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1 Introduction

The Chittenden County Regional Planning Commission (CCRPC) and the Town of Hinesburg have collaborated to prepare a corridor plan for Route 116 through Hinesburg's village growth area. The primary objectives of this plan include:

- To define a vision for the future of Route 116 through Hinesburg's village growth area, so that decisions about public and private investments will support that vision.
- To consider how to balance Route 116's role as both Main Street and regional commuter route.
- To define a set of strategies, plans and actions for the Route 116 corridor that will support the vision of Hinesburg's Village Growth Area.
- To address complex transportation and land use problems comprehensively, acknowledging that a variety of players must work together toward a vision of the corridor's future

A Corridor Study should be based on a comprehensive assessment of issues, needs, and potential solutions to address these objectives, and consider all modes, including transit, bicycling, and walking, as well as automobile and commercial vehicle travel. It should identify a mutually supportive set of strategies to maintain and enhance access, mobility, safety, economic development, and environmental quality along the transportation corridor. The range of options can include low-cost, low-impact alternatives to capital investment strategies, such as operational changes or maintenance activities. Corridor studies should consider land use strategies to address the impacts of local land use decisions and development patterns on traffic and multimodal travel demand. For Route 116, this study will consider how to accommodate planned village growth while meeting current and future travel demand. It will also seek opportunities to maximize alternative modes of transportation, and provide more efficient alternative routes for local circulation.

1.1 Background

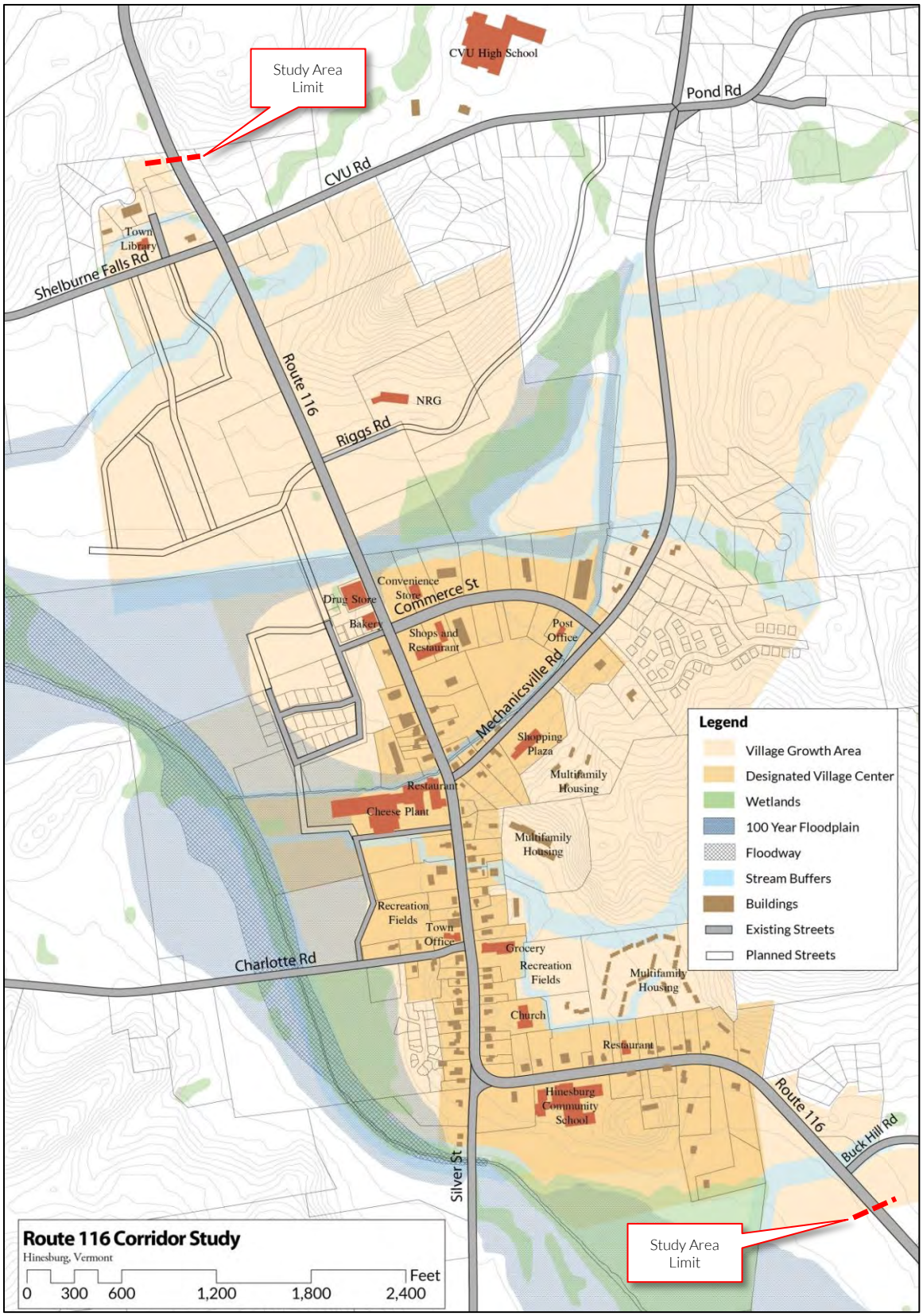
This study was initiated by CCRPC and the Town of Hinesburg in response to concerns which include traffic congestion; safety and mobility for all modes of travel; and the coordination between land use development, transportation infrastructure and stormwater management. Route 116 through Hinesburg has seen substantial changes in recent years, including land development within the village growth center, increase in through-traffic volumes due to growth and development south of the village, and several intersection projects to address safety and congestion.

1.2 Study Area

The study focuses on Route 116 and its connecting streets within Hinesburg's "Village Growth Area," which extends from 0.12 miles north of the CVU/Shelburne Falls intersection to 0.06 miles south of the Buck Hill Road intersection. The study area, shown on Figure 1.1 on the following page, is where the current congestion and safety issues are most intense and also where future growth is planned. The study area is traversed by several stream corridors, wetlands, floodplains, and the LaPlatte River floodway. Therefore, managing stormwater and flooding is important to consider in conjunction with planning for growth and transportation.

The Village Growth Area is designated in Hinesburg's zoning ordinance, and encompasses both the historic village core (roughly between Charlotte Road and Silver Street), as well as adjacent areas that are planned for compact, mixed use development. This historic village core was designated as a "Village Center" by the Vermont Department of Housing and Community Development in 2011, which provides incentives for investment in infrastructure to support development, and priority for state grants and other resources. The Town is considering applying for designation of the larger Village Growth Area as a "Growth Center," which would among other things allow innovative funding of infrastructure improvements. To qualify, a growth center should be planned a compact area planned for concentrated, mixed-use development, and should include a core that is similar in form and function to a traditional downtown.

Figure 1.1: Study Area Map



1.3 Study Process

This study generally followed the process outlined in the VTrans *Corridor Management Handbook*, which included the following steps:

- Assess existing and future conditions
- Develop a shared vision for the corridor and goals
- Identify and analyze strategies that will advance the corridor vision
- Select and prioritize strategies
- Prepare implementation plan

Over the course of the project from August 2013 through April 2014, there were four steering committee meetings and three public meetings, which are documented in Attachment 1, on CCRPC's project website, http://www.ccrpcvt.org/transportation/corridors/route116/ and the Town of Hinesburg's website http://www.hinesburg.org/route116-corridor-study/ . Table 1.1provides an overview of this study's planning timeline.

Table 1.1: Route 116 Corridor Study Schedule

Month	Activities
July 2013	Project initiation, Data Collection
August 2013	Steering Committee Meeting to review existing conditions
September 2013	Public Meeting to gauge concerns and gather ideas Steering Committee Meeting
October 2013	Develop and evaluate corridor strategies and alternatives
November 2013	Steering Committee Meeting to review strategies and alternatives
January 2014	Refine and develop recommendations
February 2014	Public Meeting to review strategies and gather input
April 2014	Present report and final recommendations to Selectboard

A steering committee was established to guide the work, provide early input and direction, and represent a variety of interests and perspectives in the community. Its members are:

- Andrea Morgante
- Tyler Billingsley
- Schuyler Jackson
- Rolf Kielman
- Frank Koss
- Rob Bast
- Dennis Place
- John Roos
- Cathy Ryan

Project Staff:

- Alex Weinhagen, Town Planner
- Christine Forde, CCRPC
- Sai Sarepalli, CCRPC
- Lucy Gibson, DuBois & King

1.4 Goals and Vision

The study began with the committee and project staff articulating a vision and goals for the corridor.

1.4.1 Vision for Hinesburg's Village Area and the Route 116 Corridor

- Hinesburg is a vibrant village with a variety of land uses and destinations, served by a complete and interconnected street network that accommodates all users.
- Route 116 provides adequate capacity to efficiently serve the commuter traffic passing through during peak traffic hours. Traffic flows at safe, slower speeds so does not detract from the village's character or compromise the safety of bicyclists or pedestrians.
- Transportation options and choices are available for both short and long trips. Key infrastructure to make easy connections between modes is in place. Bus service is convenient and many commuters chose to rideshare.
- The local street network is designed to support compact growth, walking and biking. It provides access that reduces curb cuts on Route 116, alleviating conflicts between vehicles, bicycles and pedestrians.
- Environmental impacts from transportation infrastructure and land development are minimized through implementation of low impact development standards, distributed green stormwater management and careful design in floodplain areas.
- A mix of land uses is designed and arranged in a pedestrian-oriented, walkable manner that provides a sense of community and place, efficient transportation and wide range of choice of modes.

1.4.2 Goals for the Corridor

- Safety for all users
    - Slower speeds to avoid or mitigate crashes and conflicts between users
- Transportation System Efficiency
    - Maximize performance of existing transportation infrastructure
    - Use "rightsizing" principles in the design of transportation projects to avoid excess pavement and cost.
    - Establish a Complete Street network throughout the village
- Economic Vitality and Livability
    - Attractive Streetscapes for an walkable, vibrant village center
    - Support compact, mixed use, context-sensitive growth to add to village vibrancy
- Environmental Health
    - Minimize stormwater runoff from pavement with efficient, right-sized designs
    - Integrate stormwater management into the design of public and private projects

1.4.3 Town Plan Excerpts

The following are quotes from pages 23-24 of the Hinesburg Town Plan, adopted May 16, 2011, which describe many of the planning goals that this study is intended to address.

3.2.2) To change the character of Route 116 to a "Main Street", and to create and reinforce "gateways" into the Village to give people a sense of arrival.

a) Work aggressively with the CCMPO, CCRPC, VTrans, and Hinesburg's State Legislators to implement provisions of the Route 116 Hinesburg Village Corridor Study. Pay particular attention to intersection improvements at Shelburne Falls Road, Silver Street, Charlotte Road, Mechanicsville Road, and Commerce Street.

b) Redesign the main portion of Route 116 through the Village to make it safer, more pedestrian friendly, more efficient, and more attractive. Overall, the roadway (traveled area plus shoulders) should be narrowed to reduce speeding, eliminate passing on the right, and provide more room in the right-of-way for pedestrian infrastructure, street trees, etc. Additional features should include: curbing, more sidewalks, bicycle lanes, street trees, improved lighting that is pedestrian friendly and attractive, and improved signage.

c) Assess the pros and cons of the Town taking over the Village portion of Route 116 (e.g., Buck Hill Road to Commerce Street) from the State. To create a truly "walkable" community by working toward safe and convenient pedestrian access to all portions of the Village.

3.2.3) To create a truly "walkable" community by working toward safe and convenient pedestrian access to all portions of the Village.

a) Ensure the continued safety of existing crosswalks through maintenance of signage, curbing, road striping.

b) Make modifications to the Official Map as necessary to ensure village sidewalks and paths are connected and linked to significant destinations outside the Village. Coordinate this with efforts to create a system of footpaths and trails in the rural areas of town (see section 6.7).

c) Continue to make regular improvements to pedestrian infrastructure using Municipal, State, and Federal funds.

d) Plan for and install sidewalks on both sides of Route 116 through the Village area.

3.2.4) To address the overall traffic flow and road network in the Village area to ease congestion, offer new development opportunities, and improve safety.

a) Develop the new West Side Road connecting Charlotte Road with Shelburne Falls Road as documented in the official town map, working with the Saputo Site Redevelopment Committee and private developers, and updating zoning regulations where necessary to insure implementation consistent with goals for development of the greater village area.

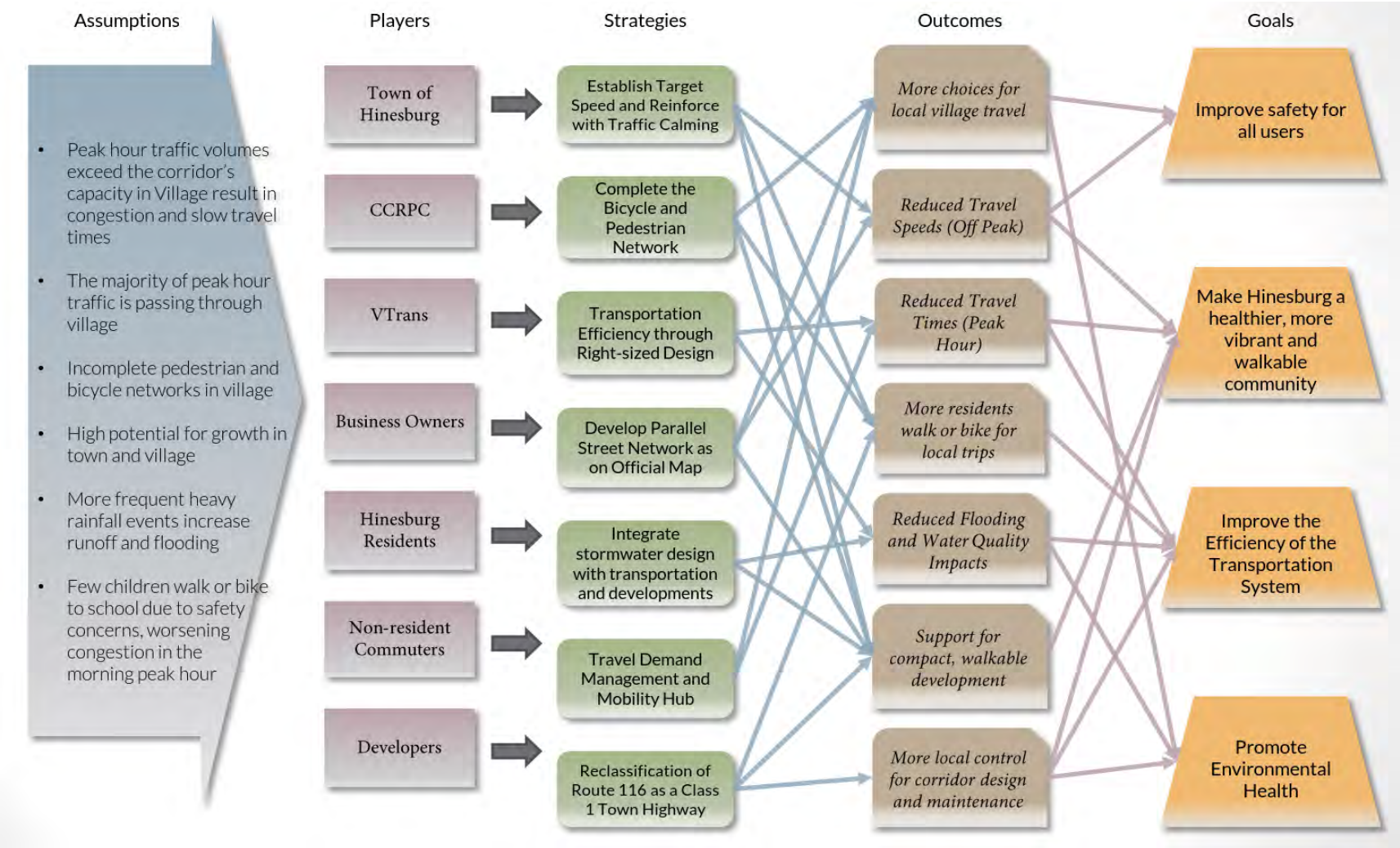
b) Work with the CCMPO to continue tracking traffic count data in and around the Village area.

c) Prioritize the enforcement of speed and other traffic laws in the Village to protect lives and promote Village character.

1.5 Corridor Plan Summary

The following graphic provides an overview of the corridor plan and its assumptions, strategies, desired outcomes and goals.

Figure 1.2: Corridor Plan Overview



2 Existing and Future Conditions Analysis

2.1 Village Land Use and Demographics

The Village is currently comprised of a small historic "core," its designated village center, surrounded by a larger area that together constitute the Village Growth Area, which are show in in Figure 1.1. The Village core is centered on the Charlotte Road/Route 116 intersection where Lantman's grocery store and the historic Town Hall are located. The village has a variety of residential types, businesses, schools, and services throughout the Village Growth Area. The following excerpt from the Hinesburg Town Plan describe the village area land uses.

> The variety of residential types, businesses, and schools in the Village make it both a lively place and the economic, social and institutional center for the Town. The Village residents range in age and background, and it is this diversity that provides a rich source of community information, involvement, and participation. While several single-family homes remain, many of the larger homes have been divided into apartments and several businesses have created apartments in their buildings. The condominiums at Lyman Meadows made ownership possible with the affordable pricing available to a larger scale development. The apartments at Kelley's Field offer safe and convenient elderly housing.
>
> Additionally, the Village is the location of the Town's public institutions. Much of the vitality of the Village stems from the core of most town services, public institutions and commerce that are within walking distance for those that live in the village as well as residents that drive to the village and then walk for shopping, recreation, public events, school, etc.

The Village Growth Area has seen steady interest in land development, with numerous projects recently completed. Table 2.1 and Table 2.2 lists current development activity in the study area, and are located on Figure 2.1.

