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1.0 INTRODUCTION

1.1 | BACKGROUND

This Scoping Study carries forward several potential sidewalk alignments identified previously through the Town planning process – either by recommendations from previous studies, or where proposed developments will likely necessitate connections to the existing village sidewalk (or trail) system.

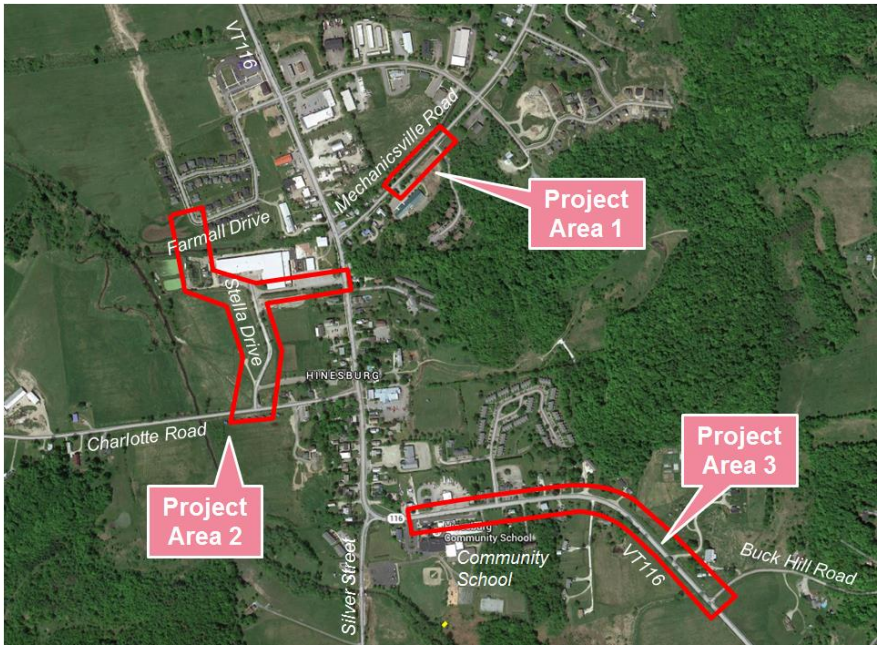
This Scoping Study, when complete, will explore in detail several potential sidewalk alignment alternatives, identify environmental and cultural resource impacts, and develops detailed cost estimates. The Scoping Study concludes with the identification of a preferred package of alternatives selected by the Hinesburg Selectboard.

This Scoping Study started in May 2014, with public local concerns meeting held in July.

1.2 | STUDY AREA

The project study areas (Figure 1) have been designated to include several areas where future sidewalks are desirable. They include a short segment of Mechanicsville Road where there is a gap in the existing sidewalk network of about 350 feet (Area 1), the area between Farmall Drive, Charlotte Road and VT116, including the former Stella Cheese Plant and Stella Road (Area 2), and a segment of VT116 from the Community Elementary School to Buck Hill Road (Area 3).

FIGURE 1: PROJECT STUDY AREAS



1.3 | PROJECT OVERSIGHT

This project is being conducted under the oversight of the following entities:

- Hinesburg Planning and Zoning
- Hinesburg Department of Public Works
- VTrans District 5
- VTrans Bicycle/Pedestrian Planning Program
- CCRPC Transportation Planning

1.4 | STAKEHOLDER & PUBLIC OUTREACH

Public involvement was integrated into several aspects of the work plan including public notice, village committee reviews, information management, and public meetings.

- **Public Notice**: The July 14, 2014 Local Concerns Meeting was noticed in the Hinesburg Record.
- **Information Management**: Information management included a website with background information, meeting notes, public meeting documents (agendas, meeting notes, link to meeting videos), and a final report. The project website can be found at: http://www.hinesburg.org/planning.html.
- **Public Meeting and Committee Reviews**: A public meeting was held on July 14, 2014. This meeting was held in conjunction with a regular Village Steering Committee Meeting. Additional detail, including meeting minutes and meeting notices are available in Appendix A.

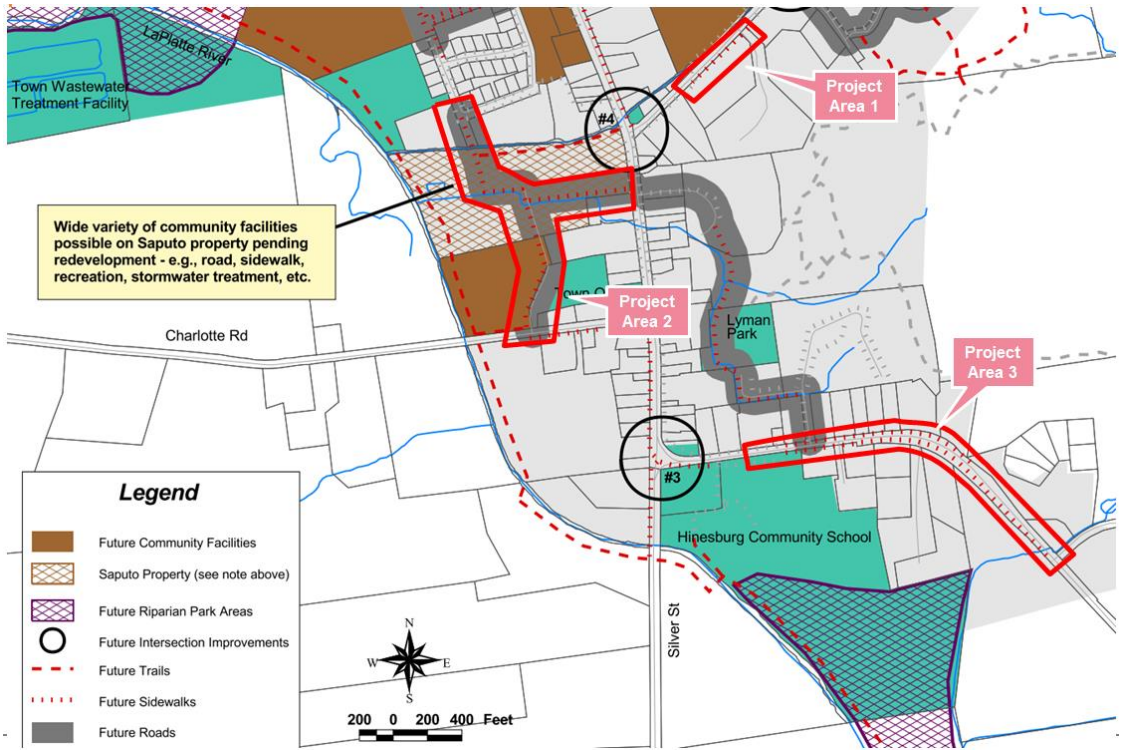
1.5 | PREVIOUS STUDIES

Several relevant studies and or projects provide valuable background to the study areas.

- **The Hinesburg Official Map**[1] - The official map is intended to identify areas and locations of future infrastructure improvements necessary to accommodate planned future growth. This planning tool includes roads, sidewalks, parks and other community facilities. It is particularly relevant to each of this study's project areas, indicating the approximate sidewalk connections, as shown in Figure x.

[1] Effective May 25, 2009

FIGURE 2. EXCERPT FROM OFFICIAL MAP



- The **2014 VT116 Corridor Plan** – This update to the 2004 Corridor Plan refines the vision for growth and necessary infrastructure along VT116. In particular, the expressed goal for connectivity, complete streets and a walkable community are primarily relevant to this scoping study. Environmental health through stormwater management is also a notable future outcome. Expected growth will make these issues more acute, and the outcome of this study even more relevant in the future.

- The **2014 VT116 Safe Routes to School Sidewalk Project**[2] - Construction of this new sidewalk project will complete an important connection from the Community School west to Silver Street and continue north to Charlotte Rd., thus nearly connecting Project Area 2 to Project Area 3.

[2] STP SRIN (24) - STP EH 08(19)

2.0 EXISTING CONDITIONS

2.1 | FUNCTION, ALIGNMENT & TOPOGRAPHY

Project study areas 1 & 2 are shown in more detail in Figure 3 below. Project area photos are provided in Appendix G. Project Area 1 involves the Mechanicsville Road segment shown (a local Class 2 road), and any area impacted on the adjacent commercial property to the east. Project Area 2 involves a commercial property formerly know as the Saputo Cheese Plant (the Cheese Plant), now owned by Redstone Development. Sidewalk connections from the Farmall Drive subdivision to the north, through an area formerly used for wastewater treatment, and along Stella drive to Charlotte Road (a local Class 2 road). This area is private property for the most part, with some public rights for access and utilities at the southern end along Stella Drive. Project Area 3, shown in Figure 4, involves the VT116 right of way from the school property to Buck Hill Road, as well as possible impacts to adjacent properties. VT116 is classified as a minor arterial, and is State owned, maintained and controlled in this area.

