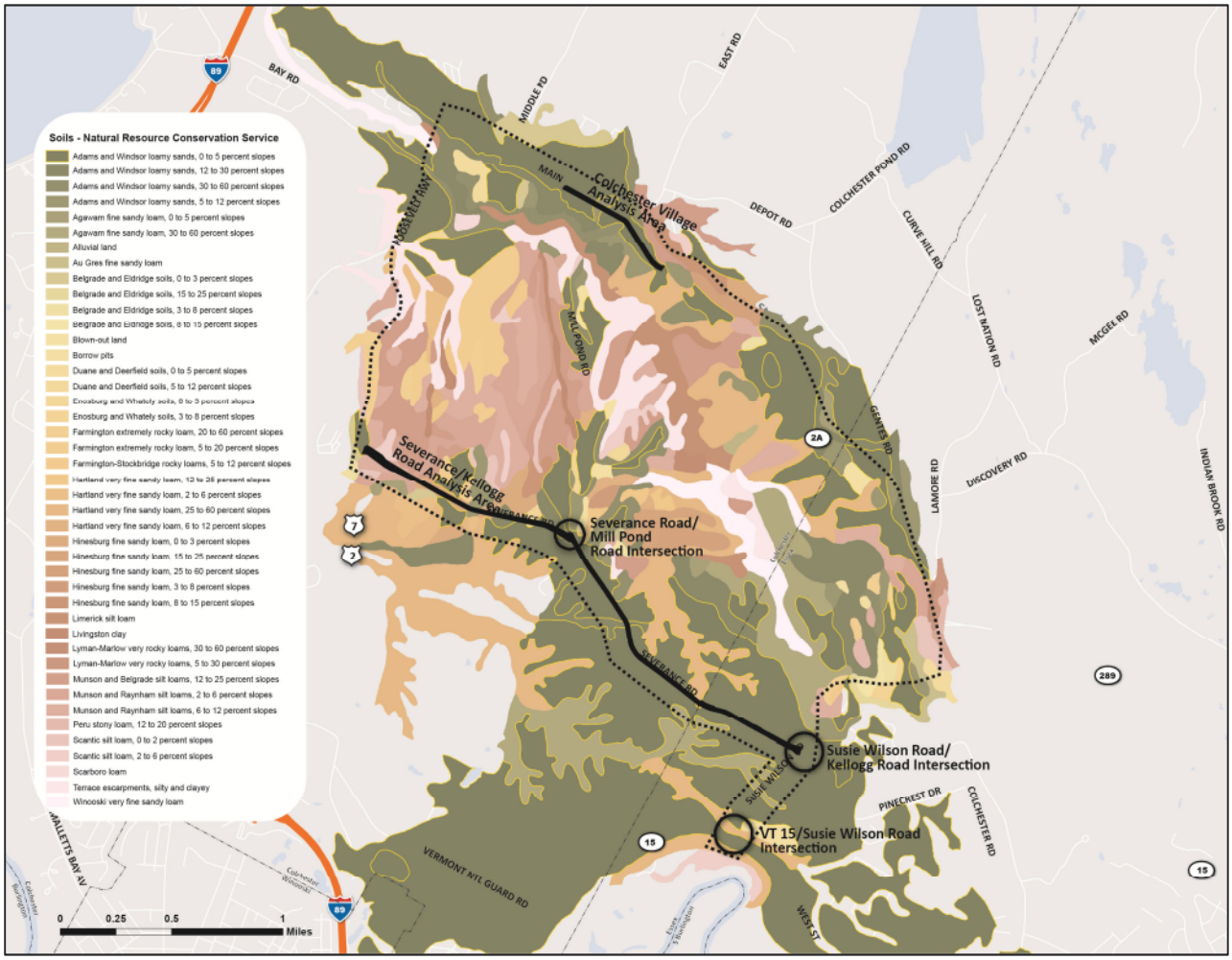
**FIGURE 21: WILDLIFE AND PLANT HABITAT**



## SOILS AND SLOPES

According to the Natural Resource Conservation Service Soil Survey for Chittenden County, there are a variety of soils and slopes represented in the study area, although Adams and Windsor loamy sands, with 0 to 5 percent slopes, is the predominant soil in the study area corridors. The elevation ranges from 120 feet to 440 feet within the study area.

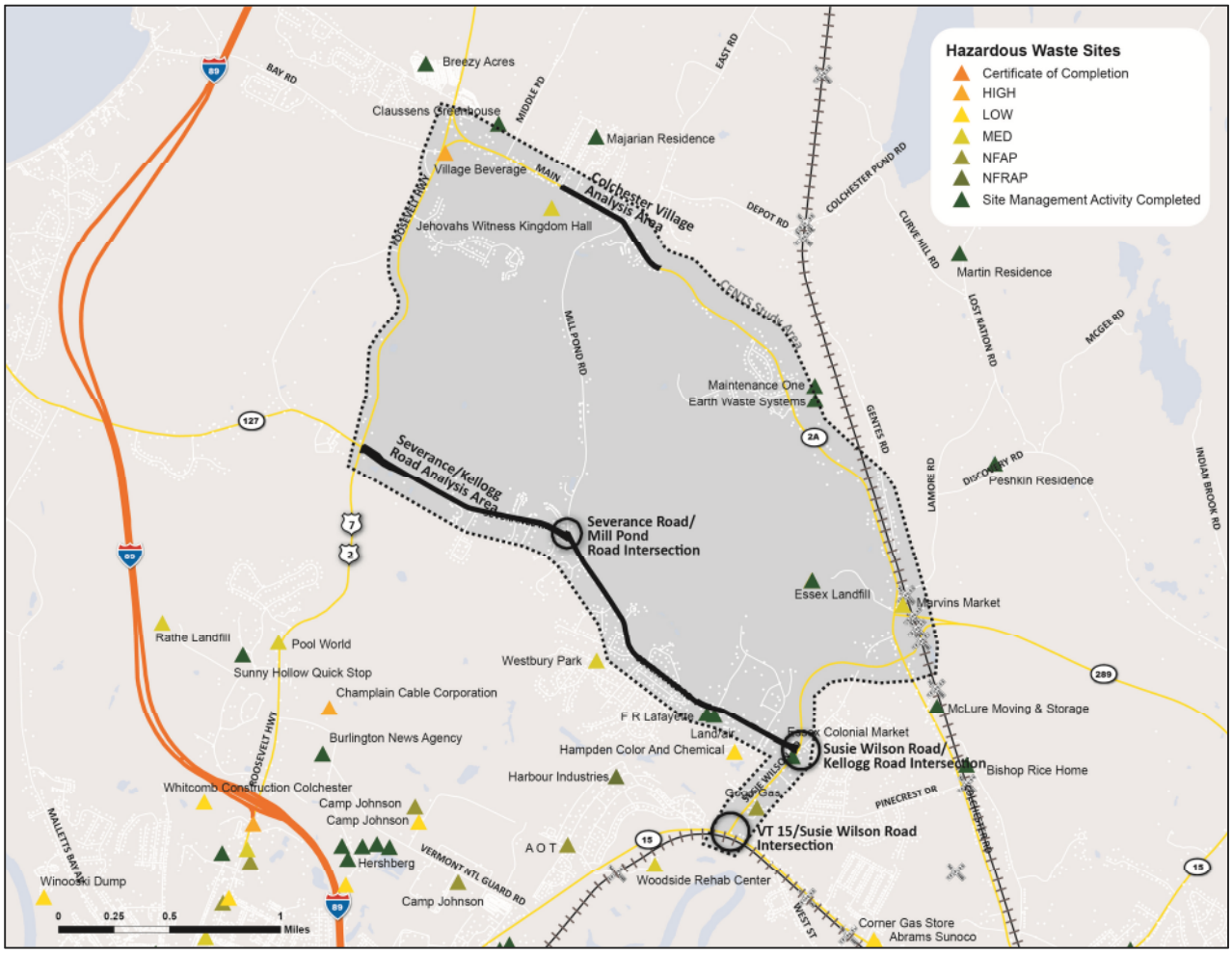
**FIGURE 22: SOILS AND SLOPES**



## 3.11 | HAZARDOUS MATERIALS SITES

Several hazardous waste sites in and adjacent to the study area were located based on the latest mapping provided by Vermont ANR. The majority of these sites are categorized as having Site Management Activity Completed (SMAC) and are not considered a concern in the case of future development or road construction.

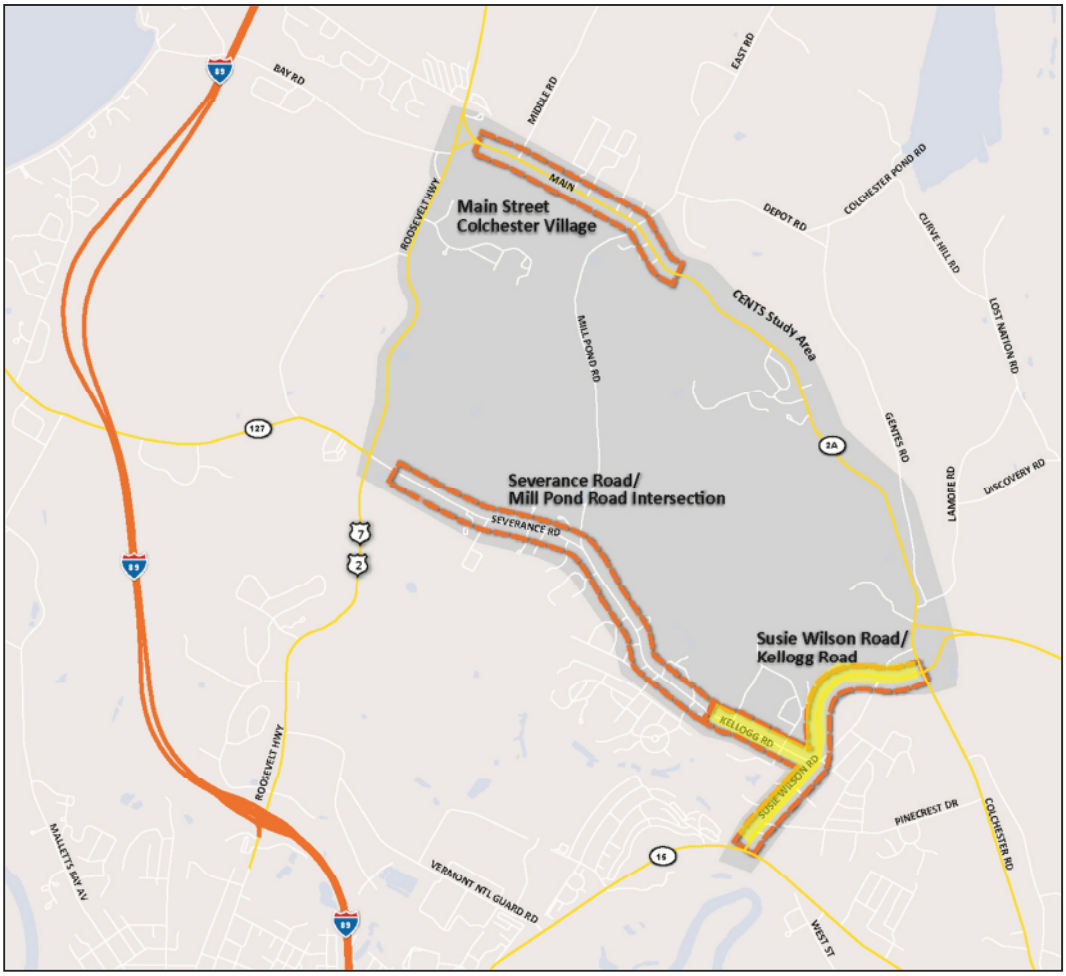
**FIGURE 23: IDENTIFIED HAZARDOUS WASTE SITES**



# 4.0 SUSIE WILSON ROAD/KELLOGG ROAD SCOPING STUDY

The Susie Wilson Road/Kellogg Road project area is located in Essex, Vermont and includes the area generally located along Susie Wilson Road from VT 15 north to VT 2A and the entire length of Kellogg Road from Susie Wilson Road to the Colchester town line.

**FIGURE 24: SUSIE WILSON ROAD/KELLOGG ROAD STUDY AREA (YELLOW HIGHLIGHT)**




## 4.1 | PURPOSE AND NEED

### PROJECT PURPOSE

The purpose of the proposed action is to provide transportation system improvements that increase mobility for people and goods and enhances safety for all users.

### PROJECT NEEDS

- **Mobility**: The partial construction of the Circumferential Highway and regional growth patterns have led to a heavy reliance on the Susie Wilson Road corridor to

provide both local accessibility to adjacent land uses as well as regional mobility for through traffic. The Susie Wilson Road/Kellogg Road intersection and the VT 15/Susie Wilson Road intersection currently operate at Level of Service (LOS) E/F conditions during the evening peak hour. Based on projected regional population and employment growth, traffic congestion is expected to worsen by 2030, with significant delays and oversaturated conditions projected along the corridor. The Susie Wilson Road corridor should include bicycle accommodations (such as adequate shoulder widths) to provide a connection from the future VT 15 bicycle path to the bicycle routes on Kellogg Road and Susie Wilson Bypass.

- **Safety**: Based on the most recent VTrans High Crash Location (HCL) report, there are three identified HCLs within the project area. HCL number 28 is located at the Susie Wilson Road/Kellogg Road intersection and had a total of 48 reported crashes in the period from 2006-2010. HCL number 41 is located at the VT 15/Susie Wilson Road intersection and had a total of 73 reported crashes in the period from 2006-2010. HCL number 139 is located along Susie Wilson Road from approximately Pinecrest Drive north to Kellogg Road (milepoints 0.100-0.400) and had a total of 78 reported crashes in the period from 2006-2010, including 13 injuries and one fatality.
- **Economic Vitality**: The Susie Wilson and Kellogg Road corridors provide access to land uses that contribute significantly to the town's tax base. Reasonable accommodations for future through traffic as well as local accessibility should be planned for accordingly to support the dense, mixed-use development plans for the corridor.

## 4.2 | ALTERNATIVES ASSESSMENT

The various alternatives considered for the Susie Wilson Road/Kellogg Road corridor were developed based on a review of existing conditions, input from project stakeholders, and in consideration of the stated Purpose and Needs. These alternatives are described in detail below.

### NO BUILD ALTERNATIVE

The No Build Alternative would leave the transportation system as it is today. Because there are no planned transportation improvements programmed for the Susie Wilson Road/Kellogg Road corridor in the foreseeable future, the transportation network in 2030 would be identical to that of today. Regional growth will continue to increase traffic along the corridor, especially during the peak periods. This traffic growth will exacerbate the delays currently experienced along the corridor, lead to peak spreading and diverted trips, and will make it increasingly difficult for pedestrians and bicyclists to find the space to navigate safely through the corridor.

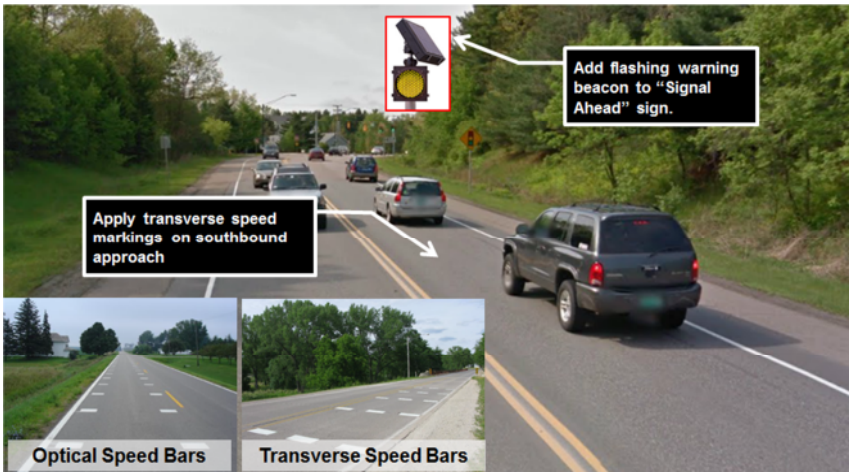
## ALTERNATIVE 1: SHORT-TERM OPERATIONAL IMPROVEMENTS

A set of short-term operational improvements were identified for implementation in the next 1-3 years to help address existing congestion and safety issues until the longer-term improvements can be implemented along the corridor.

The short-term operational improvements include the following elements:

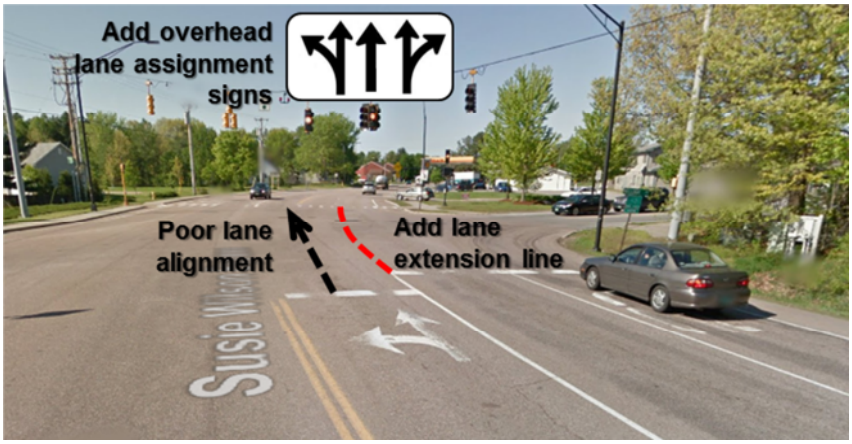
- Install video detection and adaptive signal controllers at the five signalized intersections along Susie Wilson Road from Kellogg Road to VT 15. These units should also be tied into the adaptive controllers recently installed at the VT 2A/Susie Wilson Road/VT 289 signals.
- Install a flashing warning beacon and transverse speed markings on the southbound approach to the Susie Wilson Road/Kellogg Road intersection (see Figure 25).

**FIGURE 25: SOUTHBOUND APPROACH TO KELLOGG ROAD SAFETY IMPROVEMENTS**




- Install a lane extension line to the southbound through movement through the Susie Wilson Road/Kellogg Road intersection. Supplement this lane extension line with an overhead lane assignment sign (see Figure 26 below).

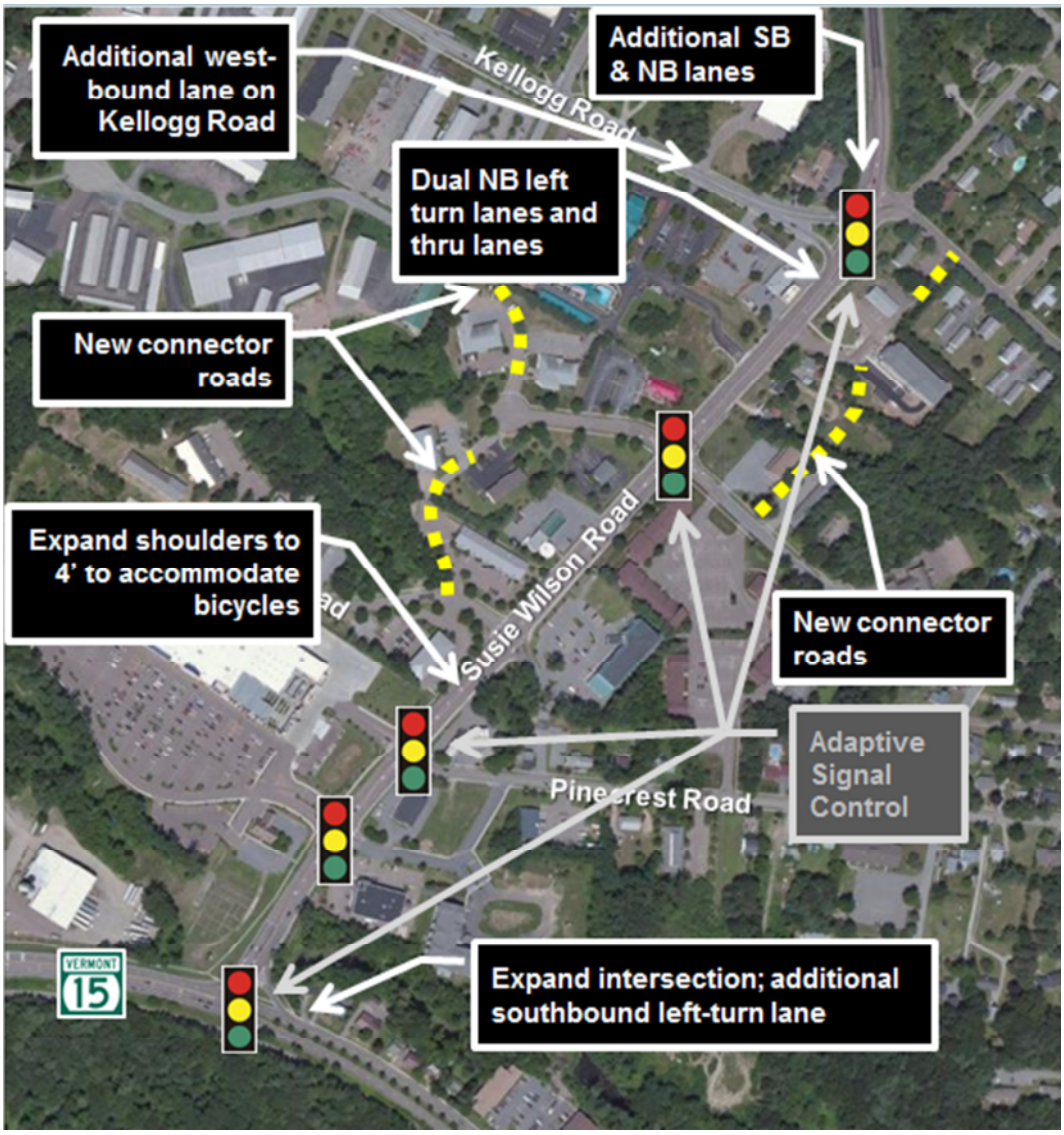
**FIGURE 26: ADDITIONAL SOUTHBOUND APPROACH TO KELLOGG ROAD SAFETY IMPROVEMENTS**



## ALTERNATIVE 2: SIGNALIZED IMPROVEMENTS PLUS WIDENED SUSIE WILSON ROAD/VT 15 INTERSECTION

An overview of the full set of Alternative 2 improvements in shown in Figure 27. The specific recommendations are described in more detail below the figure.

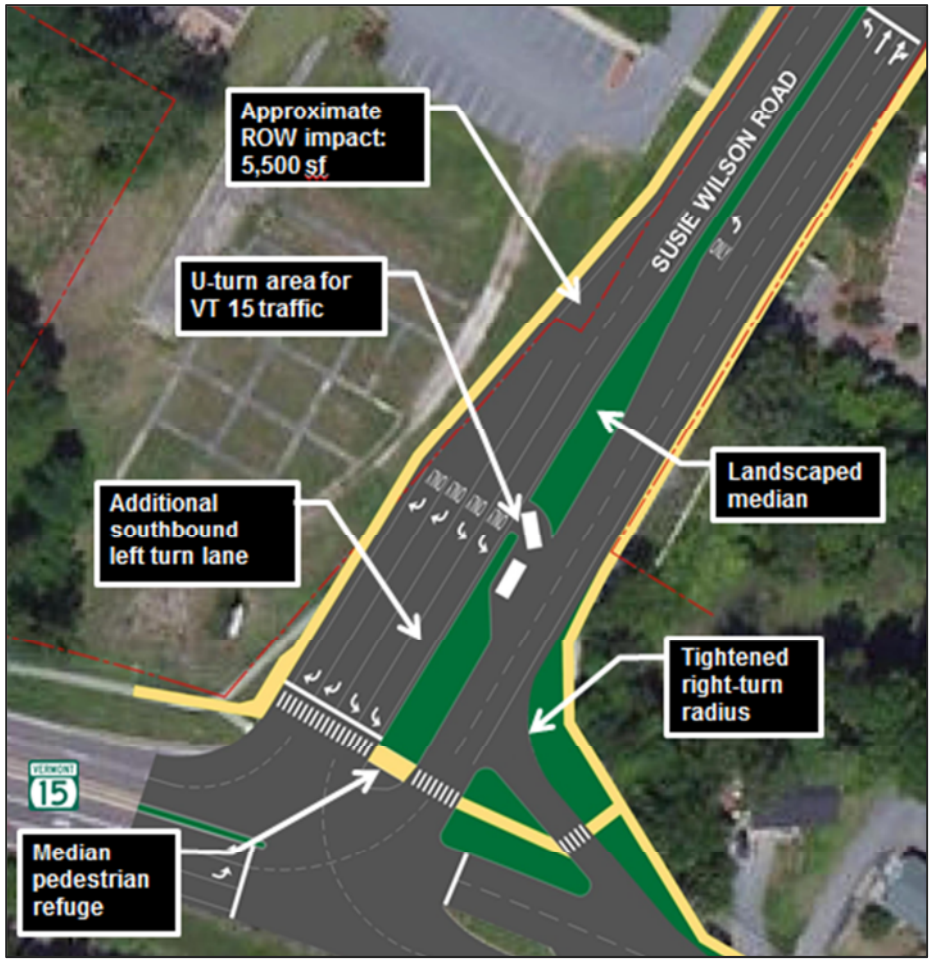
**FIGURE 27: ALTERNATIVE 2 IMPROVEMENTS OVERVIEW**



Alternative 2 includes the following components:

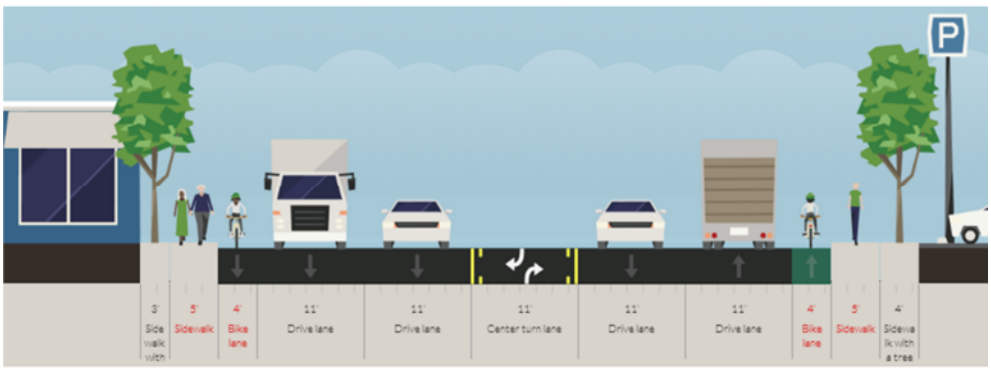
- Widening of the VT 15/Susie Wilson Road intersection to incorporate a second southbound left-turn lane (see Figure 28 below).