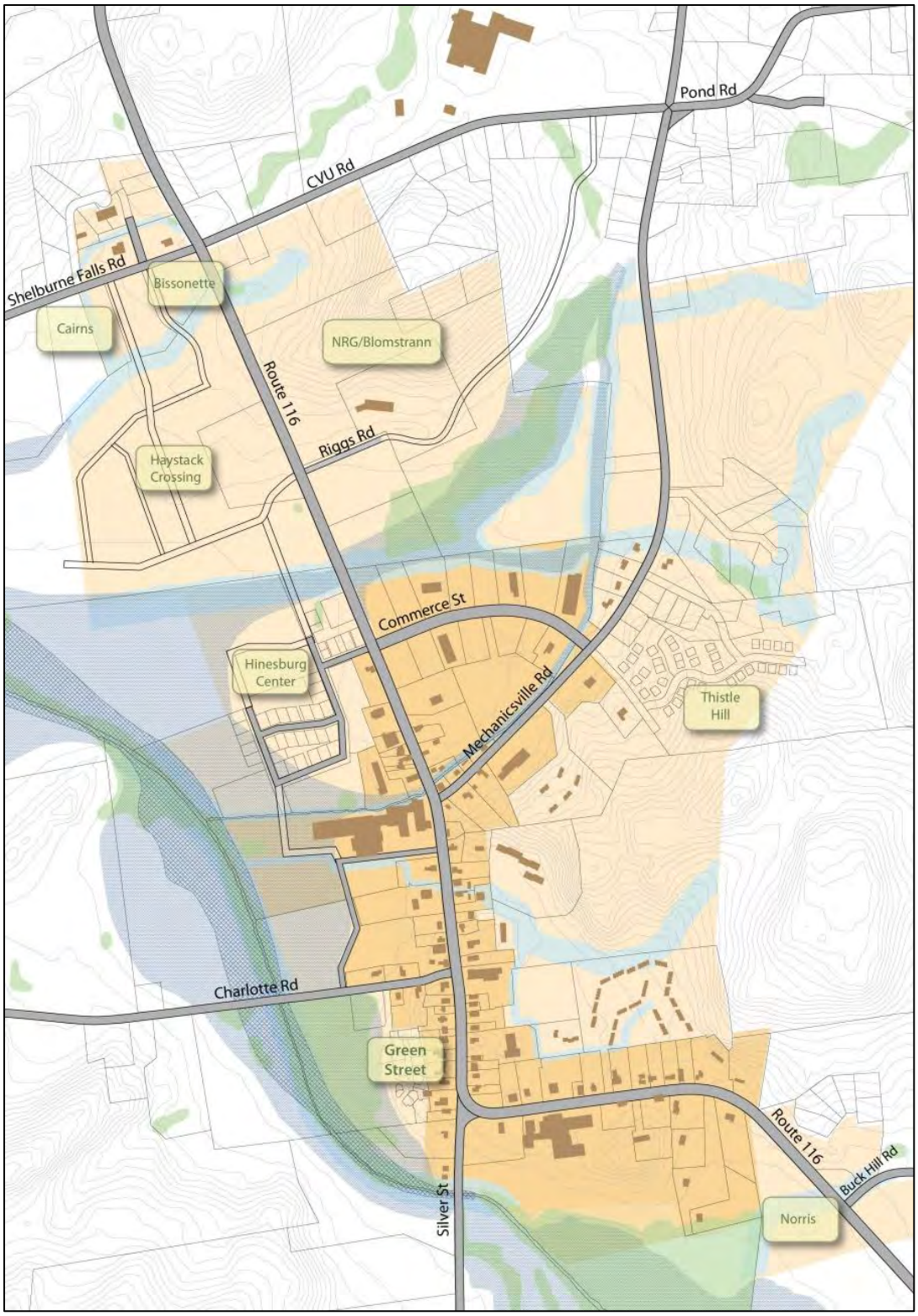
Table 2.1: Recent Non-Residential Development Activity in the Study Area

Development	Type(s)	Approximate Size (if known) (square feet)	Status
Town Police Station	Municipal Office	3,500	completed and recently occupied
Hannaford supermarket	Grocery	36,000	Locally approved, Act 250 permit required
Hinesburg Center Phase One	Office	3,000	completed, not occupied
Hinesburg Center Phase Two	Mixed Use	9,000	conceptual only
Haystack Crossing	Mixed Use	50,000	under review
Green Street	Office	6,000	needs permits
NRG/Blomstrann	Mixed Use (light industrial, office)	unknown	conceptual only
Cairns	Mixed Use	3,000	conceptual only
Bissonette Family	Mixed Use (likely retail or restaurant)	6,000	conceptual only
Cheese Plant	Industrial/Commercial	20,000	Vacancy in former plant

Table 2.2: Recent Residential Development Activity in the Study Area

Development	Units	Status
Hinesburg Center Phase One	9	completed, soon to be occupied
Hinesburg Center Phase Two	60	conceptual only
Haystack Crossing	225	under review
Green Street	23	needs permits
NRG/Blomstrann	40	conceptual only
Norris	24	under review
Thistle Hill	4	approved, under construction

Figure 2.1: Development Project Locations



2.2 Roadway Network

Route 116 through Hinesburg is a state owned road with a 66 feet (4 rod) right-of-way. It is classified as a rural minor arterial, indicating its importance as an inter-regional commuter route. Its primary role in the study area is as a main street, serving the Town's busiest civic and commercial sites, as shown in Figure 2.1. The Vermont Agency of Transportation (VTrans) is responsible for maintenance of the road's traveled way, and the Town of Hinesburg maintains bicycle and pedestrian facilities and parallel parking spaces within the right-of-way through agreements with VTrans.

2.2.1 Traffic Volumes and Patterns

Table 2.3 below shows the traffic volumes on key segments in the study area, and indicates that while there is considerable through traffic in the village area, the highest volume segment, between Mechanicsville and Charlotte Roads, also has a component of local traffic.

Table 2.3: Traffic Volumes on Route 116 and Connecting Links

Route 116 Segment	Traffic Volume (AADT, VTrans)
North of CVU Rd	8,500
Between CVU and Mechanicsville	8,600
Between Mechanicsville and Charlotte	11,000
Between Charlotte and Silver	9,700
South of Silver	5,800
Local Roads:	
Shelburne Falls Rd	2,400
Mechanicsville Rd	3,600
Charlotte Rd	2,200
Silver Street	4,100

Source: VTrans Route Log AADT

Table 2.4 lists the key intersections in the study area, along with peak hour traffic volumes and pedestrian counts.

Table 2.4: Key Intersection Data for Study Area

Intersection	Traffic Control	AM Peak Traffic (vph)	AM Pedestrians	PM Peak Traffic (vph)	PM Pedestrians
Silver	Unsignalized T	1069	0	1179	6
Charlotte	Signalized	1466	26	1383	61
Mechanicsville	Unsignalized T	1353	7	1269	4
Commerce	Signalized	1232	2	1279	21
CVU	Signalized	1698	14	1633	5

Source: CCRPC Peak Hour Counts, April 2013

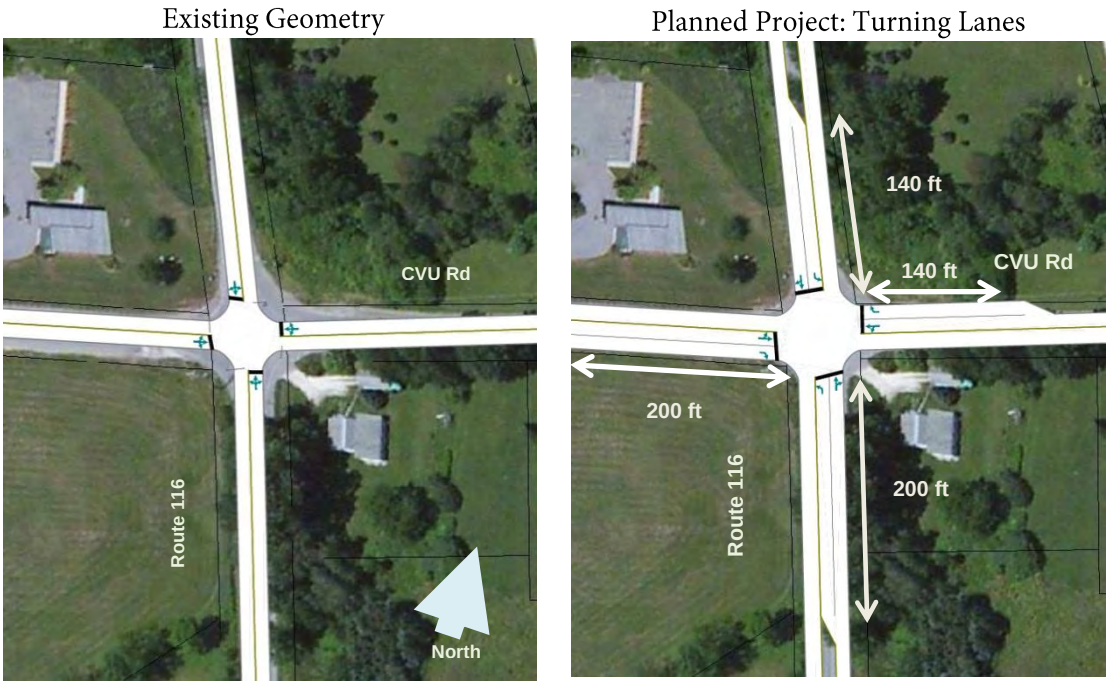
2.2.2 Planned Transportation Projects

The following projects are underway in the village area:

- **Sidewalks:** There are several sidewalk projects in various stages of planning that will greatly improve pedestrian circulation:
  - A new sidewalk on the west side of Route 116 between Charlotte Road and the Hinesburg Community School is scheduled for construction in 2014
  - A sidewalk on the east side of Route 116 between Commerce and Riggs Road (NRG's access road) is under design currently, and should be constructed in 2015.
- **Route 116/Charlotte Road Intersection**. An intersection capacity analysis shows that modifications to the signal phasing to allow concurrent east/west traffic movements would reduce delays at this intersection. Changes to the sidewalk alignment and striping are required for this project, which was proposed as part of Hannaford traffic mitigation. Because of the uncertainty of when the Hannaford supermarket may be constructed, the Town is pursuing this project independently. There is no specific timeline, but the Town is seeking technical assistance to develop the design and VTrans has agreed to assist by re-timing the traffic signal. A concept sketch is shown in Figure 2.2.
- **Route 116/CVU Road Intersection.** A project to add turning lanes on each approach and a new signal is planned for construction in 2016 by VTrans. A concept sketch is shown in Figure 2.3.
- **Hannaford Supermarket**. In addition to the above, the following projects proposed in conjunction with the construction of the Hannaford supermarket on Commerce Street include:
  - Extending the southbound left turn lane on Route 116 at Commerce Street
  - Establishing a westbound right turn lane on Commerce Street at Route 116
  - Relocating Aubuchon's curb cut to reduce conflicts with queued vehicles
  - Install "do not block" sign on Commerce Street at the Jolley Mobil access
  - Constructing sidewalk on Commerce Street to the Mechanicsville shared use path
  - Contributing to the future signalization of Route 116/Mechanicsville Road

Figure 2.2: Planned Project at Route 116/Charlotte Road: Sidewalk relocation to allow concurrent east/west traffic movement

Figure 2.3: Planned Project at Route 116/CVU/Shelburne Falls Intersection



2.2.3 Traffic Operations

Traffic congestion on Route 116 is a concern, as it can cause long delays and increased travel times for both residents and through travelers. Two measures of traffic operations are considered in this study: intersection level of service, and average corridor travel times for the PM peak hour.

2.2.3.1 Intersection Levels of Service

Intersection Level of Service (LOS) is a widely used measure of traffic congestion, and reflects the average vehicle delay during peak traffic hours. It is reported on a letter grade scale of A through F, with "A" representing free flowing conditions with no congestion and minimal delays, and "F" representing gridlock conditions with long delays, where the volumes exceed the intersection's capacity. Table 2.5 provides a description and delay thresholds for each level of service letter grade.

Table 2.5: Intersection Level of Service Thresholds

	Intersection Delay		
LOS	Signalized	Unsignalized	Description
A	≤10 sec	≤10 sec	Free flow traffic
B	10-20 sec	10-15 sec	Nearly free flow traffic
C	20-35 sec	15-25 sec	Stable, uncongested traffic flow
D	35-55 sec	25-35 sec	Approaching congested flow, nearing capacity
E	55-80 sec	35-50 sec	Unstable congested traffic flow, operating at capacity
F	≥80 sec	≥50 sec	Severe traffic congestion, forced flow, overcapacity

Source: Highway Capacity Manual, Transportation Research Board, 2011.

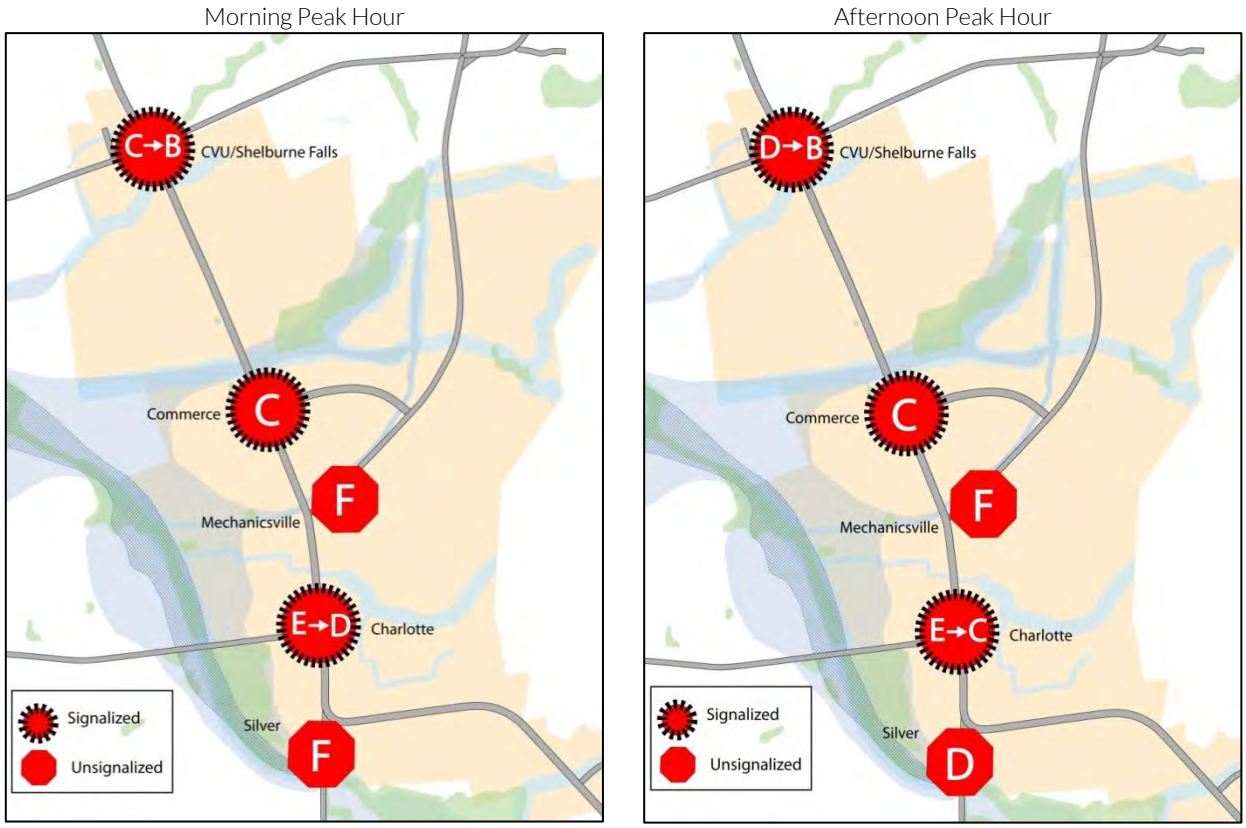
LOS was evaluated for the morning (7:15 to 8:15 a.m.) and afternoon (5:00 to 6:00) peak hour for both existing conditions and with the planned intersection projects at the CVU Road and Charlotte Road intersections. The analysis was conducted for the year 2015, and includes the traffic expected from the proposed Hannaford grocery store development has been included in this analysis.

Vehicular delays for each intersection are shown in Table 2.6. The LOS are shown in Figure 2.4. LOS is reported as an average of all legs for the signalized intersections, while for the unsignalized intersections (Mechanicsville Road and Silver Street) LOS is reported only for the stopped approach.

Table 2.6: Vehicle Delays in the Study Area

	Average Vehicle Delay (seconds)	
Intersection	AM Peak	PM Peak
CVU/Shelburne Falls	25	37
Commerce Street	22	34
Mechanicsville Rd (unsignalized approach)	112	122
Charlotte Road	70	80
Silver St (unsignalized approach)	123	28

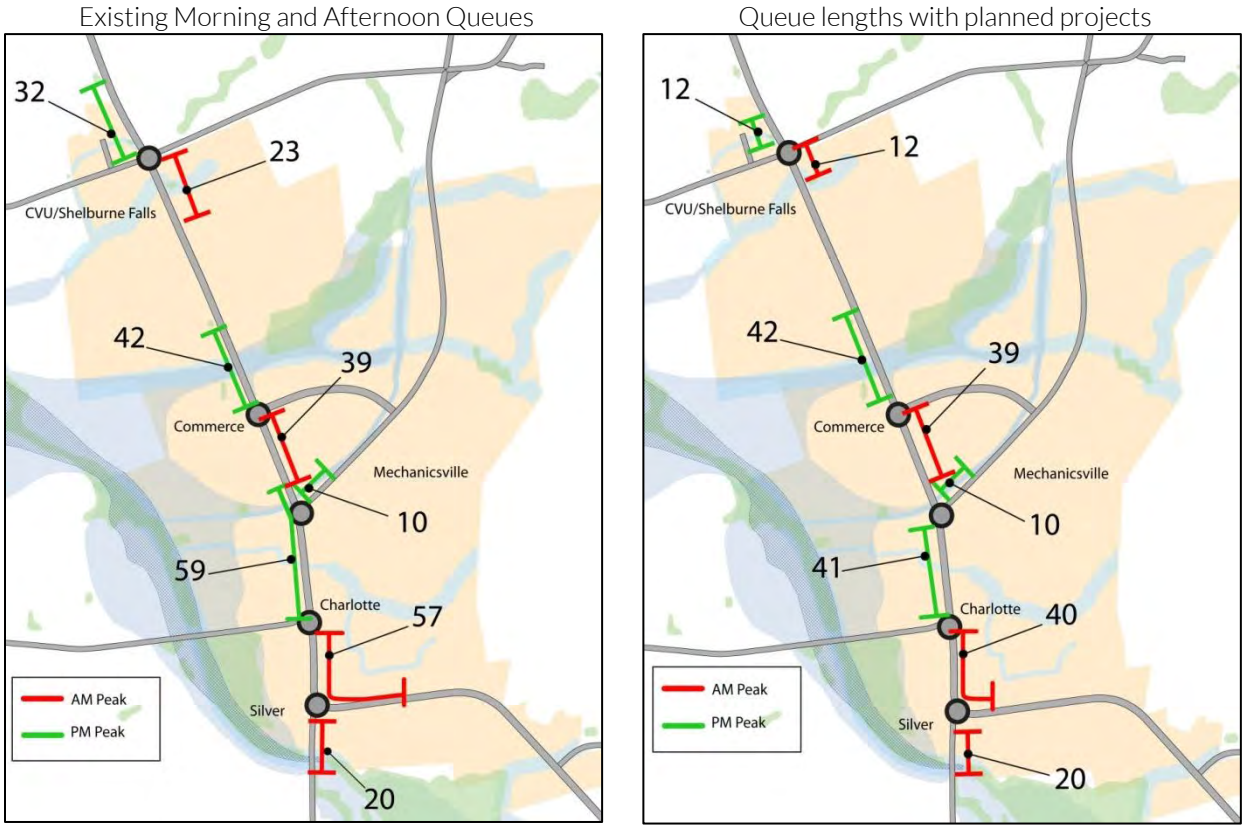
Figure 2.4: Morning and Afternoon Peak Hour Intersection Levels of Service (Existing ->Planned Intersection Projects)



The VTrans LOS policy is to maintain an LOS of C during peak hours for signalized intersections, and D for unsignalized intersections. However, the policy also recognized that maintaining LOS C is not always possible or desirable in areas with constraints such as historic buildings or environmental resources. In these cases, the policy encourages using Travel Demand Management (i.e. reducing the peak hour vehicular traffic by means such as ridesharing or increasing use of bicycling, walking or transit use). All of the signalized intersections comply with the VTrans LOS policy, although the unsignalized intersections do not.

Vehicle queues, the number of vehicles that are waiting to pass through intersection, were also evaluated using Synchro software for the morning and afternoon peak hours. Because traffic queues can be constantly changing, the queue analysis reports results in terms of the probability. The results in Figure 2.5 show the 95th percentile queue lengths, which means they could be exceeded 5% of the time. Actual queue lengths could vary considerably from this analysis due to a large number of factors that effect traffic flow. However, these results show that the planned projects should have some effect in reducing the queues at the intersections from current conditions.