FIGURE 3: PROJECT STUDY AREAS 1 & 2

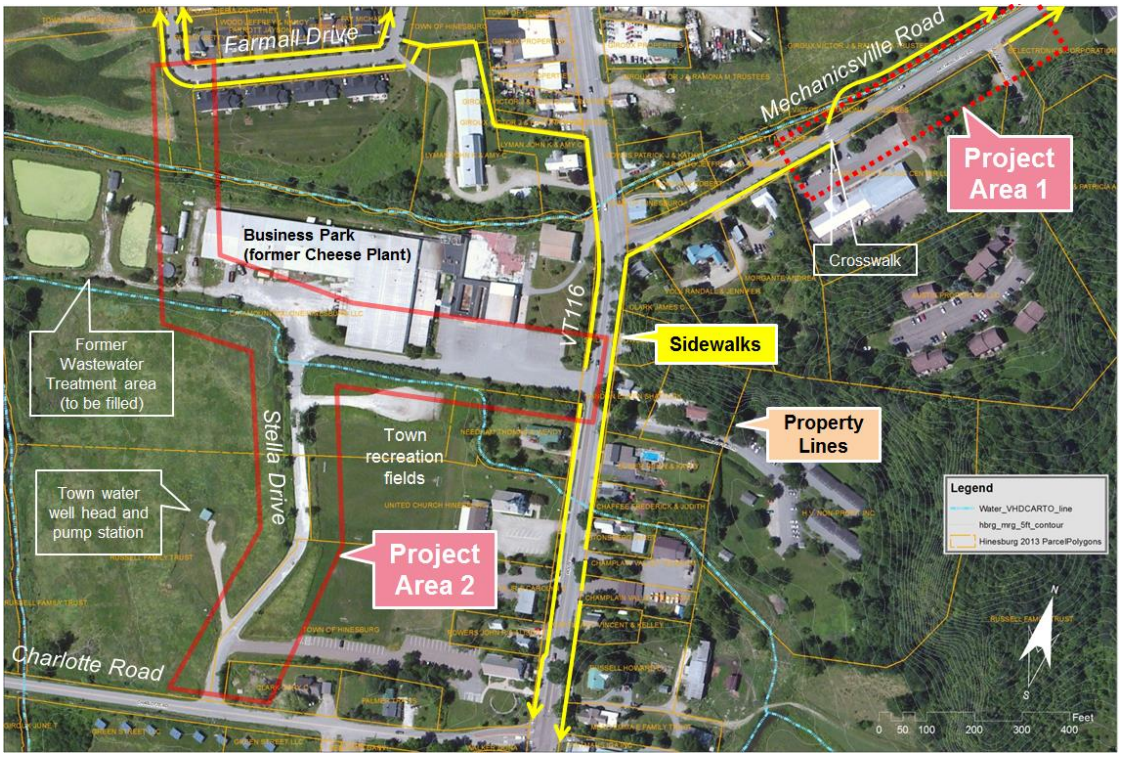
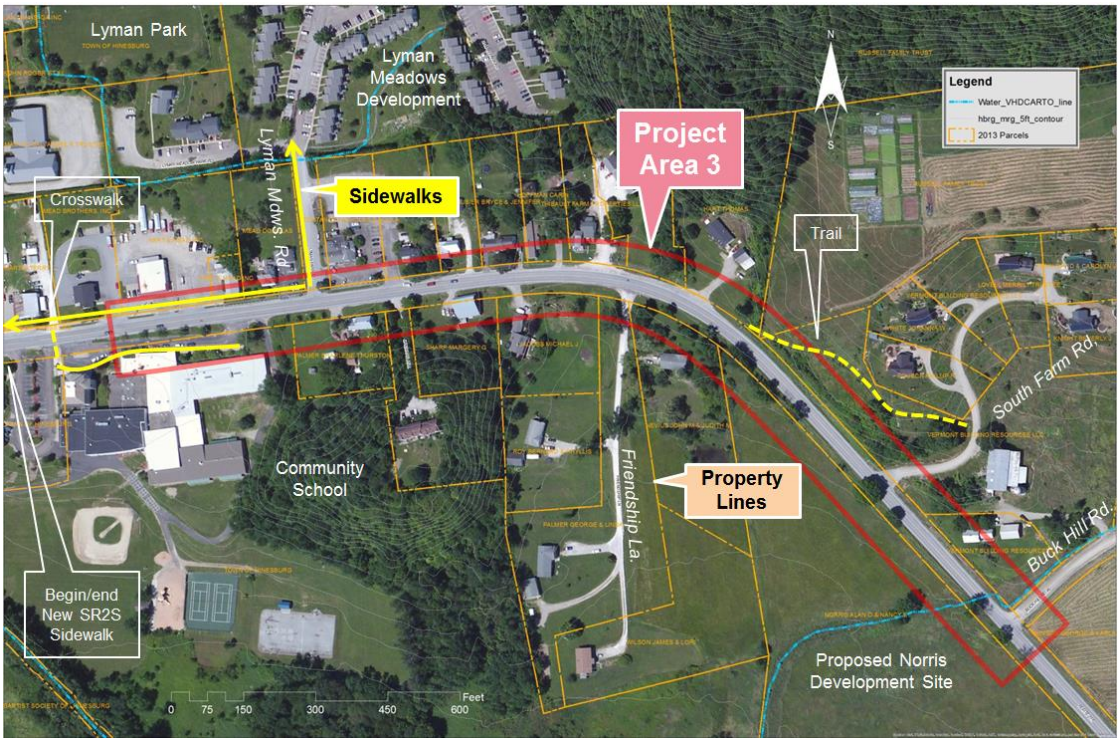


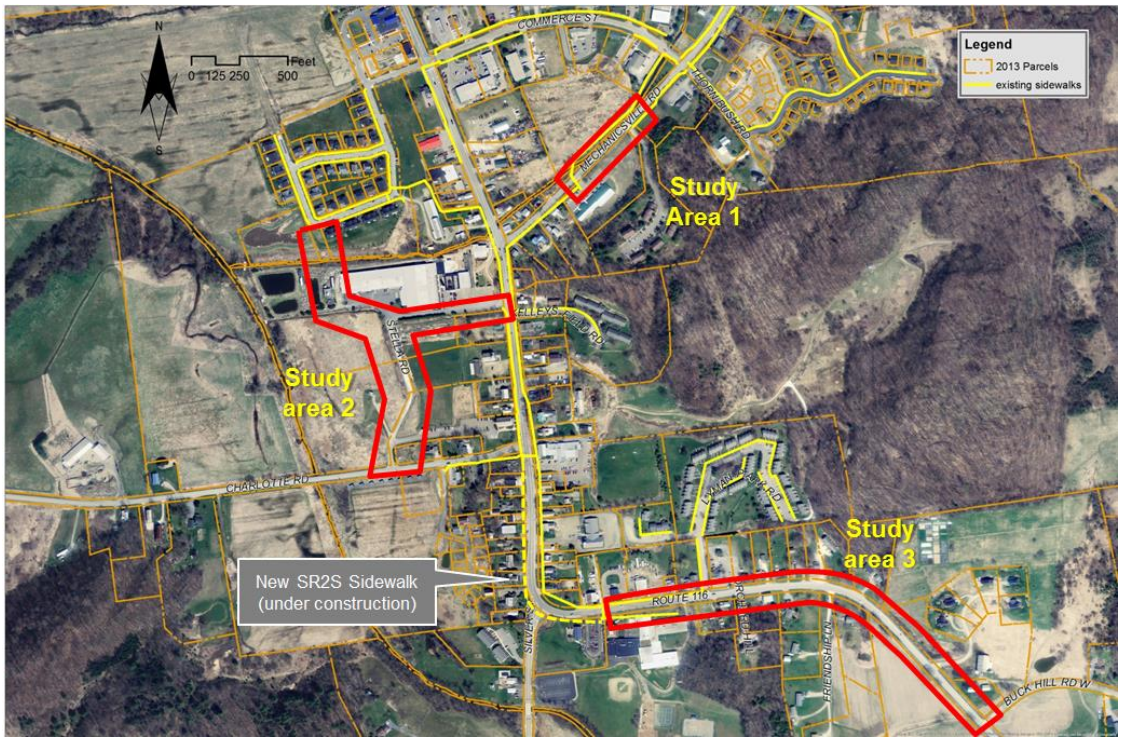
FIGURE 4. PROJECT STUDY AREA 3



2.2 | BICYCLE AND PEDESTRIAN FACILITIES

The existing sidewalk network within and adjacent to the study area is shown in Figure 5.

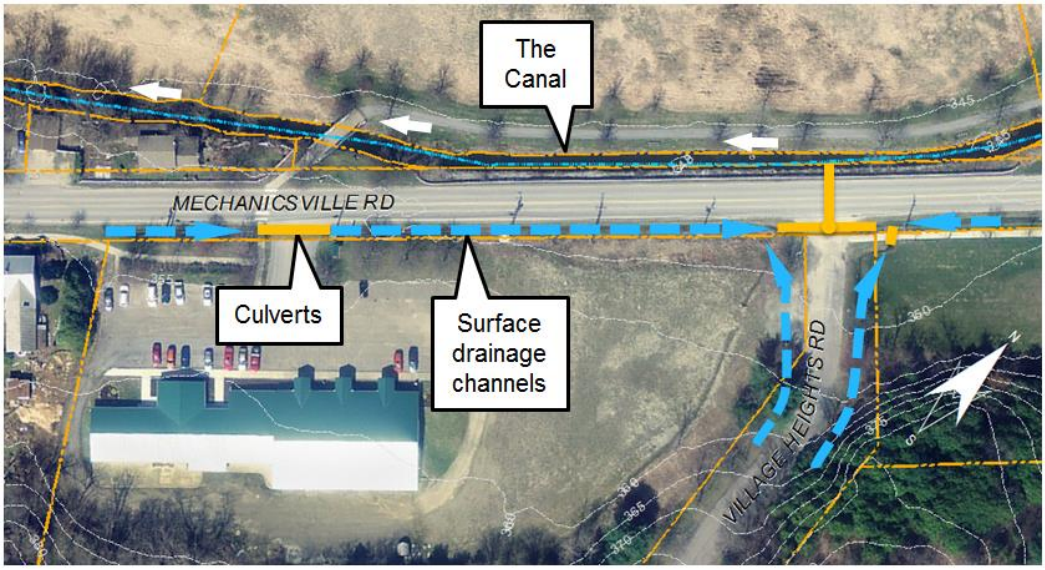
FIGURE 5. EXISTING SIDEWALK NETWORK



2.3 | DRAINAGE/HYDRAULICS

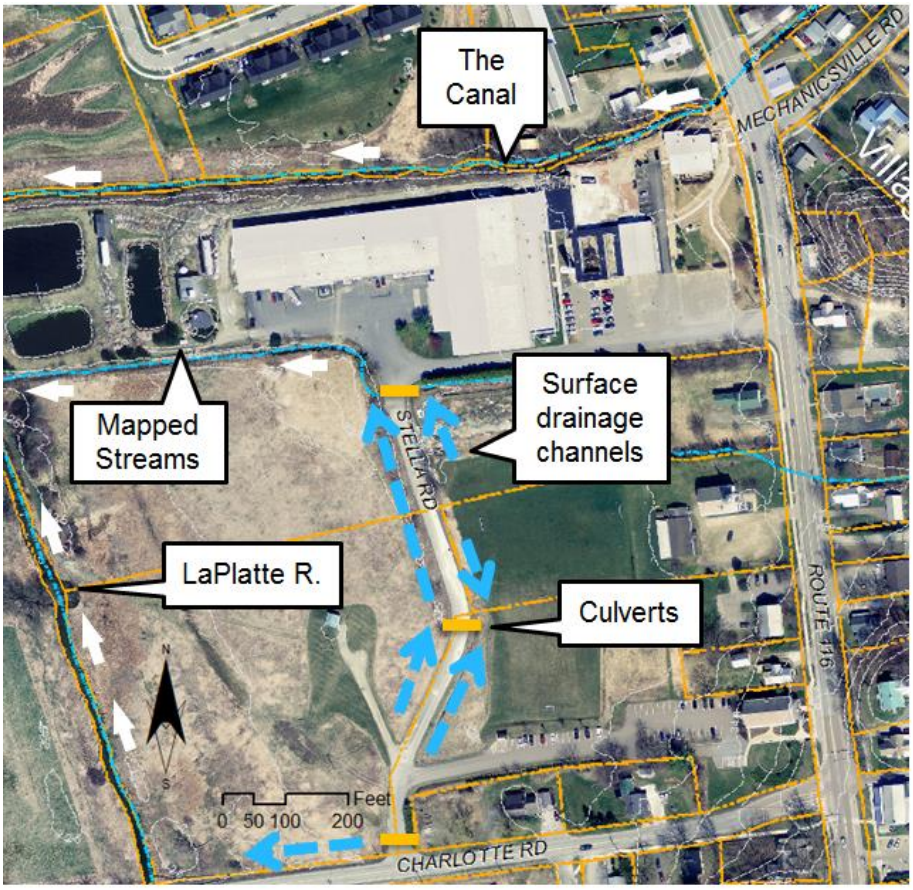
Area 1 involves two significant drainage features shown in Figure 6; a manmade canal on the north side of Mechanicsville Road, flowing west, and a large collection swale on the south side which leads to a crossing culvert at the end of Village Heights Rd.