**FIGURE 28: VT 15 INTERSECTION IMPROVEMENTS - ALTERNATIVE 2**



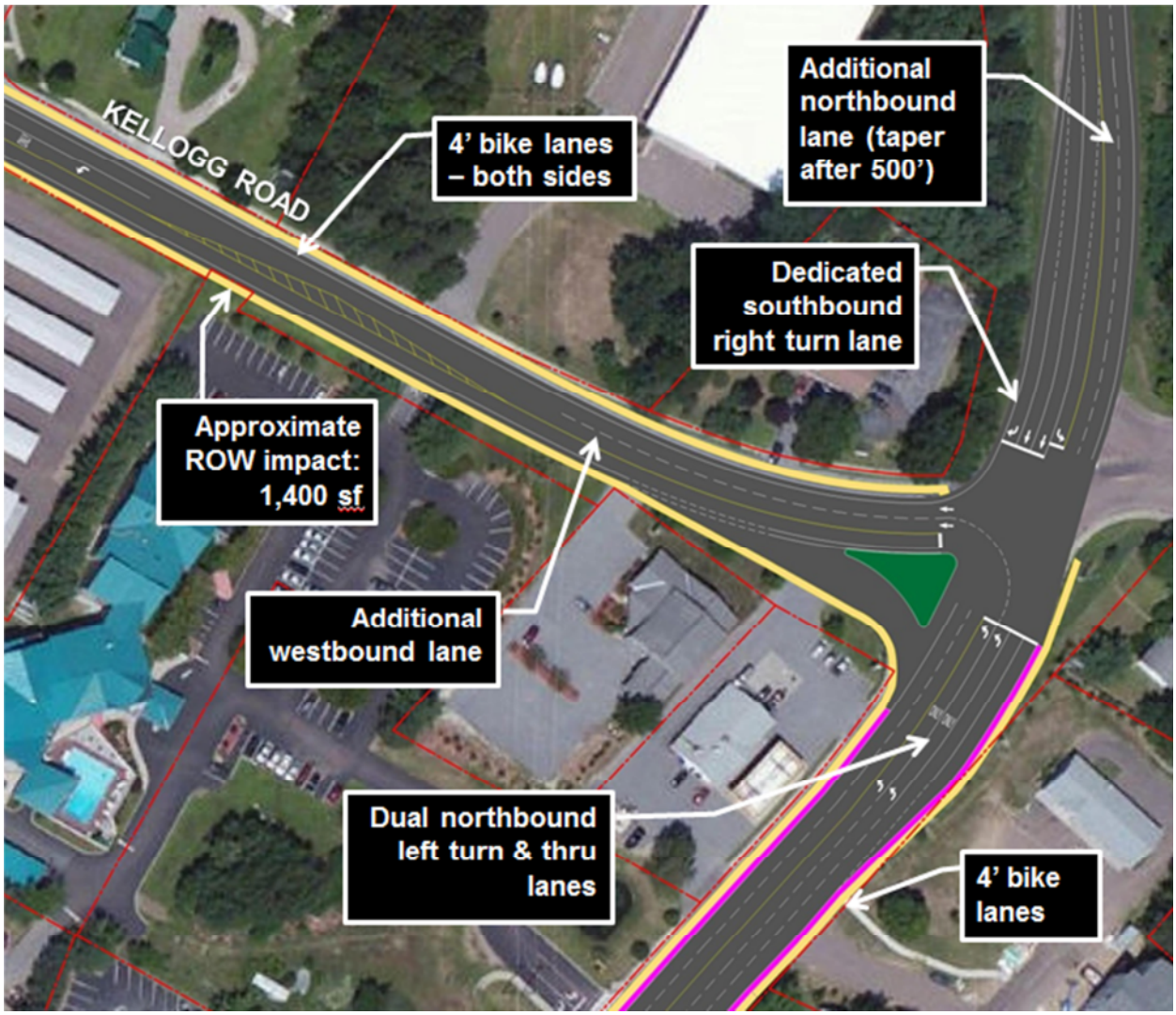

- Widening and reconstruction of Susie Wilson Road to normalize the cross-section and provide four-foot bicycle lanes in both directions (see Figure 29 below).

**FIGURE 29: ALTERNATIVE 2 SUSIE WILSON ROAD CROSS-SECTION (74' CURB-TO-CURB)**



- New internal connector roads to enhance connectivity between lots and allow some portion of local trips to take place off of Susie Wilson and Kellogg Roads.
- Widening of the Susie Wilson Road/Kellogg Road intersection to add an additional northbound left turn lane and through lane as well as an additional southbound through lane (see Figure 30).

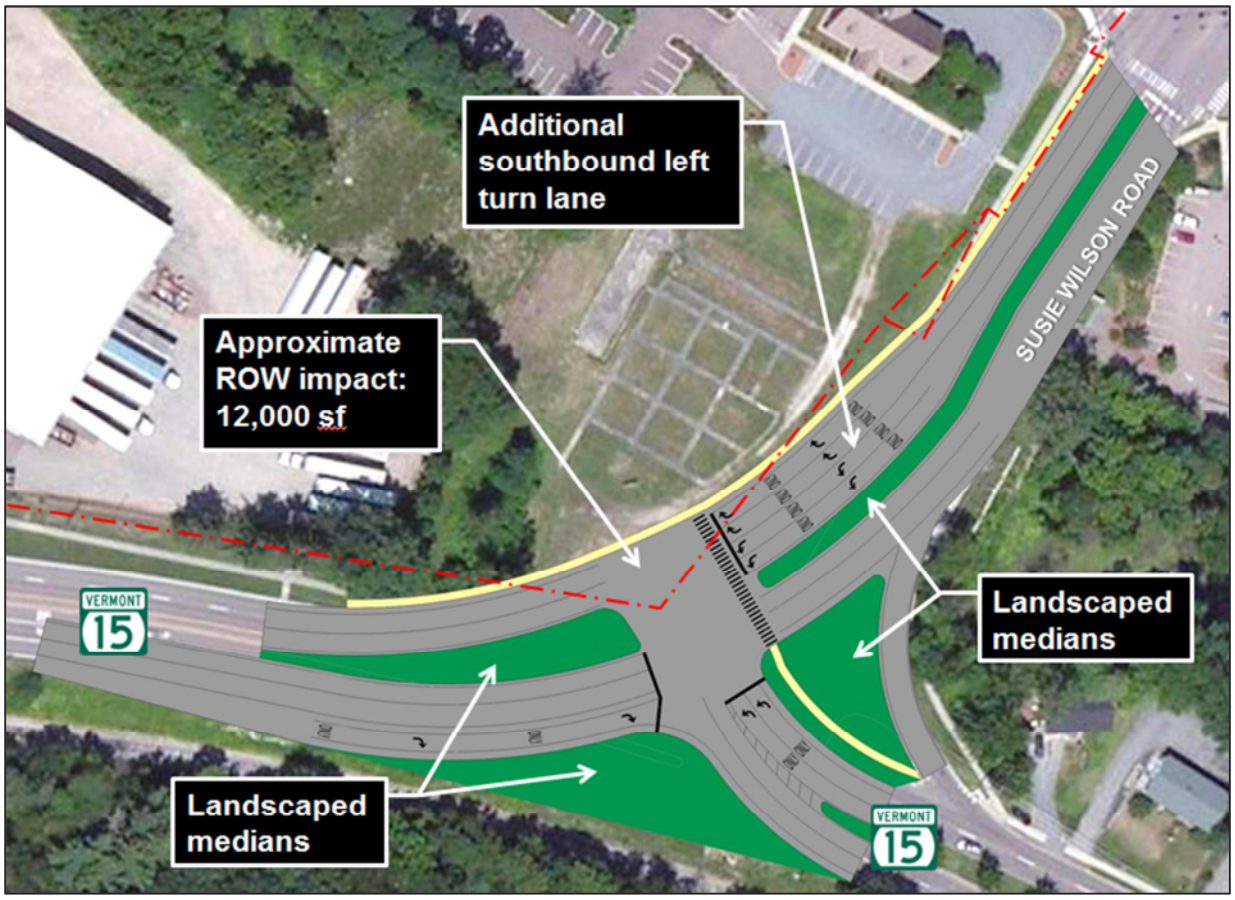
**FIGURE 30: ALTERNATIVE 2 KELLOGG ROAD INTERSECTION IMPROVEMENTS**



## ALTERNATIVE 3: SIGNALIZED IMPROVEMENTS PLUS RECONFIGURED SUSIE WILSON ROAD/VT 15 INTERSECTION

Alternative 3 differs from Alternative 2 only at the Susie Wilson Road/VT 15 intersection. While Alternative 2 maintains the overall Susie Wilson/VT 15 intersection configuration and simply adds a second southbound left turn lane, Alternative 3 involves reconfiguring the entire intersection to make Susie Wilson Road flow directly into VT 15 west of the intersection. This reconfiguration better accommodates the heaviest traffic flows by shifting them from left- and right-turns to through movements. This reconfiguration would "T" VT 15 east of the intersection into Susie Wilson Road.

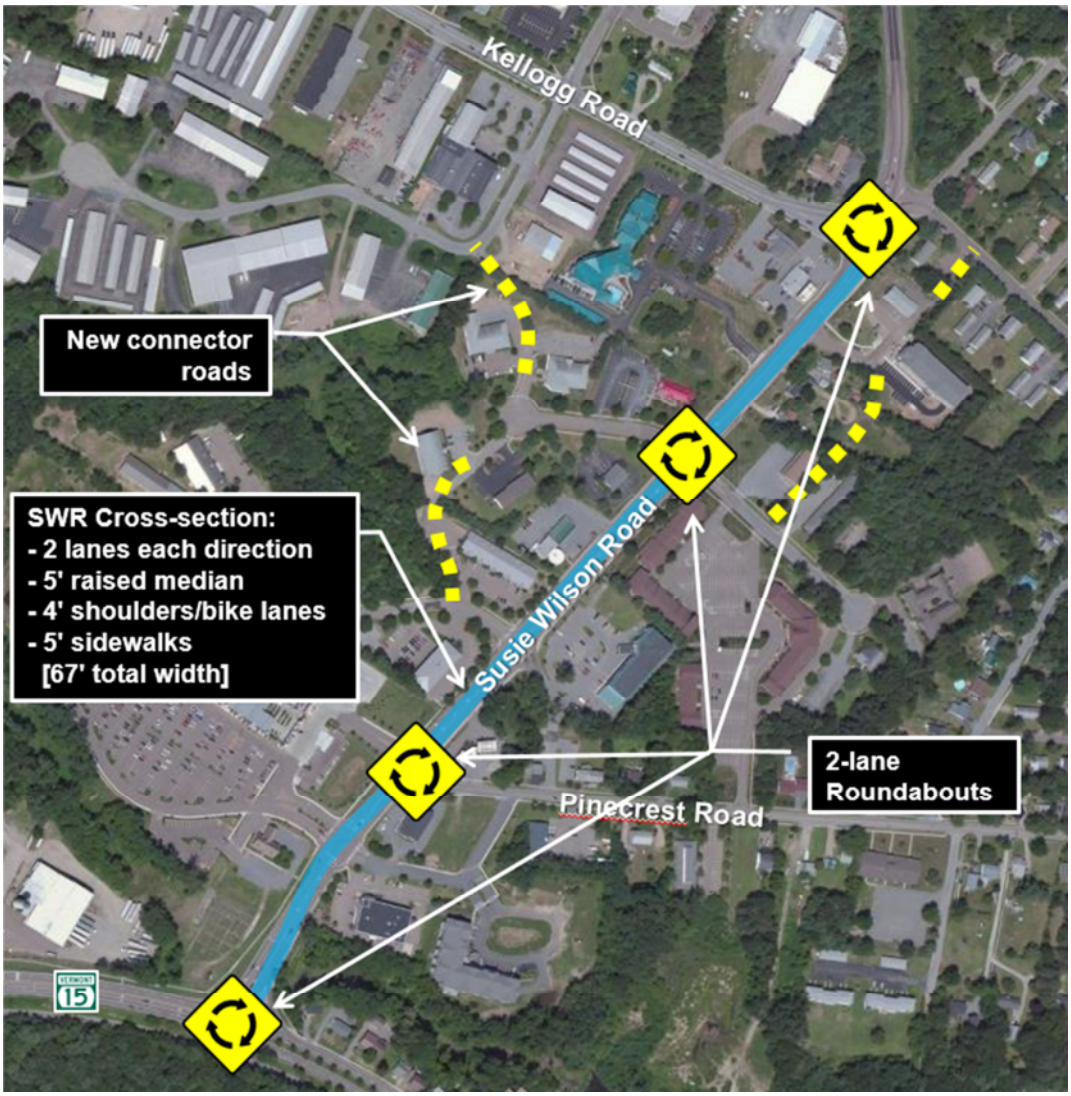
**FIGURE 31: REALIGNMENT OF SUSIE WILSON ROAD AND VT 15**



## ALTERNATIVE 4: ROUNDABOUT CORRIDOR

Alternative 4 transforms Susie Wilson Road between VT 15 and Kellogg Road into a roundabout corridor. As shown in the figure below, this alternative consists of four two-lane roundabouts along the Susie Wilson Road corridor – with roundabouts located at VT 15, Pinecrest Road, David Drive, and Kellogg Road. In coordination with the roundabouts, this alternative would include a raised central median, effectively eliminating all left-turns from the corridor. All turns in and out of minor streets and driveways would be right turns, with drivers provided the opportunity to make u-turns at upstream roundabouts to access destinations on the left side of the street. The elimination of the left turns (and fifth travel lane) creates space within the existing curb-to-curb width to provide four-foot bicycle lanes in each direction.

**FIGURE 32: ALTERNATIVE 4 IMPROVEMENTS OVERVIEW**



## 4.3 | EVALUATION OF ALTERNATIVES

### TRAFFIC FLOW (2030 NO BUILD VS. BUILD CONGESTION RESULTS)

Traffic volumes were grown to 2022 and 2030 Design Hour conditions using a combination of background growth rates and forecasted growth in the CCRPC Regional Travel Demand Model. The operational performance of each alternative was evaluated and is presented below in Table 8

**TABLE 8: CONGESTION ANALYSIS**

| | 2022 AM Peak Hour | | | | | | 2030 AM Peak Hour | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No Build | | | Alternative 1 - Short Term | | | No Build | | | Alternative 2 - Signals | | | Alternative 3 - Signals + Realignment | | | Alternative 4 - Roundabouts | | |
| Signalized Intersections | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c |
| Susie Wilson Rd/Kellogg Rd | C | 23 | 0.88 | C | 21 | 0.91 | C | 31 | 0.98 | C | 25 | 0.86 | C | 25 | 0.86 | C | 18 | 0.92 |
| Susie Wilson Rd/David Dr | A | 9 | 0.61 | A | 7 | 0.61 | A | 9 | 0.65 | A | 8 | 0.65 | A | 8 | 0.65 | A | 6 | 0.64 |
| Susie Wilson Rd/Pinecrest Dr | A | 10 | 0.67 | A | 7 | 0.67 | B | 11 | 0.72 | A | 9 | 0.72 | A | 9 | 0.72 | B | 13 | 0.90 |
| Susie Wilson Rd/Joshua Way | B | 15 | 0.72 | B | 14 | 0.72 | B | 19 | 0.77 | B | 17 | 0.77 | B | 17 | 0.77 | | | |
| Susie Wilson Rd/VT 15 | C | 26 | 0.88 | C | 23 | 0.88 | C | 29 | 0.93 | C | 24 | 0.93 | C | 21 | 0.81 | F | >100 | 1.55 |

| | 2022 PM Peak Hour | | | | | | 2030 PM Peak Hour | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No Build | | | Alternative 1 - Short Term | | | No Build | | | Alternative 2 - Signals | | | Alternative 3 - Signals + Realignment | | | Alternative 4 - Roundabouts | | |
| Signalized Intersections | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c |
| Susie Wilson Rd/Kellogg Rd | F | 96 | 1.06 | F | 87 | 1.12 | F | >100 | 1.14 | C | 34 | 0.80 | C | 34 | 0.80 | F | 34 | 1.04 |
| Susie Wilson Rd/David Dr | A | 10 | 0.56 | A | 9 | 0.56 | A | 10 | 0.60 | A | 7 | 0.60 | A | 5 | 0.60 | A | 7 | 0.68 |
| Susie Wilson Rd/Pinecrest Dr | B | 12 | 0.71 | B | 11 | 0.71 | B | 13 | 0.76 | B | 16 | 0.76 | B | 13 | 0.76 | C | 22 | 0.98 |
| Susie Wilson Rd/Joshua Way | A | 10 | 0.68 | A | 9 | 0.68 | B | 11 | 0.73 | B | 12 | 0.73 | B | 10 | 0.73 | | | |
| Susie Wilson Rd/VT 15 | F | 104 | 1.03 | F | 93 | 1.03 | F | >100 | 1.10 | C | 29 | 0.91 | C | 29 | 0.89 | F | >100 | 1.75 |

As the above table shows, the No Build alternative continues to reflect poor traffic operations, particularly at the VT 15 and Kellogg Road intersections through the future analysis years. Alternatives 2 and 3 (i.e. the signalized alternatives) significantly enhance future traffic operations, improving the overall Level of Service at the Kellogg Road and VT 15 intersections from LOS from F to C during the PM peak hour. The roundabout alternative (Alternative 4) demonstrates relatively high delays and volume/capacity figures in 2030, with LOS F conditions reported at both the Kellogg Road and VT 15 intersections.

### ORDER OF MAGNITUDE COST ESTIMATE

Cost estimates were developed based on square foot unit costs of the various project elements. Table 9 below shows the overall estimated cost for design and construction of the the three alternatives. Further breakdown of these costs and assumptions can be found in **Appendix B.** The unit costs are based on past project experience in similar locations and provide a planning level construction cost estimate. These estimates do not include costs associated with obtaining any necessary rights-of-way.

**TABLE 9: ORDER OF MAGNITUDE COST ESTIMATE**

| ALTERNATIVE 1: SHORT TERM OPERATIONAL IMPROVEMENTS | ALTERNATIVE 2: SIGNAL IMPROVEMENTS | ALTERNATIVE 3: SIGNAL IMPROVEMENTS + RECONFIGURED VT 15 INTERSECTION | ALTERNATIVE 4: ROUNDABOUT IMPROVEMENTS |
|---|---|---|---|
| $310,000 | $3,190,000 | $7,360,000 | $13,660,000 |

## EVALUATION MATRIX

The Evaluation Matrix shown below in Figure 33 summarizes the relative performance of each alternative with respect to ability to meet the Purpose and Need Statement, environmental/cultural impacts, and potential permitting needs. Green shading indicates a positive improvement; red shading indicates potential impacts or characteristics that may trigger a permit. The Evaluation Matrix shows that the Short Term improvements (Alternative 1) address the stated purpose and needs and have limited impacts or permitting needs. The two signalized alternatives (Alternatives 2 and 3) both address the project purpose and needs, and have similar environmental/cultural and permitting impacts – with Alternative 3 having a significantly higher cost and roughly double the area of private property impacted than Alternative 2. The roundabout alternative (Alternative 4) is approximately twice the cost of Alternative 3, does not address the goal of improving congestion, and has relatively significant right-of-way impacts, when compared with the other alternatives.

**FIGURE 33: ALTERNATIVE EVALUATION MATRIX**

| | | No Build | Alternative 1 Short-Term Improvements | Alternative 2 Signals | Alternative 3 Signals + Realignment | Alternative 4 Roundabouts |
|---|---|---|---|---|---|---|
| COST | Preliminary Cost Estimate (final design, construction, inspection, contingency) | $0 | $310,000 | $3,190,000 | $7,360,000 | $13,660,000 |
| PURPOSE & NEED | Congestion/Level of Service | No Change | Improve | Improve+ | Improve+ | Worsen |
| | Bicycle Mobility | No Change | No Change | Improve | Improve | Improve |
| | Safety | No Change | Improve | Improve | Improve | Improve |
| | Economic Vitality | No Change | Improve | Improve | Improve | Mixed |
| IMPACTS | Agricultural Lands | No | No | No | No | No |
| | Archaeological | No | No | Potential | Potential | Potential |
| | Historic Structures/Sites | No | No | Potential | Potential | Potential |
| | Floodplain | No | No | No | No | No |
| | Rare, Threatened & Endangered | No | No | Yes | Yes | Yes |
| | Right of Way | No | No | Yes (6,000 sf) | Yes+ (13,000 sf) | Yes+ (50,000+ sf) |
| | Public Lands | No | No | No | No | No |
| | Wetlands | No | No | No | No | No |
| PERMITS | Act 250 | No | No | No | No | No |
| | 401 Water Quality | No | No | No | No | No |
| | 404 Corps of Engineers Permit | No | No | No | No | No |
| | Stream Alteration | No | No | No | No | No |
| | Conditional Use Determination | No | No | No | No | No |
| | Storm Water Discharge | No | No | Potential | Potential | Potential |
| | Shoreland Encroachment | No | No | No | No | No |
| | Endangered & Threatened Species | No | No | Yes | Yes | Yes |
| | VTrans ROW Permit | No | No | Yes | Yes | Yes |
| | State Historic Preservation Office Clearance | No | No | Potential | Potential | Potential |
| | NEPA Category | No | Categorical Exclusion | Categorical Exclusion | Categorical Exclusion | Categorical Exclusion |

## 4.4 | PUBLIC OUTREACH EFFORTS

A number of community meetings were held throughout the development of this study and scoping report. The following is a summary of meetings held for this project as pertaining to the Susie Wilson Road/Kellogg Road study area. **Appendix A** includes relevant meeting agendas, meeting notes, and outreach material regarding this project and meetings.

- **Local Concerns Meeting, June 27, 2013.** The Local Concerns Meeting was held to solicit input on ways to improve travel, safety and streetscapes in all three study areas. The meeting highlighted several issues along the Susie Wilson Road corridor, including:
  - The presence of a high Crash Location segment along Susie Wilson Road and the location and type of crashes along the corridor;
  - Potential internal and cross-lot connections;
  - Potential cross-section enhancements along Susie Wilson Road;
  - Intersection reconfiguration improvements at VT 15 and Kellogg Road; and
  - Potential cross-section enhancements along Kellogg Road.
- **Public Meeting - Alternatives Presentation, September 5, 2013**. Four action alternatives were developed in detail and the public was invited to attend a presentation of the alternatives at the Elley-Long Music Center. Each of the alternatives were presented and potential impacts of each alternative were discussed. The public input included the following:

- Include bicycle lanes on Susie Wilson Road to connect with bike path planned along VT 15
- Getting across the VT 15/Susie Wilson Road intersection is very dangerous for pedestrians.
- Vehicles turning right off of Susie Wilson Road onto VT15 drive right into bus stop. Consider moving the bus stop or providing the bus with a pull-off.
- Taking a left out of Ewing Place is extremely difficult. Would like a signal at Ewing Place intersection with Susie Wilson Road.