Figure 2.5: Vehicle Queue Lengths for Morning and Afternoon Peak Hours: Existing Conditions and with Planned Projects



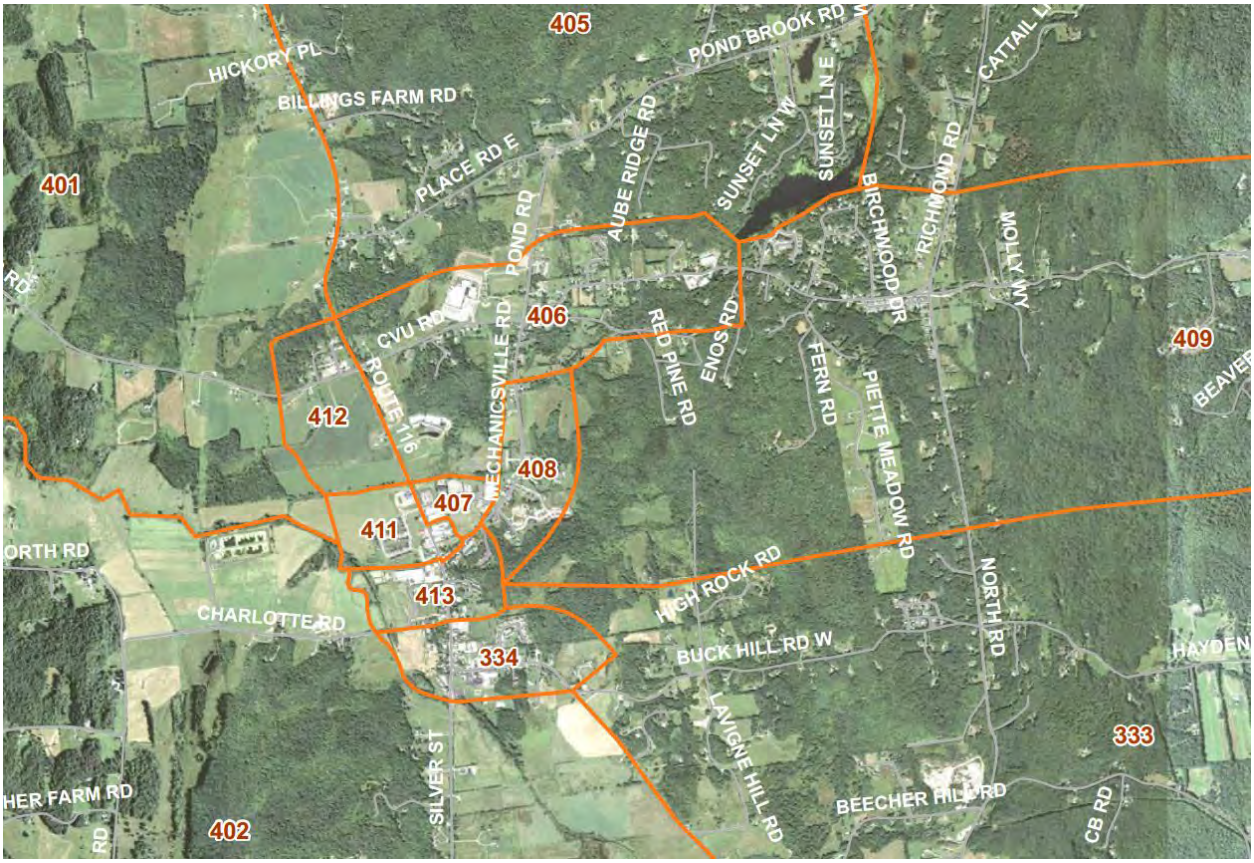
The results above are reasonably consistent with field observations conducted during peak hours, and with public input. During peak hours, queues on Route 116 at the Charlotte Road intersection regularly extend through and block the next intersections (Silver Street in the morning and Mechanicsville Road in

the afternoon). This further increases queues and delays for these unsignalized approaches. Documentation of the analysis is included in Attachment 2.

2.2.3.2 Peak Hour Travel Time Analysis

The CCRPC, using the Regional Travel Demand Model in conjunction with TransModeler software, developed a sub-area model for Hinesburg's growth area in order to allow more accurate and detailed testing and evaluation of possible future projects and scenarios. The subarea model can assess cumulative effects of additional development and intersection design changes on traffic volumes and operations, including corridor travel times. Among the important enhancements of the subarea model are smaller Travel Analysis Zones (TAZs) than included in the regional model. TAZ's are geographic areas, which have households and employment that generate traffic and feed it onto the region's roadway network. Smaller TAZ's, as used in this subarea model, allow for a more refined analysis of traffic and operations.

Figure 2.6: Sub Area Model Travel Analysis Zones



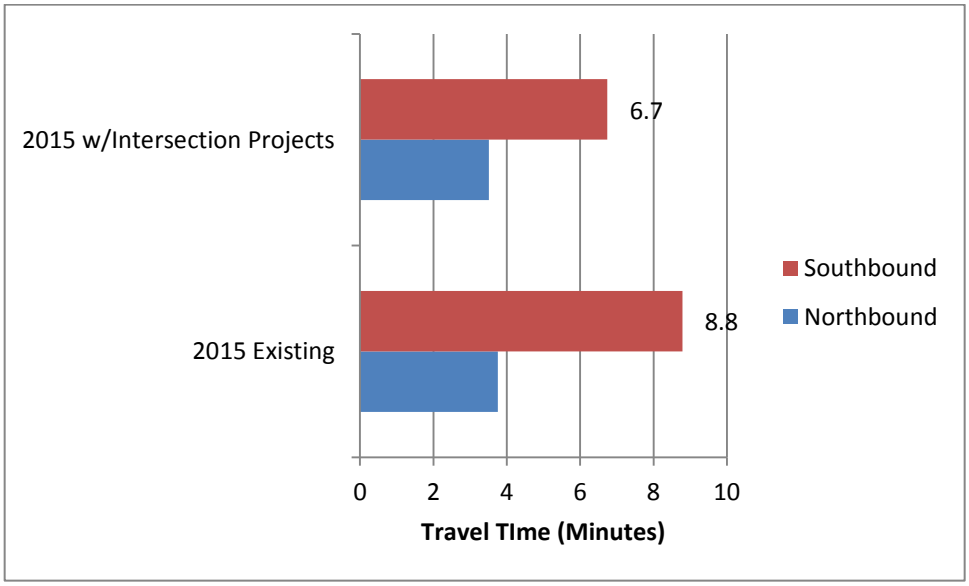
Each of the TAZs shown above have residential and non-residential land uses associated with them, which are used in the model to estimate traffic flows on the study area roads. The following table shows the households and employment in each of the study area's TAZs for the base year (2015) and future (2035) scenarios.

Table 2.7: TAZ Households and Employment, 2015 and 2035

TAZ	Description	2010 Households	2010 Jobs
334	Village Core	211	166
406	East of 116 along CVU Road	87	412
407	East of 116 - North of Commerce	1	140
408	East village along Mechanicsville	73	15
411	Village along Farmall Dr	49	55
412	West of 116 Shelburne Falls Rd	9	22
413	Cheese Plant Area	17	6
333	East of Village - Hayden Hill	241	26
335	Southwest	121	9
401	Northwest	68	10
402	West Central	97	73
403	South Central	83	30
404	Southeast	63	22
405	North Central	239	26
409	East of Village - Texas Hill	352	18
410	Northeast	168	25
Total		1,879	1,055

Figure 2.7 shows the afternoon peak hour average travel times between Place Road W, located north of CVU Road, and Silver Street for the existing conditions, and with implementation of the planned projects. This analysis indicates that the CVU Road and Charlotte Road intersection projects should be expected to decrease southbound average travel times by more than two minutes, or 24%, in the PM peak hour

Figure 2.7: Peak Hour Average Travel Time (minutes): Existing Conditions and with Planned Projects



The following are key findings on traffic operations and congestion in the study area:

- The Charlotte Road/Route 116 intersection is the primary bottleneck in the network for both morning and afternoon peak hours. Queue lengths extend south from this intersection in the morning, and north in the afternoon. The planned project to change the signal phasing at this intersection will increase its vehicular capacity and reduce delays and queues.
- The CVU Road intersection is congested during the afternoon peak hour, as southbound left turning vehicles block the high volume of southbound through traffic. Operations will improve significantly with the planned VTrans intersection improvement project.
- Silver Street and Mechanicsville Road have poor levels of service for the side street vehicles. In reality, vehicles waiting at these side streets are often waved in by queued drivers on Route 116, which provides some relief. The intersection project at Charlotte Road could reduce the queues and increase vehicle throughput, which would make this courteous behavior less safe and less common. Of particular concern is Silver Street, as Mechanicsville traffic has an alternate route via Commerce Street available.

2.3 Traffic Safety

There are two high crash locations within the study area based on the most recent VTrans crash analysis of 2008 - 2012: the intersection of Route 116/CVU Road, and a 0.6 mile segment of Route 116 between Silver Street and Commerce Road, shown in Figure 2.8. High crash locations have statistically higher crash rates than typical for that type of intersection or roadway, which suggest there may be an issue with road geometry, driver behavior, or other factors that should be evaluated further. The frequency of crashes in these locations is significantly higher than would be expected considering the traffic volumes and roadway type.

The project planned for the Route 116/CVU Road/Shelburne Falls Road is expected to reduce the frequency of crashes, many of which are related to oncoming traffic trying to pass left turning vehicles according to VTrans crash reports. The crashes in the segment from Silver Street through Commerce Road are not particularly concentrated at any one location, though the Commerce Street intersection has had the greatest number of crashes, 14 over five years.

Approximately 25% of the crashes in the study area resulted in injuries, which is close to the state average. There were no fatalities reported in the five year period. The VTrans data show that “rear-end” collisions are by far the most common type of crash, as shown in Figure 2.9. These are often associated with traffic congestion and long traffic queues. Another indication that crashes are correlated with congestion is that crashes occur primarily on weekdays.

Figure 2.8: Crash Locations in Study area, VTrans 2008-2012

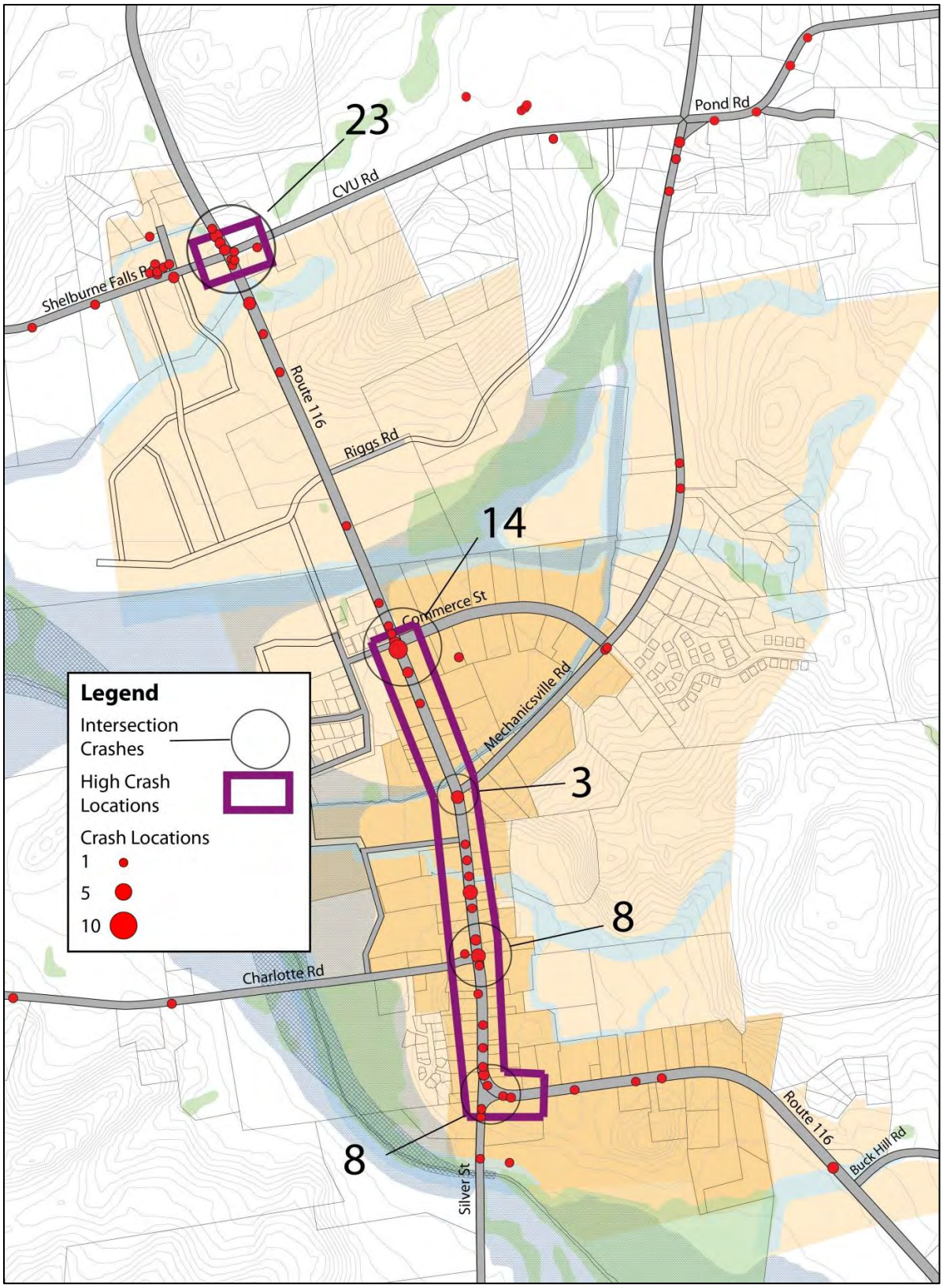
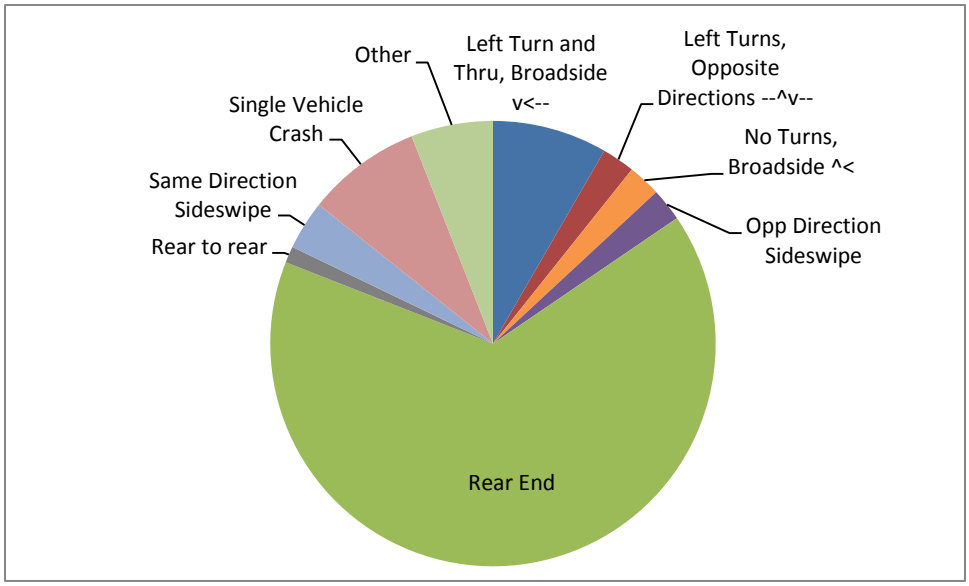
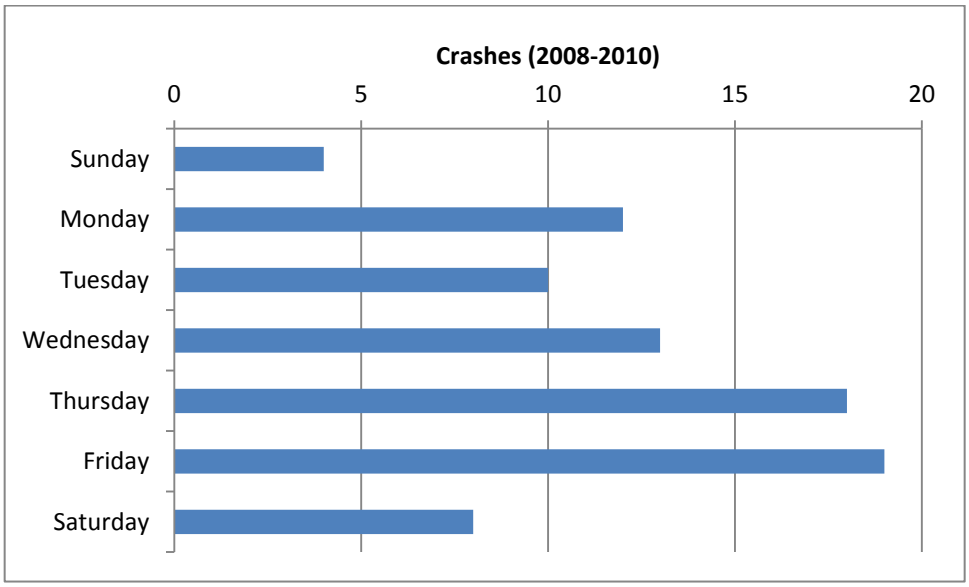


Figure 2.9: Types of Crashes and Day of Week Occurrence in Study Area, 2008-2012

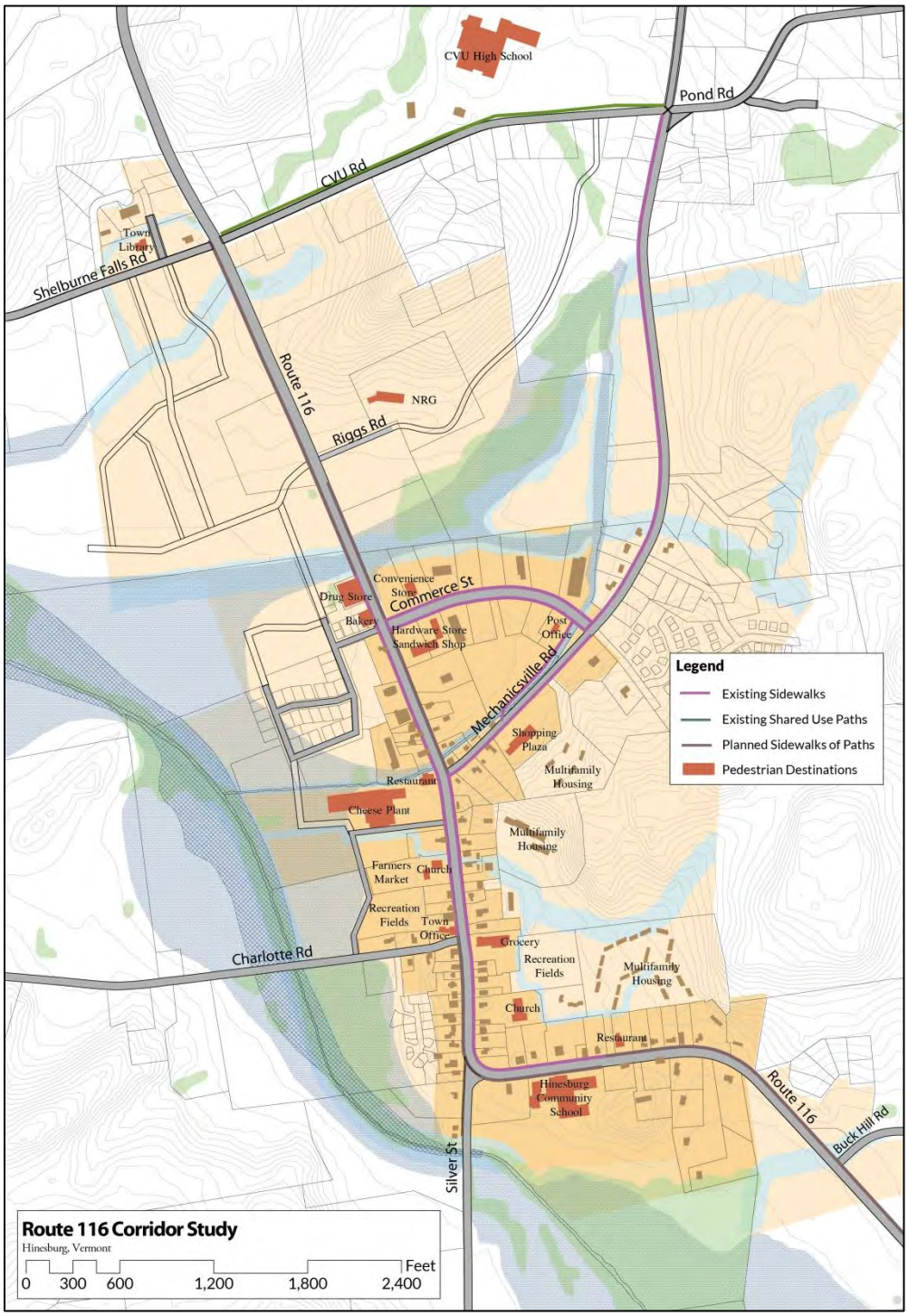




2.4 Pedestrian Network

Hinesburg's village center has many characteristics that make it a very walkable place, including a concentration of land uses and activities in a compact area, and an extensive pedestrian network, shown in Figure 2.10.