FIGURE 6. RECEIVING WATERWAYS IN PROJECT AREA 1



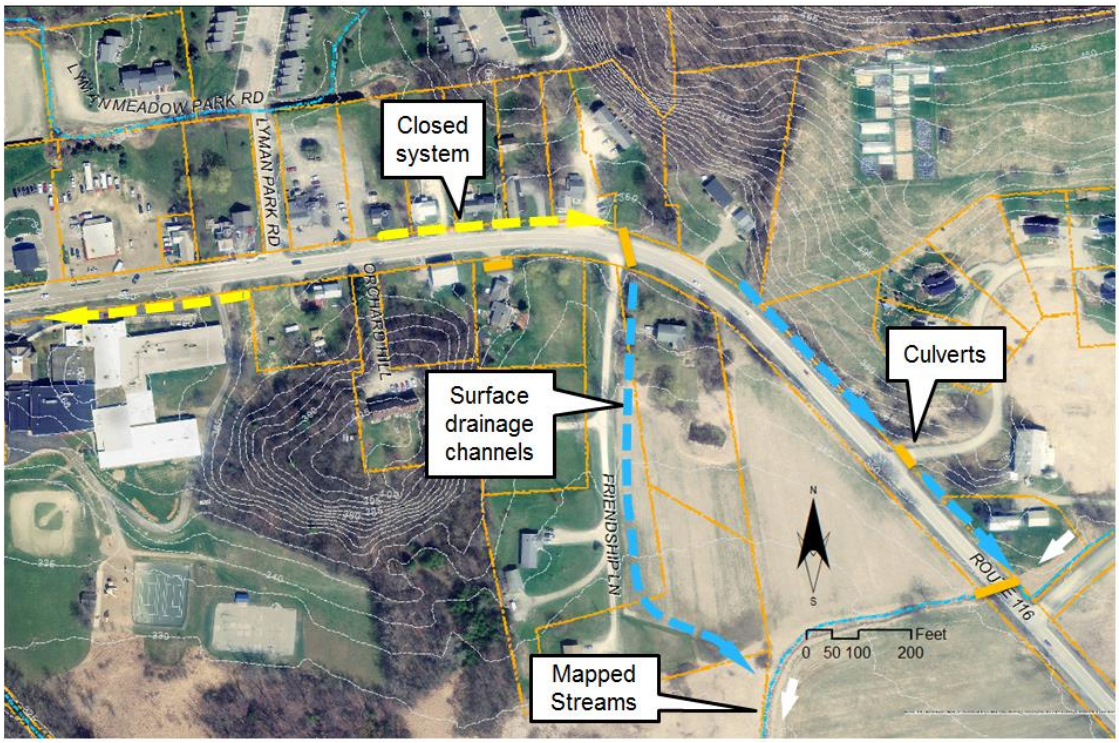
Drainage of Area 2 is defined by the Laplatte River on the west side (Figure 7), flowing north, the same canal found along Area 1, terminating at the LaPlatte River., and another mapped stream flowing east to west, also terminating at the Laplatte River. Several culverts along Stella Rd facilitate side ditches and surface runoff from east to west.

FIGURE 7. RECEIVING WATERWAYS IN PROJECT AREA 2



Drainage in Area 3 (Figure 8) flows west from Lyman Meadows Road in a closed municipal system. To the east a mixed system of ditches, catchbasins and culverts leads to the mapped stream to the wouth east.3

FIGURE 8. RECEIVING WATERWAYS IN PROJECT AREA 3



2.4 | UTILITIES

Area 1 – Mechanicsville Road has a waterline under the northeast bound lane and overhead utilities (power, phone, cable, etc.) are located along the southeast right of way.

Area 2 – Several underground utilities are associated with the former Cheese plant which are shown on the existing conditions mapping. The Russell parcel includes a Town water well and pumping station with several underground lines – also shown on the existing conditions mapping.

Area 3 – Overhead utilities (power, phone, cable, etc.) are found along the north and east right of way. Underground utilities found in the right of way include municipal stormwater, water and sewer lines, as well as natural gas (VT Gas).

Green Mountain Power owns the utility poles in all three areas, and manages access to other utilities using these poles.

2.5 | RIGHT-OF-WAY

Area 1 – Mechanicsville Road appears to be a 49.5 foot (3 Rod[3]) right of way. There remains the possibility that some parts of the Mechanicsville Rd. ROW may be wider, subject to formal deed research.

Area 2 – The Cheese Plant parcel is privately owned. Stella Road is on a right of way partially owned by the United Church of Hinesburg to the east, P. Russell to the west and the Town of Hinesburg. This ROW is shared by these entities and the Redstone/Cheese Plant parcel.

Area 3 – Based on previous surveys by others in this area, VT116 is 50 feet wide at the western end of the project area, and widens to the south to 75 feet at 11064 Vermont 116 (just west of Friendship Lane).

2.6 | LAND USE

The project study areas are contained within the designated village growth area (see Figure 9 below for corresponding village zoning districts). As discussed previously the study areas were chosen as logical extensions of the existing sidewalk and trail system, with either current or future needs for new sidewalks due to imminent developments, or in the case of area 1 – as a missing link.

Several important origins and destinations have the potential to benefit from sidewalks in these areas:

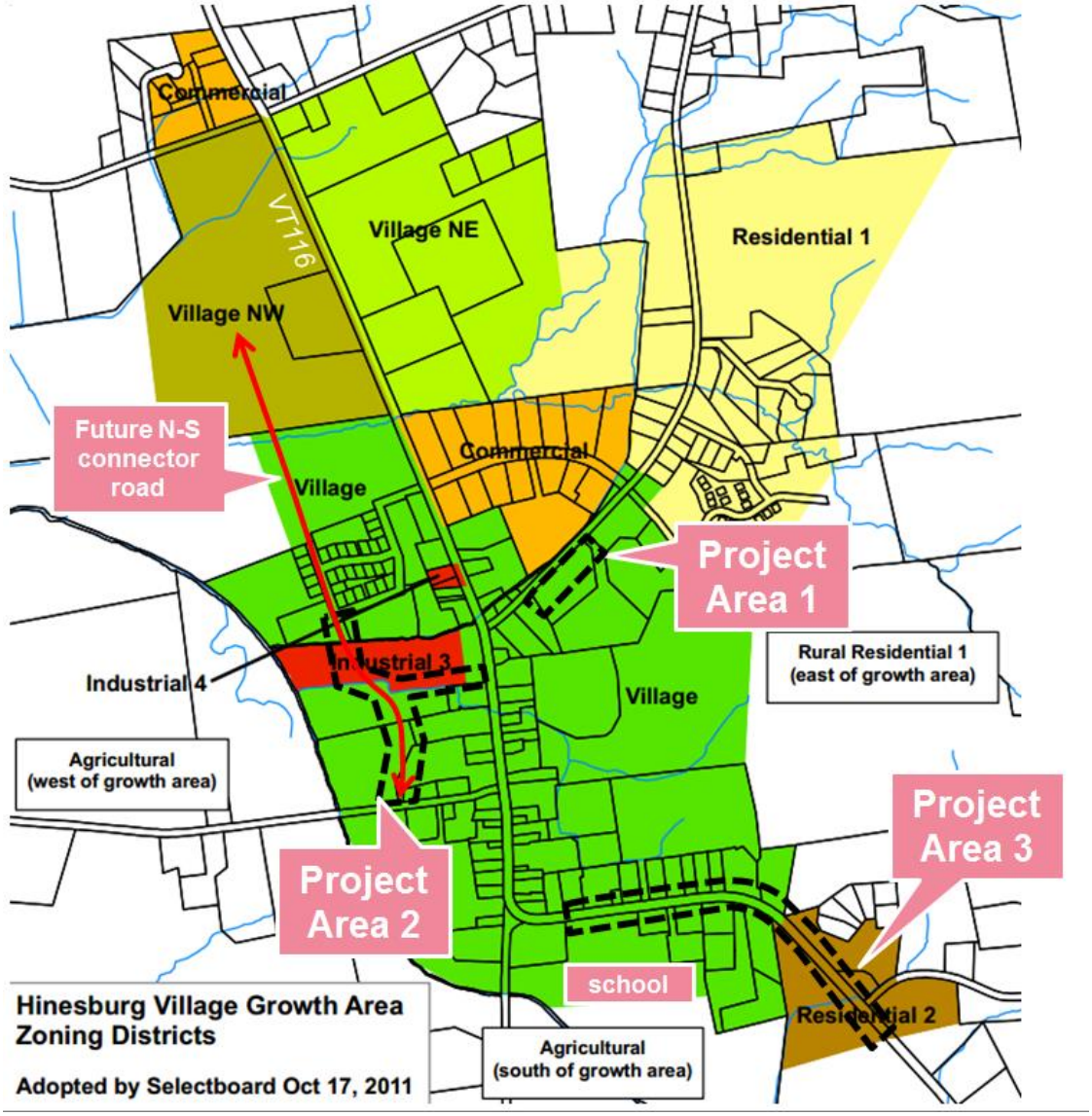
- A connection along the planned N-S connector road from the Village NW district to the central village, recreation fields, town offices, Charlotte Road and Green Street development (Area 2).
- Residences in the growing Resident 1 district to the village (Area 1). i.e. Thorn Bush Road, Village Heights Road
- Residences in the Resident 2 district to the school and village. Area 2 – Buck Hill Road, Friendship Lane, and the planned Norris development.