## 4.5 | PREFERRED ALTERNATIVE

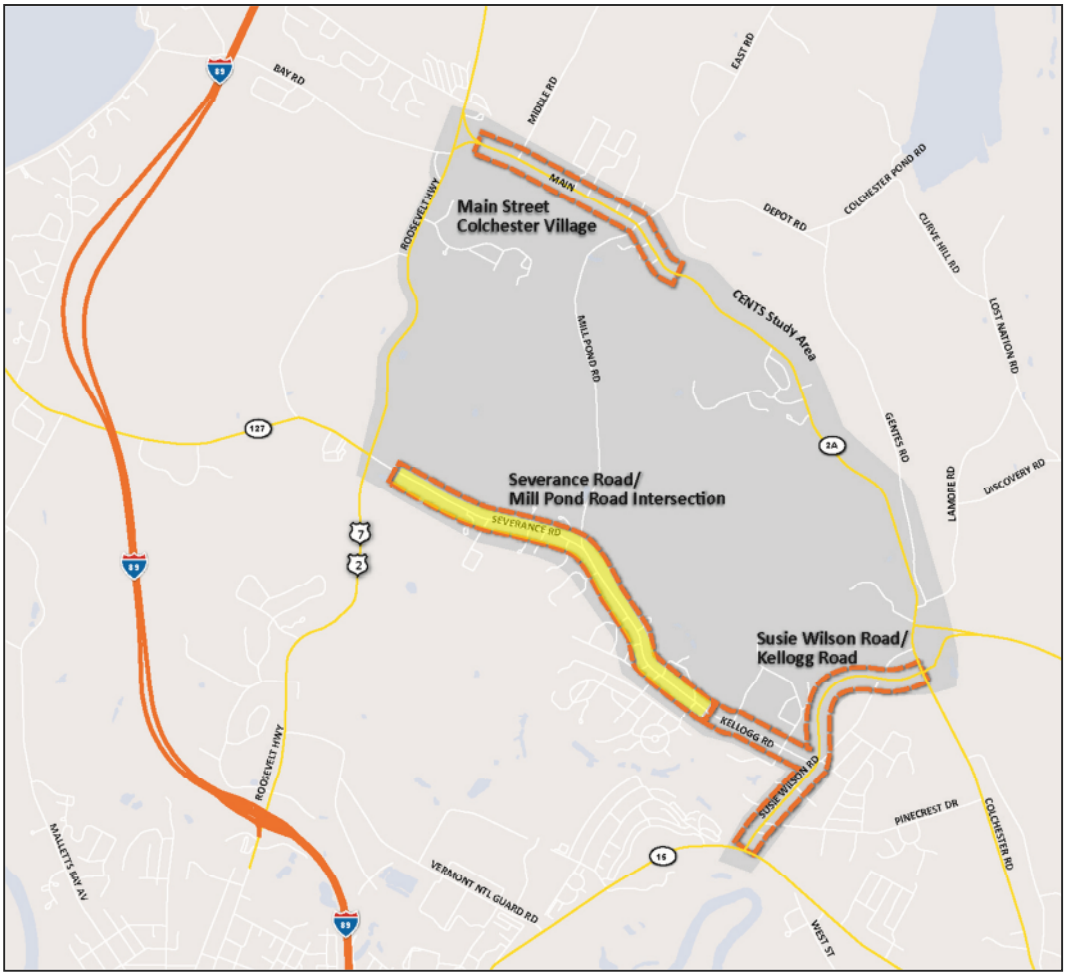
On November 18, 2013, the Town of Essex Selectboard endorsed the following preferred alternatives:

- Short-Term: Recommended Alternative 1 as presented above
- Mid/Long-Term: Recommended Alternative 2 (Signalized Alternative) with the following items to be addressed during the early stages of conceptual design:
  - Resolution of the slip lane and reverse movements on VT 15 from westbound to eastbound
  - Resolution of the appropriate location for the pedestrian crossing
  - Bicycle transition heading east on VT 15

# 5.0 SEVERANCE ROAD SCOPING STUDY

The Severance Road corridor runs approximately 2.5 miles from the eastern terminus of VT 127 at Severance Corners in Colchester east to Susie Wilson Road in Essex. Severance Road in Colchester is a two-lane (one lane in each travel direction) collector roadway with two to four foot shoulders surrounded by generally low-density residential land uses. At the western end of Severance Road is Severance Corners, a 278-acre Growth Center, with 417 dwelling units and 141,000 square feet of commercial space planned or already constructed. The Average Annual Daily Traffic (AADT) along Severance Road is approximately 8,000 vehicles per day.

**FIGURE 34: SEVERANCE ROAD STUDY AREA**




## 5.1 | PURPOSE AND NEED

### PROJECT PURPOSE

The purpose of the proposed action is to develop feasible alternatives that provide all corridor users with safe, efficient, and reliable transportation conditions. The purpose is comprised of the following objectives:

- Improve mobility and accessibility for the movement of people, goods, and services;
- Provide pedestrians and bicyclists of all user types connectivity to the local and regional network; and
- Minimize impacts in local communities.

## PROJECT NEED

### *Bicycle and Pedestrian Safety*

There are currently no continuous sidewalks on either side of Severance Road, and by and large, the shoulders are not wide enough to safely accommodate bicycles. As such, there is very little pedestrian activity present in the corridor, and bicycle activity is relegated to sharing travel lanes with vehicles.

### *Mill Pond Road Intersection Deficiencies*

There is only one controlled intersection along this stretch of Severance Road, which is located at Mill Pond Road. This is a one-way stop-controlled intersection, with a stop sign for southbound Mill Pond Road and no control for eastbound and westbound traffic on Severance Road. Existing and future projected operating conditions at this intersection indicate little delay, although field observations and community input have revealed that some delay is experienced due to vehicles waiting for a gap to make a left turn onto Mill Pond Road from Severance Road. The lack of a left-turn pocket to accommodate this movement poses a potential safety risk to all drivers during heavily congested travel periods.

The planned growth at the Severance Corners Growth Center, as well as regional growth in the Essex, Williston, and Colchester areas, will continue to put pressure on the Severance Road corridor. As this growth pushes drivers to seek alternatives to heavily congested east-west corridors from areas north and south of Severance Road, this corridor will experience heavier congestion during the peak periods, which will exacerbate the delay experienced at the Mill Pond Road intersection and will make it increasingly difficult for pedestrians and bicyclists to find the space to navigate safely through the corridor.

# 5.2 | ALTERNATIVES ASSESSMENT

## DEVELOPMENT OF ALTERNATIVES

Two build alternatives were developed in order to address the purpose and need of the proposed action. These alternatives were developed in coordination with project stakeholders and reflect community concerns voiced during public outreach activities conducted in late June 2013. The alternatives are composed of the following elements.

### *Intersection Improvements*

As stated previously, congestion was not shown to be a factor at the intersection of Severance Road and Mill Pond Road with existing traffic volumes or with planned growth in the foreseeable future. However, safety concerns at this location still need to be addressed.

A turn lane warrant analysis was conducted using existing and year 2030 projected traffic volumes for both the AM and PM peak hours. This analysis was conducted to establish

whether adding a left turn lane at the unsignalized intersection is warranted from a traffic operations standpoint. A significant advantage to adding a left turn lane to an unsignalized intersection is the reduced probability of accidents that result from removing conflicting left turns from the main traffic stream.

Harmelink's methodology for unsignalized intersections indicated that an eastbound left turn lane and a westbound right turn lane are warranted during the PM peak hour for existing conditions and in 2030. The analysis indicated that neither turn lane is warranted for the AM peak hour. The turn warrants were also conducted using a second method developed by Kikuchi and Chakroborty (1991), which modified the Harmelink equation to correct errors in its application of queuing theory.[4] This method provided identical results to the Harmelink method.

Guidance provided in the 2011 Green Book (FHWA, 2011) indicates that the storage length of the turn lane should be determined based on the number of turning vehicles likely to arrive in an average two-minute period within the peak hour. Based on this guidance, a 75-foot length is recommended for the left-turn pocket, which would accommodate three queued vehicles. VTrans' minimum-required length of 50 feet is proposed for the right-turn pocket because it is a free movement (no stop required).

### *Bicycle and Pedestrian Facilities*

As stated previously, there is currently a lack of adequate bicycle and pedestrian facilities in the Severance Road corridor. Current bicycle usage is limited to the paved roadway shoulders, which range in width from two to four feet. Pedestrians rarely travel through the corridor due to the sparse development pattern and the overall lack of walkable destinations in the area. Those pedestrians who do use the corridor are relegated to informal (i.e., not maintained) paths at the edge of the paved roadway. Bicycle and pedestrian facilities (e.g., sidewalks, bicycle lanes) are currently provided at both ends of the corridor at Severance Corners and at the Essex Town line, so filling this gap in the network will provide continuous and safe regional access for bicyclists and pedestrians.

The Official Map of the Town of Colchester, adopted in February 2004, indicates the Town's desire for a separated path along the south side of Severance Road through the length of the study corridor. Chapter 5 of the Vermont Pedestrian and Bicycle Facility Planning and Design Manual (VTrans 2002) indicates that a multi-use path should be 10-feet-wide with a minimum 7-foot-wide buffer. This cross section is intended to minimize conflicts between diverse path users, who travel at different speeds and require different amounts of space depending upon skill level and trip type. Additionally, a three-to five-foot-wide shoulder/recovery area is recommended at the outer edge of the path.

Improvements to on-road bicycle facilities are also desirable along Severance Road because experienced cyclists will likely prefer to be on the road to avoid potential conflicts with users

[4] Larson, Larry & Fred L. Mannering, Method for Prioritizing Intersection Improvements, January 1997, Washington State Transportation Commission, Department of Transportation and U.S. Department of Transportation, Federal Highway Administration, 2 June 2003, <http://www.wsdot.wa.gov/PPSC/Research/CompleteReports/WARD413_1IntersectionImprove.pdf>.

of the shared-use path, who are typically less experienced, operate at lower speeds, and require more space for maneuvering. According to Chapter 4 of the Vermont Pedestrian and Bicycle Facility Planning and Design Manual (VTrans 2002), a range of three to five feet is recommended for bicycle use of the paved shoulder. In the instance of Severance Road, four feet is recommended because of the dense vegetation in some areas, which is considered a "roadside barrier". Therefore, it is proposed that the shoulder be widened on both sides of the roadway to four feet in areas where it is currently less than that.

### *Elements Considered and Eliminated*

- **Sidewalks** – standard-width sidewalks were considered for both sides of the street to accommodate pedestrians. The Town of Colchester deemed this improvement unacceptable because it would be inferior to the multi-use path that is currently favored by the Town.
- **Spot-Shoulder Widening** – widened paved shoulder for eastbound approach to Mill Pond Road/Severance Road intersection. This improvement was suggested to accommodate vehicles travelling eastbound on Severance Road who circumvent stopped, left-turning vehicles. This improvement idea was eliminated once it was determined that a left-turn pocket is warranted at the intersection. The installation of a turn pocket at this location will allow eastbound vehicles to continue in the travel lane unhindered, as stopped, left-turning vehicles will be removed from the traffic stream.

## NO BUILD ALTERNATIVE

The No Build Alternative would leave the transportation system as it is today and would not include any of the intersection improvements or bicycle and pedestrian facility improvements described above. Because there are no planned or programmed transportation improvements slated for the Severance Road corridor in the foreseeable future, the transportation network in 2030 would be identical to that of today. Regional growth will bring more congestion to Severance Road, especially during the peak periods, which will exacerbate the delay experienced at the Mill Pond Road intersection and will make it increasingly difficult for pedestrians and bicyclists to find the space to navigate safely through the corridor.

## ALTERNATIVE 1: SOUTH-SIDE MULTI-USE PATH

Alternative 1 is shown below in Figure 35. This alternative would include the following elements:

- Intersection Improvements: New eastbound left-turn pocket and new westbound right-turn pocket at Mill Pond Road, as shown in Figure 37.
- Bicycle and Pedestrian Facilities:
  - Expanded paved shoulders to provide continuous four-foot-wide on-road bicycle facilities on both sides of the roadway

- New 10-foot-wide multi-use path on the south side of the roadway, with a buffer of seven feet between the path and the roadway and a shoulder/recovery area of three feet at the outer edge of the path

Figure 36 illustrates the typical street cross-section that is proposed for Severance Road in Alternative 1. Severance Road is a town-maintained road with a three-rod, or 49.5-foot, right-of-way and this alternative preserves the existing centerline. The section includes a 10-foot temporary easement for construction that would be lifted once construction of the multi-use path is complete. In specific instances where there are structural elements that would constrain this cross-section, the seven foot landscaped buffer can be reduced in width to decrease impacts on private property.

**FIGURE 35: ALTERNATIVE 1 – SOUTH-SIDE MULTI-USE PATH**

**FIGURE 36: ALTERNATIVE 1 – TYPICAL STREET CROSS-SECTION**

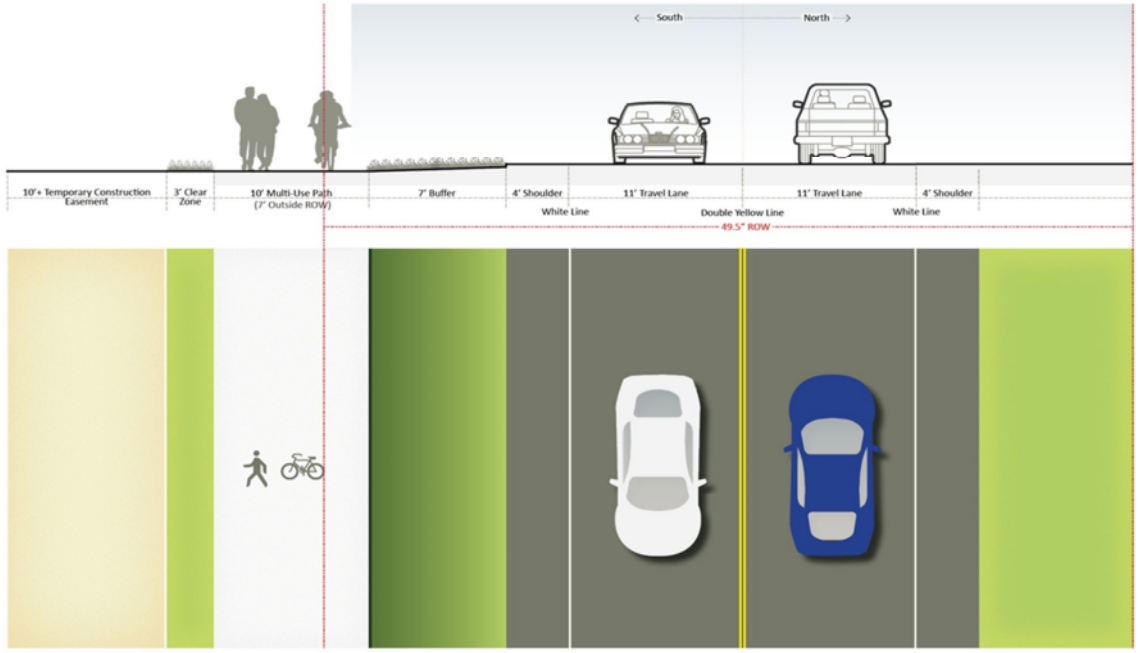



**FIGURE 37: ALTERNATIVE 1 – INTERSECTION DESIGN**

### *Capacity Analysis*

Table 10 below shows existing and projected 2013 delay and level-of-service (LOS) for the Mill Pond Road/Severance Road intersection during the AM and PM peak hours. Table 10 shows the results for the No Build Alternative (no improvements), and Table 11 provides the congestion results for Alternative 1.

**TABLE 10: CONGESTION ANALYSIS FOR SEVERANCE ROAD/MILL POIND ROAD – NO BUILD**

| | AM Peak Hour | | | | | | PM Peak Hour | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015 | | | 2030 | | | 2015 | | | 2030 | | |
| Unsignalized Intersections | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c |
| Severance Road/Mill Pond Road | | | | | | | | | | | | |
| EB, along Severance Rd | A | <1 | 0.02 | A | <1 | 0.02 | A | 2 | 0.07 | A | 2 | 0.09 |
| WB, along Severance Rd | A | <1 | 0.21 | A | <1 | 0.26 | A | <1 | 0.31 | A | <1 | 0.37 |
| SB, exiting Mill Pond Rd | C | 20 | 0.48 | E | 48 | 0.80 | C | 17 | 0.17 | C | 21 | 0.25 |

**TABLE 11: CONGESTION ANALYSIS FOR SEVERANCE ROAD/MILL POIND ROAD – ALTERNATIVE 1**

| | AM Peak Hour | | | | | | PM Peak Hour | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015 | | | 2030 | | | 2015 | | | 2030 | | |
| Unsignalized Intersections | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c |
| Severance Road/Mill Pond Road | | | | | | | | | | | | |
| EB, along Severance Rd | A | <1 | 0.02 | A | <1 | 0.02 | A | 1 | 0.07 | A | 2 | 0.09 |
| WB, along Severance Rd | A | <1 | 0.19 | A | <1 | 0.23 | A | <1 | 0.22 | A | <1 | 0.26 |
| SB, exiting Mill Pond Rd | C | 19 | 0.47 | E | 43 | 0.78 | C | 15 | 0.15 | C | 19 | 0.22 |

The operational improvements resulting from the added eastbound left-turn pocket and the westbound right-turn pocket are as follows:

- Eastbound approach: no change
- Westbound approach: 10-12% improvement in V/C during the AM Peak; 29-30% improvement during the PM Peak; no change in delay
- Southbound approach: 2% improvement in V/C and 5-10% improvement in delay during the AM Peak; 12% percent improvement in V/C and 10-12% improvement in delay during the PM Peak

As there was very little delay to begin with at this intersection, it is not surprising that there was no change to operating conditions in the eastbound approach. As stated previously, the introduction of a left-turn pocket at this location was for safety reasons and not to improve intersection operations. Modest improvements are projected for the PM Peak hour for the other two intersection approaches (westbound and southbound), while the AM Peak hour is projected to benefit less from the proposed intersection improvement elements.

The capacity analysis for Alternative 2 (below) is the same as that presented for Alternative 1, because both alternatives are comprised of the same intersection improvement elements.

## ALTERNATIVE 2: NORTH-SIDE MULTI-USE PATH

This alternative has similar elements to those described for Alternative 1. The primary difference is that the multi-use path would be located on the north side of the roadway instead of the south side. Although locating the facility on the north side of the roadway is inconsistent with the Town of Colchester's vision, it was selected for study in the event that

potential environmental impacts or barriers are found that make a location on the south side of the roadway infeasible.

**ALTERNATIVE 2 WOULD INCLUDE THE FOLLOWING ELEMENTS:**

- Figure 40. A colored pavement crosswalk would be added for pedestrians crossing Mill Pond Road along the north side of Severance Rd.
- Bicycle and Pedestrian Facilities:
  - Expanded paved shoulders to provide continuous 4-foot-wide on-road bicycle facilities on both sides of the roadway
  - New 10-foot-wide multi-use path on north side of the roadway, with a total buffer of 7 feet between the path and the roadway and a shoulder/recovery area of 3 feet at the outer edge of the path

The overall concept plan for Alternative 2 is shown below in Figure 38. Figure 39 illustrates the typical street cross-section that is proposed for Severance Road in Alternative 2, where there will be a modest amount of acquiring private property on the north side to gain the full 10-foot width needed for the shared use path. The section also includes a 10-foot temporary easement for construction that would be lifted once construction of the multi-use path is complete.

**FIGURE 38: ALTERNATIVE 2 – NORTH-SIDE MULTI-USE PATH**

**FIGURE 39: ALTERNATIVE 2 – TYPICAL STREET CROSS-SECTION**

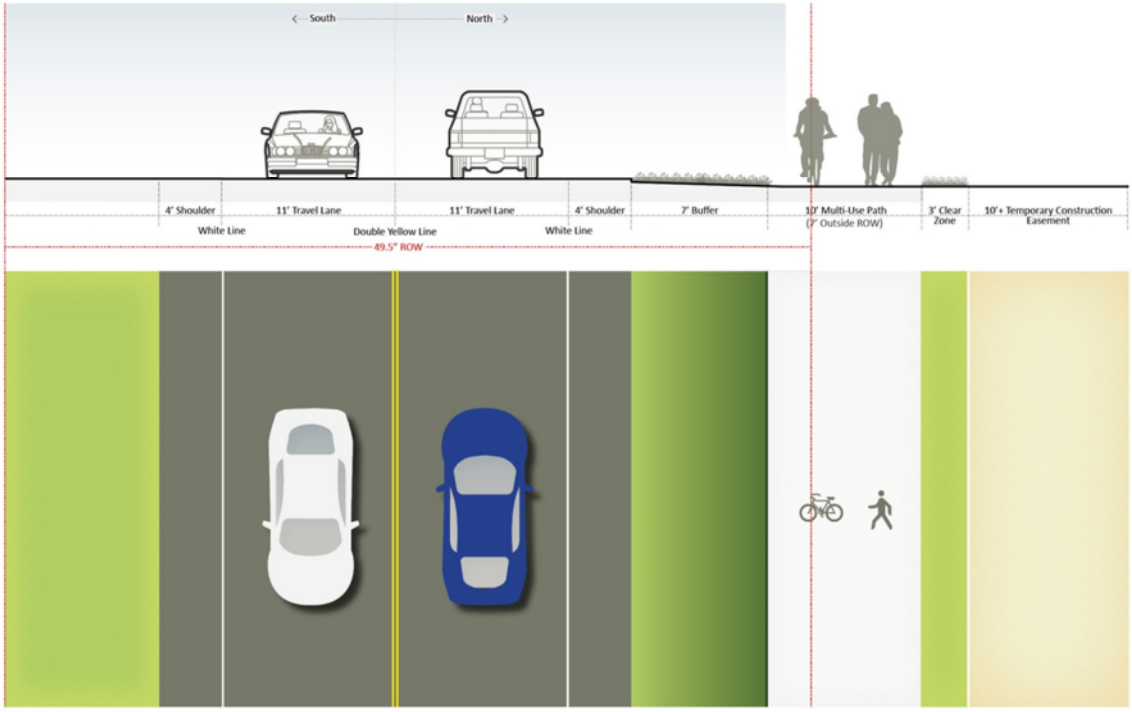
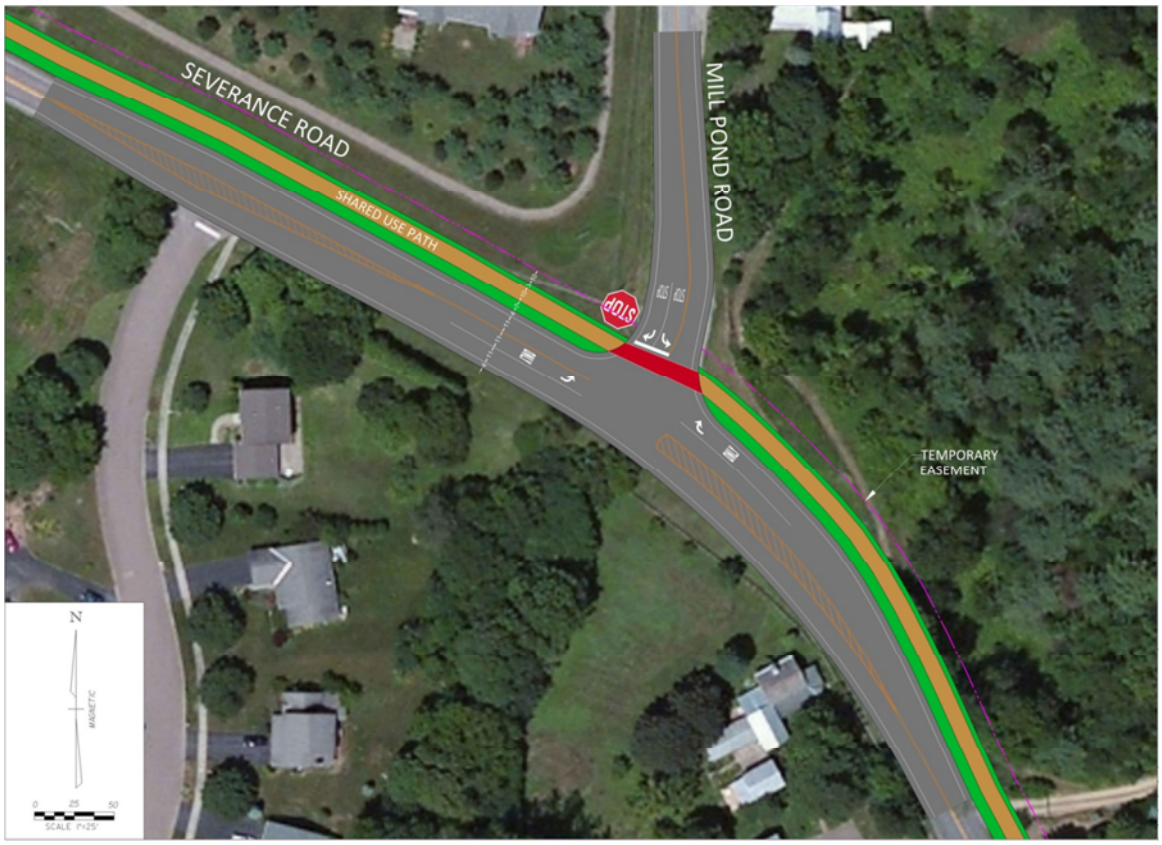



**FIGURE 40: ALTERNATIVE 2 – INTERSECTION DESIGN**



### *Capacity Analysis*

The capacity analysis for Alternative 2 is exactly the same as that presented for Alternative 1, as both alternatives are comprised of the same intersection improvement elements.