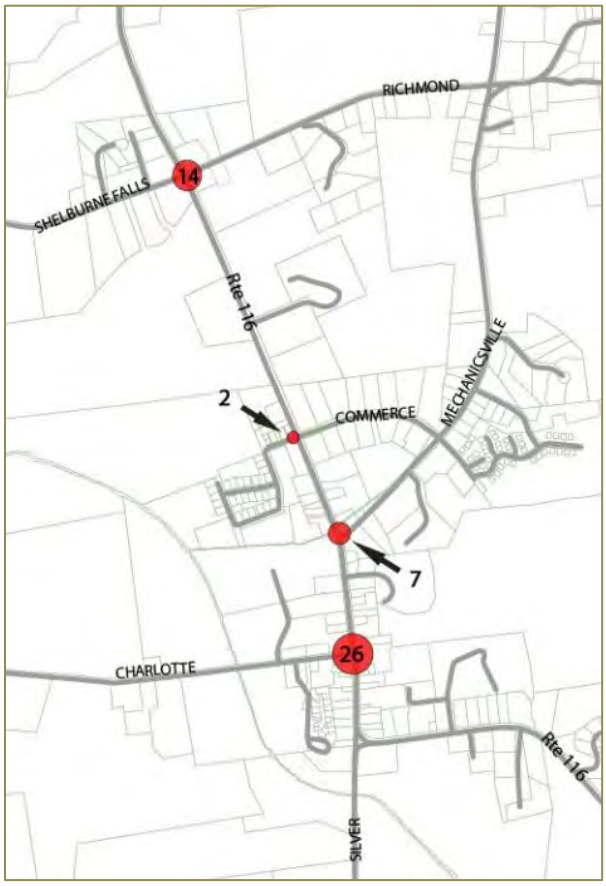
Figure 2.10: Pedestrian Network in the Study Area



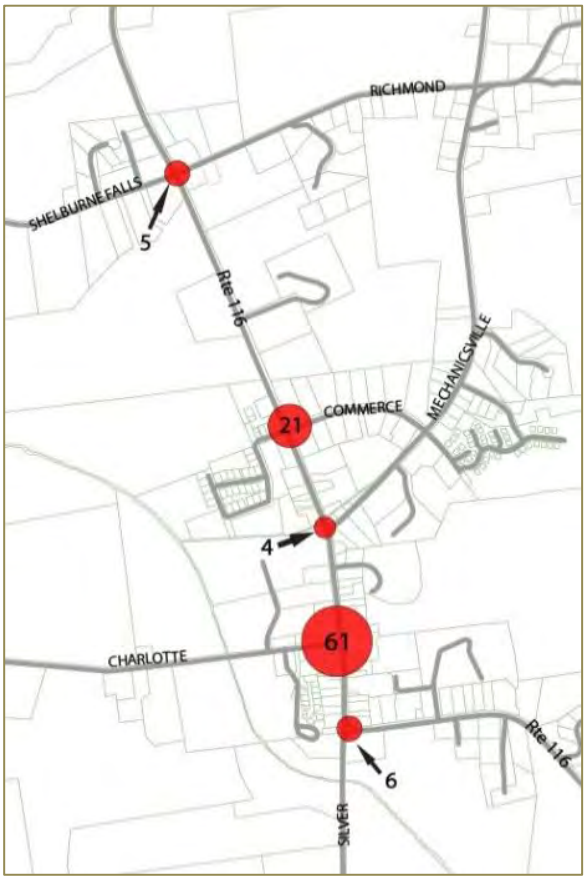
Recent intersection counts show where pedestrian activity is most concentrated in Figure 2.11.

Figure 2.11: Pedestrian Volumes at Study Area Intersections

Morning Peak Hour



Afternoon Peak Hour

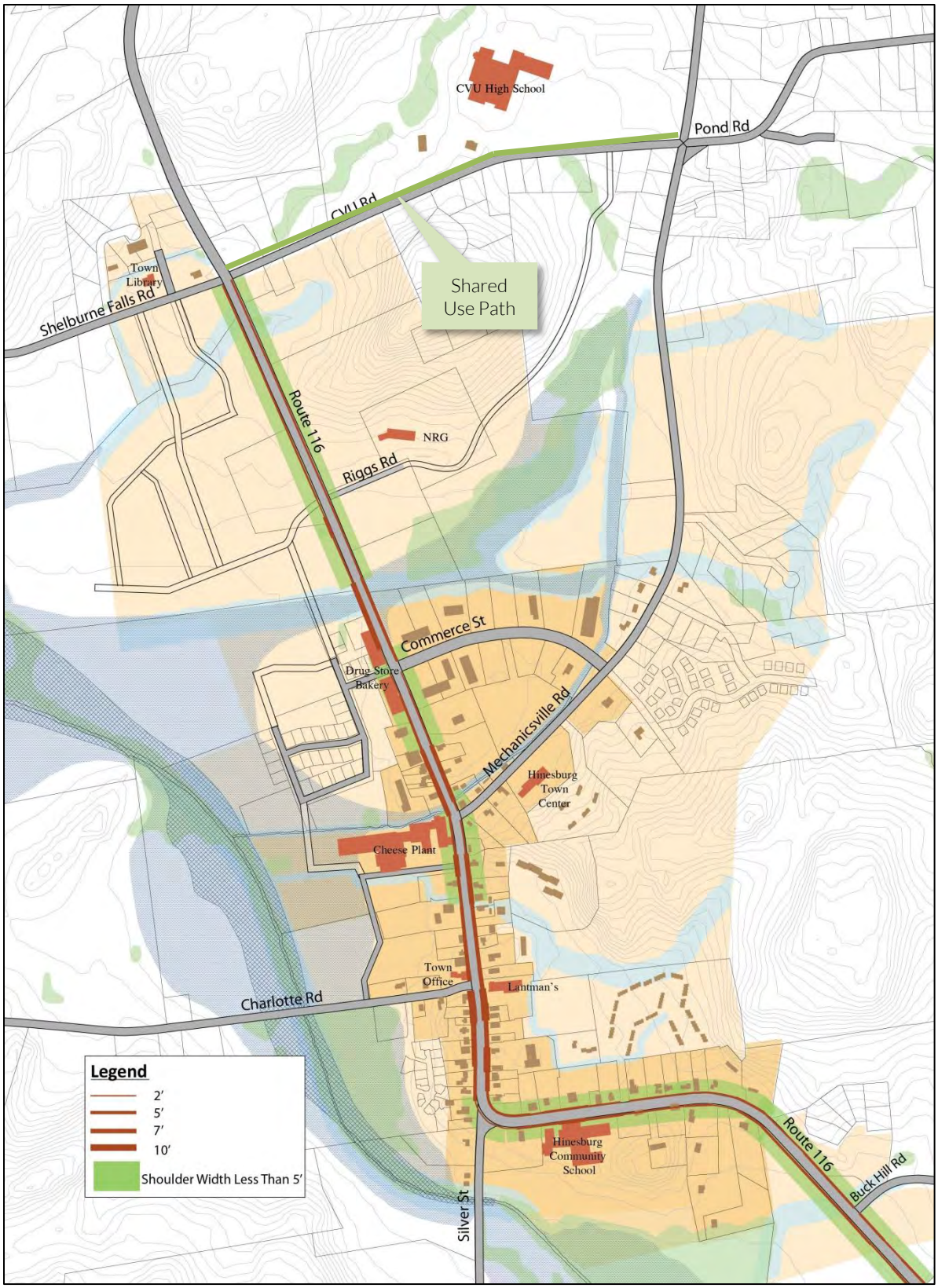


The role of the Charlotte Road/Route 116 intersection as "the heart of town" is supported by the pedestrian counts, showing significantly greater pedestrian activity than the other intersections.

2.5 Bicycle Network

The study area's bicycle network consists of a shared use path along CVU Road and shoulders on Route 116, between 2 and 10 feet wide, shown in Figure 2.12. While experienced riders are able to comfortably use the Route 116 shoulders for bicycling, the larger population of less experienced cyclists is not well served by the available facilities. The CVU Bike Path provides a safe and welcoming facility for less confident riders, but does not serve most village residences and destinations.

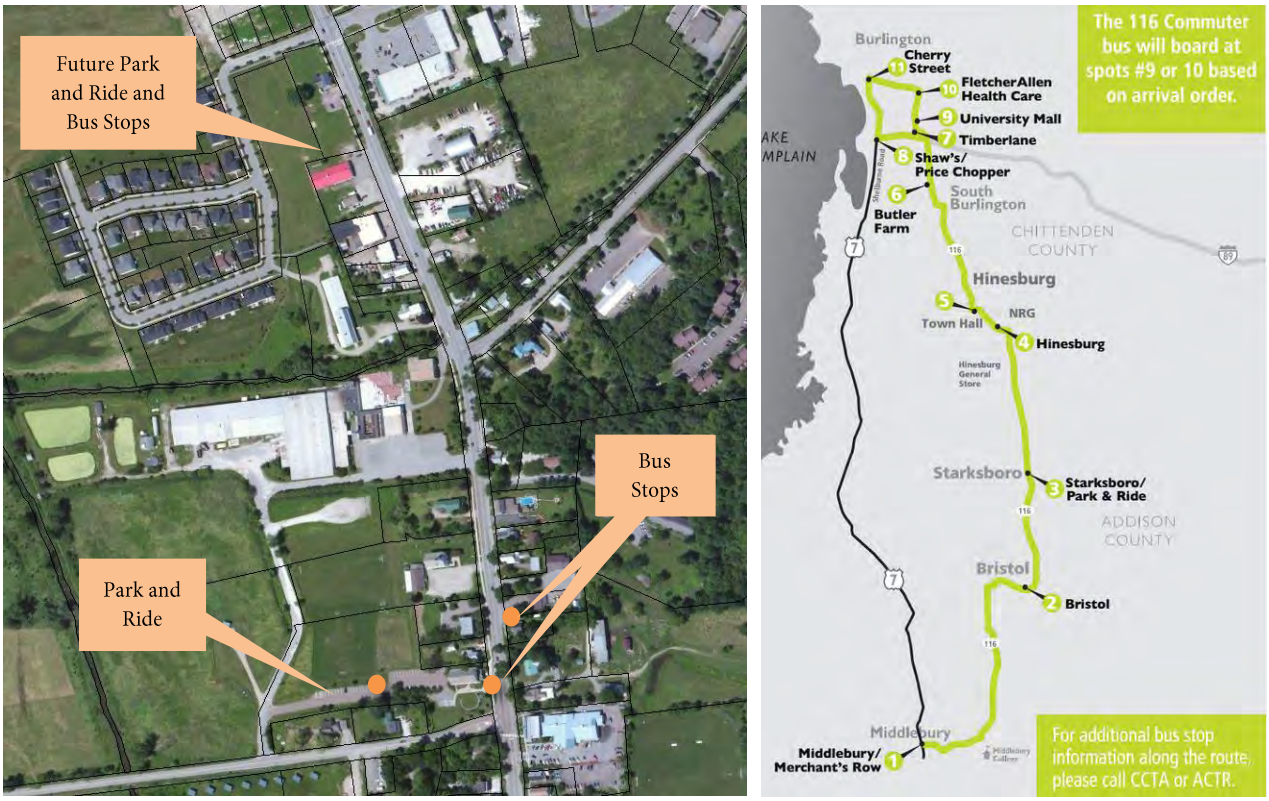
Figure 2.12: Study Area Bicycle Network



2.6 Transit System

Hinesburg has commuter buses stopping near the Town Offices as they make two northbound trips and two southbound trips each day. The services are operated jointly by Chittenden County Transportation Authority (CCTA), and Addison County Transit Resources (ACTR). The CCTA buses terminate their service at the Hinesburg Park and Ride lot, while the ACTR buses stop along Route 116 in the vicinity of the Town Hall and Waitsfield Telecom, a short walk from the Park and Ride lot, en route from Middlebury and Bristol to locations north in Chittenden County. Recent ridership data from CCTA and ACTR show that on average there are 12 boardings per day in Hinesburg.

Figure 2.13: Hinesburg Transit Route Map and Bus Stop Locations

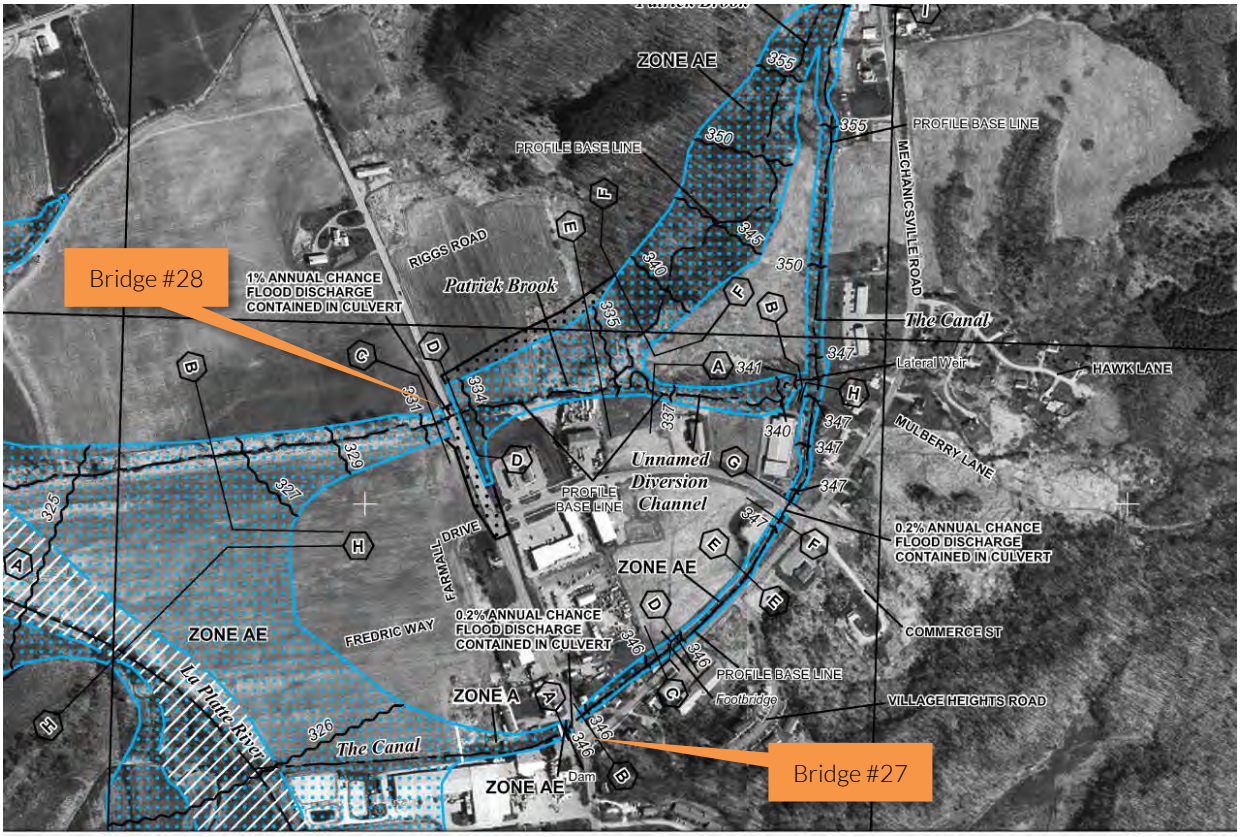


The Town is planning to develop an additional Park and Ride lot on town-owned property near the Fire Station, which will become the primary bus stop for routes in both directions. This will allow for more consistency in where the buses stop, and provide more parking for patrons.

2.7 Hydrology

Stormwater management and flooding in the village area is of increasing concern as intense rainfall events are becoming more frequent. There are a number of recent studies and reports listed in Attachment 3. Of particular concern is Bridge #28, an undersized culvert on Route 116 just north of Commerce Street. This culvert is a constraint that creates a larger floodplain area upstream, and leads to overtopping of Route 116 during flood events. The official FEMA map of the area is shown in Figure 2.14.

Figure 2.14: FEMA Floodplain Map of Route 116 in Village Center



There are two major culverts in the study area, which are labeled in Figure 2.14. The following table summarizes information regarding the culverts

Table 2.8: Route 116 Culvert Data

	Bridge #27	Bridge #28
Type	Reinforced Concrete Box Culvert	Reinforced Concrete Box Culvert
Culvert Length	43 ft	41 ft
Span	17 ft	7 ft
Year Built	1985	1919, Reconstructed in 1989
Condition Notes	Not rated due to requirements for inspection with divers.	Box is in good condition. Headwall on the outlet should be repaired.

Source: VTrans Bridge Inspection Reports

Hydrologically, bridge #28 is too narrow for this location. D&K conducted a hydraulic screening analysis at this location which indicates, based on the size of the watershed, that its span should be approximately 30 feet to carry the "bank full width" of Patrick Brook. However, because the culvert is structurally sound, it is not eligible for federal funding for replacement. A further issue to consider is that the traffic mitigation proposed for the Hannaford supermarket included lengthening this culvert to allow for widening of Route 116.

2.8 Future Conditions

A forecast of future land use and transportation in the study area was developed that incorporated the population forecast in the Hinesburg Town Plan, and traffic forecasts obtained from the CCRPC regional model. While counts conducted by VTrans in Hinesburg show a decline in traffic since around 2000, the regional model shows a long term increase in traffic due to expected regional economic and population growth.

The subarea model, discussed in section 2.2.3.2, was used to project future traffic volumes under the above growth scenario. In order to do this, the projected growth is allocated among the TAZ's of the subarea model based on the building permits information and proposed developments within the Town. The allocation of projected new households and jobs were distributed based primarily on currently proposed developments and available land. Approximately 45% of the town-wide growth was distributed to TAZs within the village growth area that have capacity to support additional growth, and where significant development projects are planned. The remaining 55% of the projected growth was distributed to TAZs outside the Village Growth Area.