Other important proximate origins and destinations include:

- the Town recreation fields (Area 2, Figure 3)
- Lyman Park (Area 3, Figure 4)
- The adjacent termini of the existing sidewalk system (Figure 5)

[3] A rod is a unit of measure representing 16.5 feet

FIGURE 9: VILLAGE GROWTH AREA ZONING (SOURCE: TOWN OF HINESBURG)



2.7 | TRAFFIC

AADT

Average Annual Daily Traffic (AADT) volumes in the project area are presented in Table 1 below. The AADT noted as *actual* are based on VTrans traffic counts collected in 2011/2012, while those noted as *estimates* are based on previous short-term counts or nearby turning movement counts combined with appropriate statewide growth rates.

TABLE 1. EXISTING ROADWAY AADT

ROUTE	LOCATION	AADT	ACTUAL/EST.
Charlotte Rd.	West of VT116 (study area 1)	2,200	Estimate
Mechanicsville Rd.	East of VT116 (study area 2)	3,600	Actual
VT116	Gilman Rd. to Silver St. (study area 3)	5,800	Estimate
	Silver St. to Charlotte Rd.	9,700	Estimate
	Charlotte Rd. to Mechanicsville Rd.	11,000	Estimate

HIGHWAY SPEED LIMITS

Table 2 presents the various roadway speed limits in the various project areas.

TABLE 2. SPEED LIMITS

ROUTE	LOCATION	SPEED LIMIT (MPH)
Charlotte Rd.	West of VT116 (study area 1)	30
Mechanicsville Rd.	East of VT116 (study area 2)	30
VT116	CVU Rd to Friendship Lane (study area 3)[4]	30
	Friendship to Buck Hill Rd (study area 3)	40
	South of Buck Hill Rd	50

[4] Speed limit in school zone at Community School is 25 when flashing

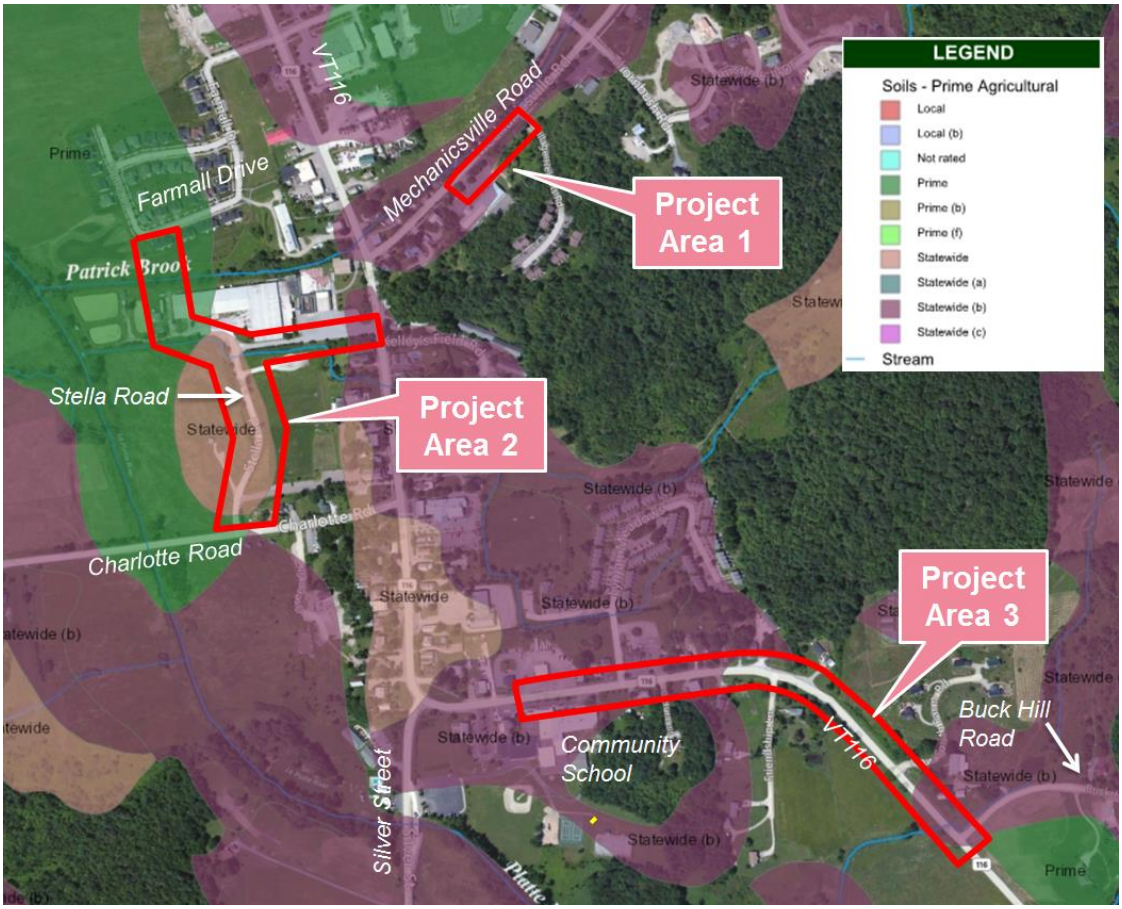
2.8 | ENVIRONMENTAL AND CULTURAL RESOURCES

The following environmental and cultural resources were considered for potential impacts by improvements proposed in the project area.

AGRICULTURAL LANDS

Many of the soil types in the project area(s) are designated as having statewide (b) significance by the Natural Resources Conservation Service. These areas are shown on the Significant Soils Map in Figure 10 below. Areas within public rights of way, as well as commercially developed abutting properties are not typically useful for agricultural purposes. The one area of prime agricultural soils, in the northern end of Area 2, involves the former wastewater treatment facility of the industrial zone, and the area surrounding the Farmall Drive subdivision.

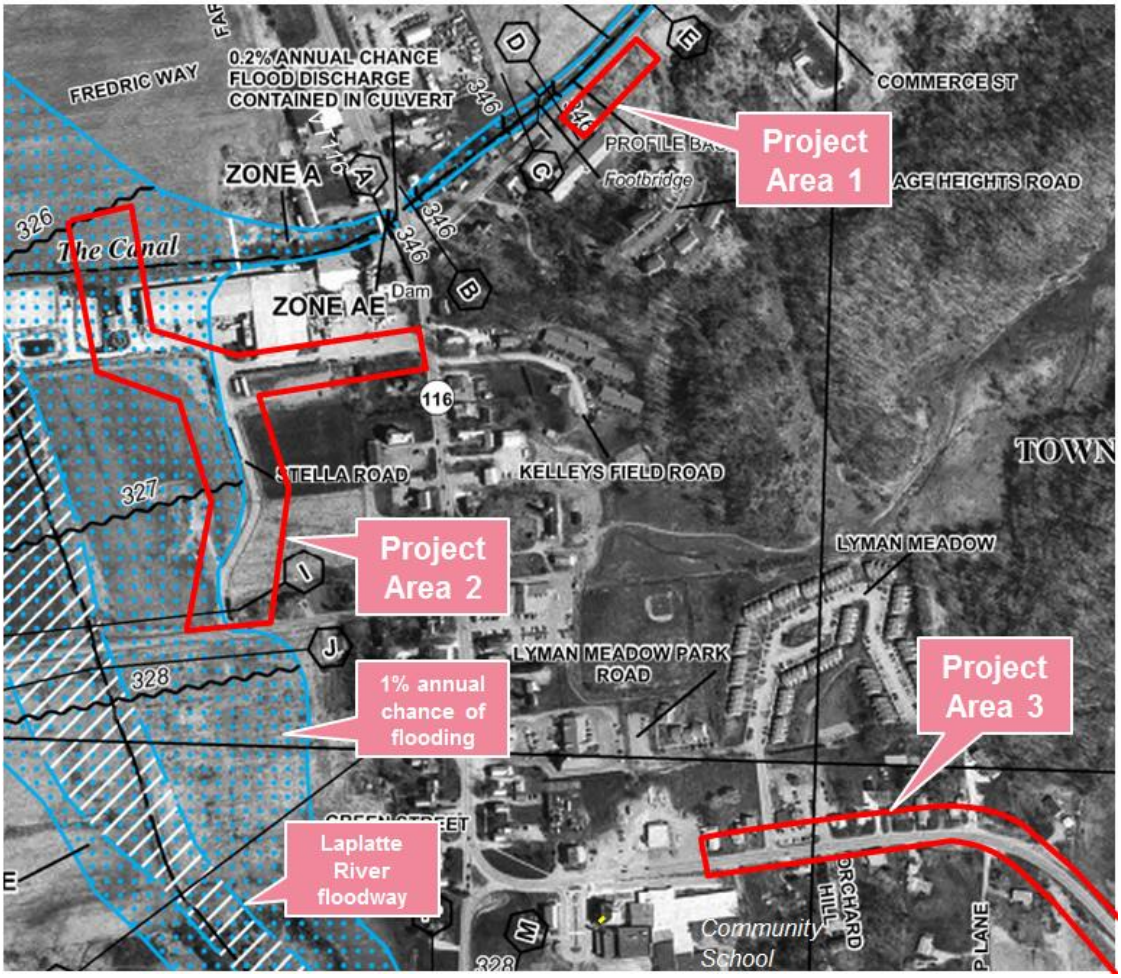
FIGURE 10: PRIME AGRICULTURAL SOILS (SOURCE: VT ANR NATURAL RESOURCE ATLAS)



FLOODPLAIN

Consultation of the Federal Emergency Management Agency flood mapping shows a significant floodplain associated with the Laplatte River. This floodplain occupies most of Area 2 west of Stella Road. The FEMA mapping for this area is shown in Figure 11.