The tables below show existing and projected 2030 delay and level-of-service (LOS) for the Mill Pond Road/Severance Road intersection during the AM and PM peak hours. Table 12 shows the results for the No Build Alternative (no improvements), and Table 13 provides the congestion results for Alternative 2.

**TABLE 12: CONGESTION ANALYSIS FOR SEVERANCE ROAD/MILL POIND ROAD – NO BUILD**

| | AM Peak Hour | | | | | | PM Peak Hour | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015 | | | 2030 | | | 2015 | | | 2030 | | |
| Unsignalized Intersections | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c |
| Severance Road/Mill Pond Road | | | | | | | | | | | | |
| EB, along Severance Rd | A | <1 | 0.02 | A | <1 | 0.02 | A | 2 | 0.07 | A | 2 | 0.09 |
| WB, along Severance Rd | A | <1 | 0.21 | A | <1 | 0.26 | A | <1 | 0.31 | A | <1 | 0.37 |
| SB, exiting Mill Pond Rd | C | 20 | 0.48 | E | 48 | 0.80 | C | 17 | 0.17 | C | 21 | 0.25 |

**TABLE 13: CONGESTION ANALYSIS FOR SEVERANCE ROAD/MILL POIND ROAD – ALTERNATIVE 2**

| | AM Peak Hour | | | | | | PM Peak Hour | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015 | | | 2030 | | | 2015 | | | 2030 | | |
| Unsignalized Intersections | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c | LOS | Delay | v/c |
| Severance Road/Mill Pond Road | | | | | | | | | | | | |
| EB, along Severance Rd | A | <1 | 0.02 | A | <1 | 0.02 | A | 1 | 0.07 | A | 2 | 0.09 |
| WB, along Severance Rd | A | <1 | 0.19 | A | <1 | 0.23 | A | <1 | 0.22 | A | <1 | 0.26 |
| SB, exiting Mill Pond Rd | C | 19 | 0.47 | E | 43 | 0.78 | C | 15 | 0.15 | C | 19 | 0.22 |

The operational improvements resulting from the added eastbound left-turn pocket and the westbound right-turn pocket are as follows:

- Eastbound approach: no change
- Westbound approach: 10-12% improvement in V/C during the AM Peak; 29-30% improvement during the PM Peak; no change in delay
- Southbound approach: 2% improvement in V/C and 5-10% improvement in delay during the AM Peak; 12% percent improvement in V/C and 10-12% improvement in delay during the PM Peak

As there was very little delay to begin with at this intersection, it is not surprising that there was no change to operating conditions in the eastbound approach. As stated previously, the introduction of a left-turn pocket at this location was for safety reasons and was not intended to improve intersection operations. Modest improvements are projected for the PM Peak hour for the other two intersection approaches (westbound and southbound), while the AM Peak hour is projected to benefit less from the proposed intersection improvement elements.

## 5.3 | EVALUATION OF ALTERNATIVES

The following evaluation criteria were assessed to identify specific features of the proposed alternatives that would affect the selection of a preferred alternative. These criteria as they relate to each alternative are discussed below.

### *Satisfying the Project Purpose and Need*

The No Build alternative does not satisfy the purpose and need. The two action alternatives have been developed to address the issues identified by the purpose and need by proposing improvements to the Mill Pond Road intersection and to provide a multiuse path for bicyclists and pedestrians.

### *Traffic Flow*

The No Build alternative proposes no changes to the infrastructure and continues to pose potential safety and congestion issues, particularly as growth in this geographic region increases flows on east-west corridors and exacerbates the delays at the Mill Pond Road intersection. The additional turn lanes proposed in Alternatives 1 and 2 improve traffic flows and delays slightly, particularly during the PM Peak period.

### *Safety*

The safety criteria describe whether the alternative proposes features that will affect the number and severity of incidences along Severance Road and at the Mill Pond Road intersection. The No Build alternative does not address existing safety concerns and incident rates can be expected to be maintained or exacerbated with future increases in traffic volumes. The added left turn and right turn lane for vehicles heading towards Mill Pond Road can be expected to reduce the rate of accidents that result from removing turning movements from the main though-movement traffic flow.

Pedestrian safety is dramatically enhanced by providing a wide multiuse path with a significant landscaped buffer from the road along the majority of the path. The wide multiuse path also serves recreational bicyclists of all skill levels. A striped four foot bike lane in both travel directions along Severance Road will provide a safer and well-defined space for on-road cyclists.

### *Environment*

The Vermont Agency of Natural Resources maintains the National Resource Atlas, which provides statewide geospatial information regarding the following resource types:

- Waste Management
- Fish and Wildlife
- Watershed Protection
- Geology
- Drinking Water and Groundwater Protection
- Forest Parks and Recreation

A review of identified resources along Severance Road in Colchester with a focus on the area of potential impact of the various alternative elements yielded several resources, which are shown below in Table 14. The majority of threatened and rare plants are located on the north side of Severance Road, which means that a multi-use path located on the north side of the roadway (Alternative 2) would be more likely to affect these resources than a similar facility located on the south side of the roadway (Alternative 1). The Class 2 Wetlands

(cluster of 5 sites) are located on the south side of Severance Road; however, the boundary of the nearest one is located approximately 75 feet south from the center of the roadway, which is beyond the reach of any of the alternative elements being considered by this scoping study.

**TABLE 14: SEVERANCE ROAD NATURAL RESOURCES**

| | RESOURCE | LOCATION | OTHER INFORMATION |
|---|---|---|---|
| 1 | State Threatened Plant | Liberty Lane to Essex Town Line; north side of Severance Road | Last identified in 1999 |
| 2 | Rare Plant | Wall Street; south side of Severance Rd | Last identified in 2003 |
| 3 | Uncommon Species | Woodrose Lane; north side of Severance Road | Vascular Plant last identified in 1990 |
| 4 | Class 2 Wetlands | Western end of corridor near US 2; south side of Severance Road | Series of 5 sites totaling 2.4 acres |

In summary, the natural resource with the highest likelihood of being impacted by the build alternatives would be three different plants with different levels of protection. Further investigation is necessary to determine the name and sensitivity of each plant species. Alternative 2 would likely cause the greatest potential risk to these resources.

**FIGURE 41: SEVERANCE ROAD CORRIDOR ENVIRONMENTAL RESOURCES**


### *ROW Impacts*

The No Build alternative proposes no new infrastructure, and therefore does not create any impact to the ROW. Alternatives 1 and 2 will require ROW acquisition for construction and

an additional 10-foot temporary construction easement. Alternative 2 will likely require additional ROW to grade the slope or add a retaining wall due to topographical challenges on the north side.

### *Constructability*

Constructability refers to the design and construction complexity that can be expected due to construction activities. The No Build alternative proposes no infrastructure, so this criterion is not applicable. The widened intersection at Mill Pond Road will likely impact through and turning traffic during construction activity. In Alternative 2, topographical challenges on the north side may require grading of the slope or the addition of a retaining wall, which will involve greater design complexity and increase the cost of the project.

### *Order of Magnitude Cost Estimate*

Cost estimates were developed based on square foot unit costs of the various project elements. Table 18 shows the overall estimated cost for design and construction of the No Build and the two alternatives. Further breakdown of these costs and assumptions is listed in **Appendix B.** The unit costs are based on past project experience in similar locations and is meant to be a planning level cost estimate, which includes a 25% contingency. These estimates do not include costs associated with obtaining any necessary rights-of-way. Additional detail will be used as a preferred alternative is designed and developed into a full construction plan, with more detailed cost estimates.

**TABLE 15: ORDER OF MAGNITUDE COST ESTIMATE**

| NO BUILD ALTERNATIVE | ALTERNATIVE 1: SOUTH-SIDE MULTI-USE PATH | ALTERNATIVE 2: NORTH-SIDE MULTI-USE PATH |
|---|---|---|
| $0 | $2,420,000 | $2,380,000 |

## EVALUATION MATRICES

The Evaluation Matrix shown below in Table 16 was prepared to summarize the conclusions of the Evaluation Criteria discussion. Green shading indicates a positive improvement; red shading indicates potential impacts or characteristics that may trigger a permit.

**TABLE 16: SEVERANCE ROAD - EVALUATION MATRIX**

| | | No Build | Alternative 1<br>South Side Path | Alternative 2<br>North Side Path |
|---|---|---|---|---|
| COST | Preliminary Cost Estimate<br>(final design, construction, inspection, contingency) | $0 | Intersection Widening: $272,250<br>Shared-Use Path + Shoulder Widening = $1,829,125<br>**Total = $2.42M** | Intersection Widening: $272,250<br>Shared-Use Path + Shoulder Widening = $1,795,000<br>**Total = $2.38M** |
| PUPRPOSE & NEED | Bicycle and Pedestrian Safety | Worsen | Improve | Improve |
| | Intersection Deficiencies | Worsen | Improve | Improve |
| TOWN CONFORMANCE | Consistency with Town Plan and Community Vision | No Change | Yes | No |
| IMPACTS | Agricultural Lands | No | No | No |
| | Archaeological | No | No | No |
| | Historic Structures/Sites | No | No | No |
| | Floodplain | No | No | No |
| | Rare, Threatened & Endangered | No | Yes | Yes |
| | Right of Way | No | Permanent: Moderate<br>Temporary: Moderate | Permanent: Moderate<br>Temporary: High |
| | Relocate Utilities | No | 27 Poles | 20 Poles |
| | Public Lands | No | No | No |
| | Class II Wetlands | No | Potential Buffer Intrusion | No |
| PERMITS | Act 250 | No | No | No |
| | 401 Water Quality | No | No | No |
| | 404 Corps of Engineers Permit | No | No | No |
| | Stream Alteration | No | No | No |
| | Conditional Use Determination | No | No | No |
| | Storm Water Discharge | No | Potential | Potential |
| | Shoreland Encroachment | No | No | No |
| | Endangered & Threatened Species | No | Yes | Yes |
| | VTrans ROW Permit | No | No | No |
| | State Historic Preservation Office Clearance | No | No | No |
| | NEPA Category | No | Categorical Exclusion | Categorical Exclusion |

## 5.4 | PUBLIC OUTREACH EFFORTS

A number of community meetings were held throughout the development of this study and scoping report. The following is a summary of meetings held for this project as pertaining to the Severance Road and Mill Pond Road intersection. Appendix A includes relevant meeting agendas, meeting notes, and outreach material regarding this project and these meetings.

- **Local Concerns Meeting, June 27, 2013.** The Local Concerns Meeting was held to solicit input on ways to improve travel, safety, and streetscapes in all three study areas. The meeting highlighted several issues along Severance Road and Mill Pond Road intersection, including:
  - Lack of safe pedestrian ways to connect residential neighborhoods along Severance Road; and
  - Lack of a safe bicycle facility that can accommodate a range of skill levels, including children who wish to bike in their own neighborhood.
- **Public Meeting - Alternatives Presentation, September 24, 2013**. Two action alternatives were developed in detail for Severance Road and the public was invited

to attend a presentation of the alternatives at a public Selectboard meeting in Colchester. Both action alternatives were illustrated in plan and section, and potential impacts of each alternative were discussed. Residents from neighborhoods along Severance Road expressed concern about impacts to their property in Alternative 1. The consultant team addressed this by reinforcing the possibility of reducing the landscaped buffer in order to accommodate any built structures that would fall within the planned shared use path alignment.

- **Alternatives Assessment Meeting, October 22, 2013.** The alternatives were brought before the Colchester Selectboard at a second alternatives assessment meeting. The discussion of the meeting focused on the benefits of each alternative, particularly the larger residential population on the south side of Severance Road and its alignment with the Town's desire for a separated path along the south side of the road.

## 5.5 | PREFERRED ALTERNATIVE

On November 12, 2013, the Colchester Selectboard selected and approved the preferred alternative, Alternative 1: South-side Multi-use Path. This was based on the feedback received at the alternatives presentation public meeting, where this was determined to provide the greatest improvements and fulfill the full project purpose and need with the least amount of physical impacts.

# 6.0 MAIN STREET COLCHESTER VILLAGE

As the historic center within the Town of Colchester, Main Street/Route 2A serves as a direct east-west link between Route 7 and I-89, and functions as a thriving village corridor, with local retailers and community-serving facilities interspersed among residential homes and recreational facilities. The length of the study corridor is 4650 feet, or 0.9 miles, from the Union Memorial School to Jocelyn Court, as shown in Figure 42.

With feedback from representatives of the Town of Colchester, including village residents, business stakeholders, and the public works director, as well as in consultation with the Chittenden County Regional Planning Commission (CCRPC), the following project purpose and needs statement was developed.

**FIGURE 42: MAIN STREET COLCHESTER VILLAGE STUDY CORRIDOR**


## 6.1 | PURPOSE AND NEED

### PROJECT PURPOSE

The purpose of the proposed action is to improve bicycle and pedestrian safety, as well as the village character along Main Street in Colchester Village. The project purpose is comprised of the following objectives:

- Reduce traffic conflicts at the intersection of Mill Pond Road, East Road, and Main Street.
- Improve pedestrian and bicycle safety and accessibility along Main Street Colchester Village.
- Minimize the negative impacts of truck traffic and noise along Main Street, particularly in the residential areas.
- Enhance the character and streetscape of Main Street to reflect a village destination.

## PROJECT NEED

The Main Street/Route 2A study area runs along an urban minor arterial corridor that stretches approximately 0.88 miles east-west between US 7/US2 and just to the east of Mill Pond Road/East Road. As of 2010, the Average Annual Daily Traffic (AADT) along Main Street in Colchester was approximately 9,700 vehicles, higher than the counts on US 7/US 2/Roosevelt Highway between Main Street and Severance Road.

Based on future year (2030) traffic growth rates obtained from the CCRPC regional TransCAD model, the traffic volume at the intersections of US 7/US 2 and Main Street, and Main Street and Mill Pond Road/East Road, is anticipated to grow 20% and 25%, respectively. This will increase the amount of vehicular congestion on Main Street, with delays at Main Street and Mill Pond Road/East Road estimated to function at LOS D in the AM Peak, and E in the PM Peak hour.

- **Traffic Flow at Main Street/Mill Pond Road/East Road Intersection** – Due to the poor sight lines on the approach to this intersection, particularly from northbound Mill Pond Road, this signalized intersection poses safety concerns for both vehicular and pedestrian traffic. Vehicles turning left from Main Street onto southbound Mill Pond Road cannot easily see oncoming traffic. The current signals were originally designed to be temporary and there is only one signal phase for both turning and through traffic.
- **Pedestrian Safety and Accessibility** –A curbed 4 foot sidewalk runs along the north side through the corridor, with an approximately 3 foot green buffer between the sidewalk and the roadway. Overland water flow is currently drained and absorbed in the grass buffer, but flooding issues along shoulders, side streets, and driveways result in icy conditions in the winter. Much of the existing four-foot wide sidewalk along the north side of Main Street between Union Memorial School and just west of East Road is in fair to poor condition, with segments in need of repair, and it does not meet ADA accessibility guidelines.
- **Bicycle Safety and Accessibility –**In the 2008 CCRPC Recommended On-Road Facilities Pedestrian & Bicycle Plan Update, Main Street/VT 2A is considered a "Common Route Not Designated" on-road bike facility. Currently, the narrow one- to two-foot shoulders offer little space for cyclists, and drivers must veer towards the center of the road to avoid cyclists, creating unsafe conditions for both drivers and cyclists.
- **Traffic Calming**– Many community-serving facilities line both sides of Main Street along the entire corridor, including small retailers, churches, civic buildings, a library, and a school. However, there are currently no crosswalks along the entire extent of the village center, and vehicular speeding is a key concern expressed by many community members. These factors serve to create an environment that is unsafe for pedestrians and points to a need for methods to calm traffic speeds.
- **Village Main Street Character –**The project area segment serves as a destination within the Town of Colchester, but does not presently have a distinguishing presence

along its Main Street. There is desire for the village center to have a more recognizable identity to alert travelers to its unique mixed-use character.

## 6.2 | ALTERNATIVES ASSESSMENT

Main Street is a VTrans-maintained state road with a three-rod, or 49.5-foot, right-of-way; two 11-foot lanes (one lane in each direction); and narrow one- to two-foot shoulders on both sides. The speed limit along the stretch within Colchester Village is 35 mph, with a 25 mph school zone in segments within 200 feet of the Union Memorial School. Utility and light poles alternate between the north and south sides of the road, roughly between three and eight feet off the edge of pavement. Considerations should be made for signage, mailboxes, and other vertical elements located presently within the landscaped buffer on the north side between the edge of the road and the existing sidewalk.

To address the purpose and needs of the project area, three build alternatives were developed, analyzed, and compared to the No Build alternative.

### *Intersection Improvements*

Given the projected delays and queues in the 2030 PM Peak traffic condition, a protected left turn lane on Main Street at the Mill Pond Road and East Road intersection is recommended for all three of the action alternatives, as shown in Table 17 comparing the No Build and Build alternatives. The left turn pockets, as well as protected left-turn phase for eastbound and westbound approaches, will increase vehicle safety and improve traffic flow. By giving the high volume eastbound left its own turn-lane and timed phase, it discourages cars from weaving out of their travel lane in order to bypass a car waiting to turn. In addition, it allows for better signal timing optimization for the eastbound and westbound through movements.

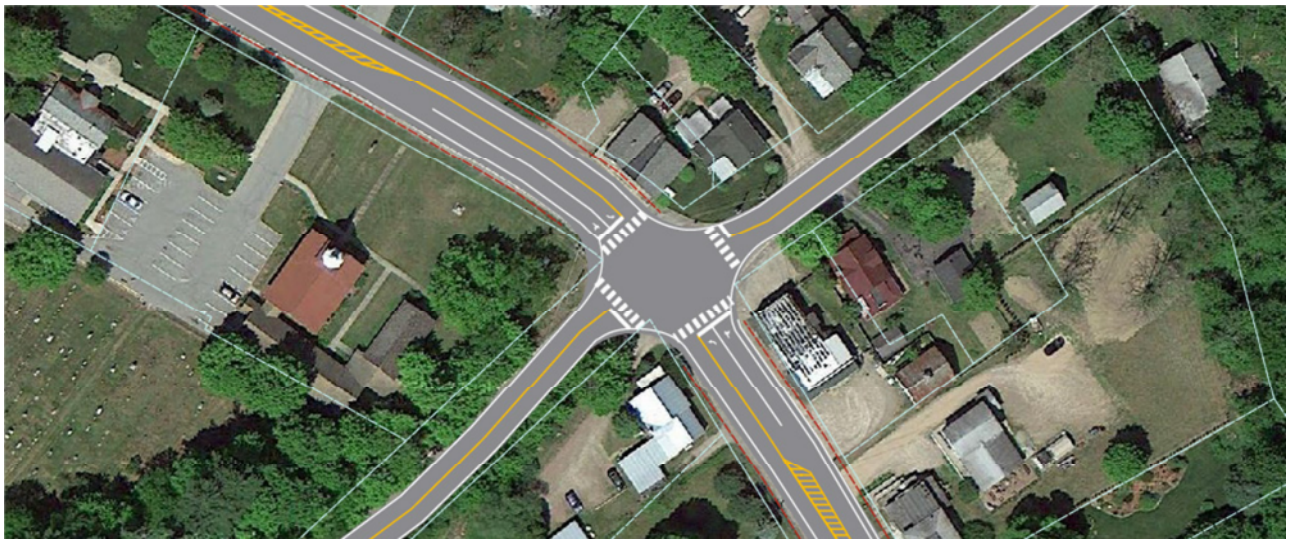
To enhance the traffic flow at the Main Street/Mill Pond Road/East Road intersection, new left-turn pockets will be added on Main Street in both eastbound and westbound directions. Based on guidance provided in the 2011 Green Book (FHWA, 2011), the storage length of the turn lane should be determined based on the number of turning vehicles likely to arrive in an average two-minute period within the peak hour. Based on this guidance, a 150 foot length is recommended for the eastbound left-turn pocket, which would accommodate six queued vehicles. The left-turn storage lane on the westbound side is recommended to be a maximum of 115 feet in length, since there were significantly fewer cars turning left from Main Street onto Mill Pond Road, but it should be given a slightly longer taper distance due to higher vehicle speeds arriving from the east.

One additional improvement proposed for this intersection is to replace the current temporary signals with permanent mast arms and add vehicle detection. Vehicle detectors can sense the presence of vehicles and activate a traffic light change. This would be useful at the Main Street/Mill Pond Road/East Road intersection during certain times, such as off-peak hours when there are fewer vehicles, as well as particular instances, such as detecting when a vehicle has entered a turn lane.

**TABLE 17: LOS, DELAY, AND QUEUES AT MAIN ST, MILL POND RD, AND EAST RD IN 2030 (PM PEAK)**

| | 2030 | | |
|---|---|---|---|
| | LOS | AVERAGE DELAY (SECONDS) | QUEUE (FEET) |
| 1. No Build, no detection | F | 100+ | Up to 140’ |
| 2. Optimize signals + detection, with dedicated left-turn pockets in both directions on VT 2A | E | 64 | Up to 37’ |

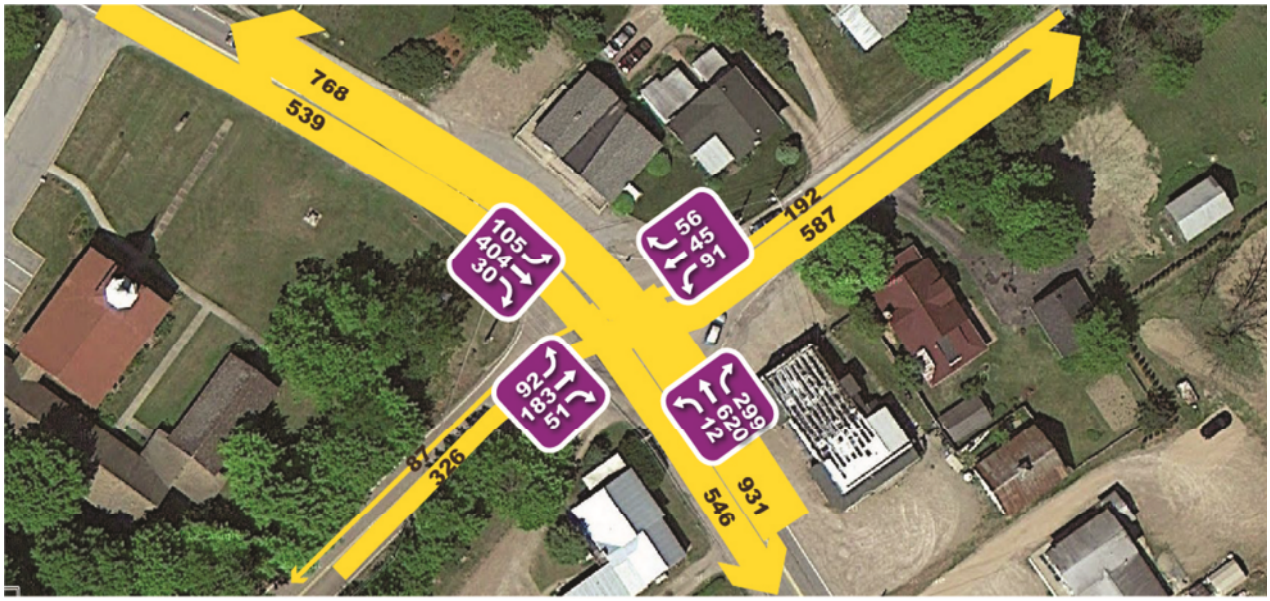
**FIGURE 43: ADDING TURN LANES**



## NO BUILD ALTERNATIVE

The No Build Alternative would leave the transportation system as it is today. Since there are no planned or programmed transportation improvements programmed for the study area in the foreseeable future, the transportation network in 2030 would be identical to that of today. Regional growth will continue to increase traffic along the corridor, especially during peak periods. This traffic growth will exacerbate the delays currently experienced in Colchester Village and will make it increasingly difficult for pedestrians and bicyclists to navigate safely through the corridor.