Table 2.9: Household Growth by TAZ

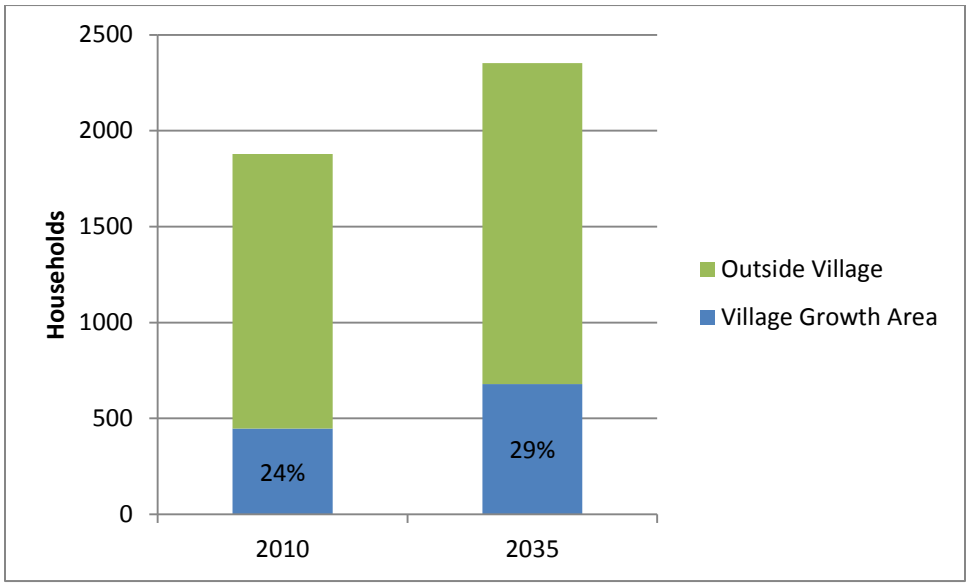
TAZ	Description	2010 Households	Increase	2035 Households
334	Village Core	211	37	248
406	East of 116 along CVU Road	87	3	90
407	East of 116 - North of Commerce	1	0	1
408	East village along Mechanicsville	73	5	78
411	Village along Farmall Dr	49	38	87
412	West of 116 Shelburne Falls Rd	9	140	149
413	Cheese Plant Area	17	9	26
333	East of Village - Hayden Hill	241	27	268
335	Southwest	121	27	148
401	Northwest	68	27	95
402	West Central	97	27	124
403	South Central	83	27	110
404	Southeast	63	27	90
405	North Central	239	27	266
409	East of Village - Texas Hill	352	26	378
410	Northeast	168	27	195
Total		1879	474	2353

Table 2.10: Employment Growth by TAZ

TAZ	Description	2010 Jobs	Job Increase	2035 Jobs
334	Village Core	166	26	192
406	East of 116 along CVU Road	412	22	434
407	East of 116 - North of Commerce	140	10	150
408	East village along Mechanicsville	15	0	15
411	Village along Farmall Dr	55	13	68
412	West of 116 Shelburne Falls Rd	22	16	38
413	Cheese Plant Area	6	8	14
335	East of Village - Hayden Hill	26	5	31
401	Southwest	9	4	13
402	Northwest	10	5	15
403	West Central	73	7	80
333	South Central	30	2	32
404	Southeast	22	6	28
405	North Central	26	4	30
409	East of Village - Texas Hill	18	6	24
410	Northeast	25	5	30
Total		1055	138	1193

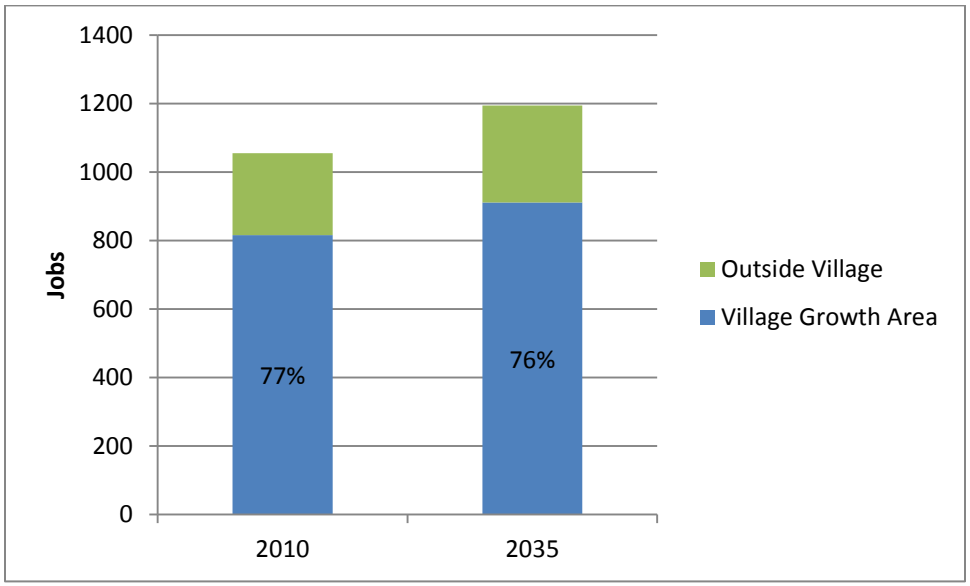
Figure 2.15 shows that of the 1,879 households in Hinesburg in 2010, 24% of them are inside the Village Growth Area. By 2035, the forecast shows an additional 447 households in the Town, with about half of in the Village Growth Area. This brings the total households in town to 2,353, with 29% of town residents in the Village Growth Area.

Figure 2.15: Residential Land Use in Hinesburg: 2010 and 2035 Projections



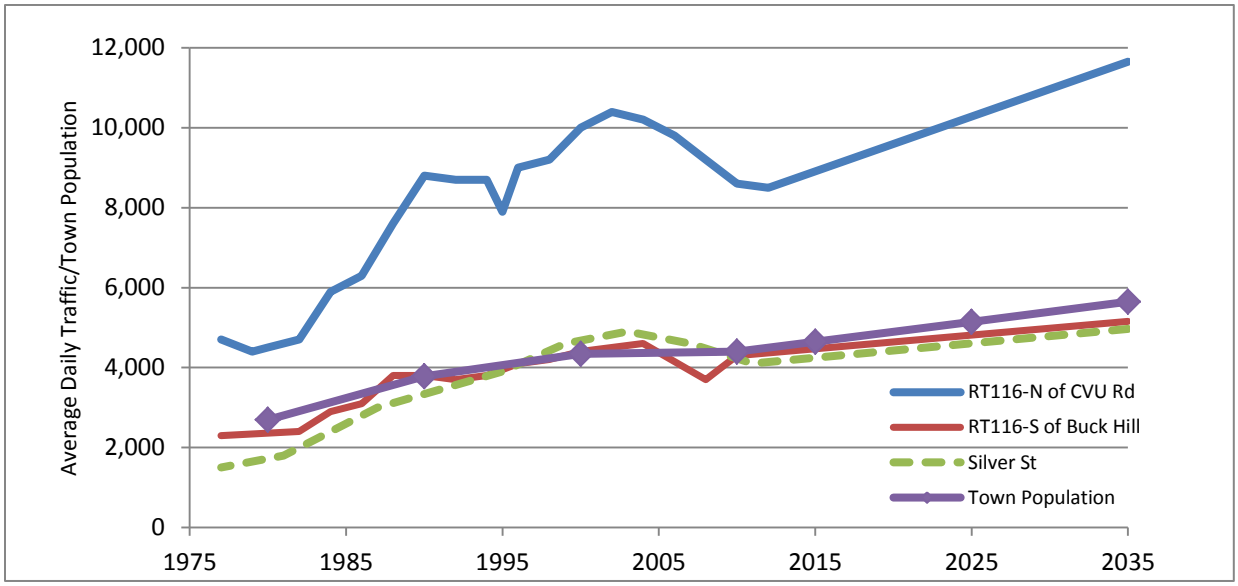
A similar assessment of current and future employment has been developed for the model, which includes all non-residential land uses. These are broken down by retail, non-retail commercial, industrial, institutional, education and others. More than three quarters of the Town's employment is currently within the Village Growth Area, and that pattern is expected to continue through 2035.

Figure 2.16: Employment in Hinesburg 2010 and 2035 Projections



The subarea model, using the data shown above, produced forecasts of traffic. While the model does account for use of other modes of travel, including transit, walking and biking, it generally assumes a continuation of the same travel behavior into the future. These forecasts could overestimate traffic growth if there are shifts away from driving and towards other modes, and there is some recent evidence to suggest such a trend is underway. Figure 2.17 shows traffic and population data from the past 3 decades, and compares to the forecast of the next 25 years. The corridors south of the village (Route 116-South of Buck Hill Road and Silver Street) are projected to grow at a much lower rate than traffic north of the village on Route 116.

Figure 2.17: Population and Traffic Growth



2.9 Key Findings

The following summarize the most significant findings related to traffic and transportation in the study area.

- Peak hour traffic volumes exceed the corridor's capacity in the Village resulting in congestion, long vehicle queues and slow travel times. Morning peak hour congestion is highly correlated with the school schedule, while afternoon traffic persists throughout the year.
- The majority of peak hour traffic is passing through the village to or from locations south, which has declined by 15% to 20% over the past ten years. This trend could be reversed with changes in demographics and the economy. Regional forecasts suggest that growth in through traffic will return, but at a slower pace.
- The discontinuous pedestrian and bicycle networks in the village don't adequately serve potential users of these modes.
- More frequent heavy rainfall events with increased runoff will exacerbate hydraulic limitations in the village area, particularly at undersized culverts. The addition of new street crossings could further impact the village area's hydrology.
- The regional traffic forecasts generally assume an extrapolation of current behavior in terms of mode and trip lengths. With growing fuel prices and an aging population that is driving less, there is some evidence that traffic growth may be lower than projected in the regional model.
- There is high growth potential in Hinesburg's village due to its attractive rural/village environment, affordability relative to the region, employment opportunities and consistency with local plans and regulations. The effect of local growth on traffic volumes will depend heavily on the modes of transportation used, which can be shaped by the design and form of newly developed areas.

3 Toolbox of Strategies

The following sections outline a range of strategies to meet the goals and achieve the vision for the community set forth at the start of the corridor planning process. Many of these strategies can have multiple influences and may help to advance more than one goal.

3.1 Efficient, Right-sized Intersection Design

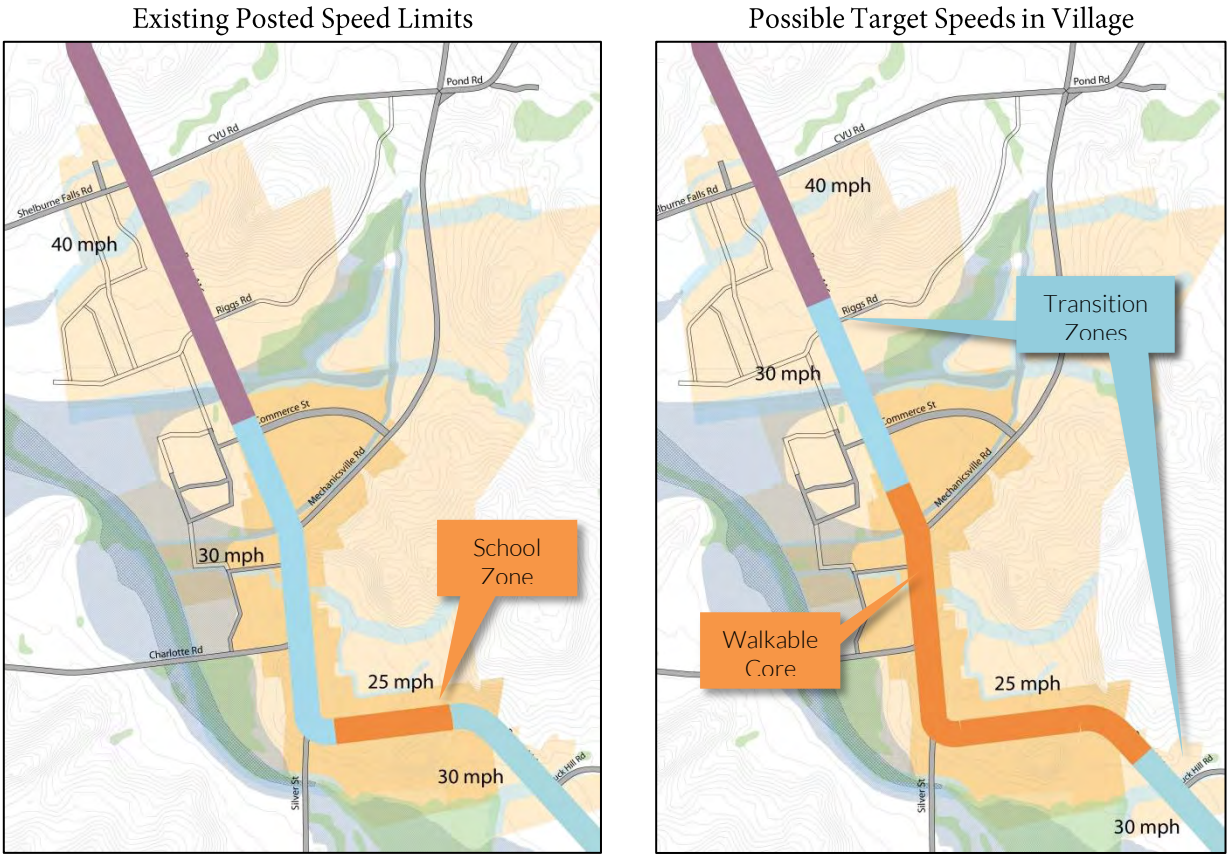
Intersections within the village area should be designed and managed to allow them to function as efficiently as possible within their current footprint before considering widening or expansion. Among the tools that are available include:

- Evaluating intersections for the most efficient signal timing and phasing patterns.
- Consider roundabout intersections which can in many cases provide higher capacities with a smaller paved area, as they can eliminate the need for turning lanes.

3.2 Adopt a Target Speed and Reinforce with Traffic Calming

Managing speed is important to make the village safer and more comfortable for walking. Traffic moving at speeds of greater than 30 mph feels uncomfortable to pedestrians, and is less safe in the event of a pedestrian-vehicle crash. A target speed that will provide a pedestrian-friendly environment in the village core should be established and reinforced through street design and management. Figure 3.1 shows the existing posted speeds on the left, and designations of possible target speeds on the right. Changing the speed limits requires VTrans consent, and will be easier to accomplish if lower speeds are reinforced by design.

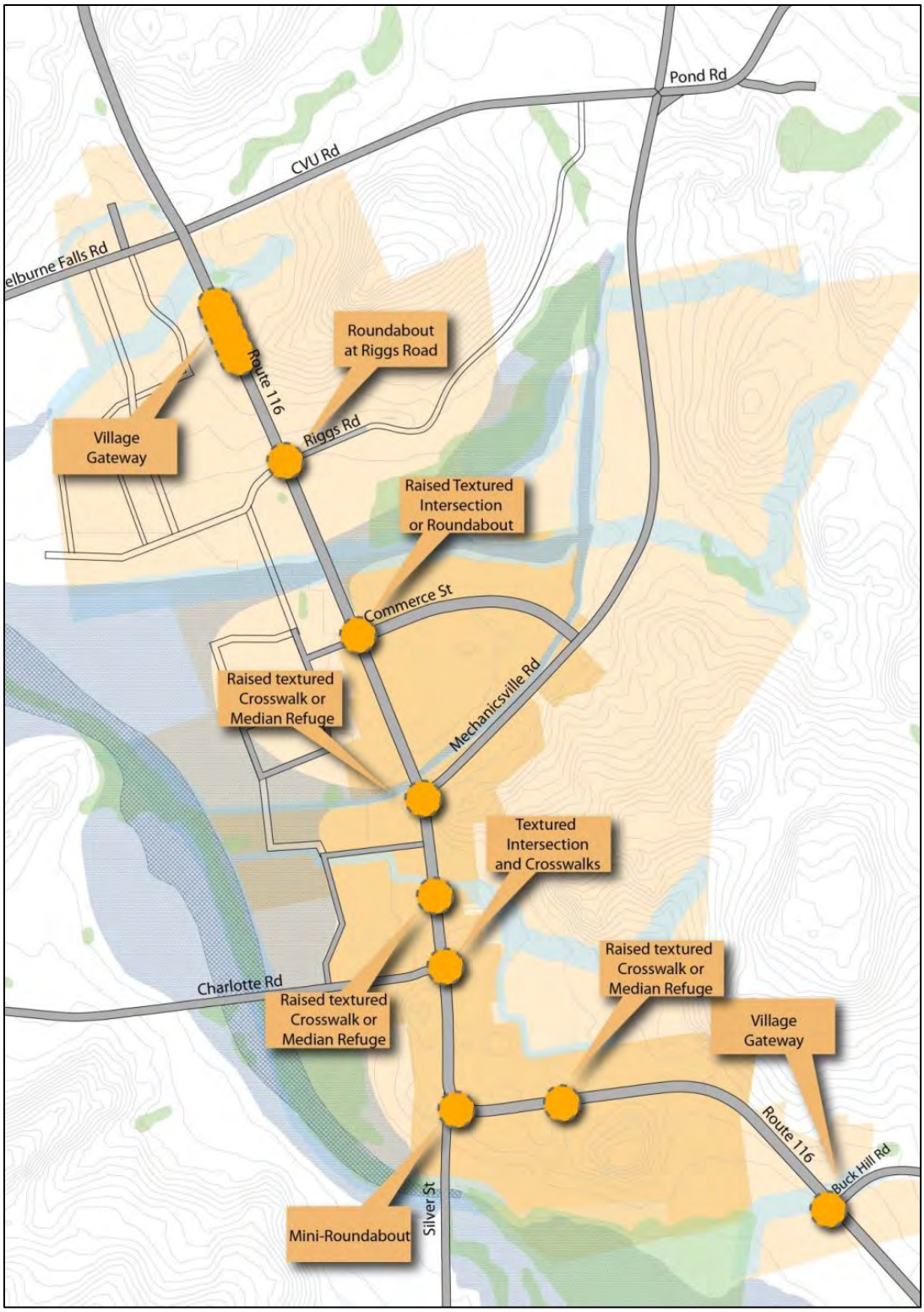
Figure 3.1: Existing Posted Speed Limits and Possible Target Speed Zones



The target speeds can be reinforced with a set of traffic calming measures located at intervals along the Route 116 corridor in the village, such as raised crosswalks, landscaped medians, tight corner radii, narrow travel way widths and by establishing gateways to the village with speed transitions zones. These features together will increase driver attention and awareness of the village environment, and decrease travel speeds. Figure 3.2 shows examples of traffic calming design features on a rural arterial route that are applicable to Hinesburg. Figure 3.3 shows how traffic calming measures can be spaced through the corridor and integrated into other projects.

Figure 3.2: Examples of Arterial Traffic Calming Features on US Route 50 in Loudoun County, Virginia

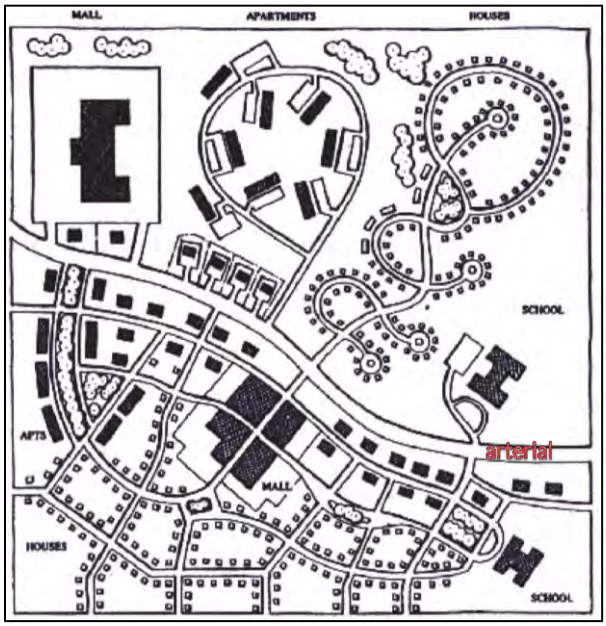
Figure 3.3: Traffic Calming Strategy



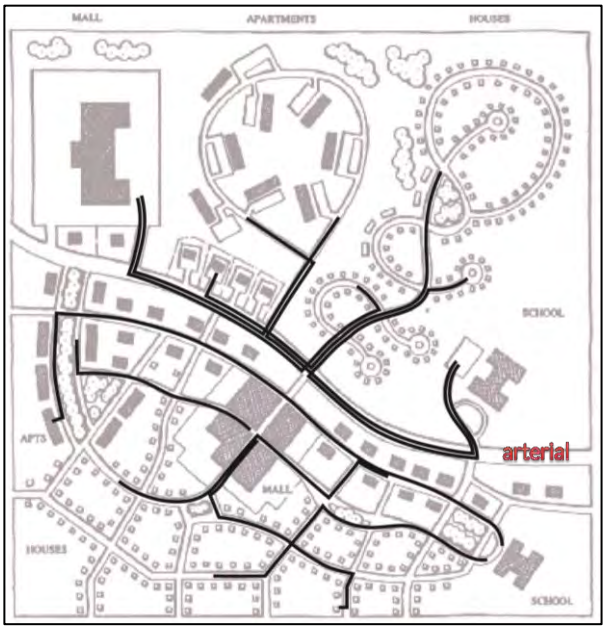
3.3 Connected Local Street Network

Hinesburg has long planned to support growth and development in the village area by building out a local street network. Advantages of a connected street network include greater convenience and more direct routes for pedestrians and more efficient development patterns. An additional advantage is the potential to reduce the traffic volume on the main arterial routes. Figure 3.4 illustrates two contrasting types of street networks on the left, and maps out the travel routes for local trips on the right.

Figure 3.4: Street Network Connectivity and Traffic Patterns



The development pattern in the upper portion of the above graphic above has every land use connect directly to the arterial. The lower pattern has a highly connected street network with small blocks.