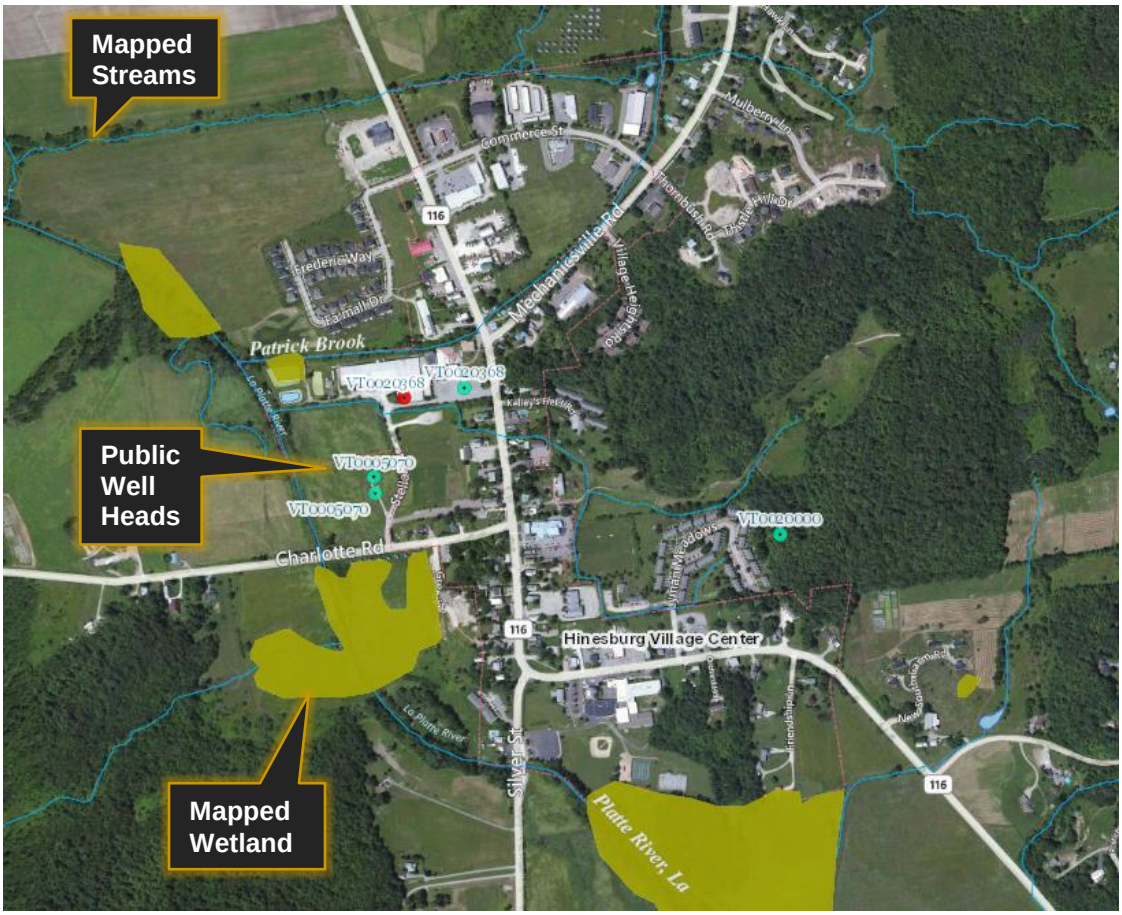
FIGURE 11. FLOOD HAZARDS (SOURCE:FEMA)



STREAMS, WETLANDS AND PUBLIC WATER SUPPLY SOURCES

Mapped streams (watercourses[5]) and wetlands (from the Vermont Significant Wetland Inventory) in or near the project area are shown in Figure 12 below. In addition several public water well heads are found located within Area 2.

FIGURE 12: MAPPED STREAMS, WELL HEADS AND WETLANDS IN PROJECT VICINITY (SOURCE: VT ANR NATURAL RESOURCE ATLAS)



RARE THREATENED OR ENDANGERED SPECIES, WILDLIFE HABITAT, RARE AND IRREPLACEABLE NATURAL AREAS

Based on a consultation with the VT ANR Natural Resource Atlas, no Rare, Threatened or Endangered Species, Wildlife Habitat, or Rare and Irreplaceable Natural Areas have been mapped in or adjacent to the project area.

SECTION 4(F) AND LAND AND WATER CONSERVATION FUND (LWCF) SITES

Transportation related funding is often restricted by the presence of so called Section 4(f) properties, which includes publicly owned park and recreation areas that are open to the general public, publicly owned wildlife and waterfowl refuges, and public or privately owned historic sites.

[5] , source: USGS, EPA and VCGI, 6/9/2010. Vermont Hydrography Dataset.

None of these are types of properties are present in any of the project areas, with one exception. LWCF funding instances in Hinesburg according to the Vermont Department of Forests Parks and Recreation listing of grant sites revised May 2011.

1. 1980 HINESBURG RECREATION AREA (ID#5000325E) $21,937.83
2. 1990 HINESBURG COMMUNITY PLAYGROUND (ID#5000477) $43,745.00
3. 2002 HINESBURG REC AREA RECON AND IMPR (ID#5000545) $33,543.00

All three of these grants were made for improvements to the recreation area behind (south of) the Hinesburg Community School at 10888 VT116. While project impacts to the school property must follow Federal Transportation funding guidelines, it is unlikely any impact would be realized. A follow up with the Land & Water Conservation Fund Administrator confirmed that no sites have been added since that listing.[6]

ARCHAEOLOGICAL AND HISTORIC RESOURCES

Archaeological and historic resource assessments were performed in the Hinesburg Village area for the 2004 VT116 Corridor Study by the Archeology Consulting Team, Inc. and CK Quinn & Co., LLC, respectively. The Historic Resource Report (dated July 11, 2000), an addendum (dated September 17, 2000), and Archaeological Resource Assessment, dated August 15, 2000 are provided in the appendix. The project limits for these reports were from CVU Road to Buck Hill Road. Improvement alternatives included widening VT 116 from Silver St. to Friendship Lane for bike lanes and new sidewalks, and a shared use path (northeast side) from Friendship Lane to Buck Hill Road. Findings include:

Historic Sites and Structures:

As delineated in the Historic Sites Report, the Lower Village Historic District is located along VT 116, between Mechanicsville Road and The Community School. None of the included structures are in, or abut, any of this study's project areas.

The addendum to the Historic Sites Report (Appendix C) investigates the buildings along VT 116 to the south and east of the historic district. None of these were found to be eligible for historic designation at that time.

Archaeological Resource Assessment

Findings include:

> 'Based on the represented forest communities, former and existing drainages, and Hinesburg's documented history, Native American and European archaeological information is likely to exist along the project corridor. Those portions of the project corridor considered highly sensitive are shown in Figure 6 [15]. However, it is also likely that subsequent construction activities within the village have altered some of the

[6] Ed O'Leary, Forestry District Manager, via email, 8/18/14

archaeological information to the extent that its research value, or significance, has been lost. Once the extent of the APE is chosen, we recommend a field visit to determine the integrity of these potential archaeologically sensitive locations.'

Note that APE refers to area of potential effect. From the map provided in the assessment (Figure 13), most, if not all this study's project areas are to be considered archaeologically sensitive, however as noted in the excerpt above, in the village areas the significance of any information has likely been lost from construction activities.

FIGURE 13. ARCHIOLOGICALLY SENSITE AREAS (SOURCE: 2000 ARCHAOLOGICAL ASSESSMENT, APPENDIX OF 2004 VT116 CORRIDOR STUDY)

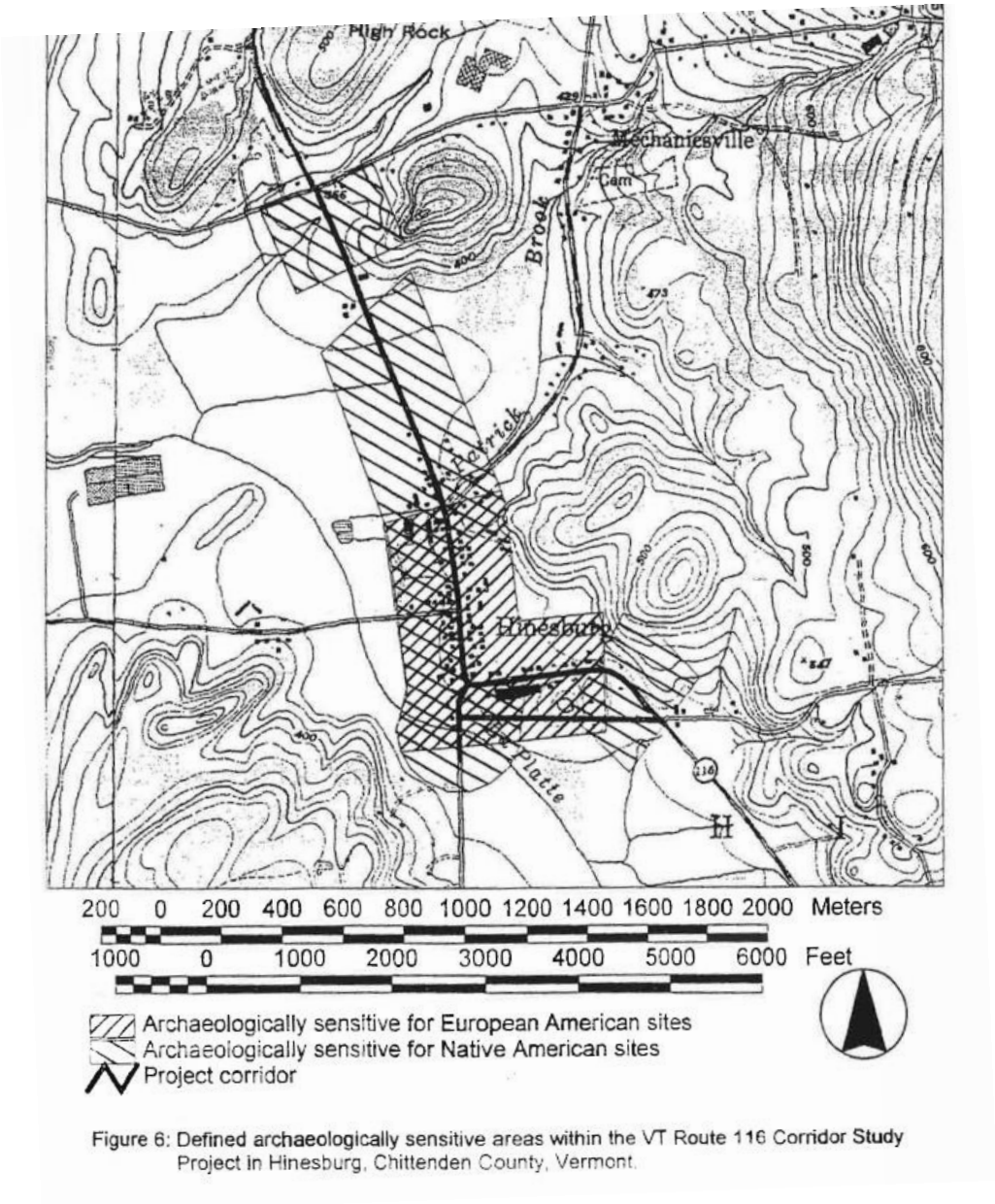


Figure 6: Defined archaeologically sensitive areas within the VT Route 116 Corridor Study Project in Hinesburg, Chittenden County, Vermont.