FIGURE 44: MAIN ST, MILL POND RD, AND EAST RD IN 2030 (PM PEAK)




## ALTERNATIVE 1: WALKABLE NEIGHBORHOOD

To address the project needs, Alternative 1 proposes a modest set of improvements that will help make Colchester Village a more walkable neighborhood, as shown in Figure 45. All existing utility poles and other street furniture remain as is and there are no changes to the existing roadway.

- **Traffic Flow at Main Street/Mill Pond Road/East Road Intersection**: To enhance the traffic flow at the Main Street/Mill Pond Road/East Road intersection, new left-turn pockets will be added on Main Street in both eastbound and westbound directions.
- **Pedestrian Accessibility:** Pedestrian accommodations, particularly handicap accessibility, are a key priority in this alternative. This alternative recommends replacing the existing poor condition sidewalk on the north side with a five foot concrete sidewalk.
- **Village Main Street Character –** Community members and stakeholders felt that Colchester Village should serve as a destination for the town and have the look and feel of a village main street. Strategies in this alternative include adding gateway treatments, such as banners, art, or colored intersection paving at both ends of the village center.

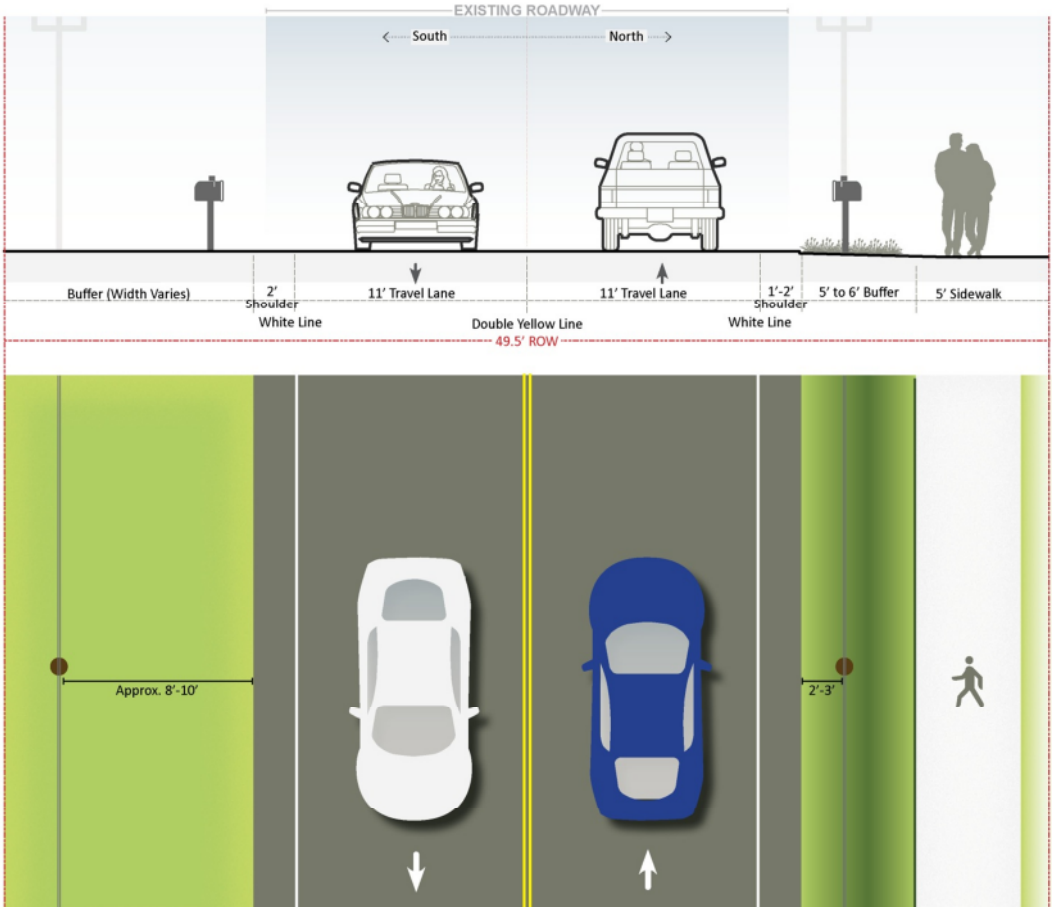
**FIGURE 45: ALTERNATIVE 1 – OVERALL RECOMMENDATIONS**


**FIGURE 46: ALTERNATIVE 1 - PROPOSED CHANGES ON MAIN STREET**

***Proposed Street Section***

Figure 47 illustrates the minimal changes proposed for the typical street section along Main Street for Alternative 1. The sidewalk will be widened to five feet in order to accommodate handicap accessibility. Drainage will continue to flow overland and be absorbed in the landscaped buffer. The roadway will remain the same, with 11-foot travel lanes in each direction and narrow shoulders. All utility poles remain in their existing locations. Utility poles are located on either the south or north side of Main Street, but not both. The street section shows how the utility poles may be accommodated in either north or south side situations.

**FIGURE 47: ALTERNATIVE 1, TYPICAL STREET SECTION**




## ALTERNATIVE 2: MAIN STREET CHARACTER

Alternative 2 proposes a robust set of improvements that will help bolster the Main Street character for Colchester Village, as shown in Figure 48. Depending on the location of existing street furniture, the centerline may shift up to two feet in order to accommodate four-foot bike lanes in each direction and a widened curbed sidewalk on the north side.

- **Traffic Flow at Main Street/Mill Pond Road/East Road Intersection**: As detailed earlier in this section, Alternative 2 recommends enhancing the traffic flow at the Main Street/Mill Pond Road/East Road intersection with new left-turn pockets on Main Street in both eastbound and westbound directions. This alternative also recommends realigning the intersection to improve the sight distances, particularly in the configuration of Mill Pond Road and East Road. Additionally, adding curbing to the stores on three of the four corners of this intersection will improve access management and prevent unpredictable vehicular movements.
- **Pedestrian Safety and Accessibility:** Pedestrian accommodations and handicap accessibility are provided by replacing the existing 4-foot sidewalk on the north side with a curbed five-foot concrete sidewalk and landscaped buffer between the sidewalk and the roadway. A closed drainage system would be installed on both sides of the roadway to collect and process stormwater flows and to prevent flooding and

icing issues on the pedestrian- and bike-ways. In addition to the intersection improvements detailed earlier in this section, Alternative 2 proposes adding pedestrian detection and signals to provide safer crossings at the Main Street/Mill Pond Road/East Road intersection. A leading pedestrian interval would give pedestrians a chance to safely cross ahead of traffic and make them more noticeable to drivers.

- **Bike Safety and Accessibility:** To create a safer bicycling environment, Alternative 2 recommends that the Main Street segment through Colchester Village become a "Designated On-Road Facility." Four-foot striped bike lanes in each direction can be accommodated within the existing right-of-way to provide a safe width for bicyclists to ride in a separated space from vehicle traffic. The striped bike lane would narrow to a shared lane with the travel lane upon approaching the Main Street/Mill Pond Road/East Road intersection.
- **Village Main Street Character –** To improve the presence of the Main Street character, Alternative 2 recommends adding gateway treatments, such as banners, art, or colored intersection paving at both ends of the village center to alert travelers that they are entering a distinct community corridor. Classic "Main Street"-style lighting along the northern edge of the sidewalk would add to a consistency in the character of this corridor and provide a safe and well-lit environment for pedestrians.

**FIGURE 48: ALTERNATIVE 2 – OVERALL RECOMMENDATIONS**

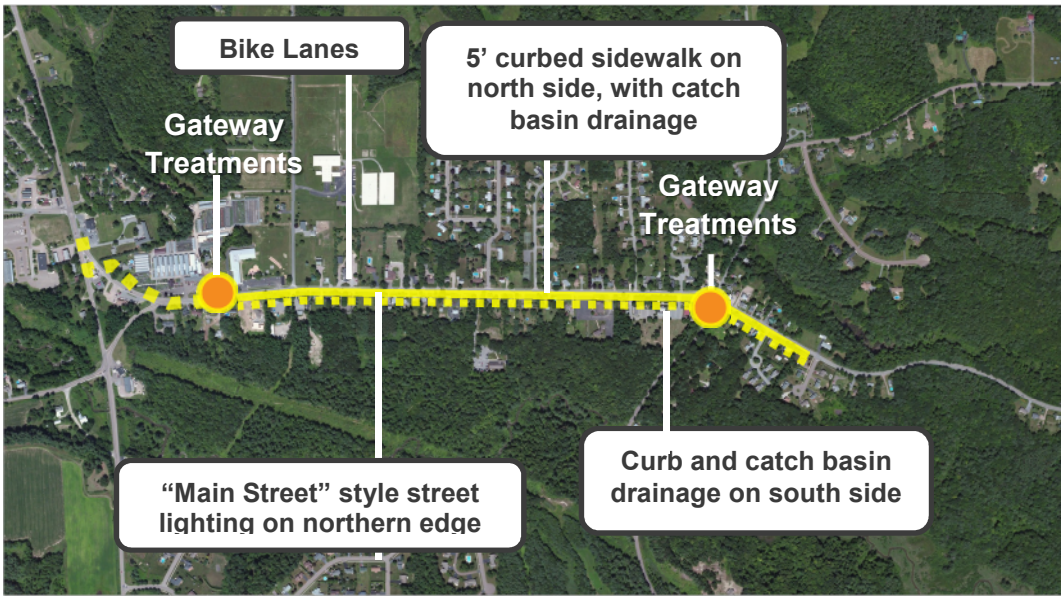


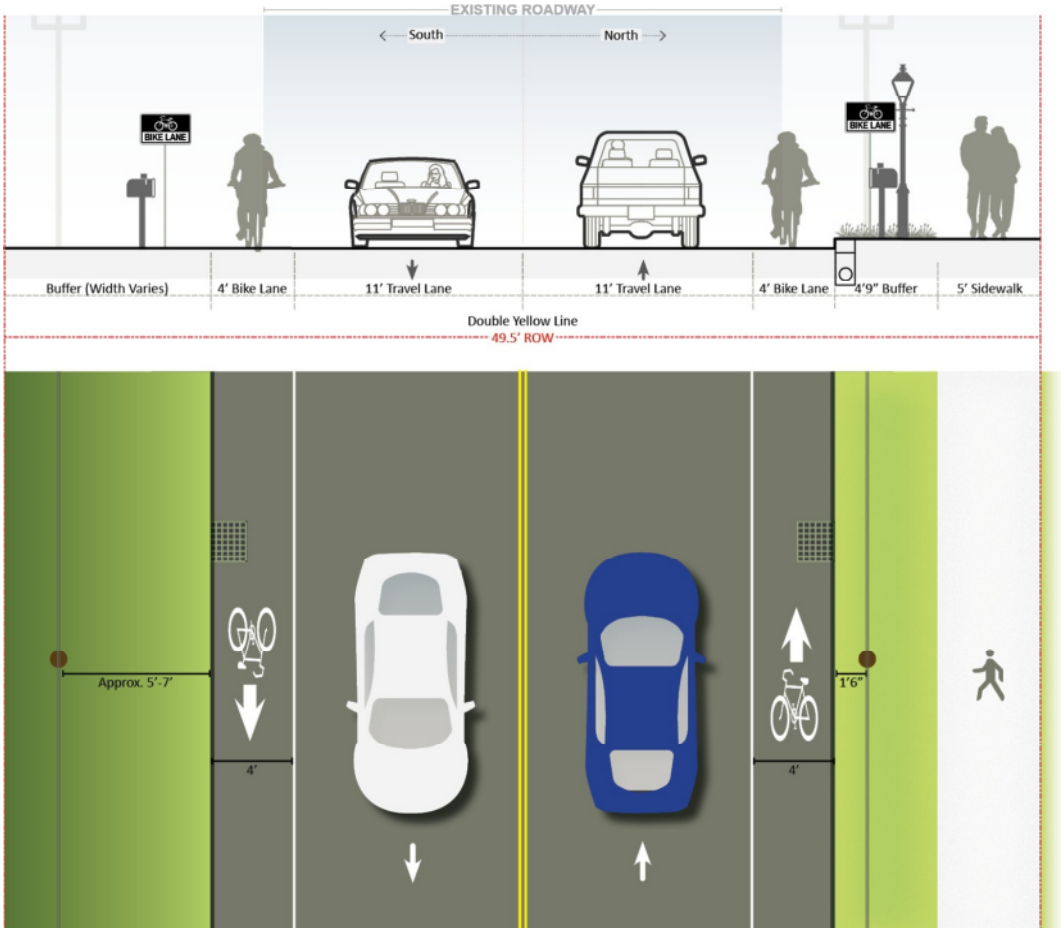
**FIGURE 49: ALTERNATIVE 2 - PROPOSED CHANGES ON MAIN STREET**

### *Proposed Street Section*

Figure 50 illustrates the typical street section along Main Street for Alternative 2. The roadway will widen by four feet to accommodate striped bike lanes on both sides, with 11-foot travel lanes in each direction. To collect and process stormwater flows and prevent flooding and icing conditions, a closed drainage system is recommended on both sides of the roadway. The sidewalk will be curbed and widened to five feet in order to accommodate handicap accessibility. A four- to five-foot landscaped buffering helps separate the pedestrian way from the road and serves as a space for utility and lighting poles.

Utility poles are located on either the south or north side of Main Street, but not both. The typical Main Street section shows how the utility infrastructure may be accommodated on either north or south sides of the street. Utility poles on the north side will be shifted by approximately one-and-a-half feet to accommodate bike lanes and snow plows. Utility poles on the south side will remain in their existing locations.

**FIGURE 50: ALTERNATIVE 2, TYPICAL MAIN STREET SECTION**




## ALTERNATIVE 3: VILLAGE DESTINATION

Alternative 3 proposes a full set of improvements that will help bolster the Main Street character for Colchester Village, as shown in Figure 48. The centerline may shift up to two feet in order to accommodate bike lanes in each direction, utility and light poles, and a curbed sidewalk with landscaped buffering on both sides of the street.

- **Traffic Flow at Main Street/Mill Pond Road/East Road Intersection**: Like Alternative 2, Alternative 3 recommends enhancing the traffic flow at the Main Street/Mill Pond Road/East Road intersection with new left-turn pockets on Main Street in both eastbound and westbound directions. This alternative also recommends realigning the intersection to improve sight distances, particularly in the configuration of Mill Pond Road and East Road. Additionally, adding curbing to the stores on three of the four corners of this intersection will improve access management and prevent unpredictable vehicular movements.
- **Pedestrian Safety and Accessibility:** Pedestrian accommodations and handicap accessibility are provided by replacing the existing 4-foot sidewalk on the north side with a curbed five-foot concrete sidewalk and landscaped buffer on both sides of the street. A closed drainage system would be installed on both sides of the roadway to

collect and process stormwater flows. In addition to the intersection improvements detailed earlier in this section, Alternative 3 proposes adding pedestrian detection and signals to provide safer crossings at the Main Street/Mill Pond Road/East Road intersection. A leading pedestrian interval would give pedestrians a chance to safely cross ahead of traffic and make them more noticeable to drivers.

- **Bike Safety and Accessibility:** To create a safer bicycling environment, Alternative 3 recommends that the Main Street segment through Colchester Village become a "Designated On-Road Facility," and is signed and striped appropriately. Four-foot striped bike lanes in each direction are accommodated within the existing right-of-way to provide a safe width for bicyclists to ride in a separated space from vehicle traffic. Following VTrans Pedestrian and Bicycle Facility Planning and Design Manual standards, the bike lane would widen to five feet where adjacent to on-street parking in front of the historic center and village green.
- **Traffic Calming:** To help slow the speeds of vehicular and truck traffic along Main Street, Alternative 3 recommends traffic calming measures along this corridor, including two to three signed and colored pedestrian crossings, in addition to crossings and pedestrian signals at the Main Street/Mill Pond Road/East Road intersection. Furthermore, on-street parking in front of the historic center and community buildings will serve as a visual cue to drivers that the corridor is a mixed-use, walkable corridor and not a speedy thoroughfare.
- **Village Main Street Character –** To improve the presence of the Main Street character, Alternative 3 recommends adding gateway treatments, such as banners, art, or colored intersection paving at both ends of the village center to alert travelers that they are entering a distinct community corridor. Classic "Main Street"-style lighting along both sides of the corridor would highlight the village community buildings, add to a consistent village character, and provide a safe and well-lit environment for pedestrians.

**FIGURE 51: ALTERNATIVE 3 – OVERALL RECOMMENDATIONS**

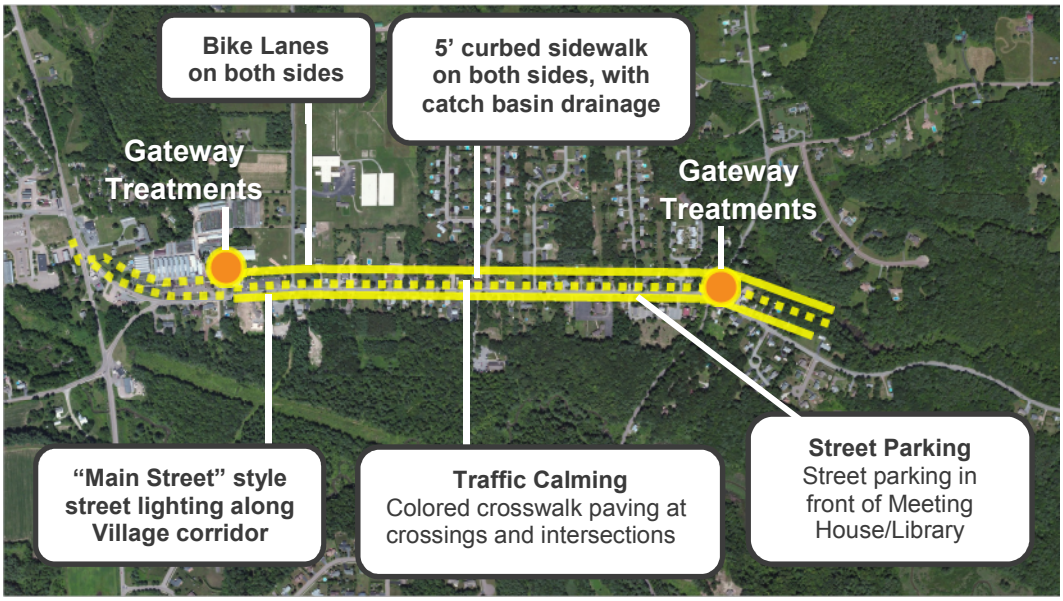



**FIGURE 52: ALTERNATIVE 3 - PROPOSED CHANGES ON MAIN STREET**

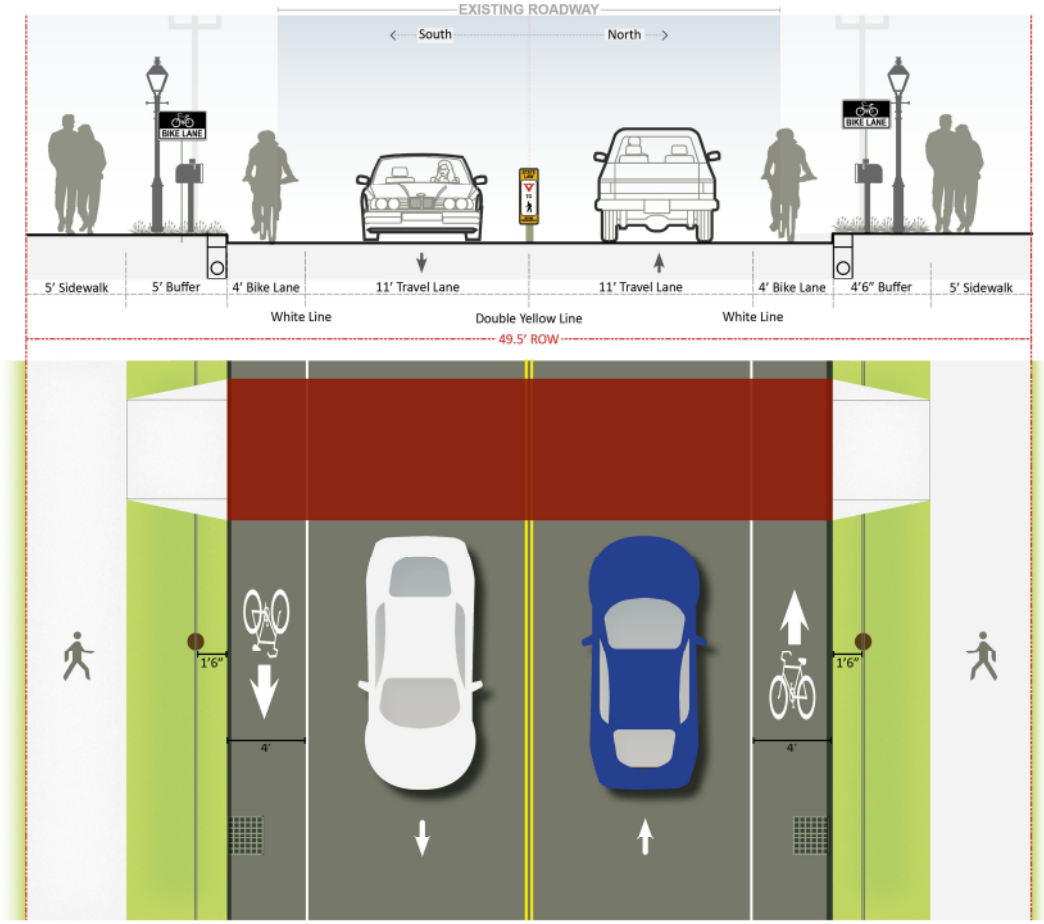
### *Proposed Street Section*

Figure 53 illustrates the typical street section along Main Street for Alternative 3. The roadway will widen by four feet to accommodate striped bike lanes on both sides, with 11-foot travel lanes in each direction. In order to accommodate a five-foot curbed concrete sidewalk along both sides of the street, a closed drainage system will need to be installed to collect and process stormwater flows. A four- to five-foot landscaped buffer helps separate the pedestrian way from the road and serves as a space for utility and lighting poles.

Utility poles are located on either the south or north side of Main Street, but not both. This figure shows how the utility poles may be accommodated in both situations. Utility poles on

the south side shift by five to six feet towards the road to accommodate the sidewalk and landscaped buffer. Utility poles on the north side shift by one to two feet away from the road to accommodate bike lanes and snow plows.

**FIGURE 53: ALTERNATIVE 3, TYPICAL MAIN STREET SECTION**




## 6.3 | EVALUATION OF ALTERNATIVES

The following evaluation criteria were assessed to identify specific features of the proposed alternatives that would affect the selection of a preferred alternative. These criteria, as they relate to each alternative, are discussed below.

### *Satisfying the Project Purpose and Need*

The No Build alternative does not satisfy the purpose and need. All other alternatives were developed to address some or all of the purpose and need objectives. Alternative 1 addresses three out of the five items in the project needs. Alternative 2 satisfies four out of the five items in the project needs. Alternative 3 addresses the full spectrum of project needs.

### *Traffic Flow*

The No Build alternative continues to offer poor traffic operations through the study corridor, with the potential for much worsened conditions in the future due to the projected

increase in traffic volume along VT 2A. The three action alternatives all address traffic flow and traffic operations with an additional left turn pocket.

### *Safety*

The safety criteria describe whether the alternative proposes features that will affect the number and severity of incidences along Main Street. The No Build alternative does not propose any new infrastructure, so existing safety concerns and crash rates can be expected to be maintained or exacerbated with the increase in traffic volumes. The added left turn pockets and optimized signal timings in all three alternatives can be expected to reduce the amount of weaving and broadside collisions at the Main Street/Mill Pond Road/East Road intersection. The added pedestrian signals and leading pedestrian interval will improve safety for those who are crossing the intersection by foot and help slow traffic entering Colchester Village.

### *Environment*

The Vermont Agency of Natural Resources maintains the BioFinder database and map, which provides statewide geospatial information regarding the high priority ecosystems, natural communities, habitats, and species in a given area of analysis. A review of identified resources along Main Street in Colchester, with a focus on the area of potential impact of the various alternative elements, yielded no impacts.

### *ROW Impacts*

The No Build alternative proposes no new infrastructure, and therefore does not create any impact to the ROW. All other alternatives will require ROW acquisition for construction, particularly for the widening of the intersection at Main Street/Mill Pond Road/East Road, and for adding additional width to the roadway to accommodate striped bike lanes in Alternatives 2 and 3. Alternative 3 proposes on-street parking in front of the village community buildings; this will require utilizing a portion of the Town-owned property to accommodate the proposed roadway section in this segment of the property corridor.