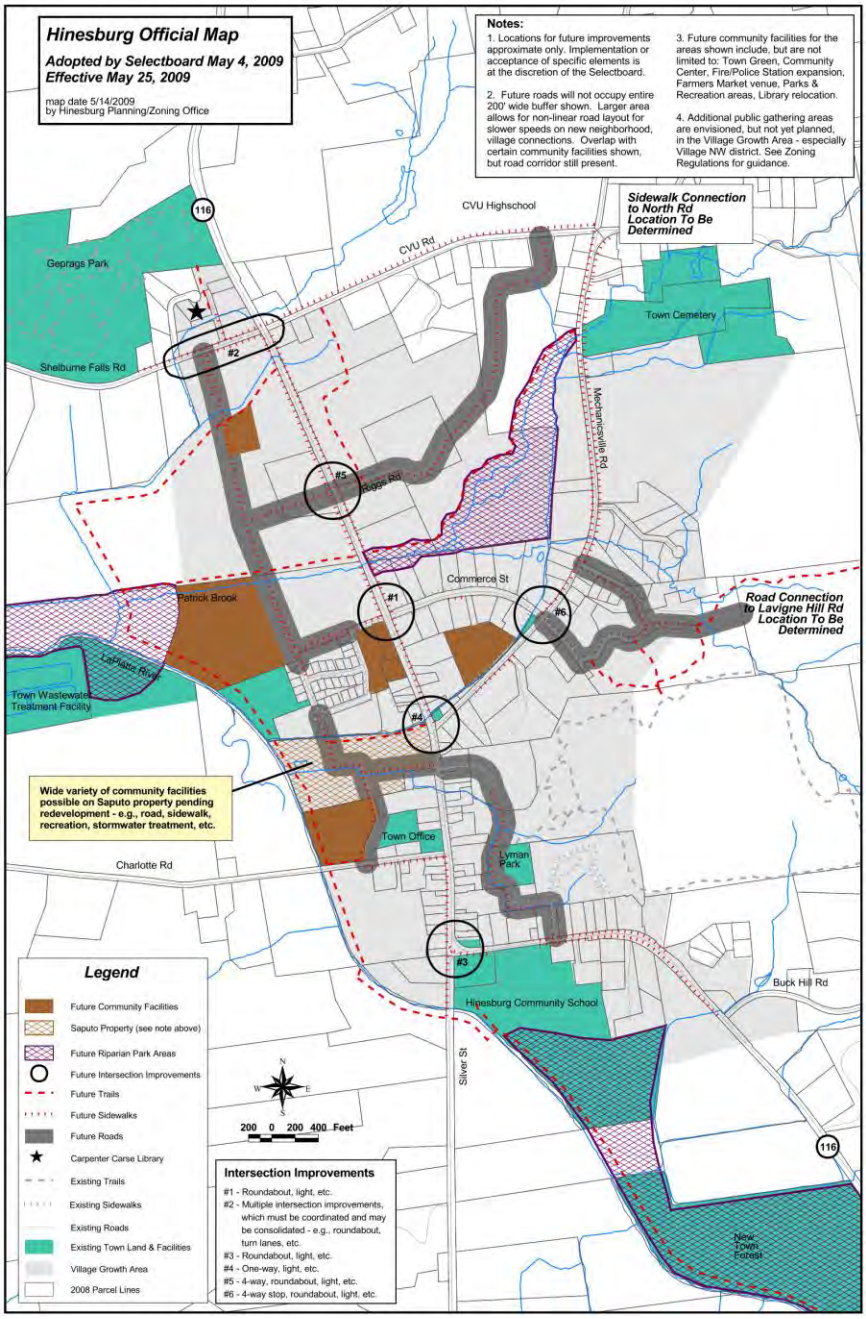


Every trip to or from the land uses in the upper pattern must use the arterial street, resulting in congestion and conflicts with through traffic. In the connected street network (lower), local trips can avoid the arterial, reducing conflicts and congestion.

The connected street network (lower) allows local trips to avoid the arterial route, easing congestion and increasing safety. In addition, local trips can often be shorter on a connected street network, and therefore more likely to be made by walking or biking.

Hinesburg's official map, shown in Figure 3.5, lays out future street corridors that are intended to eventually form a complete network as development occurs. While developments in the affected areas have been laid out to be consistent with the official maps street network, there are concerns about the impact of the street network on the natural environment, and the potential for cut-through traffic.

Figure 3.5Hinesburg's Official Map for Street Network Development



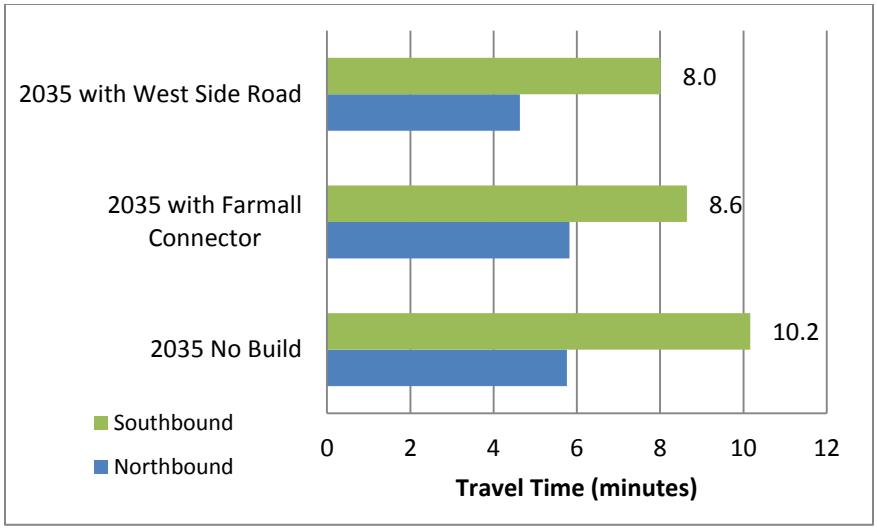
As part of this study, CCRPC conducted a sub-area analysis and traffic simulation modeling for several street network scenarios to help understand the benefits and traffic circulation implications of the street network.

- **2035 No Build**: Planned growth in village area and planned intersection projects.
- **2035 Farmall Drive Connector**: Includes the street network between Commerce Street and Farmall Drive.
- **2035 West Side Street**: Full Build-out of the official map street network west of Route 116.

The following were assumptions in the traffic modeling:

- Streets in future scenarios are modelled as local streets with narrow width, 25 mph and low capacity street segments.
- Intersections along future street network are modelled as un-signalized control.
- Primary purpose of the street network is to provide access to potential development land uses but not to mitigate congestion on Route 116.
-

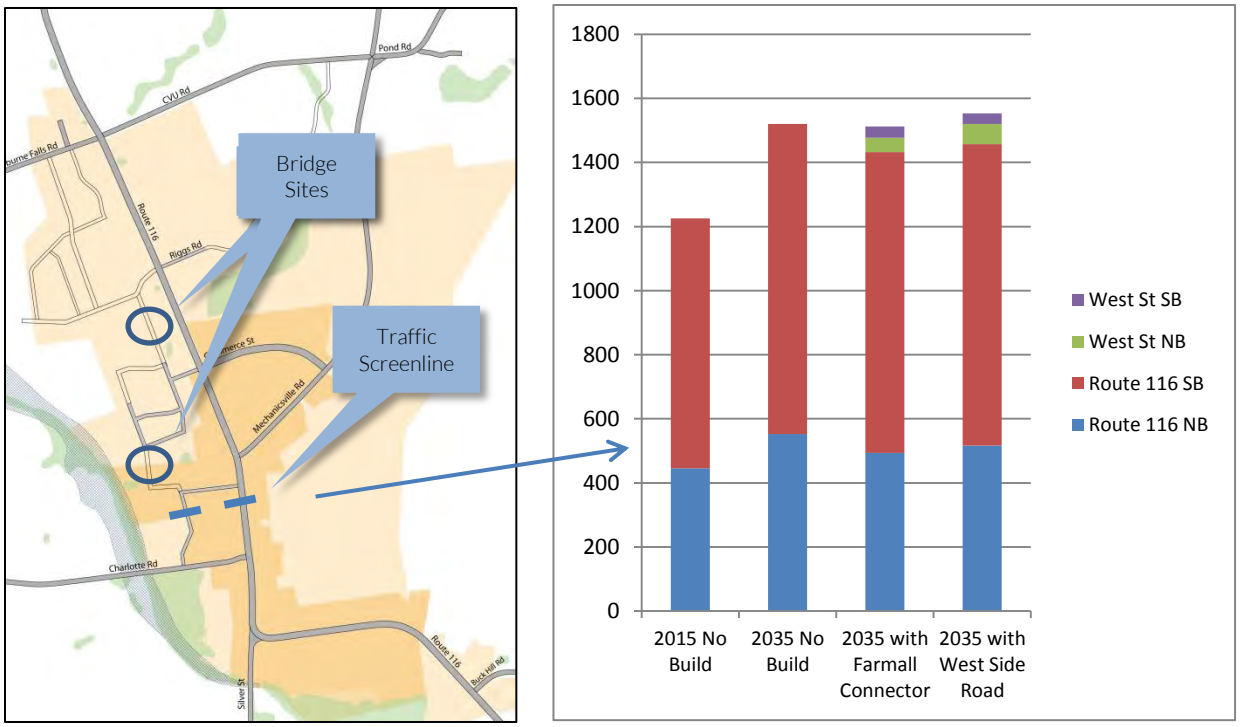
Figure 3.6: Travel Time Modeling Results for Street Network Scenarios



The model results show that southbound travel times will be reduced by 15% (from 10.2 to 8.6 minutes) with the Farmall Drive Connector, and by an additional 7% (from 8.6 minutes to 8.0 minutes) with the full implementation of the west side street network.

In addition to looking at travel times, the effect of the street network on traffic volumes was assessed with a screenline analysis. A screenline is an imaginary line, across which all traffic is reported, and can included multiple streets. Figure 3.7 shows the location of the screenline and the p.m. peak hour scenario volumes on the right. In the no-build scenarios, traffic volumes on Route 116 are shown for both directions. For the street network scenarios, the volumes that are passing through the screenline on the new street network are also shown on the chart. These results show that only a small portion of corridor traffic will be using the new street network, and the vast majority will remain on Route 116. However, the small shift of traffic onto the new street network does have an effect of reducing traffic times and congestion. ()

Figure 3.7: Traffic Modeling of Route 116 and New Street Connections

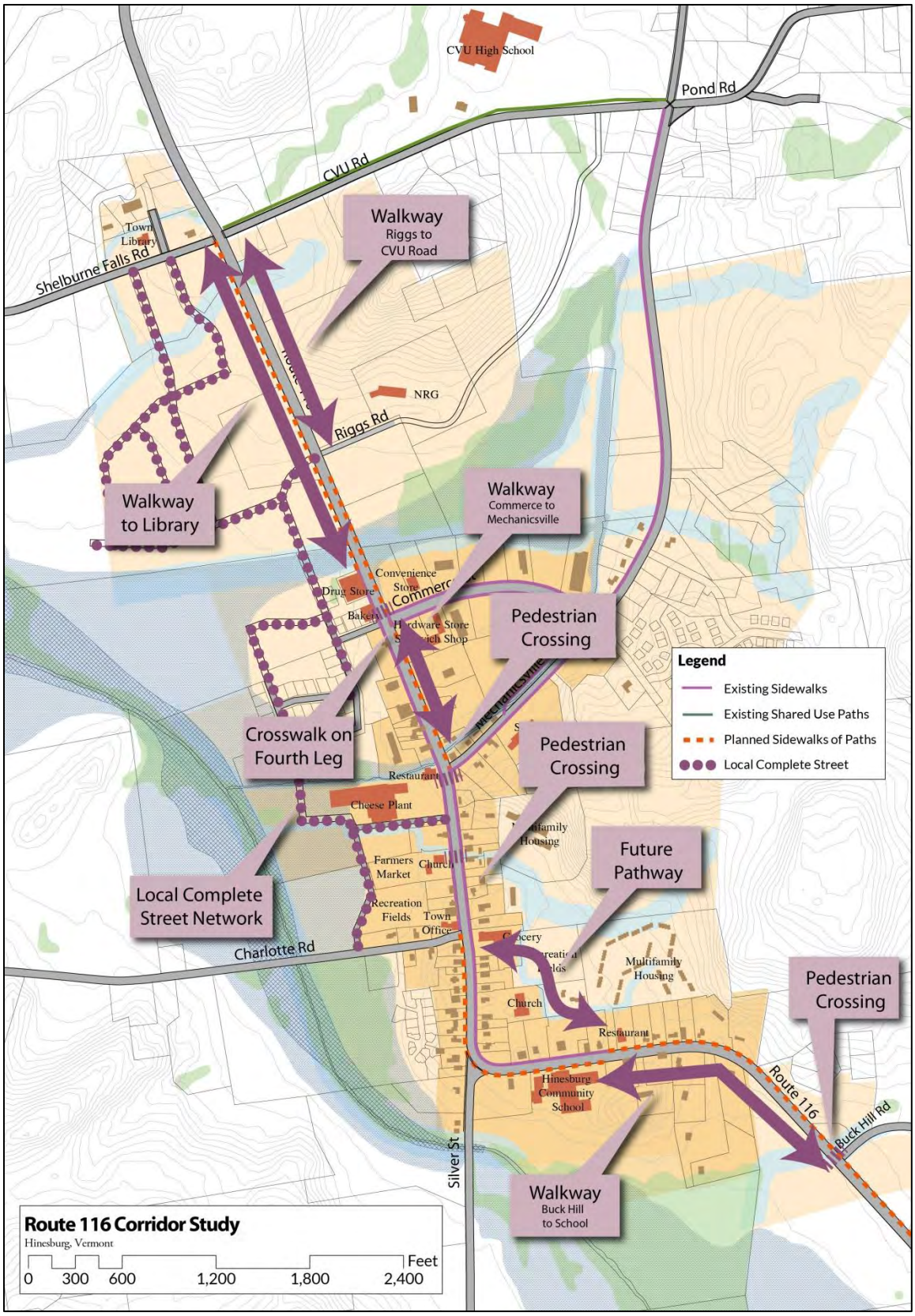


While the primary purpose of the west side street network is to serve the planned growth in this quadrant of the Village Growth Area, it can also have a significant effect in reducing peak hour travel times. These effects are likely due more to locally generated traffic from the newly developing areas having options to avoid the most congested portions of Route 116, rather than by diversion of through traffic from Route 116 to the new street network.

3.4 Pedestrian Network

The following figure shows a set of sidewalk/pathway projects to complete the Hinesburg Village's pedestrian network. The components of the network are shown in detail in Section 4, and described in Section 5.

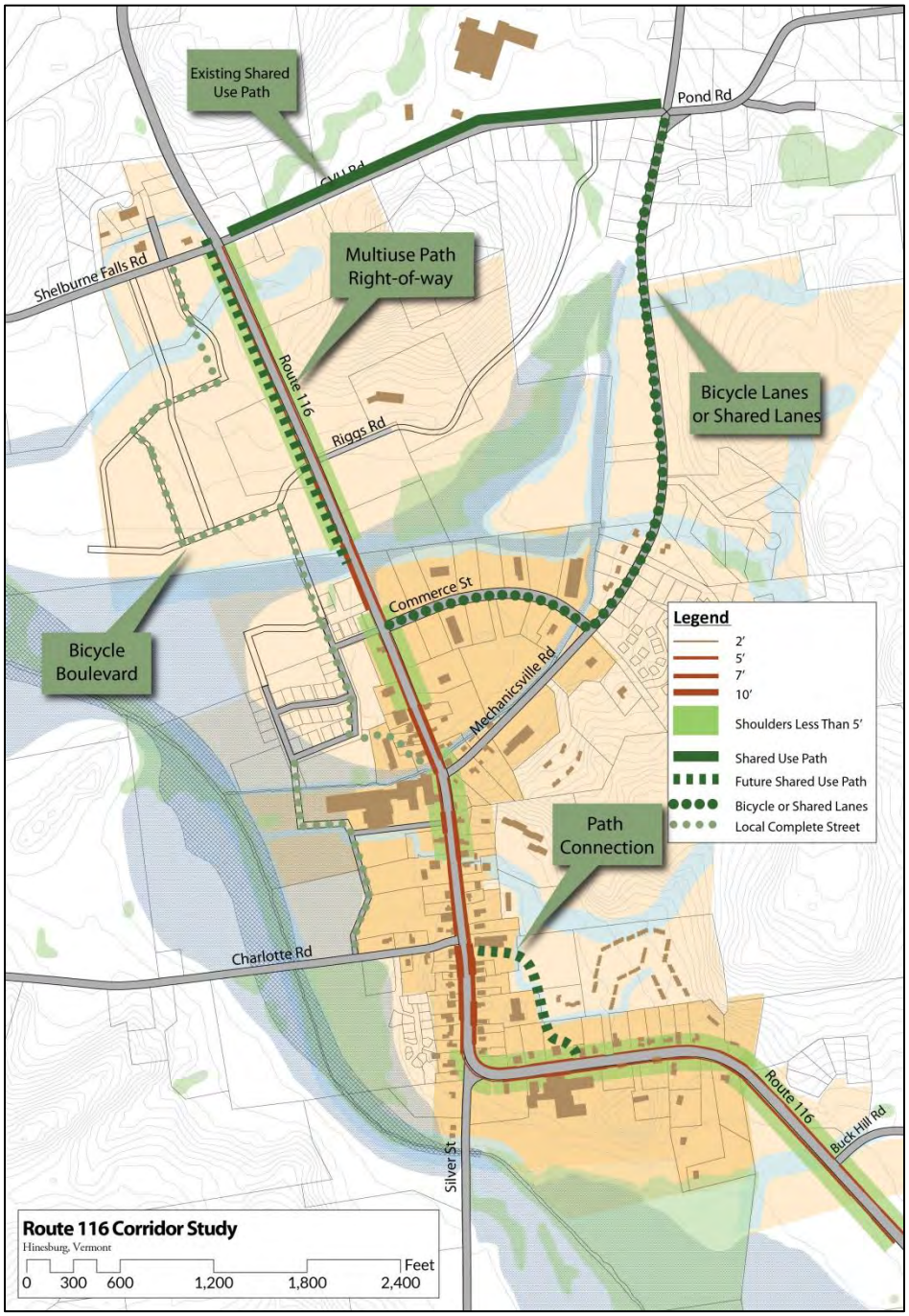
Figure 3.8: Pedestrian Network Strategies



3.5 Bicycle network

Figure 3.9 shows a set of projects to create a bicycle network that will better serve the wide range of bicyclists in the community. While experienced riders can generally use the shoulders of Route 116, shared use paths connecting a local street network can form a low volume/low speed street network suitable for younger or less confident cyclists. The components of the network are shown in detail in Section 4, and described in Section 5.

Figure 3.9: Bicycle Network Strategies



3.6 Stormwater Management Integrated Design

Because of the hydraulic concerns in the village noted earlier, in particular the undersized culvert north of Commerce St, the following are key strategies for reducing stormwater discharge resulting from transportation and land development sources.

- Minimize impervious surfaces with right-sized facilities, including both on Route 116 and in new development.
- Avoid curbing where possible to promote infiltration of stormwater.
- Integrate stormwater management into all transportation and development projects.
    - Bioswales can line new sidewalks along Route 116.
    - Landscaped curb extensions at intersections of the local street network can provide stormwater treatment and infiltration opportunities.
- A local stormwater utility can be established to monitor progress and permits.

Figure 3.10: Examples of bio-retention swales, parking lined with a rain garden, and curbless street

3.7 Travel Demand Management

Beyond the encouragement for walking and bicycling that a well-designed complete street network will achieve, there are several initiatives that can further reduce the share of trips made by automobiles.

3.7.1 Transit Stop/Park and Ride/Mobility Hub

The relocation of the bus stop provides an opportunity to create a "mobility hub" in Hinesburg: a place where all modes of travel conveniently intersect, and are encouraged by design. Its design should provide attractive access routes in an efficient manner for all modes – especially walking and biking. The mobility hub should have bicycle access and parking, and a great pedestrian environment to encourage access using these modes.

3.7.2 Education and Outreach

There are several opportunities for increasing the awareness of alternatives, which can be promoted to both residents and workers in Hinesburg. Hinesburg Rides has been established as a local carpooling resource, but has seen little activity. Participation in events such as "Way to GO Commuter Challenge" or "Bike to Work Week" can all help change travel attitudes and behavior over time.