HAZARDOUS WASTE SITES

Eight hazardous waste sites have been identified by the Vermont Department of Environmental Conservation (DEC) near the project areas as shown below in Figure 14. Details on each site are provided in Table 3.

FIGURE 14: HAZARDOUS WASTE SITES (SOURCE: VT ANR NATURAL RESOURCE ATLAS)

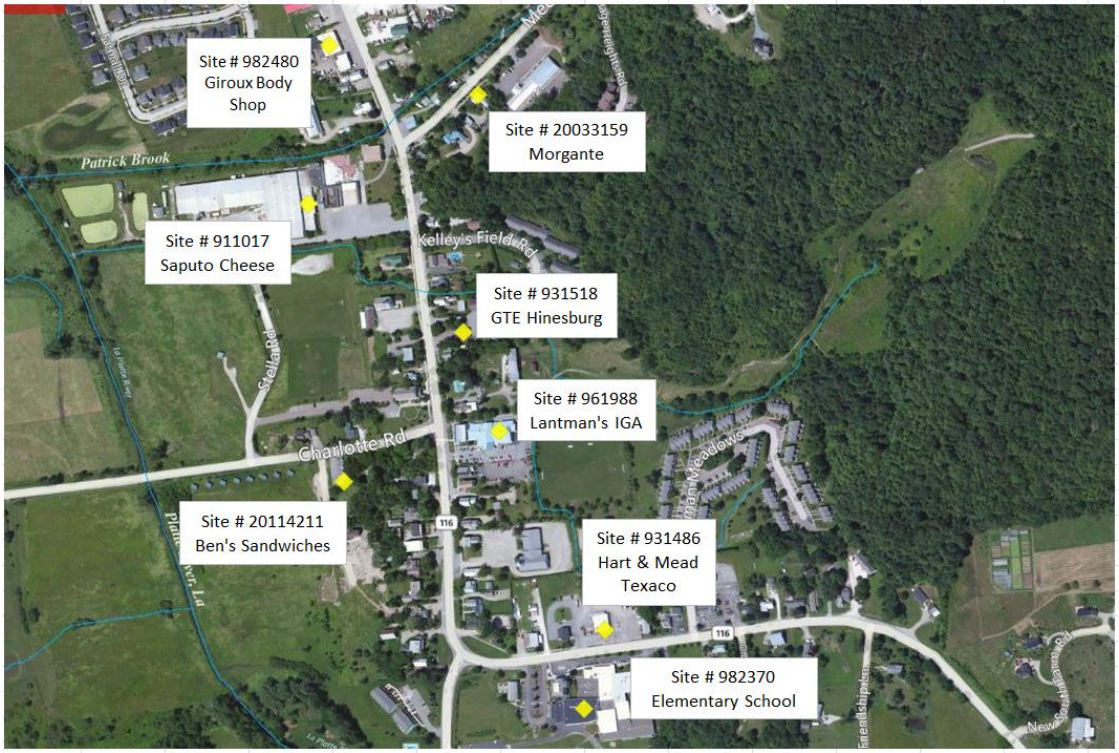


TABLE 3. SUMMARY OF HAZARDOUS WASTE SITE DATA

SITE NUMBER	SITE NAME	LAND USE RESTRICTION	PRIORITY	SOURCE OF CONTAMINATION
911017	Saputo Cheese	No	SMAC	UST-Gasoline, UST-Heating Oil
931486	Hart and Mead Texaco	No	MED	UST-Gasoline
931518	G T E Hinesburg	No	SMAC	UST-Gasoline
961988	Lantman's IGA	No	HIGH	UST-Gasoline
982370	Elementary School	No	SMAC	UST-Heating Oil
982480	Giroux Body Shop	No	LOW	UST-Gasoline
20033159	Morgante Residence	No	SMAC	UST-Heating Oil
20114211	Ben's Sandwiches	No	SMAC	UST-Heating Oil

All of these sites are due to contamination from underground storage tanks (UST). These sites are prioritized by their ongoing remediation status as either LOW (site with contamination to soils or groundwater, but *no effect* on sensitive receptors), MED (site with sensitive receptors that are *threatened* by contamination) or HIGH (site with sensitive receptors that are *affected* with contamination), or SMAC (Site Management Activity Complete), indicating that required

remediation has been completed. Of note is the Lantman's IGA site, which is reportedly affecting project area 2[7].

[7] The VTDEC Hazardous Site List notes: "Multiphase extraction system cleanup ongoing 2013 (initiated in 2008) due to MTBE bedrock aquifer contamination. MTBE levels below drinking water standards in former Saputo supply well and later the Hinesburg Town wells following fire and well shutdown at Saputo. Lantman and MTBE impacted Martin bedrock wells closed following municipal connection. Town Source Permit application due Jan 2014 due to decreasing yield at well field. WH evaluating efficiency measures for vapor extraction treatment."

3.0 ALTERNATIVES INVESTIGATION

An overview of the various sidewalk alternatives is provided below followed by a discussion of crosswalk alternatives. Further comparison and evaluation of the sidewalk alternatives is provided in Sections 3.2 (Evaluation), 3.3 (Evaluation Matrix) and 3.4 (Discussion).

3.1 | OVERVIEW OF ALTERNATIVES

NO-BUILD ALTERNATIVE

Scoping must always consider the no-build alternative as an option should costs or impacts be determined to be prohibitively or unacceptably high. This alternative is also referred to as the no-action or null alternative.

BUILD ALTERNATIVES

Area 1: Both alternative concepts for this area are shown schematically in Figure 15. Please see large scale drawings in the appendix for more detail.

FIGURE 15. ALTERNATIVE ALIGNMENTS - AREA 1

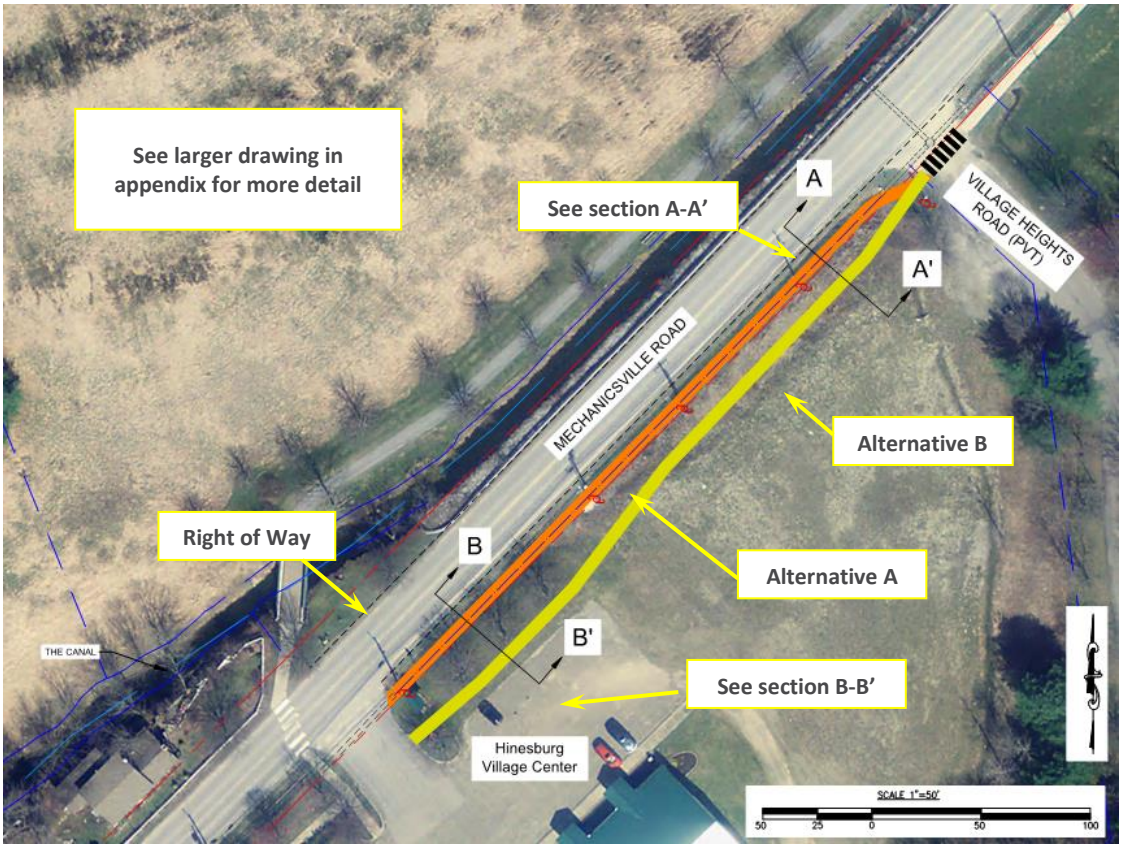
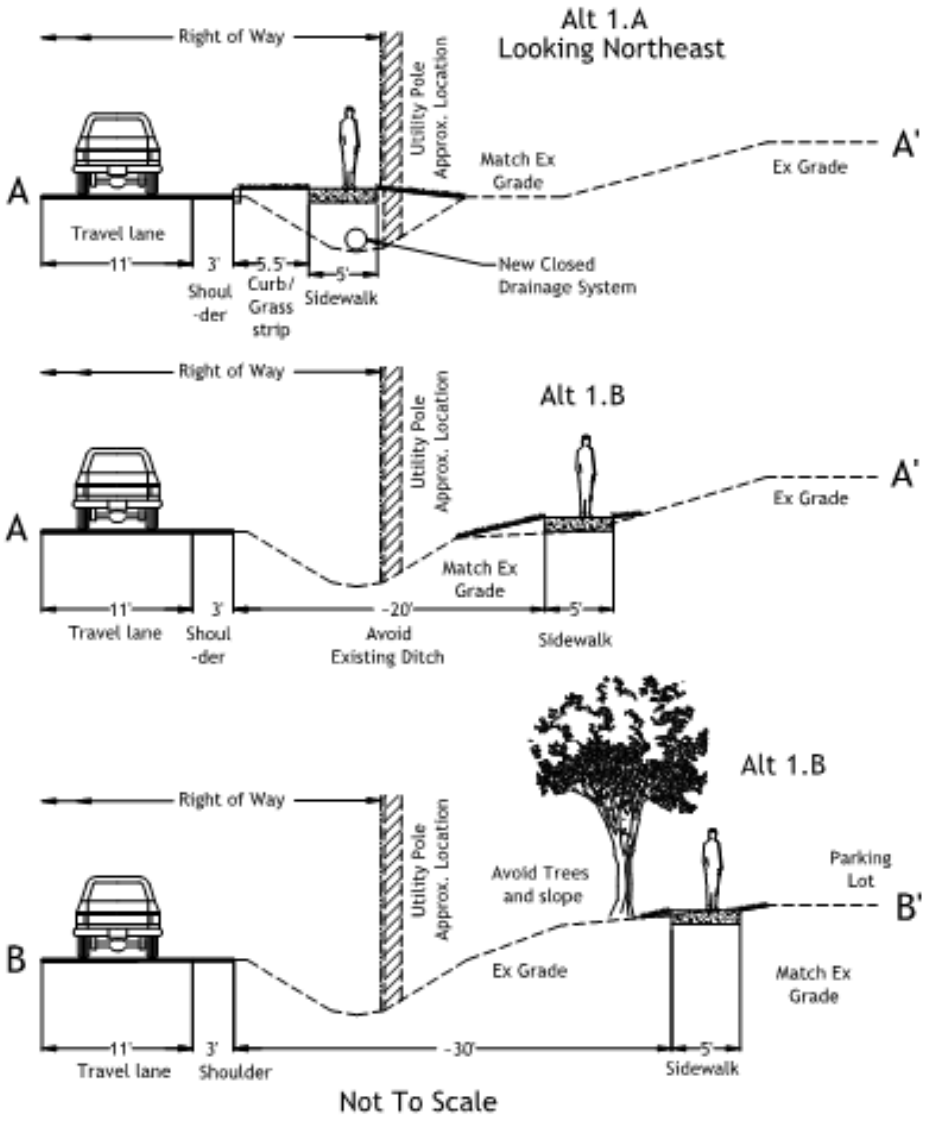