### *Constructability*

Constructability refers to the amount of design and construction complexity that can be expected due to construction activities. The No Build alternative proposes no infrastructure, so this criterion is not applicable. The widened intersection and added detection at Main Street/Mill Pond Road/East Road will likely impact through traffic on VT 2A during construction activity. Both Alternatives 2 and 3 would affect utilities and propose adding a closed drainage system, which would involve greater design and phasing complexity.

### *Order of Magnitude Cost Estimate*

Cost estimates were developed based on square foot unit costs of the various project elements. Table 18 shows the overall estimated cost for design and construction of the No Build and the three alternatives. Further breakdown of these costs and assumptions are listed in **Appendix B.** The unit costs are based on past project experience in similar locations and it is meant to be a planning level cost estimate, which includes a 25% contingency. These

estimates do not include costs associated with obtaining any necessary rights-of-way. Additional detail will be used as a preferred alternative is designed and developed into a full construction plan, with more detailed cost estimates.

**TABLE 18: ORDER OF MAGNITUDE COST ESTIMATE**

| NO BUILD ALTERNATIVE | ALTERNATIVE 1: WALKABLE NEIGHBORHOOD | ALTERNATIVE 2: MAIN STREET CHARACTER | ALTERNATIVE 3: VILLAGE DESTINATION |
|---|---|---|---|
| $0 | $820,000 | $2,540,000 | $3,960,000 |

## EVALUATION MATRICES

The comparison matrix in Table 19 was prepared to summarize the conclusions of the Evaluation Criteria discussion. Green shading indicates a positive improvement; orange shading indicates potential impacts or characteristics that may trigger a permit.

**TABLE 19: MAIN STREET COLCHESTER VILLAGE EVALUATION MATRIX**

| | | No Build | Alternative 1 Neighborhood Walkability | Alternative 2 Main Street Character | Alternative 3 Village Destination |
|---|---|---|---|---|---|
| COST | Preliminary Cost Estimate (final design, construction, inspection, contingency) | $0 | $850,000 | $2,990,000 | $3,870,000 |
| PURPOSE & NEED | Traffic Conflicts | No Change | Improve | Improve | Improve |
| | Walkability | No Change | Improve | Improve | Improve |
| | Traffic and Noise | No Change | Improve | Improve | Improve |
| | Village Character | No Change | Potential | Improve | Improve |
| IMPACTS | Agricultural Lands | No | No | No | No |
| | Archaeological | No | No | No | No |
| | Historic Structures/Sites | No | No | No | No |
| | Floodplain | No | No | No | No |
| | Rare, Threatened & Endangered | No | No | No | No |
| | Public Lands | No | No | No | No |
| | Utilities | No | No | Yes | Yes |
| | Wetlands | No | No | No | No |
| PERMITS | Act 250 | No | No | No | No |
| | 401 Water Quality | No | No | No | No |
| | 404 Corps of Engineers Permit | No | No | No | No |
| | Stream Alteration | No | No | No | No |
| | Conditional Use Determination | No | No | No | No |
| | Storm Water Discharge | No | No | Potential | Potential |
| | Shoreland Encroachment | No | No | No | No |
| | Endangered & Threatened Species | No | No | No | No |
| | VTrans ROW Permit | No | Yes | Yes | Yes |
| | State Historic Preservation Office Clearance | No | No | No | No |
| | NEPA Category | No | Categorical Exclusion | Categorical Exclusion | Categorical Exclusion |

## 6.4 | PUBLIC OUTREACH EFFORTS

A number of community meetings were held throughout the development of this study and scoping report. The following is a summary of meetings held for this project as pertaining to the Main Street Colchester Village study area. **Appendix A** includes relevant meeting agendas, meeting notes, and outreach material regarding this project and meetings.

- **Local Concerns Meeting, June 27, 2013.** The Local Concerns Meeting was held to solicit input on ways to improve travel, safety and streetscapes in all three study areas. The meeting highlighted several issues along Main Street in Colchester Village, including:
  - Excessive speeds and truck noise;

- Limited sight distances partially due to topography and alignment at the intersection of Main Street, Mill Pond Road, and East Road.;
- Lack of pedestrian crossings and poor sidewalk conditions, particularly near the Union Memorial School and the village community buildings; and
- Lack of presence as a village destination for residents in the Town of Colchester.

- **Public Meeting - Alternatives Presentation, September 24, 2013**. Three action alternatives were developed in detail and the public was invited to attend a presentation of the alternatives for the two Colchester project areas at a public Selectboard meeting. Each of the three alternatives were illustrated in plan and section, and potential impacts of each alternative were discussed. The public input was mixed; the Selectboard heard comments expressing both a desire for better pedestrian and bicyclist facilities, as well as concern over the cost of adding these additional facilities. Following the public presentation of the alternatives, the consultant team met with members from CCRPC and VTrans to discuss the proposed alternatives and to assess whether VTrans had any concerns about the proposed items. VTrans supported sidewalks on both sides of Main Street and stamped colored paving at two to three crosswalk locations.
- **Alternatives Assessment Meeting, October 22, 2013.** With the input and approval of VTrans, the alternatives were presented before the Colchester Selectboard at a second alternatives assessment meeting. The discussion of the meeting focused on the benefits of each alternative, particularly bicycle and pedestrian safety  provided in Alternative 3.

## 6.5 | PREFERRED ALTERNATIVE

On November 12, 2013, the Colchester Selectboard selected and approved the preferred alternative, Alternative 3: Village Destination. This selection was based on the feedback received at the alternatives presentation public meeting, where this alternative was determined to provide the greatest improvements and best fulfil the full project purpose and needs.

# APPENDICIES

**Appendix A:** Summary of Meeting Agendas, Notes, and Public Outreach Material

**Appendix B:** Cost Estimates

**Appendix C:** Study Area Photos

# APPENDIX A:
## SUMMARY OF MEETING AGENDAS, NOTES, AND PUBLIC OUTREACH MATERIAL

# agenda

**CENTS Kick-Off Meeting**
3/7/2013
3:00pm to 4:30pm
CCRPC Office

| | |
|---|---|
| 1. | **Introductions** |
| 2. | **Steering Committee Membership** |
| 3. | **Review of the proposed scope of work**<br>• Technical methods and outcomes<br>• Public involvement – notifications, meeting format, meeting location<br>• Schedule<br>• Other? |
| 4. | **Other issues or concerns** |
| 5. | **Next Steps** |

CENTS Meeting Notes
March 8, 2013

| | |
|---|---|
| *Present:* | Bryan Osborn (Colchester DPW Director), Dennis Lutz (Essex DPW Director), Christine Forde (CCRPC), Michelle Boomhower (CCRPC), Sai Sarepalli (CCRPC), David Saladino (RSG), Grace Wu (RSG) |
| *Next meeting:* | Steering Committee Meeting #2 – May 2013 |

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## I. Introductions

The group went around the table and each introduced themselves and their organizations.

## II. Steering Committee Membership

Sarah Hadd (Colchester Planning & Zoning Director) to also be included on the project Steering Committee.

## III. Review of Proposed Scope of Work

- Scoping vs. Corridor
    - Scoping – Essex: Looking for specific actions and recommendations
    - Corridor – Colchester: Looking at broader planning and land use concepts
- Timeline
    - One goal of this study is to develop recommendations (preferred alternative with cost estimate) for mid-November 2013, ready for review by the Circ Task Force by end November 2013
    - By November 2013, aiming for 75% of the corridor study and 100% of the scoping study
    - By March 2014, aiming for 100% of the corridor study
- Existing Traffic Conditions
    - AM Peak movement from Essex west along Severance and south on Rt 1 towards Burlington
    - Intersection of Rt 7 and Severance is a growth center – mainly residential use
    - Transit access potential along Rt 7 to growth center and from 289 to VT 15
    - After a bit of discussion, the group generally agreed that there may not be a large contingent of drivers who can be redirected from VT 2A to Severence Road (or vice-versa) by modifying roadway treatments along either road
    - Analyze origins/destinations of users on VT 2A and Severance*
    - Analyze existing and future businesses, especially along Susie Wilson Rd*
- Susie Wilson Road thoughts:
    - Accommodating all queuing lanes. Issue that left turn pocket onto VT 15 and left turn pocket into Lowes utilize the same center lane - so neither pocket can be lengthened without widening of Susie Wilson Road
    - Need to address southbound left turn queues onto VT 15 (particularly during PM peak)
    - Examine latest crash data (CCRPC staff can get data through previous month from VTrans)
    - Evaluate roundabout at Kellogg Road intersection
    - Potential widening to accommodate lengthened turn pockets, 4' shoulder/bike lanes, and raised (potentially landscaped) median
- Severance/Kellogg Road thoughts:
    - 2-lane highway, with little to upgrade
    - Consider dedicated eastbound left turn lane onto Mill Pond Road

    - Consider multi-use path from Severance Corners (growth center) to Susie Wilson Road
    - Evaluate future traffic volumes to determine whether any additional capacity improvements are needed
- VT 2A thoughts:
    - Consider traffic calming and streetscape enhancements through Colchester Village
    - As an alternative, evaluate opportunity for Town to take over control of US 2 through Colchester Village (need to define limits) Main St between Mill Pond and Rt 7
    - Full roadway reconstruction of VT 2A through village necessary before Town takes over roadway
    - Intersection upgrades currently moving forward for VT 2A/VT 289/Susie Wilson Road intersection
    - Intersection upgrades planned for VT 2A/US 7 intersection (currently slated for construction in 2015)
- Historic comparison of AADT on study area roads
    - Analyze conditions in Colchester prior to Circ vs. present-day conditions. Better understand which action items to expedite and what damage has been done by the abandonment of the Circ.
    - Pre-289 à 289 à Today
    - Understand traffic and crashes from a "projected" and "actual" outcome of the Circ alts project
- Rt 15 thoughts – Comparison of the usage of Rt 15 vs. VT 2A as growth occurs along Severance and Susie Wilson

**IV. Public Outreach**

- #1 - Study Area-wide Local Concerns Meeting
- Defined Public Input during Scoping Study phase
    - #2 - Susie Wilson Road (to include Kellogg Road and VT 15 intersections)
    - #3 - Severance Road & Colchester Village (to include Mill Pond and Severance Rd intersection)
- #4 = Study Area-wide Public Meeting to review Draft Report

**V. Next Steps**

- RSG develop draft Tech Memo #1 (Existing & Future Conditions) - end of April
- Steering Committee Meeting #2 - May
- Local Concerns Meeting – May

**VI. Action Items**

- Dennis Lutz to send latest Traffic Impact Studies to RSG (particularly most recent L&D study for development behind Lowes) [Update: 3/15/13 complete]
- Christine Forde to send VT 2A/VT 289 Scoping Report to RSG [complete]

# agenda

**CENTS Steering Committee Meeting**
5/14/2013
10:00am to 11:30am
CCRPC Office – Main Conference Room

| | |
|---|---|
| 1 | **Schedule** |
| 2 | **Review of Existing Conditions Assessment** |
| 3 | **Review of Future Year No Build Traffic Assessment** |
| 4 | **Initial Discussion of Potential Recommendations**<br>• |
| 5 | **Other issues or concerns**<br>• Public involvement – notifications, meeting format, meeting location |
| 6 | **Next Steps** |

CENTS Meeting Notes
May 14, 2013

| | |
|---|---|
| *Present:* | Bryan Osborne (Colchester DPW Director), Christine Forde (CCRPC), Michelle Boomhower (CCRPC), Sai Sarepalli (CCRPC), Amy Bell (VTrans), David Saladino (RSG), Grace Wu (RSG) |
| *Next meeting:* | Public Meeting #1 – June 2013 |

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## I. Schedule Update

The project is currently in the Existing and Future Conditions Assessment phase and RSG is working towards the first public meeting in June. The project team recognizes that the scoping level assessment will need to be pushed up to accommodate the late Fall recommended improvements. Consequently, preferred alternatives will be needed by late November 2013. Ideally, RSG will start the scoping study immediately after presentation at the first local concerns meeting in June.

## II. Existing Conditions Assessment Overview

Jason Charest produced a quick map showing the 2015-2030 growth in households and employment per TAZ. Most notable is the growth in TAZ #287, which shows the substantial projected increase (744 households, 1390 employees) in the Severance Corners growth center, of which three of the four corners are not subject to Act 250 requirements. (Only the southwest development, which is currently under construction/leasing, is under Act 250 designation.) CCRPC explained that the desire was for a split of residential and businesses in the growth center, but the current demand is for only housing.

- Existing Plan Review
    - In reviewing the history of studies within the project area, RSG recognizes that several locations within the project area have already been looked at before, particularly Susie Wilson Road.
- Traffic Volumes
    - RSG explained their SelectLink analysis on Severance Road and VT 2A during the morning and evening peak periods. The analysis shows magnitude of traffic volumes go in both direction passing through any given corridor that travels onto the selected link. On VT 2A, there is a
    - Notable high traffic locations include: Westbound out of Essex towards Burlington/Winooski on Severance Road and Southbound right on US 7 and westbound off Severance Road in the AM peak period.
    - Drivers are trying to avoid Rt 15 and the Winooski circulator and Rt 7 merge, so they are choosing to take Severance Road instead
    - Severance Corners has already been scoped for its projected land uses and CCRPC acknowledges that there is little more to be done for the traffic at the intersection of US 7 and Severance. Therefore, it is not a focus for the CENTS study.
    - Susie Wilson Bypass adaptive control has been successful and CCRPC is seeing that the volumes are increasing while congestion is decreasing.
- Public Transit
    - Currently, the study area is not served by public transit, except for Route 2 which runs along VT 15 and has a stop at Susie Wilson Road. The hope is that if Colchester was part of the CCTA, Routes 56 and 96 would make a detour off of I-89 to serve Severance Corners. Bryan

from the Town of Colchester explains that the town is not yet a member of the CCTA because it needs a public vote of approval and residents want to see the benefits in paying into the CCTA system. Also, the Town of Milton may opt out of CCTA, which may increase costs for Colchester to join. Worth calculating the decrease in trips generated by having transit serve Severance Corners.

- Susie Wilson Bypass
    - Questions were raised about the development of the Susie Wilson Bypass. CCRPC believes it was constructed in anticipation of the Circ highway, to appease local residential neighborhoods and ensure that traffic would not flow through their streets to connect to VT 289. Munson Engineers were the contractor for the Susie Wilson Bypass. J. MacDonald (?) was the contractor for VT 289.
- Main Street Colchester
    - The Town does not know how much traffic calming would be allowed on a state-maintained road. The option of taking over and maintaining a portion of VT 2A is still up for consideration so that it gives the Town flexibility to add streetscaping, sidewalks, and parallel parking in some areas.
    - The Town would also be able to control truck traffic if they owned a portion of VT 2A and limit the frequency or time of day trucks could go down their Main St.
    - One of the often-heard complaints from residents is to get the trucks out of the village and add pedestrian improvements and traffic calming measures.
- VT 2A/East Road/Mill Pond
    - This intersection is problematic because of the topography (slopes upwards with a peak in the center of the intersection, with poor sight distances from any direction) and there are notable tire skid marks at the southeast corner between VT 2A and Mill Pond Road.
    - The signal was intended to be temporary but has become permanent.
- Land Use
    - RSG mapped the existing land use and future planning areas, noting the differences in residential character between Severance Road (suburban) and Main Street (village).
    - RSG also pointed out that the Severance Corners area is a "Center Planning Area" which is intended to serve regionally with a mix of jobs, housing, and community facilities. Ideally, the traffic volumes in Severance Corners would not increase as much as projected from its permitted land use because of its mixed-used character.
    - The Susie Wilson Road corridor is designated as a metro planning area to serve jobs and housing in a density that supports transit service and encourages pedestrian activity.

**III. Public Meeting (June)**

- The public meeting will be held at Colchester Meeting House
- Recommendation that a breakfast meeting would best accommodate business owners for Susie Wilson Road

**IV. Next Steps**

- RSG will get a set of available dates from Robin Parry for the Colchester Meeting House and then circulate a Doodle Poll to the rest of the team to set a preferred date/time.
- RSG to double check the signal plans for Intersections of Bay Road, Main Street, and US 7.
    - Permanent signal control at intersection of Bay Road and US 7. Stop control at US 7 and Main Street.

- RSG to confirm with CCRPC that Green Mountain Coffee employment figures are in the 2015 TAZ base numbers already.
    - "There was some growth added to that TAZ (238) as part of the WENTS process in the 2010 permitted file (see attached Excel spreadsheet). It totals 60 additional employees for the TAZ. To check the numbers I looked at their Traffic Impact Assessment (relevant page attached). The daily net change in employment comes to 70 employees but the total change would be 580. The former is pretty close to what was added in the 2010 permitted file and seems reasonable. My thought is we shouldn't use the total change (580) as that is not what the area will realistically see on a daily basis. I don't have much experience with these nuances so I have copied Eric and am hoping he can weigh in. We typically don't have the luxury of knowing what a daily employment number would be. Also, I think it was Bob and Mark who met with the town originally to gather these numbers, so they might be able to shed some light as well." (Jason Charest, CCRPC)
- CCRPC to send RSG the Stantec chart of capacity increase to VT 289/VT 2A/ Susie Wilson Bypass to update the RSG Synchro model. Michele Boomhower will look into the Carnegie Mellon/Pittsburgh study for ways to get Synchro to model the adaptive control behavior.
- RSG to confirm Severance Corners/VHB traffic design study and LOS results
- RSG to get the new Jeffersonville commuter bus route information from Meredith Birkett at CCTA that will serve Susie Wilson Road and Bypass.
    - Anticipate that the route will begin Monday, October 8, 2013. Two morning trips and two afternoon trips during peak hour commute time.
    - "In terms of routing, we anticipate the route will take Rt 15 to 289 in Essex. At the end of 289, the route will take Susie Wilson Bypass/Susie Wilson back to Rt. 15. Dennis Lutz in Essex indicated there is going to be a large development at the corner of 2A and Susie Wilson Bypass and that it might make sense to install a bus stop on 2A right before the bypass intersection where the bus will turn right. However, the tricky part will be finding a spot for a bus stop in the other direction, to allow people to return to Essex and points east. Susie Wilson Bypass is currently 45 mph, which means we wouldn't be comfortable stopping to pick up passengers in the travel lane. I am hesitant to consider a bus pull-off at the eastbound bypass/2A intersection. I travel that way frequently and know how cars queue up to enter 289, and I think it would be very difficult for the bus to get back into traffic. Now that I think of it, this would actually be a great place for a queue jump lane for the bus, in conjunction with a bus stop. To make this all work, there would need to be a crosswalk parallel to 2A to cross the bypass. And lastly, it would be great if there were a pedestrian connection from the town park & ride on 2A to the bus stop on 2A"
- RSG to confirm with Dennis (Essex) why VTrans does not allow Susie Wilson Bypass as a limited access road? What are the future development plans for the adjacent area?
- RSG to look into the future planning use shapefile; the area in northern Colchester should be "rural" and not "enterprise".
    - Double-checked with Pam Brangan and the planning areas shapefile has been updated on CCRPC's end.

# PRESS RELEASE

For Immediate Release

**RE: Colchester-Essex Network Transportation Study (CENTS) - Local Concerns Meeting**

**CENTS Local Concerns Meeting**
**Thursday, June 27th at 6:30 PM**
**Colchester Town Offices**
**781 Blakely Road**
**Colchester, VT 05446**

## We Want to Hear From YOU!

### Bring us your ideas on how to improve travel along Susie Wilson Road, Severance and Kellogg Roads, and Main Street in Colchester Village.

On Thursday, June 27 at 6:30 PM, join us at Colchester Town Offices to learn more about the **Colchester-Essex Network Transportation Study (CENTS).** The purpose of this first public meeting is to present current findings and collect early input on thoughts, issues, and recommendations for travel along Susie Wilson Road, Severance and Kellogg Roads, and Main Street in Colchester Village.

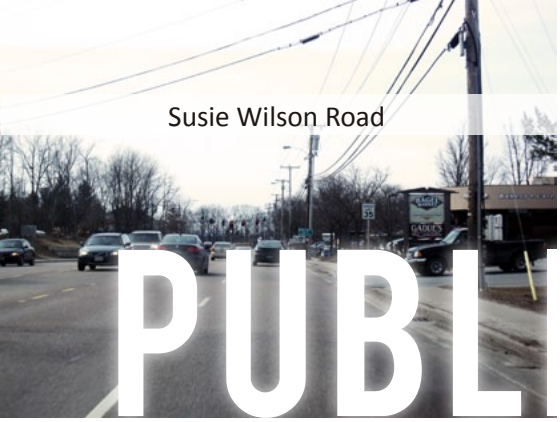
The **CENTS** will develop and analyze a number of transportation alternatives to address existing and projected traffic congestion and improve the streetscape to enhance safety for all users.

The study area includes three focus areas: 1) Susie Wilson Road from Kellogg Road to VT 15; 2) Severance and Kellogg Roads, including the Mill Pond Road intersection; and 3) Main Street in Colchester Village.

The Study is sponsored by the Chittenden County Regional Planning Commission (CCRPC) and the Towns of Colchester and Essex. Light refreshments will be served.

All are welcome and encouraged to attend. In accordance with provisions of the Americans with Disabilities Act (ADA) of 1990, the CCRPC will ensure that public meeting sites are accessible to people with disabilities. Requests for free interpretive or translation services, assistive devices, or other accommodations should be made to Christine Forde, Senior Transportation Planner, cforde@ccrpcvt.org or 802-846-4490 ext. 13 (711 for Telecommunications Relay Services), at least 72 hours in advance.

For additional information, go online to http://www.ccrpcvt.org/transportation/scoping/cents/


Susie Wilson Road


Severance Road/Kellogg Road


Colchester Village Main Street

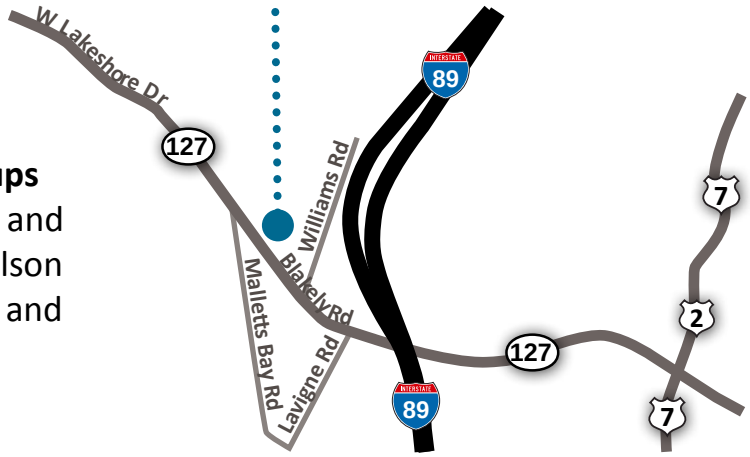
# PUBLIC MEETING

## Colchester-Essex **Network Transportation Study**

**6:30PM**

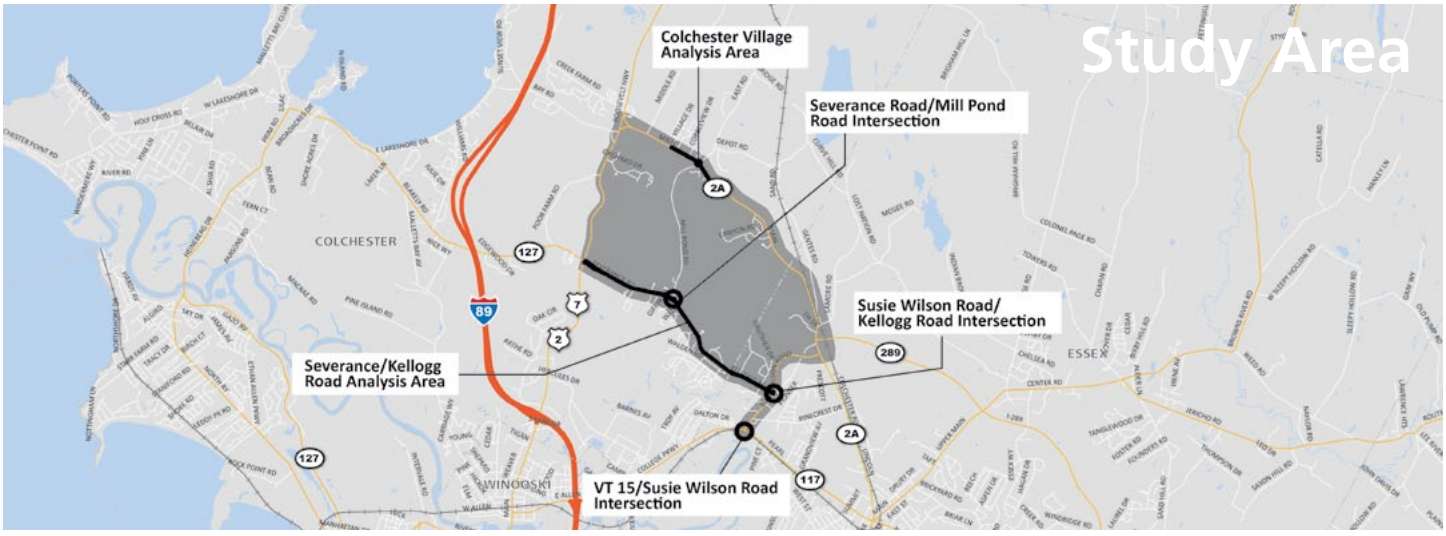
**Thursday**
**June 27, 2013**

**at the Colchester Town Offices**
**781 Blakely Road, Colchester, VT 05446**




Come join us for an **open house and presentation**, followed by **breakout groups** to discuss ways to improve travel, safety, and enhance the streetscapes along Susie Wilson Road, Severance Road and Kellogg Road, and along Main Street in Colchester Village.