3.7.3 School Transportation

Observations suggest that a significant portion of Hinesburg's school children are driven to school by their parents, and there may be an opportunity to increase walking and biking to school and consequently reduce morning peak hour traffic congestion. Providing safe and attractive networks for biking and walking and reduced travel speeds, particularly during the afternoon peak hour when there is less traffic congestion, can encourage more walking and biking to school. Hinesburg's participation in the Safe Routes to School program can provide a source of technical assistance and ideas for promoting walking and biking to school, and addressing safety concerns that are specific to school transportation. Remote drop-offs, such as at the Mobility Hub, combined with safe walking routes in the school vicinity may encourage alternatives for parents who drive to school.

3.8 Access Management

Access management is an important tool in balancing between the need for access for existing or new land uses, and the interest in reducing conflicts between through- and local traffic. There are many opportunities to implement access management in development and transportation projects.

- Access management is currently required by VTrans and the Town for new development on Route 116, and has resulted in the plans for a single new access to Route 116 for the entire section between the Commerce Street and CVU Road intersections.
- There are several locations on Route 116 where existing land uses have wide or multiple curb cuts, which can form a barrier for pedestrians. Pedestrian and streetscape projects in these areas will be opportunities for access management retrofits.
- As some areas undergo redevelopment or site plan changes, such as along Commerce Street, opportunities for greater access management should be explored, such as combining parking lots in the rear and limiting driveway access points.

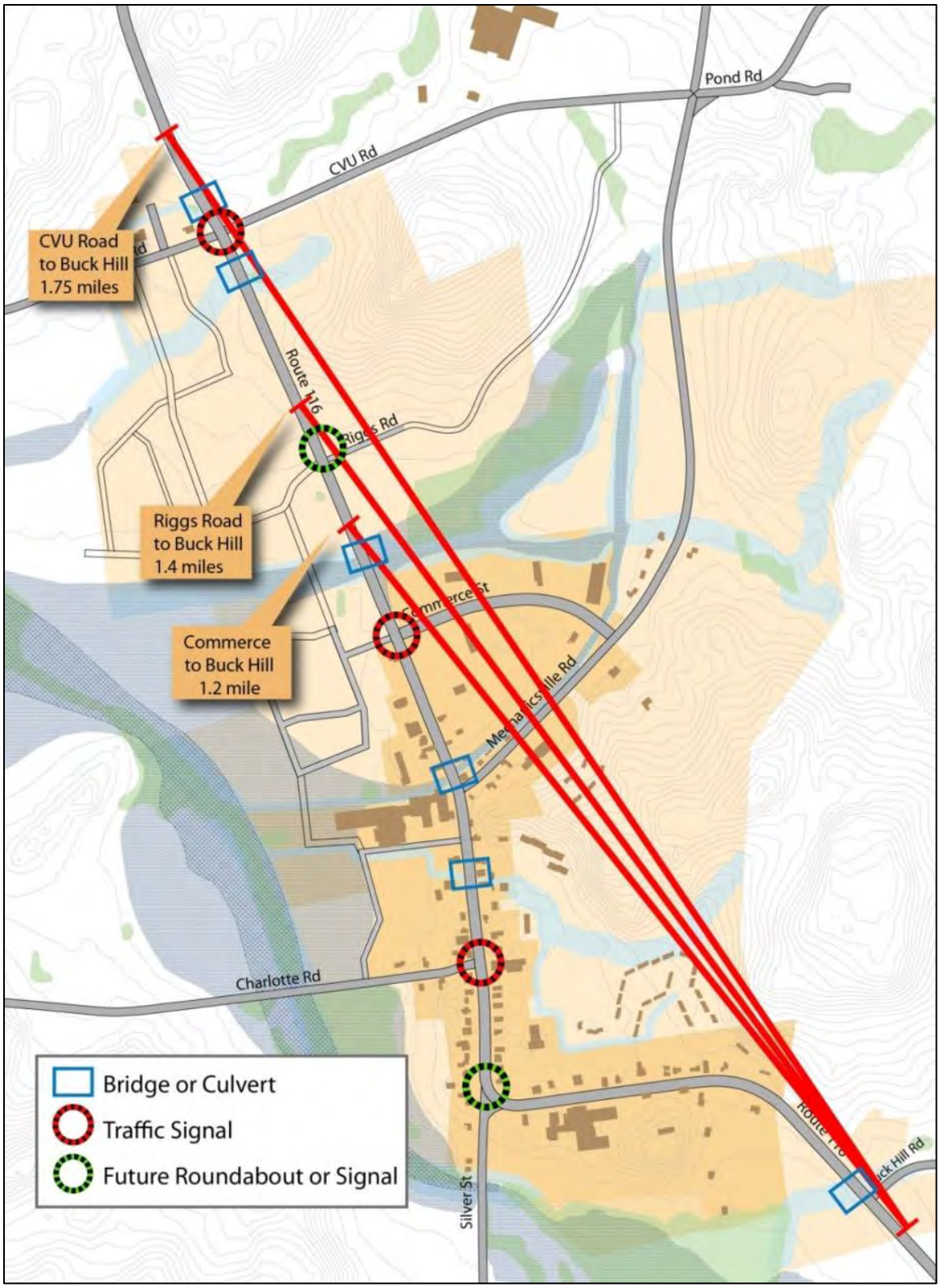
3.9 Reclassification of Route 116 as a Class 1 Town Highway

The Town of Hinesburg is evaluating the possibility of taking jurisdiction of Route 116 through all or some of the designated Village Growth Area by requesting reclassification for a portion of Route 116 to a Class 1 Town Highway. This has the following implications:

- The Town takes responsibility to maintain the roadway, including snow removal, pavement markings, traffic signals, signs, and cleaning drainage structures.
- The Town will receive funding from VTrans to compensate the additional road maintenance costs, on the order of $10,000 to $15,000 per year depending on the length that is reclassified.
- The Town will have greater autonomy in terms of street design, maintenance practices, crosswalks, speed limits and priorities for projects.

Figure 3.11 shows three possible scenarios for the reclassification limits.

Figure 3.11: Possible Reclassification Scenarios



3.9.1 Class 1 Town Highway Responsibilities

Table 3.1 outlines the allocation of responsibilities between the Town and VTrans in the existing jurisdiction and under a reclassification scenario. Items which switch from State to Town responsibility are shown in boldface type.

Table 3.1: Responsibilities for Maintenance of Route 116: Currently and with Reclassification

	Current		Class 1	
Item	Hinesburg	VTrans	Hinesburg	VTrans
Traffic Signal Maintenance		✓	✓	
Street Lights-Pedestrian	✓		✓	
Street Lights-Highway Safety		✓	✓	
Bridges and Culverts		✓	✓	
Sidewalks	✓		✓	
Striping – Centerline		✓		✓
Striping– Stop bars		✓	✓	
Striping– Edge lines		✓	✓	
Striping – on-street parking	✓		✓	
Striping – Crosswalks on Side Streets (3)	✓		✓	
Striping – Crosswalks on Route 116 (2)		✓	✓	
Plowing – Travel Lanes		✓	✓	
Plowing – on-street parking	✓		✓	
Plowing – sidewalks	✓		✓	
Pavement – Resurfacing		✓		✓
Pavement – Patching and crack sealing		✓	✓	
Cleaning Curbs and Drainage		✓	✓	
Replacing or Repairing Signs		✓	✓	

3.9.2 Revenue and Costs

Reclassification would have some funding implications for future infrastructure projects. Under town jurisdiction, VTrans will provide funding for Route 116 for the following types of projects:

- **Class 1 Town Highway Resurfacing**. Resurfacing projects will be conducted by VTrans at no cost to the Town. With the completion of the recent resurfacing, it is likely to be 10 to 12 years before another resurfacing project is completed.
- **Town Highway Bridge Program**. Bridge structures will be eligible for funding under this program, with matching funds of 10% for replacement and 5% for rehabilitation. The Town's goal to replace the undersized culvert just north of Commerce Street would be subject to this matching requirement if conducted through this program.

- **Transportation Alternatives and Bicycle-Pedestrian Grants**. There would be no changes to funding responsibility or priorities for these grant funded programs. However, the design flexibility afforded by local jurisdiction could allow for more context sensitive and efficient design. These programs do all include VTrans design review.

An analysis of the maintenance costs versus revenue of the Town accepting maintenance responsibility for Route 116 in included in Attachment 4, and summarized in Table 3.2.

Table 3.2: Cost Analysis Results

Scenario	Revenue/Year	Cost/Year	Net Cost to Town	Cost/Revenue Ratio
CVU Road	$ 19,623	$ 24,958	$ 5,334	127%
Riggs Road	$ 15,699	$ 18,190	$ 2,491	116%
Commerce Road	$ 13,456	$ 16,860	$ 3,404	125%

This shows that the financially most advantageous scenario is for the Town to take on Riggs Road to Buck Hill Road, with net annual cost to the town of about $2,500. There are numerous assumptions that went into this analysis, which was also based on information collected from communities with Class 1 Town Highways, including Bethel, Randolph, and Essex Junction. The following should be considered:

- The cost to maintain Route 116 will ultimately depend on how intensively and thoroughly the Town maintains the road. There are no requirements for "bare roads" snow removal, or immediate patching of potholes, for example, and the Town would have some discretion in the maintenance costs.
- The cost of maintaining traffic signals is one of the most significant cost items. It is assumed that the Town will contract with a local firm for this service, which can range widely based on the condition and needs of the signals.
- Initially, maintenance costs will be lower due to good condition of the road and signals. Ten years from now costs could be significantly higher, as the pavement deteriorates and the traffic signals age. The analysis above reflects an average annual cost over a ten year period, assuming some deterioration of the road.

The town's highway budget currently exceeds $900,000, so the additional cost of local maintenance of Route 116 will be quite small compared to total town highway spending. There is also some precedent of VTrans sharing responsibility for signal maintenance with Essex Junction, which is an option that Hinesburg could explore with VTrans. If the Town were not responsible for signal maintenance, the analysis shows that the revenues would be sufficient to cover maintenance costs, even for ten years from now.

3.9.3 Benefits of Reclassification

The following are among the most important benefits of reclassification.

Coordination of Maintenance Activities. This is particularly an issue for winter maintenance on sections of road that have sidewalks. Currently, there is no coordination between the Town removing snow from the sidewalks, and VTrans plowing the roadway. This can be very inefficient; as VTrans might plow snow onto a recently cleared sidewalk, requiring the Town to repeat sidewalk snow removal. As the Town's sidewalk network expands, this could become an increasingly important issue.

Design Control and Flexibility. Reclassification would provide the Town of Hinesburg with greater autonomy for many street design features. In particular, the Town would have greater flexibility for the following items:

- lane widths
- shoulder widths
- on-street parking
- clear zone of 15 feet on either side of road centerline for plowing ease

For the following street design elements, VTrans policies would no longer apply. However, they would be subject to MUTCD regulations, which are adopted by State law. The Town would have greater ability to apply engineering judgment and interpretation, and would be the final decisonmaker.

- Posted speed limits
- Crosswalk locations
- Signal warrants
- Other road signs

Speed Management. VTrans specifically prohibits many traffic calming features, and does not favor the use of textured or colored materials on roadway projects. Implementing designs that could make snow removal more challenging, such as raised crosswalks or median refuges for pedestrians, is simply not permitted by VTrans on a state highway. Reclassification would allow a much wider range of options to implement village traffic calming and arterial speed management. It should be noted that many traffic calming features will take more care and effort for snow removal, and this should be weighed against the safety benefits of lower speeds.

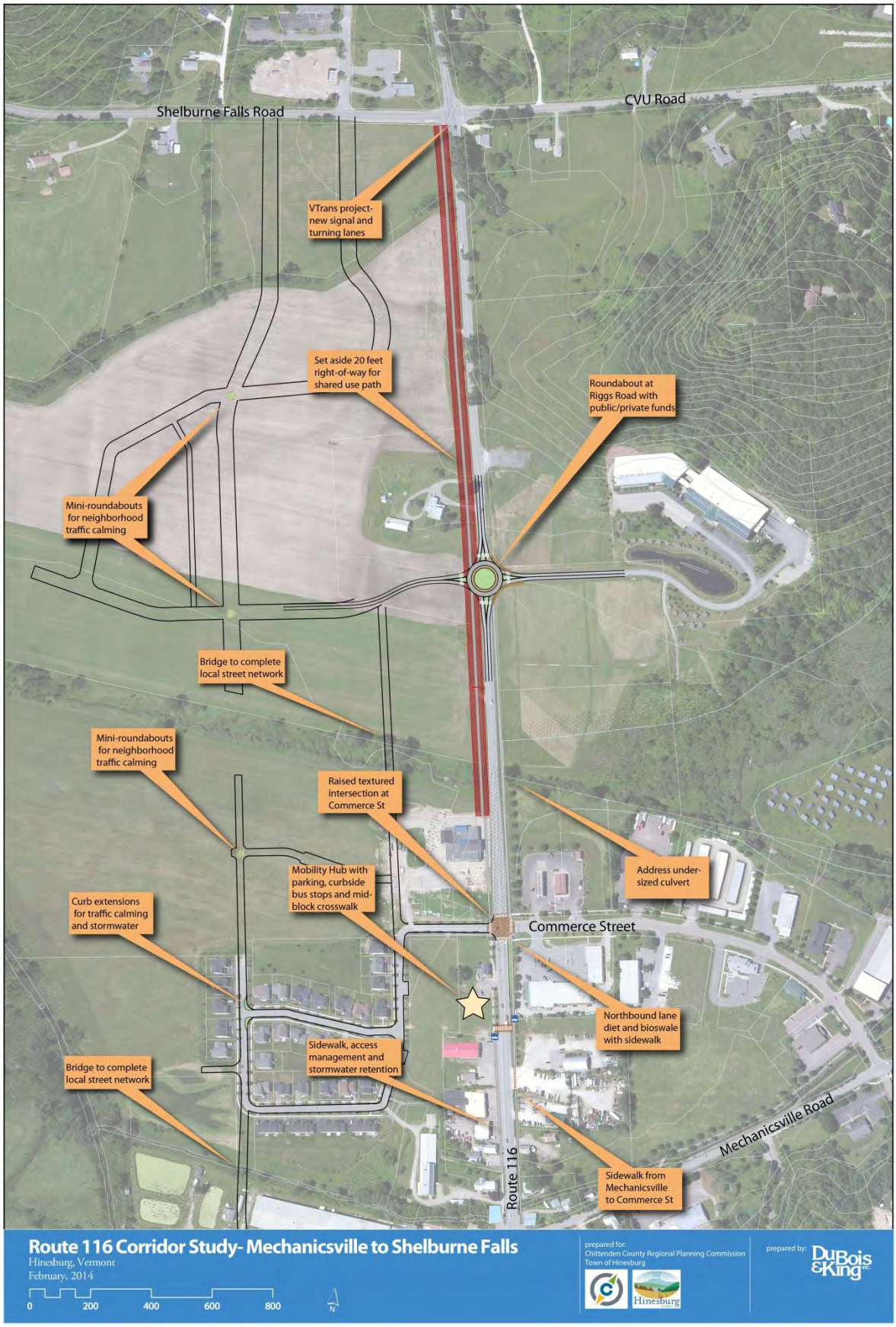
Access Management. Reclassification would allow greater Town authority over the granting of access permits. With the amount of development that may occur in the growth area over the next ten years, this could have significant advantages.

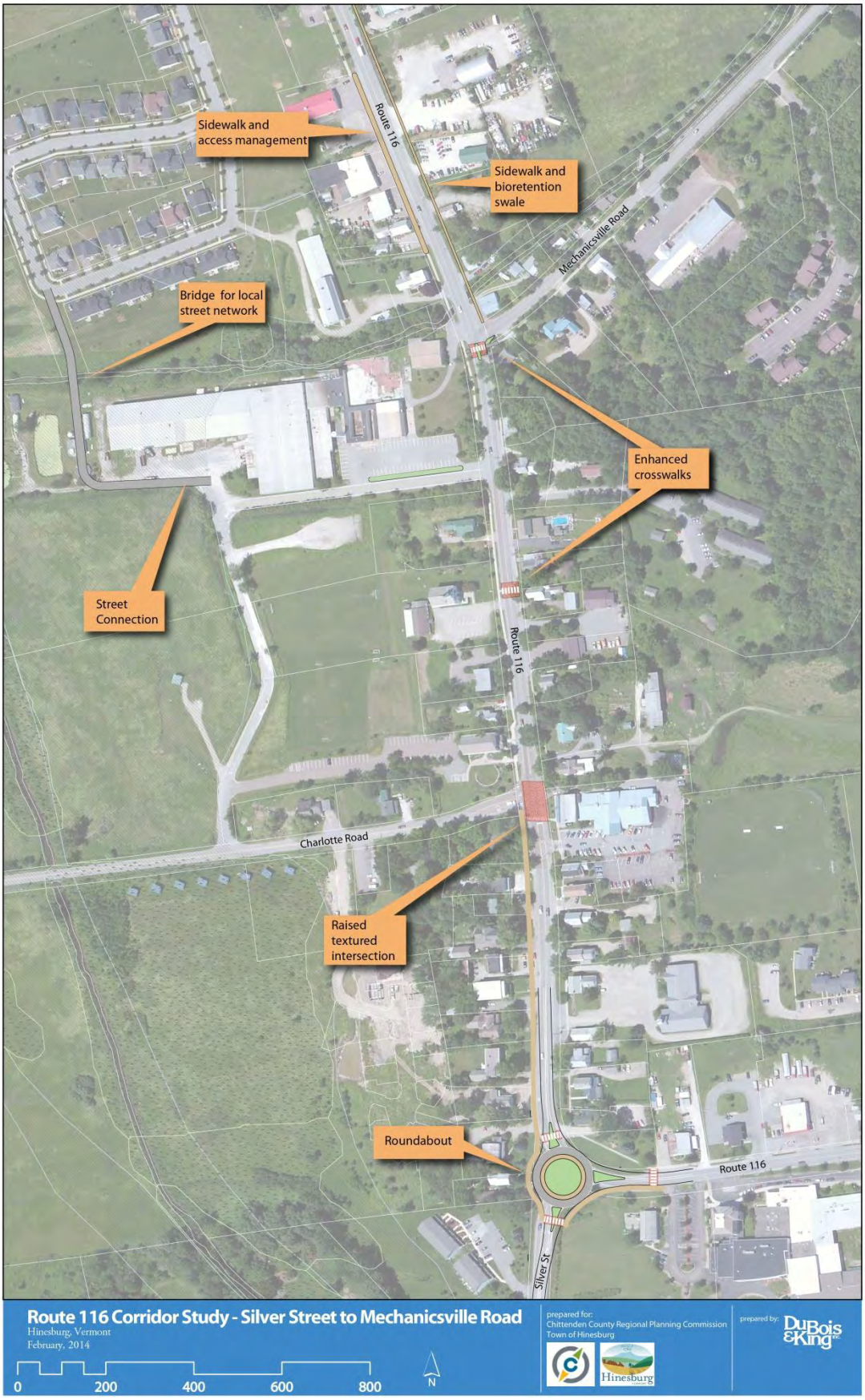
Attachment 4 provides relevant excerpts from Vermont Statutes for Class 1 Town Highways for information.

4 Detailed Plan

The following sections illustrate a set of infrastructure improvements and planning initiatives to advance the community's goals in the Village area. These plans were presented at a public workshop on February 11, 2014, and input was received both through comments and through a dot exercise for positive and negative input on each feature.