FIGURE 16. AREA 1 ALTERNATIVE CROSS SECTIONS



Alternative A is tight to the road with a minimal green strip (5 feet), but this occupies the space currently used as an open drainage way. Utility poles are very near the edge of the right of way and outside edge of the sidewalk. Some minor turns may be necessary to avoid some of these poles. Alternative B provides a more generous green strip and avoids impacts to the drainage or existing features associated with the Hinesburg Village Center (parking, landscaping, etc.), but encroaches more on that property. This alignment avoids the sign and trees at the south end, and occupies the slope between higher flatter ground and the wide ditch. This alignment could be modified further in several ways to accommodate specific site improvements (unknown at this time), but still avoid the power poles and wide ditch. These changes would not affect expected cost or impacts.

Area 2: Starting at Farmall Drive (Figure 17), both alternatives share a common footprint across the Canal, adjacent to the planned future N/S connector street. Alternative A remains

consistently offset from a likely future street alignment leading east to VT116 (see Figure 19 for continuation). Alternative B diverts from A, leading further south and crosses the mapped stream, before turning east towards VT116. Alternative B gives a much wider buffer to the Redstone development, however crosses the mapped stream twice. Again there could be many variations in this second alternative that have the same cost or impacts.

FIGURE 17. ALTERNATIVE ALIGNMENTS - AREA 2 (PART 1 OF 2)

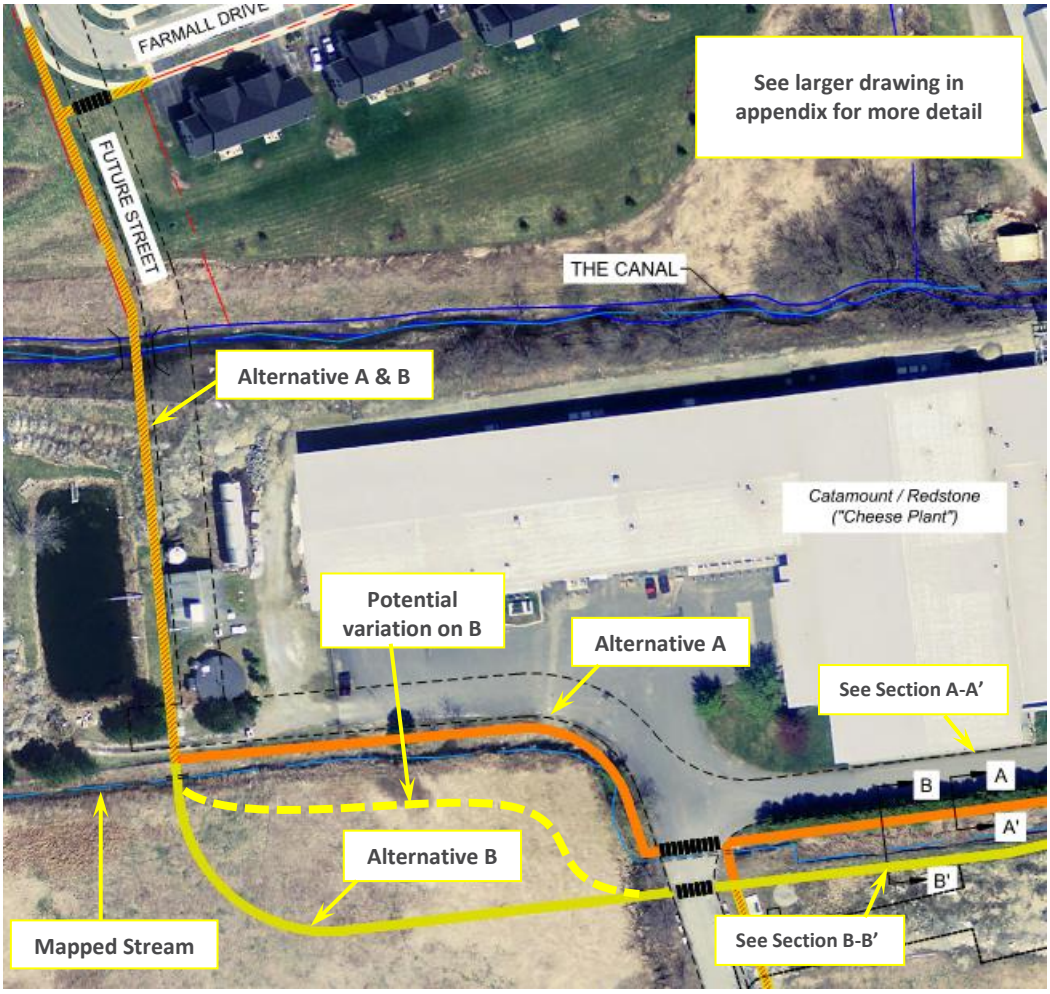
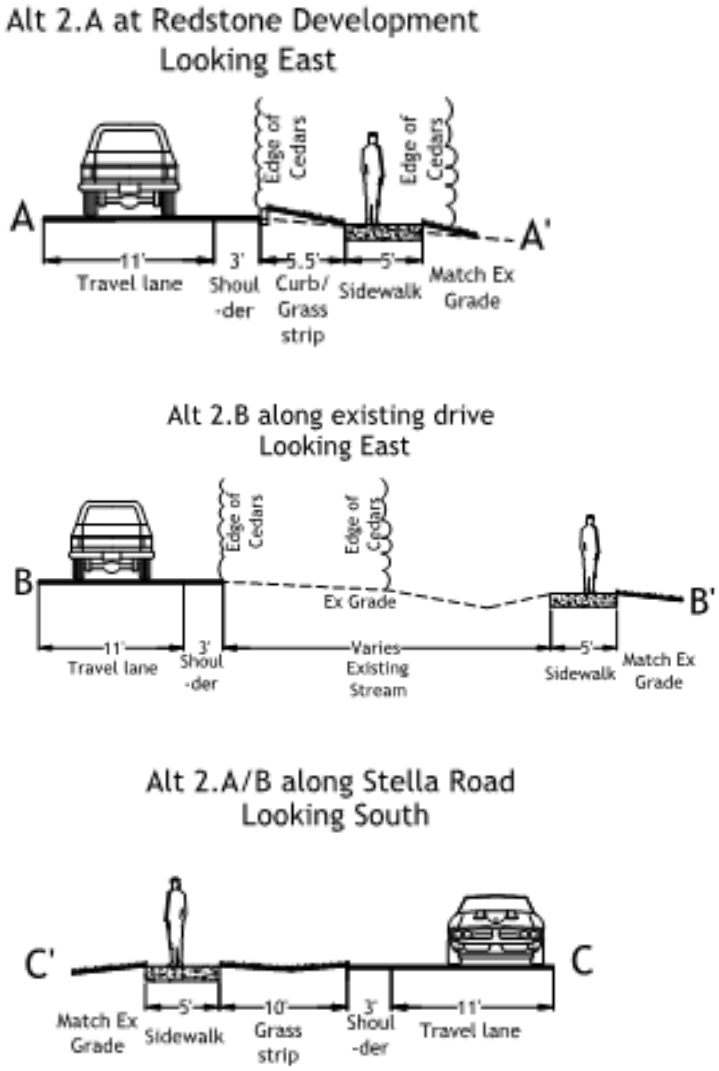


FIGURE 18. TYPICAL CROSS-SECTIONS – AREA 2



Both alternatives continue south on the east side of Stella Road to Charlotte Road on the same side as the recreation / soccer fields, the transit stop and town offices. A crosswalk and final leg of sidewalk along Charlotte Road would complete the connection to the existing sidewalk at Green Street. Given that the new crossing on Charlotte Road is not at a controlled intersection, and this road is particularly busy at peak times, we recommend supplemental warning devices such as warning signs with solar powered Rapid Flashing Beacon.