Light refreshments will be provided!




For more information, go to www.ccrpcvt.org/transportation/scoping/cents or contact:
Christine Forde, Senior Transportation Planner • (802) 846-4490 ext.13 • cforde@ccrpcvt.org

CHITTENDEN COUNTY RPC
Communities Planning Together

RSG INC.
RESOURCE SYSTEMS GROUP, INC

# Colchester-Essex Network Transportation Study

# Local Concerns Meeting

## June 27th at 6:30 PM

### Colchester Town Offices, 781 Blakely Rd

***Sponsored by the Towns of Colchester and Essex***

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## Come share your ideas on how to improve travel in this area!

***The study area includes Susie Wilson Road, Severance and Kellogg Roads, and Main Street Colchester Village***

## www.ccrpcvt.org/cents

The Study is sponsored by the Chittenden County Regional Planning Commission (CCRPC) and the Towns of Colchester and Essex. Light refreshments will be served. All are welcome and encouraged to attend. In accordance with provisions of the Americans with Disabilities Act (ADA) of 1990, the CCRPC will ensure that public meeting sites are accessible to people with disabilities. Requests for free interpretive or translation services, assistive devices, or other accommodations should be made to Christine Forde, Senior Transportation Planner, cforde@ccrpcvt.org, 802-846-4490 ext. 13 (711 for Telecommunications Relay Services), at least 72 hours in advance.

## MEETING AGENDA

Colchester-Essex Network Transportation Study

**Steering Committee Meeting #3B**

Tuesday, July 22, 2013

10:00 AM – 11:00 AM Essex DPW

# AGENDA:

## 1. Review Draft Purpose and Need Statement

## 2. Review and Discuss Susie Wilson Road Alternatives

- Alternative 1 (Operational Improvements)
- Alternative 2 (Capacity Improvements – Signals)
- Alternative 3 (Capacity Improvements – Roundabouts)

## 3. Schedule and Next Steps

- Alternatives Assessment: August
- Public Meeting: Mid-September
- Selection of Preferred Alternative: October *[note: need to receive endorsement from SB in October]*

55 Railroad Row, White River Junction, Vermont 05001
TEL 802.295.4999 • FAX 802.295.1006 • www.rsginc.com

SUSIE WILSON ROAD

# PUBLIC MEETING

## Colchester-Essex **Network Transportation Study**

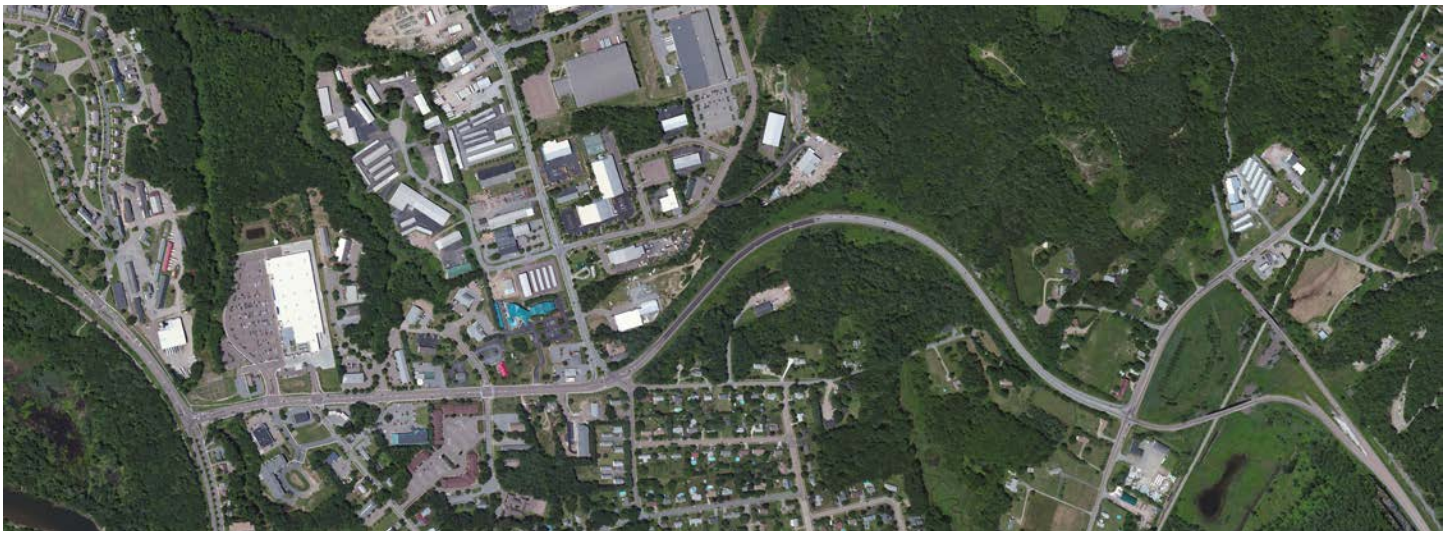
**7:00PM**
**Thursday, September 5, 2013**

@

**Elley-Long Music Center**
at Saint Michael's College
**223 Ethan Allen Avenue, Colchester, VT**

Come join us for a presentation and open comment period to **give your feedback on alternative ways to improve Susie Wilson Road.** Topics will include traffic, safety, and ways to create a better experience for all travelers.

***Light refreshments will be provided!**



For more information, go to www.ccrpcvt.org/transportation/scoping/cents or contact:
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Chittenden County RPC
Communities Planning Together

Essex Vermont

RSG INC.
Resource Systems Group, Inc.

# Colchester-Essex Network Transportation Study

# Public Meeting

## September 5th at 7:00 PM

### Elley-Long Music Center
### at Saint Michael's College
### 223 Ethan Allen Avenue, Colchester

***Sponsored by the Town of Essex***

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**Come give your feedback on alternative ways to improve travel on Susie Wilson Road and Kellogg Road!**

## www.ccrpcvt.org/cents

The Study is sponsored by the Chittenden County Regional Planning Commission (CCRPC) and the Town of Essex. Light refreshments will be served. All are welcome and encouraged to attend. In accordance with provisions of the Americans with Disabilities Act (ADA) of 1990, the CCRPC will ensure that public meeting sites are accessible to people with disabilities. Requests for free interpretive or translation services, assistive devices, or other accommodations should be made to Christine Forde, Senior Transportation Planner, cforde@ccrpcvt.org, 802-846-4490 ext. 13 (711 for Telecommunications Relay Services), at least 72 hours in advance.

CENTS Meeting Notes
September 5, 2013

*Present:* Dennis Lutz (Essex DPW Director), Christine Forde (CCRPC), Sai Sarepalli (CCRPC), David Saladino (RSG), Austin Feula (RSG), few others that I'm forgetting, two local business owners, and a couple other local residents.

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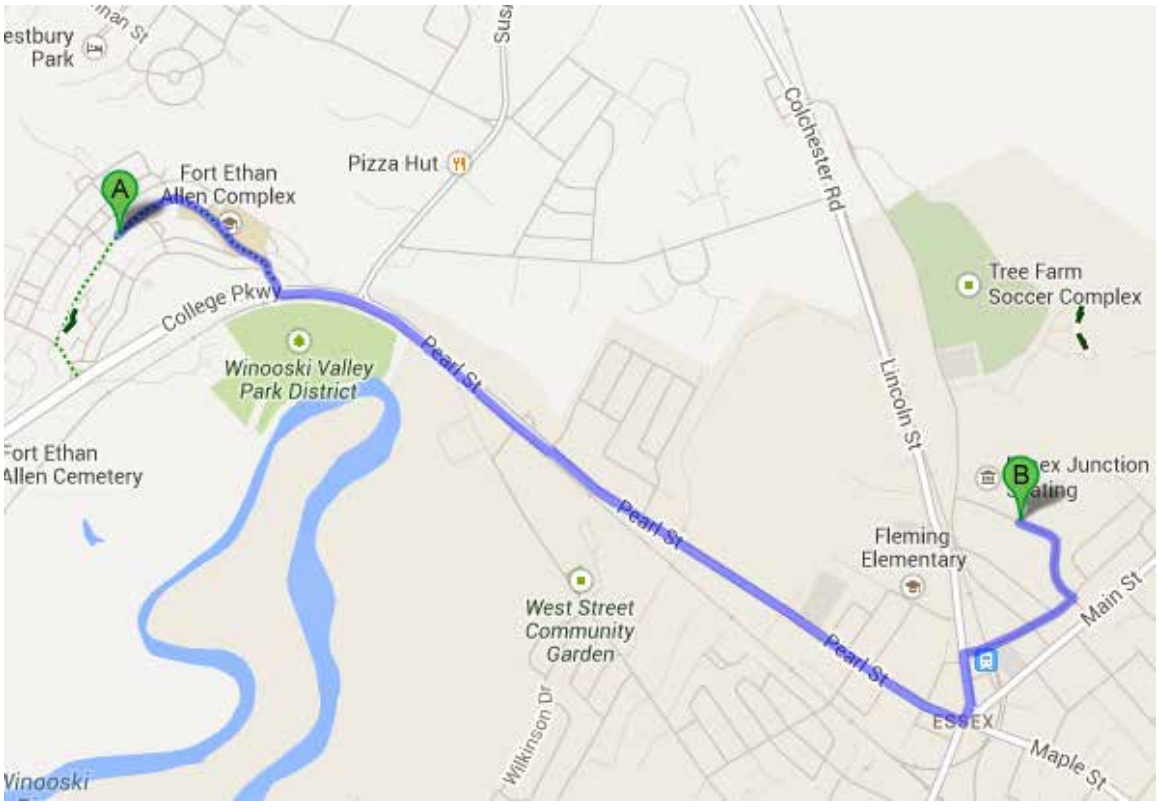
## I. Presentation by David Saladino

## II. Public Comments

- Are there bike lanes planned for Susie Wilson Road. If not is there a way to route bicyclists around SWR on a bike/ped specific path?
- Is there room for bike lanes on SWR?
- A 10' wide bike/ped lane is being installed from Camp Johnson to Lowe's.
- Biking from For Ethan Allen Complex to Essex High School is quite dangerous and not at all bike friendly




- Getting across the WB right slip lane from VT15 to SWR is very dangerous for pedestrians. Vehicles take this movement at very high speeds due to the long curve. There signal to prohibit vehicles from making the movement even when it is a pedestrian walk phase at the rest of the intersection.


- Vehicles turning right off of SWR onto VT15 drive right into bus stop. Maybe consider moving the bus stop or providing the bus with a pull-off (CCTA does not like pull-offs since buses will then have difficulty merging back into traffic)


- Taking a left out of Ewing Place is extremely difficult. Would like to a signal here (I think that is what he was trying to convey). Connector roads between developments on SWR is a bad idea since there are lots of children playing back there and limited room for a road. Additionally, currently there is not enough ROW for this.
-



# PUBLIC MEETING

## Colchester-Essex **Network Transportation Study**

**6:30PM**
**Tuesday, September 24, 2013**

**@ Colchester Meeting House**
**830 Main Street, Colchester, VT**

Come join us for a presentation and open comment period to **give your feedback on alternatives for improving travel on Severance Road and on Main Street in Colchester Village.** Topics will include traffic, safety, and ways to create a better experience for all travelers.


### Study Areas


For more information, go to www.ccrpcvt.org/transportation/scoping/cents or contact:
Christine Forde, Senior Transportation Planner • (802) 846-4490 ext.13 • cforde@ccrpcvt.org

CHITTENDEN COUNTY RPC
Communities Planning Together

RSG INC.
RESOURCE SYSTEMS GROUP, INC.

## MEETING AGENDA

Colchester-Essex Network Transportation Study

**Steering Committee Meeting #3B**

Tuesday, September 17, 2013
10:30 PM – 11:30 PM CCRPC

# AGENDA:

## 1. Review and Discuss Public Meeting Slides and Alternatives

– Severance Road
– Main Street Colchester Village

## 2. Outreach and Public Meeting Materials Status

– Flyers, Newspaper Ad, Front Porch Forum, Press Release
– Sign-in Sheet, Comment cards

## 3. Schedule and Next Steps

– Selectboard Meeting 1 – 9/24 – Public Meeting
– Selectboard Meeting 2 – 10/22 – Selection of preferred alternative

**CENTS Meeting Notes**
September 17, 2013

| | |
|---|---|
| *Present:* | Bryan Osborn (Colchester DPW Director), Christine Forde (CCRPC), Sai Sarepalli (CCRPC), Grace Wu (RSG), Shadde Rosenblum (RSG) |
| *Next meeting:* | Steering Committee Meeting #3B – September 2013 |

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## I. Public Meeting Logistics

- Presentation at 6:30pm on September 24, 2013 Selectboard Meeting to introduce alternatives, not for the board to vote
- Presentation should be kept to 20 minutes and will be first on the agenda
- Brian will present the overview of the CENTS and Circ Alternatives projects
- Shadde will give brief overview of the background, highlights of existing info analysis for the two Colchester projects, including traffic volumes today, etc.
- Large map containing both of the Severance Road options to be displayed on either easel or wall

## II. Severance Alternatives

- Text bullet changes for consistency in Severance Road introduction slide
- Update the turning movements diagram (Grace)
- In calculation of ROW impacts, consider…
    - 3' clear zone, in addition to the 10' multi-use path
    - 7' landscape buffer may be reduced in areas where there are impacts to private land/structures
    - 10' temporary easement for construction
    - Topographical challenges on the north side – may need additional ROW to grade the slope or add retaining wall
    - Consider any environmental impacts on the south side and necessary measures to limit the impacts
- Create plan view (1:100 scale?) of entire Severance Road corridor with both options displayed
- Brian seemed okay with the cost – look to Stantec West Lakeshore Path report as example

## III. Main Street Alternatives

- Add "25mph" speed limit caveat for school zone
- Change to LOS D in the PM peak hour (based on updated SimTraffic calcs)
- All Alts: Extend sidewalk to Jocelyn Court, east of Mill Pond Road
- All Alts: Propose left-turn lanes at intersection for all three alternatives
- Alt 2: Add curb & drainage to the south side – (Does VTrans allow swales on state routes? Need to explain how drainage will be addressed on south side…)
- Alt 3: Add street parking in front of village green in the Village Destination alternative – update plan view and update mock-up rendering
- Costs: Update to reflect 1) extended sidewalk; 2) left-turn lanes; 3) curb & drainage in alt 2; 4) street parking in alt 3

## IV. Outreach

- Flyers, Newspaper Ad, Front Porch Forum, Press Release
- Sign-in Sheet, Comment Cards

**V. Schedule and Next Steps**

- Christine to look into scheduling presentation to VTrans – perhaps combine with the Susie Wilson Road presentation already scheduled on 9/24 – 9/25.
- Selectboard Meeting 1, Public meeting – 9/24
- Selectboard Meeting 2, Selection of preferred alternative (having had VTrans input) – 10/22

## MEETING AGENDA

Colchester-Essex Network Transportation Study

**VTrans Meeting #2**

Tuesday, October 15, 2013

4:00 – 5:00 PM CCRPC

# AGENDA:

## 1. Review and Discuss Main Street Alternatives/Phasing Plan

- Alternative 1: Walkable Neighborhood
- Alternative 2: Main Street Character
- Alternative 3: Village Destination

## 2. Discussion topics for VTrans

- Shifting the centerline
    i. Min. buffer space between right of way and buildings
    ii. Coordination with resurfacing project
- Minimum buffer distances between sidewalk and edge of pavement
- Curbing and closed drainage as traffic calming, village character
    i. Precedent for new curbing without adjacent sidewalk
- Implementation: How to advance the VT 2A Reconstruction project in the Capital Program?
    i. Application of Complete Streets principles in reconstruction projects

CENTS Meeting Notes
October 15, 2013

| | |
|---|---|
| *Present:* | Ken Robie (VTrans Highway Safety and Design Program Manager); Bryan Osborn (Colchester DPW Director), Christine Forde (CCRPC), Michelle Boomhower (CCRPC), Grace Wu (RSG) |
| *Next meeting:* | Colchester Selectboard Meeting – October 22, 2013 |

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## 1. Review and Discuss Main Street Alternatives/Phasing Plan

- Michele explained purpose of meeting with VTrans – want to make sure that what is being presented to the selectboard next week is congruent with what VTrans would build. This includes concerns from the residents of their proximity to the state ROW and whether adjusting the centerline could be considered.
- Bryan emphasized Exit 16 example of how VTrans follows the complete streets principles literally and VT 2A in Colchester Village would be a prime candidate for a complete streets project through a VTrans reconstruction project or through the Circ Alts funding.
- Grace went through the discussion topics on the agenda as items to keep in mind while looking through the three alternatives.
- Grace presented an excerpt of the VT 2A slides from the last Colchester public meeting.

## 2. Discussion topics for VTrans

- Shifting the centerline
    - VTrans has no opposition to shifting the centerline.
    - However, the team decided that it is a design detail that will need to be explored in a later phase. Cannot decide in this planning stage whether or not it will be beneficial.
    - Bryan reminded the team that it would be a hard sell to ask for an easement from residents on one side of the street so that their neighbors across the street won't have a sidewalk right up to their front door.
- Minimum buffer distances between sidewalk and edge of pavement
    - This is not a VTrans issue. Colchester is responsible for maintaining the sidewalk and clearing the snow. The landscape buffer is for snow storage and where it is not possible, they will have to push the snow further down.
- Curbing and closed drainage as traffic calming, village character
    - VTrans supports sidewalk on both sides. Although it would require more work, it is a necessary hurdle.
    - Drainage is currently overdesigned on US 7. The water generally flows east to west in this area, so the pipes on US 7 can support additional pipes on Main St. Now is a good time to recommend these changes while in the US 7 design phase.
    - VTrans prefers 16' from centerline to curb, but can live with 15'.
- Street Parking
    - VTrans would not object to parallel parking
    - Team agreed to not propose angled parking or rear-in angled parking because it would take additional space from the village green.
    - Design phase will determine whether the sidewalk will be able to fit adjacent to the street parking curb AND still keep the row of trees in front of the meeting house.
- Bike Lanes

- 4' bike lane is okay. Will need to increase to 5' where there is street parking. Team has looked into this to determine it will fit.
- Will need to ask Jon Kaplan if it is possible to have it taper down to a sharrow at the intersection to allow for widening to 3 travel lanes and still keep within the ROW.

### 3. Conclusion and Action Items

- Ken does not see anything that jumps out besides the Main Street-style lighting. VTrans would be responsible for just lighting the two intersections at Mill Pond Rd and at US 7.
- Support for sidewalk on both sides, particularly if the road will be reconstructed.
- Do not need to show where the crosswalks will be located. 2-3 crosswalks will be added as needed. VTrans is okay with showing the stamped colored paving currently – the division between municipal and VTrans over construction and maintenance is a design issue to be addressed later.
- Michele asked to show the connections of the sidewalk to the restaurant, convenience store at the intersection of VT 2A and US 7. It doesn't have to be designed – just conceptual to show that we have thought about it.

### 4. For Oct 22 Selectboard meeting

- Michele wants to keep the CENTS presentation to 30 minutes, preferably 10 minutes for Severance Road corridor and 20 minutes for Main Street.
- Remove all the existing condition and analysis slides. Jump right into the alternatives, with addition of VTrans input.

Island Line Trail
Causeway Bike Ferry
Bike Recycle Vermont
Safe Routes to School
Online Trail Finder
Trailside Center

LOCAL MOTION
Trails and Bikeways

1 Steele Street #103
Burlington, VT 05401
(p) 802.652.2453
(f) 802.861.2700
info@localmotion.org
www.localmotion.org

**MEMORANDUM**

**To:** Christine Forde, Senior Planner, CCRPC
**From:** Katelin Brewer-Colie, Complete Streets Project Manager
**Date:** October 28, 2013

**RE: Scoping Study - CENTS Colchester Main Street and Severance Road/Mill Pond Road Intersection**

**Local Motion appreciates the opportunity to comment on the CENTS Main Street and Severance Rd/Mill Pond Intersection projects in Colchester.** As northwest Vermont's advocate for people-powered transportation and recreation, we work with a wide range of partners to incorporate improved facilities for walking and biking into transportation projects and plans. As part of our contract with the Chittenden Regional Planning Commission, Local Motion has been asked to provide expertise related to bike and pedestrian issues as applied to various projects. The many projects that are a part of the CIRC Alternatives implementation process are a once-in-a-generation opportunity to contribute to a safe and convenient transportation network for a range of users including cyclists, pedestrians and automobiles.

**Local Motion is happy to see that walk and bike facilities have been incorporated into the design for this project.** Our comments focus on several ways in which these positive attributes could be expanded or reinforced to benefit a wide range of users. This letter serves as our official comment related to the proposed project alternatives. We respectfully submit these comments with the recommendations below.

## Severance Road/Mill Pond Road Intersection

**Local Motion supports Alternative 2, with the multi-use path on the south side of the roadway.** We believe this is the best option because locating the path on the south side of the road will maximize connectivity with the neighborhoods to the south. In addition, we recommend the following:

- **Incorporate on-street bicycle lanes to minimize conflicts between motorists and experienced bicyclists.** It is important that major bicycle corridors like this one accommodate all types of bicyclists, from experienced riders who prefer to ride fast (bike lanes) to novice or casual riders seeking a more leisurely pace (path).
- **Design any street crossings along this path (and all other paths in town) as multiuse crossings, not simply as pedestrian crosswalks.** That is, include pavement markings and signage that alert drivers to the fact that there is bicycle traffic crossing the road. Crossings are a common location of crashes on multiuse paths, as drivers fail to look far enough up and down a path to see if a bicyclist is coming.
- **Alert residents whose driveways cross the path about bicycle cross traffic when entering and exiting their driveways.** This could be done via bicycle stencils in the path at the point of intersection with each driveway.

**Local Motion also urges the project team to evaluate the possibility of a single lane roundabout design at the Mill Pond Rd/Severance Rd. intersection.** If the balance of traffic from each of the three legs and the geometry of the intersection allow for a roundabout, this design could provide multiple benefits for the community and for traffic flow, as follows:

- **A roundabout would likely require less encroachment into adjacent properties.** The lack of turn lanes means a narrower approach to the intersection, and the tight radius of a modern single-lane roundabout has a relatively small footprint. (The roundabout could be built with a mountable center island to facilitate passage of large trucks.)
- **A roundabout would be the safest option for all modes.** Due to the simple and predictable traffic flow through a modern one-lane roundabout, the crash rate for this type of intersection is typically much lower than for a signalized intersection. It also is dramatically safer for bicyclists and pedestrians, as the low vehicle speed and one-lane-at-a-time crossing pattern minimizes both the risk and severity of crashes.

## Main Street in Colchester Village (VT 2A)

**Local Motion supports Alternative 3 because it provides the highest degree of safety and convenience for pedestrians and cyclists, with sidewalks on both sides of the street, high visibility, colored crosswalks and 5 foot bike lanes.** Because Main Street through Colchester Village is identified as a bike route in the state bike plan, the additional investment required for this walk-bike friendly design is warranted. The cost of this alternative could be reduced by reducing the travel lanes to 10 feet wide, as allowed by the Vermont State Design Standards (see below).

Regardless of the alternative chosen, there are several modifications that could be made to the design to increase safety and accessibility for people on foot and on bike:

- **Narrow travel lanes to 10 feet.** A 10-foot width is explicitly allowed by the VT Design Standards on Minor Urban and Village Arterials in highly restricted areas such as village centers. Quoting Section 4.5 of the standards:

  *"On urban and village Minor Arterials, lane widths may vary from 10 to 12 feet...The 10-foot widths are appropriate in highly restricted areas…"*
  *"Reduced lane widths ...facilitate pedestrian crossings because of reduced distance. They are also more economical to construct."*
  *"Lane and shoulder widths within historic districts should be compatible with the historic character of the district."*

  In addition to the safety and character benefits noted in the Vermont state standards, ten-foot lanes would also make it possible to accommodate **sidewalks on both sides of the road** with less need for acquisition of additional ROW. It would also be more in keeping with resident concerns about restricting the growth of the footprint of the road, particularly for residents or businesses with short setbacks.
- **Include the gateway treatments outlined in Alternative 1.** Use signage, painted crosswalks and plantings included in Alternative 1 to signal to traffic that they are entering a village. In addition to safer and narrower crossing lanes, these features will also cause traffic to slow down.