Figure 4.1: Overview of Corridor Plan Graphics


Shelburne Falls Road
CVU Road
VTrans project- new signal and turning lanes
Set aside 20 feet right-of-way for shared use path
Roundabout at Riggs Road with public/private funds
Mini-roundabouts for neighborhood traffic calming
Bridge to complete local street network
Mini-roundabouts for neighborhood traffic calming
Raised textured intersection at Commerce St
Address under-sized culvert
Mobility Hub with parking, curbside bus stops and mid-block crosswalk
Curb extensions for traffic calming and stormwater
Commerce Street
Northbound lane diet and bioswale with sidewalk
Sidewalk, access management and stormwater retention
Bridge to complete local street network
Mechanicsville Road
Route 116
Sidewalk from Mechanicsville to Commerce St
Route 116 Corridor Study- Mechanicsville to Shelburne Falls
Hinesburg, Vermont
February, 2014
0 200 400 600 800
N
prepared for:
Chittenden County Regional Planning Commission
Town of Hinesburg
Hinesburg
prepared by:
DuBois & King inc.


Sidewalk and access management
Route 116
Sidewalk and bioretention swale
Mechanicsville Road
Bridge for local street network
Enhanced crosswalks
Street Connection
Route 116
Charlotte Road
Raised textured intersection
Roundabout
Route 116
Silver St
Route 116 Corridor Study - Silver Street to Mechanicsville Road
Hinesburg, Vermont
February, 2014
0
200
400
600
800
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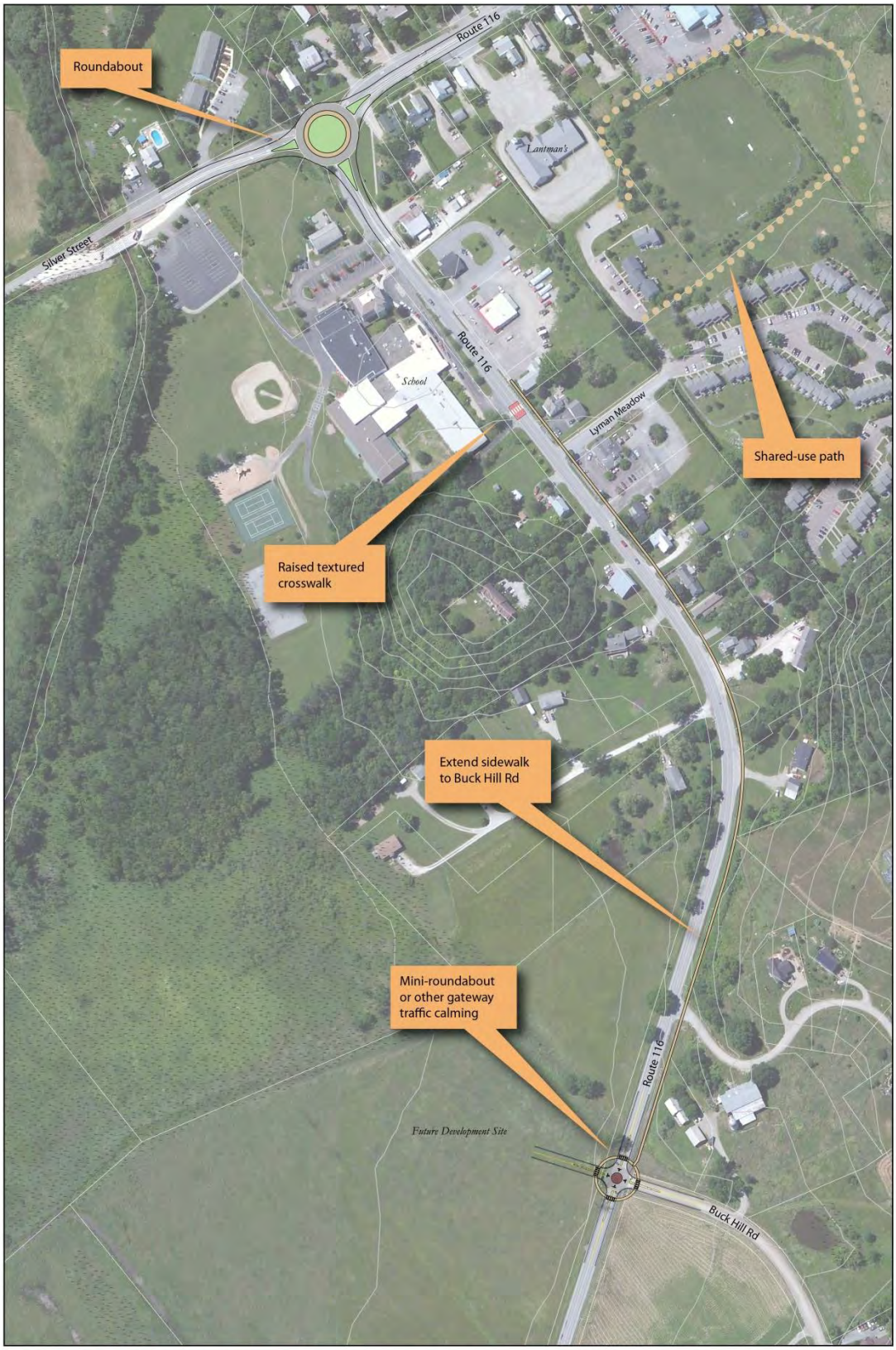
prepared for:
Chittenden County Regional Planning Commission
Town of Hinesburg
prepared by:
DuBois & King inc.



Route 116 Corridor Study - Buck Hill Road to Silver Street
Hinesburg, Vermont
February, 2014

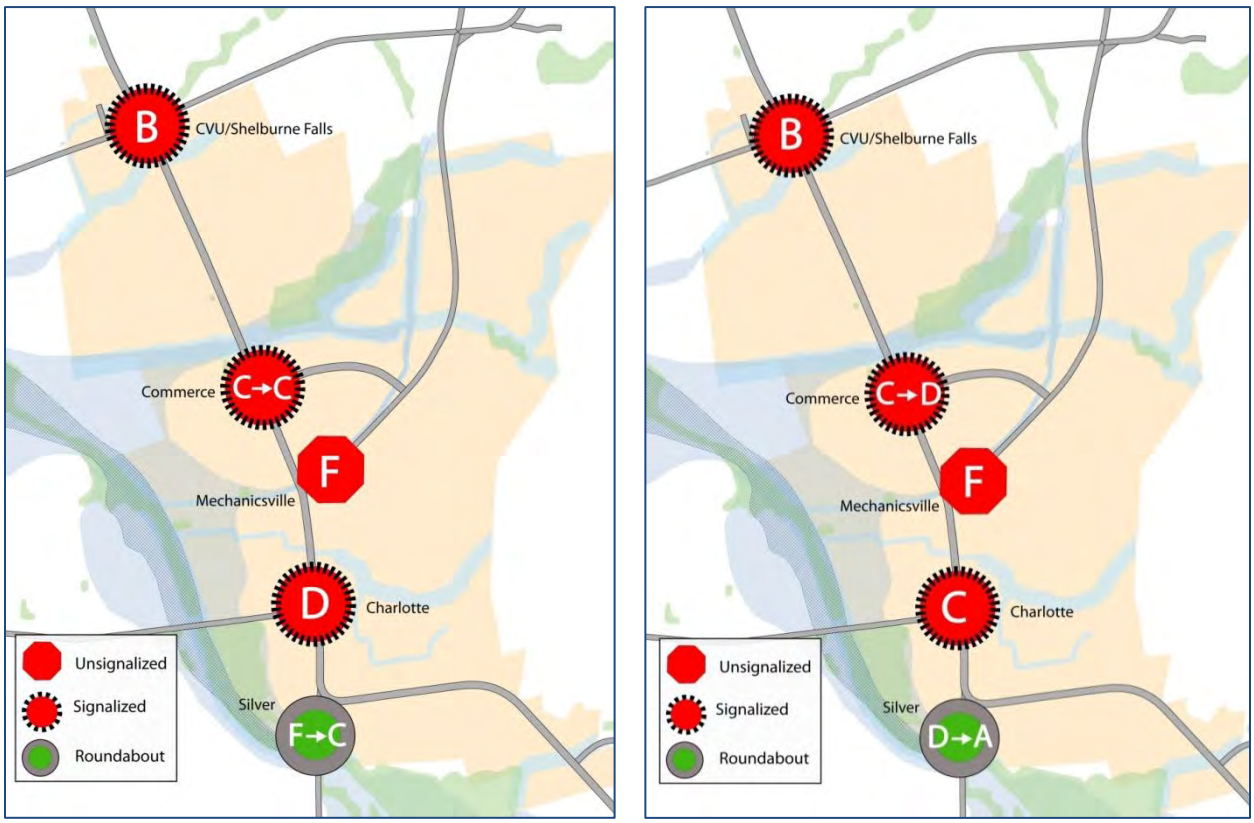
0 200 400 600 800

prepared for:
Chittenden County Regional Planning Commission
Town of Hinesburg

prepared by: DuBois & King inc.

The above design scheme includes changes to two intersections: Commerce Street (northbound lane diet) and Silver Street (roundabout). The resulting changes in intersection level of service are shown in Figure 4.2. Silver Street's LOS will improve dramatically with the roundabout, and LOS at Commerce Street will decline slightly in the p.m. peak hour if the lane diet is implemented.

Figure 4.2: Future Levels of Service



5 Implementation

The following lists the recommended implementation projects, along with a generalized cost for scoping and design and construction.

Table 5.1: Implementation Plan

Project (Not in priority order)	Next Step	Funding or Program Options	Initial Cost	Construction Cost *	Priority/Urgency (Short, medium or long term)	Notes
1) Silver Street Intersection	Scoping Study	CCRPC Scoping	$ 35,000	$ 1,500,000	Medium to Long	Study should wait until Charlotte signal project is complete
2) New and Enhanced Crosswalks	New and enhanced crosswalks at up to four locations	CCRPC Technical Assistance	$ 20,000	$ 200,000	**Short**	Design options affected by reclassification; potential to use textured/ colored materials.
3) Buck Hill Gateway	Traffic calming gateway and coordination with developers	CCRPC Technical Assistance	$ 10,000	$ 120,000	Medium	Design options affected by reclassification
4) Riggs Road Roundabout	Plans and cost estimate for roundabout; coordinate with adjoining landowners	CCRPC Scoping for concept design Public/Private for construction	$ 30,000	$ 1,250,000	Medium	Capital Planning and fair share cost allocation would allow for public/private cost sharing
5) Sidewalk: Mechanicsville to Commerce	Scoping Study	VTrans Bike-Ped or Trans Alts	$ 30,000	$ 220,000	Medium	Consider lane diet on Route 116 northbound during scoping
6) Sidewalk: School to Buck Hill Road	Scoping Study	VTrans Bike-Ped or Trans Alts	$ 30,000	$ 440,000	Medium to Long	Provide crosswalk at Buck Hill Road
7) Pedestrian Enhancements of Charlotte Rd and Commerce Street Intersections	Conceptual Design	CCRPC Technical Assistance	$ 25,000	$ 200,000	Long	Reinforce village design theme using colored/textured materials
8) Shared Use Path: Lantman's to Lyman Meadow	Conceptual Design	CCRPC Technical Assistance	$ 15,000	$ 200,000	**Short**	Primarily exists, and cost will depend on desired surface and design criteria
9) Mobility Hub/Park and Ride	Scoping / Design	VTrans Trans Alts	$ 30,000	$ 300,000	**Short**	Includes bicycle and pedestrian connection, bicycle parking and attractive urban design
10)a Bridge over Canal between Cheese Plant and Farmall Dr	Coordinated Scoping / Design/Financing Plan	Private Funding or Public/Private		$ 500,000	Medium to Long	Development activity at Cheese Plant should be considered in need and funding
10)b Bridge over Patrick Brook between Hinesburg Center and Bissonette	Coordinated Scoping / Design/Financing Plan	Private Funding or Public/Private		$ 750,000	Medium to Long	Ongoing development projects should incorporate this into their plans.
11) Replace Bridge #28	Scoping Study	Possible future resiliency fund	$ 30,000	$ 1,250,000	**Short**	Hannaford mitigation to extend existing culvert could be applied to replacement
12) Future Path Right-of-way	Conceptual Design	CCRPC Technical Assistance	$ 10,000	$ 1,000,000	**Short**	Ongoing development projects should incorporate this into their plans; Town should place on official map.

The following sections provide more detail on the above implementation projects.

5.1.1 Silver Street Intersection

This intersection has long queues, and is within a high crash location, despite the realignment project in 2005. It warrants signalization or conversion to a roundabout. Congestion is more severe during the morning peak hours, with queues extending south on Route 116 from the Charlotte Road signal through the intersection, and extending south on Silver Street. A signal or roundabout would not provide relief for the congestion, unless the Charlotte Road intersection becomes more efficient with the planned signal phasing project and the morning queues become shorter. The morning queues should be monitored after the implementation of the signal phasing changes. If the queues are substantially reduced, and no longer extend through the Silver Street intersection on a daily basis, then the potential benefit of a signal or roundabout at Silver Street should be re-evaluated.

5.1.2 Multimodal Projects

a) New and Enhanced Crosswalks: The village growth area's pedestrian network lacks several pedestrian crossings at important locations, which are a high priority for implementation. Not only can the crosswalks provided needed pedestrian connections, but they can also serve as a traffic calming feature with appropriate design, such as a median island or raised crosswalk. The design options and flexibility for these will be greatly increased if the Town of Hinesburg decides to take ownership of Route 116 in the study area.

Crosswalk with Median Refuge on US 2 in Danville, VT

b) Sidewalk-Mechanicsville to Commerce: A scoping study is needed to advance this project. At that time, the possibility of a lane diet on the northbound approach at the Commerce Street intersection can be evaluated, which would have the benefits of reducing cost, reducing paved area, and shortening the pedestrian crossing distance at the Commerce/Route 116 intersection.

c) Sidewalk-School to Buck Hill Road: With new development in planning stages in the vicinity of Buck Hill Road, a sidewalk should eventually be extended to Buck Hill Road, with a crosswalk at its end to serve both sides of Route 116 in this area. Funding assistance from the developer can be explored.

d) Pedestrian Enhancements at Charlotte Road and Commerce Street Intersections: These two intersections are important nodes in the village's economy and pedestrian network. With design enhancements such as textured surfaces, lighting, green stormwater treatment and streetscape amenities, these could become both more attractive for pedestrians and announce the arrival into the Village Growth Area's commercial core.

e) Shared Use Path to Lantman's: An informal connection between Route 116 near the Hinesburge Community School and Lantman's parking lot exists, which could be upgraded to allow shared use travel and formalized with a relatively modest investment.

f) Mobility Hub: The Town's planned project to develop a park-and-ride lot and relocate the transit stops to a new town-owned green space lot will have substantial benefits for ridesharing and transit use. With some additional planning and design attention to all modes of travel, this location could become a "Mobility Hub", which is a place where all modes of transportation come together, that is also a vibrant economic community center with a sense of place and design. A mobility hub can elevate the status and visibility of public transit, and make it easier and more pleasant to use this mode. The location planned for the new park and ride is ideal due to its central location. Important design considerations will be:

- Pedestrian and bicycle access from all major directions
- An attractive, sheltered, secure place for transit patrons to wait for the bus
- Parking for vehicles that does not detract from the public realm, and convenient bicycle parking.
- Signage and schedule information available to make it easy to use the bus, including the ability to get real time bus arrival data.
- Promoting nearby services, i.e. a place to get the newspaper and a cup of coffee.
- Curbside transit stops in order to minimize delays for through transit patrons, and further increase the visibility of transit.
- Quality urban design to create an appealing space that elevates the status of transit and other non-auto modes.

Mobility Hub Objectives from Metrolynx, Canada

5.1.3 Establish Village Gateways

Defining where the village begins and the countryside ends by design will promote Hinesburg's village as a place, but also can have the effect of changing driver behavior by increasing attention and reducing speeds through the village. The following are recommended locations for gateway treatments, which should be reinforced by other traffic calming and streetscape design elements throughout the village.

a) Buck Hill Gateway: This may become a four-way intersection with planned development on the west side of Route 116, and is an ideal location for announcing the village ahead and calming traffic. The Gateway can be integrated with the intersection, such as a roundabout, splitter islands, or a crosswalk. With development activity in the area, there may be an opportunity for developer participation in funding.

Village Gateway on US 2 in Danville, VT

b) Riggs Road Gateway: This intersection will need to be addressed due to potentially significant levels of development planned on both sides of Route 116, which creates an opportunity for developer assistance to establish a gateway. A roundabout intersection would be an ideal way to safely accommodate the increase in turning traffic, and form an attractive transition into the village.

5.1.4 Establish Local Street Network

A local street network as envisioned in the Town Plan and illustrated on the Official Map has numerous benefits. As development occurs in the growth area, the street network can provide some additional capacity that will partially offset increased traffic congestion. More importantly, the street network can provide a low volume, slow speed network that will increase the mobility of bicycles and pedestrians through the village. The street network can also provide a potentially valuable alternate route in the case of emergency closures of Route 116.

a) **Bridges to establish street network:** Bridge crossings of Patrick Brook and the Cheese Plant Canal will be required to establish the street network. While these may be partially or fully funded by developers, there are concerns about the environmental impacts of the bridges, particularly with construction in the LaPlatte floodplain. Longer span bridges would reduce impacts in the floodplain, but also add cost to the project.
b) **Neighborhood Traffic Calming**: As the street network on the west side of the village is developed, traffic calming measures should be designed into the street network. These can included neighborhood traffic circles, curb extensions that can also provide stormwater retention,

5.1.5 Planning and Design Initiatives

- Adopt a Low Impact Design Code to better integrate stormwater management into design
- Adopt town guidelines to encourage use curbless street design and texture variations rather than curbing to define street edges, particularly on neighborhood streets in newly developing areas.
- Adopt a Form Based Code to improve compatibility of development and street design goals.
- Work with landowners to set aside a 20 feet right-of-way for a future shared use path on the west side of Route 116 from Commerce Street to CVU Road

5.1.6 Reclassification

An analysis of the financial implications of reclassifying Route 116 into a Class 1 Town Highway indicates that this could result in a net cost to the town of about $3,000 per year, depending on the actual length taken over. A significant, but somewhat unpredictable cost to the town is the maintenance of 2 or 3 traffic signals (also depending on the length). There is precedent in other Vermont communities for VTrans to keep the responsibility to maintain traffic signals, so this option should be explored for Hinesburg. If the responsibility to maintain the traffic signals was removed from the local costs, then the reclassification would be roughly equal or slightly favorable for Hinesburg. With the significantly greater flexibility that local control would bring, this option should be explored with VTrans.

5.2 Public Involvement, Issues and Priorities

At a public meeting held on February 11, 2014, the above concepts were presented, with ample opportunity for public input. The following implementation options had the strongest support:

- Silver Street roundabout
- Enhanced crosswalks with traffic calming features
- Setting aside a right-of-way for a shared use path between Commerce Street and CVU Road
- Traffic calming gateway at the Buck Hill Road intersection
- Roundabout at Riggs Road
- Sidewalk from Commerce to Mechanicsville
- Sidewalk from school to Buck Hill Road

The topic that generated the greatest controversy and discussion was the development of the west side street network. The discussion focused on the bridge connections, as current developments are underway that will largely build the street network, and bridges will be needed across Patrick Brook and the Cheese Factory Canal to complete the network. Participants were split among views that both bridges should be built, only the Patrick Brook bridge should be built, or no bridges should be built. Concern about development in the floodway, as well as cost, were key reasons for those supporting no bridges.

5.3 Conclusions

The following summarizes the implementation activities in terms of advancing the project goals.

Table 5.2 Conclusions

Project	Safety	Vibrancy/ Walkbility/ Bikability	Efficiency	Environmental Health	Notes
Silver Street Intersection	●		●		Addresses High Crash Location; Provides better traffic operations
Bicycle and Pedestrian Projects	●	●	●		Addresses safety and mobility for these modes; encourages mode shift
Mobility Hub		●	●		Encourages mode shift and greater person-capacity of network
Traffic Calming and Gateways	●	●			Improves safety by reducing speeds
Develop Street Network		●	●		Improves efficiency; creates a more walkable and bikeable village
Stormwater Management and Low Impact Design			●	●	Maintaining right-sized, efficient designs can reduce run-off
Reclassification of Route 116		●	●		More flexibility and control for management of the corridor.

Attachments

Attachment 1: Public Involvement Documentation

Attachment 2: Level of Service Analysis Documentation

Attachment 3: Stormwater and Hydrology Resources

Attachment 4: Reclassification Resources