We appreciate the opportunity to comment on this project. I would be happy to meet to talk more with you about our comments.

# Memorandum

To: Patrick C. Scheidel, Town Manager and the Selectboard
From: Dennis E. Lutz, P.E., Public Works Director
Date: 12 November 2013
Subject: Colchester- Essex Network Transportation Study (CENTS) Recommendations

ISSUE: The issue is whether or not the Selectboard will recommend an alternative or alternatives to implement from among those presented in the CENTS Scoping Presentation as part of the Circumferential Highway Alternative Project Process.

DISCUSSION: Although the scope of the Study involved both Colchester and Essex, the two components are unrelated as far as potential solutions. The Colchester portion of the Study takes into account the projected traffic from Essex and vice-versa. In Essex, the issues are concentrated in the corridor from Kellogg Road to Susie Wilson Road and along Susie Wilson Road south to the intersection with VT 15.

The Study identifies a number of alternatives from short-term to medium-long term improvements.

Short-term improvements: The staff supports the short term improvements outlined in the Study (identified on slides 4,5 and 6 in the presentation, with the following change:

The original presentation indicated a recommendation to change the lane approaches on the Susie Wilson Bypass leg of the intersection to left – thru - thru/right from the current left/thru – thru – right. This impacts the capacity of the intersection. In subsequent discussions with RSG, the recommendation is now to leave the lanes as they exist but add overhead signage and dashed striping thru the intersection to indicate paths of travel.

It should be noted that the short-term improvements may provide some benefit as far as safety is concerned at the Kellogg Road – Susie Wilson Road Intersection; however they do not contribute much to overall reduction in congestion or delay. There is a substantial cost for adding adaptive signal control to all the traffic signals in the corridor. The funds may better be spent going forward with the mid/long-term recommendations quickly and adding the adaptive signal controls at that time. The short-term safety improvements however still have merit.

Mid/Long Term Improvements: The staff supports the mid-long term improvements identified generally by added lanes at the VT 15/Susie Wilson Road Intersection (Expanded version and not Reconfigured version), expanded turn lanes at the Kellogg Road/Susie Wilson Road intersection and widening of the road where necessary to provide 4-foot wide bike lanes on each side of Susie Wilson Road along its length.

Kellogg Road Intersection:

The improvements shown on slide 7 have changed since the original presentation. Staff was concerned that in the first presentation, the LOS for this intersection dropped almost to an F at the end of the study period. With an added exclusive southbound right-turn lane and northbound through lane on Susie Wilson Road at this intersection and a northbound taper lane on Susie Wilson Road Bypass, the LOS stays at C in 2030. The cost for the improvements increases by approximately $1M.

Potential Connectors:

The staff supports this concept but the changes would have to be made at the Planning Commission level as sites are redeveloped or the Town would have to purchase the land or easements to make the connections happen. These changes would not be eligible for Circ Highway funds.

Bike Lanes:

Adding 4-foot wide bike lanes north of David Drive does not pose a problem with existing 12+-foot lanes reduced to11-foot travelled lanes. However, south of David Drive, this is a major issue and a major cost. Staff does not advocate reducing the lane width to 10.5 feet on this roadway. The impacts on private property and utilities may be of such a magnitude that 4-foot wide bike lanes are not feasible in this area. This is an issue that will have to be determined during the early stages of conceptual design after more accurate surveys are available for use in the decision-making process.

VT 15/Susie Wilson Road Intersection:

Staff recommends the Expanded Version based on costs and very little difference in LOS between the Expanded and Reconfigured version. Issues to be settled during the early stages of conceptual design are:

1) resolution of the slip lane and reverse movements on VT 15 from westbound to eastbound
2) resolution of the appropriate location for the pedestrian crossing
3) bicycle transition heading east on VT 15

RECOMMENDATION: It is recommended that the Selectboard approve the CENTS Scoping Study and select the preferred alternative(s) as outlined in this memorandum.

# APPENDIX B:
## COST ESTIMATES

**ITEM 1:** Susie Wilson Road

**ITEM 2:** Severance Road and Mill Pond Intersection

**ITEM 3:** Main Street Colchester Village

**Project: Colchester-Essex Network Transportation Study**
***Susie Wilson Road / Kellogg Road Corridor***

| | | | | Short-Term Improvements | | VT 15/Kellogg Road | | VT 15/Susie Wilson Road | | VT 15/Susie Wilson Road | | Susie Wilson Road Widening | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Adaptive signal controllers (5), safety and traffic calming improvements on SB approach to Kellogg Road | | Expand intersection to include dual northbound left turn lanes onto Kellogg Rd, Second westbound lane on Kellogg Rd, Dual northbound thru lanes onto Susie Wilson Bypass, and a second northbound receiveing lane on Susie Wilson Bypass. | | Widen intersection to create second SB left-turn lane at VT 15, raised & landscaped median, pedestrian improvements, signal upgrades. | | Reconfigure intersection to align SB Susie Wilson Road with EB VT 15; "T" WB VT 15 into realigned roadway; add second SB left turn lane, raised & landscaped median, pedestrian improvements, signal upgrades. | | Expand Susie Wilson Road to provide consistent five-lane cross-section plus 4' shoulder for bicycles | |
| | | Unit | Price | Quantity | Total | Quantity | Total | Quantity | Total | Quantity | Total | Quantity | Total |
| 1 | Cold Plane 2" | SF | $0.50 | 0 | $ - | 20,000 | $ 10,000 | 28,000 | $ 14,000 | 37,000 | $ 18,500 | 0 | $ - |
| 2 | Remove & Reset Curb | LF | $15 | 0 | $ - | 1,750 | $ 26,250 | 550 | $ 8,250 | 1,000 | $ 15,000 | 4,000 | $ 60,000 |
| 3 | Granite Curb | LF | $30 | 0 | $ - | 0 | $ - | 1,000 | $ 30,000 | 1,500 | $ 45,000 | 0 | $ - |
| 4 | 5" Concrete Sidewalk | SF | $40 | 0 | $ - | 8,750 | $ 350,000 | 3,000 | $ 120,000 | 3,750 | $ 150,000 | 20,000 | $ 800,000 |
| 5 | Roadway Widening | SF | $35 | 0 | $ - | 25,000 | $ 875,000 | 12,000 | $ 420,000 | 35,000 | $ 1,225,000 | 7,330 | $ 256,550 |
| 6 | Double-lane Roundabout | EA | $1,500,000 | 0 | $ - | 0 | $ - | 0 | $ - | 0 | $ - | 0 | $ - |
| 7 | Drainage | LS | VAR | 0 | $ - | 1 | $ 100,000 | 1 | $ 75,000 | 1 | $ 100,000 | 1 | $ 100,000 |
| 8 | Removal of Pavement Markings | LF | $5 | 0 | $ - | 0 | $ - | 0 | $ - | 0 | $ - | 0 | $ - |
| 9 | Pavement Markings | LF | $2 | 200 | $ 400 | 5,400 | $ 10,800 | 2,500 | $ 5,000 | 3,000 | $ 6,000 | 8,000 | $ 16,000 |
| 10 | Durable Striping Symbols | EA | $100 | 10 | $ 1,000 | 20 | $ 2,000 | 20 | $ 2,000 | 20 | $ 2,000 | 20 | $ 2,000 |
| 11 | Signs | EA | $300 | 2 | $ 600 | 12 | $ 3,600 | 12 | $ 3,600 | 12 | $ 3,600 | 10 | $ 3,000 |
| 12 | Traffic Signal Retiming | LS | VAR | 1 | $ 5,000 | 1 | $ 5,000 | 1 | $ 10,000 | 1 | $ 10,000 | 1 | $ 2,500 |
| 13 | Traffic Signal Equipment | LS | VAR | 5 | $ 177,000 | 1 | $ 250,000 | 1 | $ 300,000 | 1 | $ 300,000 | 0 | $ - |
| 14 | Landscaping/Streetscaping | LS | VAR | 0 | $ - | 1 | $ 25,000 | 1 | $ 75,000 | 1 | $ 75,000 | 1 | $ 25,000 |
| 15 | Mobilization/Demobilization | LS | 8% | 1 | $ 14,720 | 1 | $ 132,620 | 1 | $ 85,030 | 1 | $ 156,010 | 1 | $ 101,210 |
| 16 | Traffic Control | LS | 10% | 1 | $ 19,880 | 1 | $ 179,030 | 1 | $ 114,790 | 1 | $ 210,620 | 1 | $ 136,630 |
| | | | Subtotal | | $ 218,600 | | $ 1,969,300 | | $ 1,262,700 | | $ 2,316,800 | | $ 1,502,900 |
| | | | Contingency (20%) | | $ 43,800 | (25%) | $ 492,400 | (25%) | $ 315,700 | (25%) | $ 579,200 | (25%) | $ 375,800 |
| | | | **Total Estimated Construction Cost** | | **$ 262,400** | | **$ 2,461,700** | | **$ 1,578,400** | | **$ 2,896,000** | | **$ 1,878,700** |
| | | | Engineering (10%) | | $ 26,240 | (15%) | $ 369,255 | (15%) | $ 236,760 | (15%) | $ 434,400 | (15%) | $ 281,805 |
| | | | Construction Engineering (5%) | | $ 13,120 | (15%) | $ 369,255 | (15%) | $ 236,760 | (15%) | $ 434,400 | (15%) | $ 281,805 |
| | | | Right-of-Way ($30/sf) | | $ - | ($30/sf) | $ 24,000 | ($30/sf) | $ 147,300 | ($30/sf) | $ 330,000 | ($40/sf) | $ 293,200 |
| | | | **Total Cost for Design & Construction** | | **$ 310,000** | | **$ 3,230,000** | | **$ 2,200,000** | | **$ 4,100,000** | | **$2,740,000** |

**13046 - Colchester-Essex Network Transportation Study**
**Severance Road Corridor Improvements**

## Alternative 1 - Severance Rd/Mill Pond Rd Intersection Widening with Shared Use Path on the South

**Intersection - Severance Rd/Mill Pond Rd Intersection Widening**

| Item | Unit | Quantity | Price | | Total |
|---|---|---|---|---|---|
| Cold Plane | SF | 29785 | $0.50 | $ | 14,892.50 |
| 2" Asphalt Overlay | TON | 370 | $150.00 | $ | 55,500.00 |
| Common Excavation | CY | 729 | $10.00 | $ | 7,293.33 |
| Subbase of DGCS | CY | 547 | $35.00 | $ | 19,145.00 |
| Bituminous Concrete | TON | 370 | $150.00 | $ | 55,500.00 |
| Stop Bar | LF | 30 | $12.50 | $ | 375.00 |
| Striping Lines | LF | 5753 | $1.50 | $ | 8,629.50 |
| Striping Symbols | EA | 8 | $200.00 | $ | 1,600.00 |
| Signs | EA | 2 | $1,000.00 | $ | 2,000.00 |
| Traffic Control | LS | 1 | $5,000.00 | $ | 5,000.00 |
| Removing and Resetting Fence | LF | 332 | $5.00 | $ | 1,660.00 |
| Relocate Utility Poles | EA | 3 | $10,000.00 | $ | 30,000.00 |
| Mobilization/Demobilization | LS | 1 | $16,127.63 | $ | 16,127.63 |
| | | | Subtotal | $ | 217,800.00 |
| | | | Contingency (25%) | $ | 54,450.00 |
| | | | **Intersection Construction Cost** | **$** | **272,250.00** |

**Corridor - 10' Shared Use Path on the South and Shoulder Widening**

| Item | Unit | Quantity | Price | | Total |
|---|---|---|---|---|---|
| Cold Plane | SF | 6454 | $0.50 | $ | 3,227.00 |
| 2" Asphalt Overlay | TON | 80 | $150.00 | $ | 12,000.00 |
| Clearing and Grubbing | LS | 1 | $20,000.00 | $ | 20,000.00 |
| Common Excavation | CY | 6604 | $10.00 | $ | 66,044.81 |
| Trench Excavation | CY | 3095 | $15.00 | $ | 46,421.33 |
| Subbase of DGCS | CY | 4511 | $35.00 | $ | 157,890.96 |
| Sand Borrow | CY | 1749 | $10.00 | $ | 17,492.22 |
| Bituminous Concrete | TON | 1410 | $150.00 | $ | 211,500.00 |
| Catch Basin | EA | 42 | $3,000.00 | $ | 125,337.60 |
| Drainage Pipes (18" CPEP) | LF | 10445 | $35.00 | $ | 365,568.00 |
| Striping Lines | LF | 3227 | $1.50 | $ | 4,840.50 |
| Striping Symbols | EA | 7 | $200.00 | $ | 1,392.64 |
| Signs | EA | 17 | $1,000.00 | $ | 17,000.00 |
| Seed | LB | 174 | $9.00 | $ | 1,566.98 |
| Hay Mulch | TON | 5 | $550.00 | $ | 2,750.00 |
| Topsoil | CY | 1170 | $30.00 | $ | 35,111.85 |
| Traffic Control | LS | 1 | $20,000.00 | $ | 20,000.00 |
| Removing and Resetting Fence | LF | 1335 | $5.00 | $ | 6,675.00 |
| Relocate Utility Poles | EA | 24 | $10,000.00 | $ | 240,000.00 |
| Mobilization/Demobilization | LS | 1 | $108,385.51 | $ | 108,385.51 |
| | | | Subtotal | $ | 1,463,300.00 |
| | | | Contingency (25%) | $ | 365,825.00 |
| | | | **Corridor Construction Cost** | **$** | **1,829,125.00** |
| | | | Subtotal | $ | 2,101,375.00 |
| | | | Engineering (15%) | $ | 315,206.25 |
| | | | **Total Cost** | **$** | **2,417,000.00** |

*Note: costs do not include ROW costs, which could be significant for the shared use path component.*

**13046 - Colchester-Essex Network Transportation Study**
**Severance Road Corridor Improvements**

## Alternative 2 - Severance Rd/Mill Pond Rd Intersection Widening with Shared Use Path on the North

| **Intersection - Severance Rd/Mill Pond Rd Intersection Widening** | | | | | |
|---|---|---|---|---|---|
| Item | Unit | Quantity | Price | | Total |
| Cold Plane | SF | 29785 | $0.50 | $ | 14,892.50 |
| 2" Asphalt Overlay | TON | 370 | $150.00 | $ | 55,500.00 |
| Common Excavation | CY | 729 | $10.00 | $ | 7,293.33 |
| Subbase of DGCS | CY | 547 | $35.00 | $ | 19,145.00 |
| Bituminous Concrete | TON | 370 | $150.00 | $ | 55,500.00 |
| Stop Bar | LF | 23 | $12.50 | $ | 287.50 |
| Striping Lines | LF | 5805 | $1.50 | $ | 8,707.50 |
| Striping Symbols | EA | 8 | $200.00 | $ | 1,600.00 |
| Signs | EA | 2 | $1,000.00 | $ | 2,000.00 |
| Traffic Control | LS | 1 | $5,000.00 | $ | 5,000.00 |
| Removing and Resetting Fence | LF | 332 | $5.00 | $ | 1,660.00 |
| Relocate Utility Poles | EA | 3 | $10,000.00 | $ | 30,000.00 |
| Mobilization/Demobilization | LS | 1 | $16,126.87 | $ | 16,126.87 |
| | | | Subtotal | $ | 217,800.00 |
| | | | Contingency (25%) | $ | 54,450.00 |
| | | | **Intersection Construction Cost** | **$** | **272,250.00** |

| **Corridor - 10' Shared Use Path on the North and Shoulder Widening** | | | | | |
|---|---|---|---|---|---|
| Item | Unit | Quantity | Price | | Total |
| Cold Plane | SF | 6454 | $0.50 | $ | 3,227.00 |
| 2" Asphalt Overlay | TON | 80 | $150.00 | $ | 12,000.00 |
| Clearing and Grubbing | LS | 1 | $20,000.00 | $ | 20,000.00 |
| Common Excavation | CY | 6886 | $10.00 | $ | 68,863.83 |
| Trench Excavation | CY | 3095 | $15.00 | $ | 46,419.56 |
| Subbase of DGCS | CY | 4743 | $35.00 | $ | 166,004.74 |
| Sand Borrow | CY | 1865 | $10.00 | $ | 18,651.48 |
| Bituminous Concrete | TON | 1490 | $150.00 | $ | 223,500.00 |
| Catch Basin | EA | 42 | $3,000.00 | $ | 125,332.80 |
| Drainage Pipes (18" CPEP) | LF | 10444 | $35.00 | $ | 365,554.00 |
| Striping Lines | LF | 3227 | $1.50 | $ | 4,840.50 |
| Striping Symbols | EA | 7 | $200.00 | $ | 1,392.59 |
| Colored Crosswalk Paving | SF | 908 | $30.00 | $ | 27,240.00 |
| Signs | EA | 10 | $1,000.00 | $ | 10,000.00 |
| Seed | LB | 184 | $9.00 | $ | 1,659.26 |
| Hay Mulch | TON | 5 | $550.00 | $ | 2,750.00 |
| Topsoil | CY | 1239 | $30.00 | $ | 37,179.63 |
| Traffic Control | LS | 1 | $20,000.00 | $ | 20,000.00 |
| Removing and Resetting Fence | LF | 1002 | $5.00 | $ | 5,010.00 |
| Relocate Utility Poles | EA | 17 | $10,000.00 | $ | 170,000.00 |
| Mobilization/Demobilization | LS | 1 | $106,370.03 | $ | 106,370.03 |
| | | | Subtotal | $ | 1,436,000.00 |
| | | | Contingency (25%) | $ | 359,000.00 |
| | | | **Corridor Construction Cost** | **$** | **1,795,000.00** |
| | | | Subtotal | $ | 2,067,250.00 |
| | | | Engineering (15%) | $ | 310,087.50 |
| | | | **Total Cost** | **$** | **2,378,000.00** |

*Note: costs do not include ROW costs, which could be significant for the shared use path component.*

**Project: Colchester-Essex Network Transportation Study**

| | | | | | Alternative 1<br>Walkable Neighborhood | | | Alternative 2<br>Main St Character | | | Alternative 3<br>Village Destination | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Roadway/Sidewalk Changes | | | | Replace 4' sidewalk with 5' concrete sidewalk on north side. No movement of utility poles. Widened roadway to accommodate two travel lanes and 150' left turn lane pockets in each direction at the Mill Pond Rd/East Rd/Main Str intersection. | | | Replace 4' sidewalk with 5' sidewalk on north side. Add 4' bike lanes to both sides and granite curbing on north side with 4'9" landscape buffer. Utility poles shift by 1'6" on north side. Village-style lighting on north side. Added curbing and closed drainage on the south side. Widened roadway to accommodate two travel lanes and 150' turn lane pockets in each direction at the Mill Pond Rd/East Rd/Main Str intersection. | | | Replace 4' sidewalk with 5' concrete sidewalk on north side. Add 4' bike lanes to both sides and granite curbing on both sides with approx. 4'-5' landscape buffer. Utility poles shift by 1'6" on north side and 6'10" on south side. Village-style lighting on both sides, with colored stamped asphalt at crossings. Widened roadway to accommodate two travel lanes and a 150' turn lane pockets in each direction at the Mill Pond Rd/East Rd/Main Str intersection. | | |
| | Traffic Signal Changes | | | | Signal timing optimization, permanent mast arms, vehicle detection | | | Signal timing optimization, permanent mast arms, vehicle detection, pedestrian detection and signals | | | Signal timing optimization, permanent mast arms, vehicle detection, pedestrian detection and signals | | |
| | | Unit | | Price | Quantity | | Total | Quantity | | Total | Quantity | | Total |
| 1 | Common Excavation | CY | $ | 10 | 346 | $ | 3,459 | 346 | $ | 3,459 | 2940 | $ | 29,404 |
| 2 | Trench Excavation | CY | $ | 15 | 36 | $ | 533 | 4879 | $ | 73,178 | 4879 | $ | 73,178 |
| 3 | Solid Rock Excavation | CY | $ | 30 | 288 | $ | 8,648 | 288 | $ | 8,648 | 288 | $ | 8,648 |
| 4 | Subbase of DGCS | CY | $ | 35 | 286 | $ | 10,014 | 2881 | $ | 100,819 | 4178 | $ | 146,222 |
| 5 | Bituminous Concrete | TON | $ | 150 | 18 | $ | 2,700 | 1435 | $ | 215,250 | 1435 | $ | 215,250 |
| 6 | Granite Curb | LF | $ | 30 | 0 | $ | - | 9340 | $ | 280,200 | 9340 | $ | 280,200 |
| 7 | 5" Concrete Sidewalk | SY | $ | 75 | 2594 | $ | 194,583 | 2594 | $ | 194,583 | 5189 | $ | 389,167 |
| 8 | Catch Basin | EA | $ | 3,000 | 0 | $ | - | 37 | $ | 112,080 | 37 | $ | 112,080 |
| 9 | Drainage Pipes (18" CPEP) | LF | $ | 35 | 0 | $ | - | 9340 | $ | 326,900 | 9340 | $ | 326,900 |
| 10 | Bicycle Pavement Markings | EA | $ | 150 | 0 | $ | - | 8 | $ | 1,200 | 8 | $ | 1,200 |
| 11 | Utility Poles | EA | $ | 10,000 | 0 | $ | - | 11 | $ | 110,000 | 28 | $ | 280,000 |
| 12 | Lighting | EA | $ | 9,000 | 0 | $ | - | 19 | $ | 168,120 | 31 | $ | 280,200 |
| 13 | Colored Crosswalk Paving | SF | $ | 30 | 0 | $ | - | 0 | $ | - | 360 | $ | 10,800 |
| 14 | Topsoil / Seed / Mulch | SY | $ | 5 | 0 | $ | - | 822 | $ | 4,108 | 1730 | $ | 8,648 |
| 15 | Traffic Signal Equipment | LS | | VAR | 1 | $ | 300,000 | 1 | $ | 300,000 | 1 | $ | 300,000 |
| 16 | Mobilization/Demobilization | LS | | 8% | 1 | $ | 43,600 | 1 | $ | 153,890 | 1 | $ | 198,960 |
| 17 | Traffic Control | LS | | VAR | 1 | $ | 25,000 | 1 | $ | 25,000 | 1 | $ | 25,000 |
| | | | | | Subtotal | $ | 588,600 | | $ | 2,077,500 | | $ | 2,685,900 |
| | | | | | Contingency (25%) | $ | 147,200 | | $ | 519,400 | | $ | 671,500 |
| | | | | | Total Estimated Construction Cost | **$** | **735,800** | | **$** | **2,596,900** | | **$** | **3,357,400** |
| | | | | | Engineering (15%) | $ | 110,370 | | $ | 389,535 | | $ | 503,610 |
| | | | | | **Total Cost for Design & Construction** | **$** | **850,000** | | **$** | **2,990,000** | | **$** | **3,870,000** |

| | | | | | |
|---|---|---|---|---|---|
| Segment Length (ft) | Uncurbed | 4670 | Curbed | 4670 | Curbed both sides | 9340 |

28 utility poles total
11 on north side
17 on south side

Underground drainage: within additional road width, but (trench excavation, not common)

# APPENDIX C:
# STUDY AREA PHOTOS

## BIRDS-EYE VIEW OF INTERSECTIONS IN CENTS STUDY AREA

The following aerial views of each intersection was taken from Google Earth.

### FIGURE C-1: US 7/US 2 AND SEVERANCE


### FIGURE C-2: US 7/US 2 AND BAY ROAD

**FIGURE C-3: VT 2A AND MAIN STREET**


**FIGURE C-4: US 7/US 2 AND MAIN STREET**

**FIGURE C-5: VT 2A AND MILL POND ROAD**


**FIGURE C-6: SEVERANCE ROAD AND MILL POND ROAD**

**FIGURE C-7: VT 2A AND VT 289**


**FIGURE C-8: SUSIE WILSON ROAD AND GARDENSIDE DRIVE**

**FIGURE C-9: VT 2A/VT 289 AND SUSIE WILSON BYPASS**


**FIGURE C-10: SUSIE WILSON ROAD AND KELLOGG ROAD**

**FIGURE C-11: SUSIE WILSON ROAD AND DAVID DRIVE**


**FIGURE C-12: SUSIE WILSON ROAD AND JOSHUA WAY**

**FIGURE C-13: SUSIE WILSON ROAD AND PINECREST DRIVE**

**FIGURE C-14: SUSIE WILSON ROAD AND JOSHUA WAY**

**FIGURE C-15: VT 15 AND SUSIE WILSON ROAD**