FIGURE 19. ALTERNATIVE ALIGNMENTS - AREA 2 (PART 2 OF 2)

Area 3: There are 4 logical potential sidewalk segments as described below, (generally shown in Figures 20 & 21). Each western segment (north side/A or south side /B) could be considered useful on their own, and the eastern segments (C/D) considered further extensions away from the village core, and dependent on the construction of A or B. These two areas (west and east) have distinct characteristics that should be noted; a) the west is well developed, part of the traditional village area, and a lower speed environment (30 mph), while the eastern area has few development fronting on the road and a logically higher speed environment (40 mph);

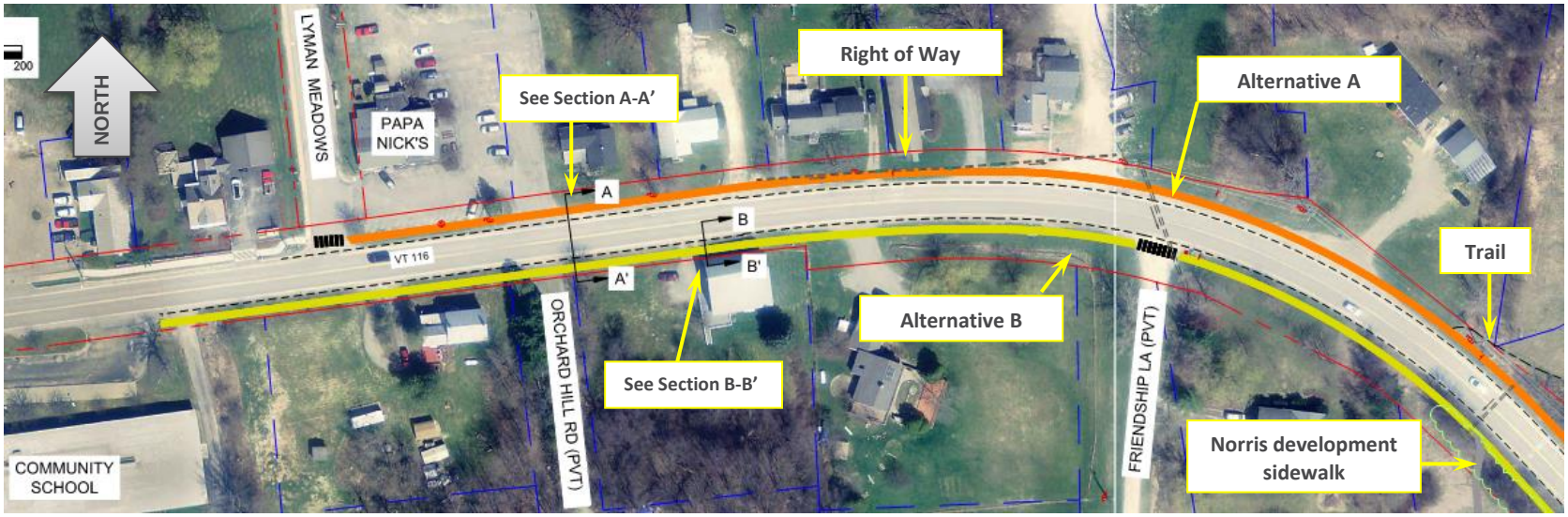
- Alternative A – includes the north / eastern segment from the existing sidewalk at Lyman Meadows Road to the primitive trail leading to South Farm Road (and potentially leading further to Buck Hill Road.)

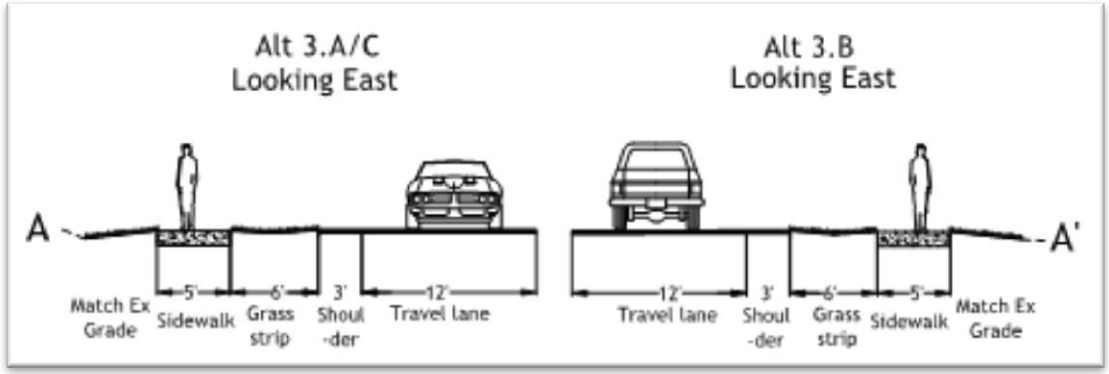
- Alternative B - the south / western segment, which leads from the existing sidewalk in front of the Community School to the planned sidewalk on the Norris property.

- Alternative C – from the eastern end of Alternative A to Buck Hill Road. This alignment notably passes adjacent to a steep slope – some of which is encumbered by a outcropping of rock ledge that would need to be removed.

- Alternative D – From the eastern end of B to Buck Hill Road and the proposed entrance to the Norris development. This segment occupies a significant roadside slope, which presents a bit of a geometric challenge. If the sidewalk were constructed at road level a significant earth fill would be required. A more modest and less expensive option was assumed here with the sidewalk midslope, and a barrier guardrail for safety.

FIGURE 20: ALTERNATIVE ALIGNMENTS AND CROSS SECTIONS - AREA 3 WESTERN SEGMENT





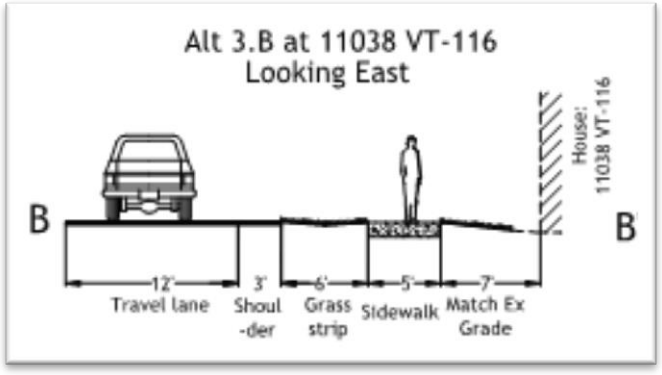
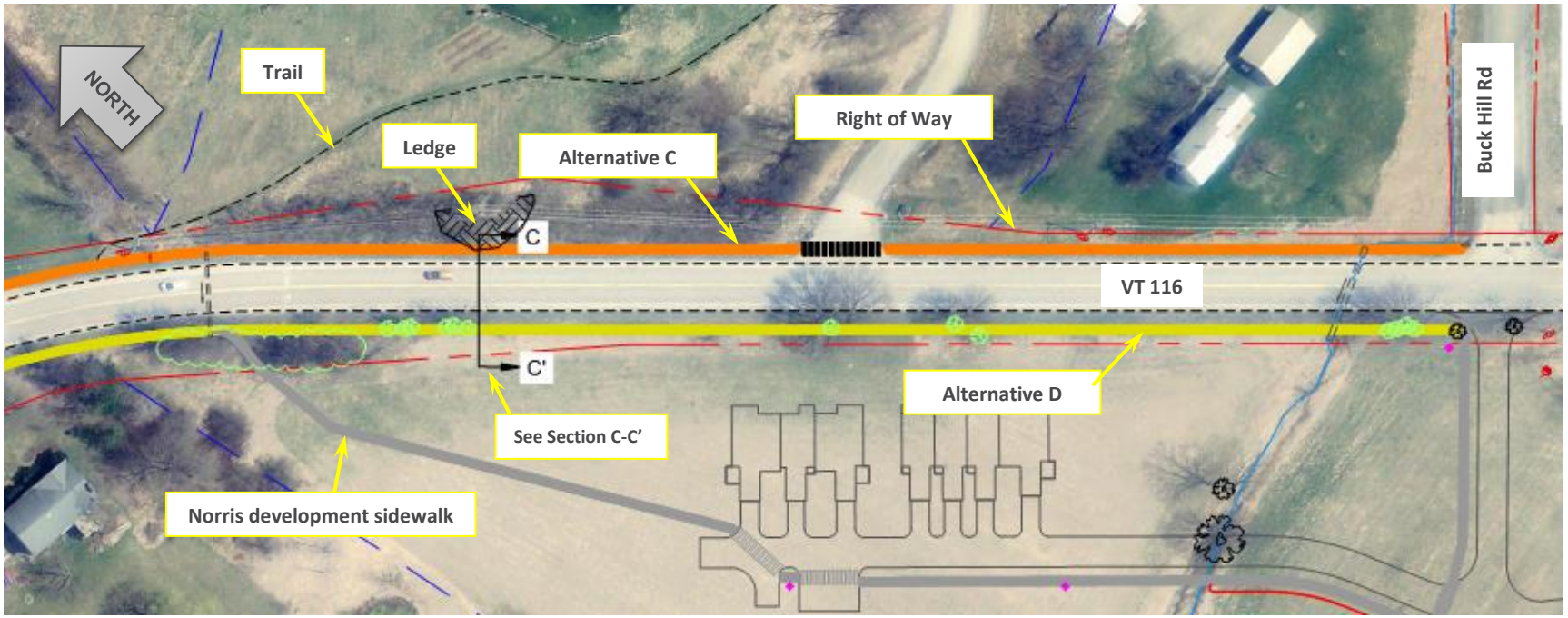
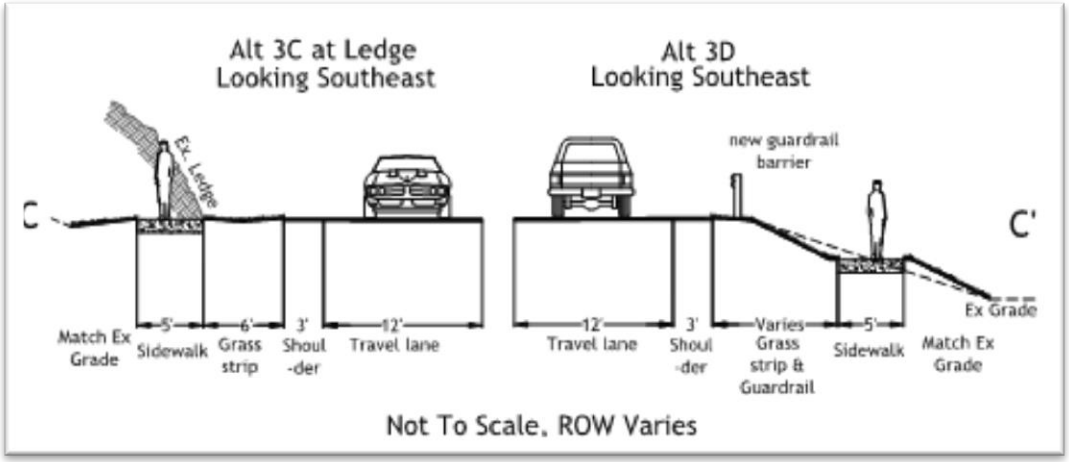


FIGURE 21. ALTERNATIVE ALIGNMENTS AND TYPICAL CROSS SECTION - AREA 3 EASTERN SEGMENT





Potential new crosswalks: Two potential VT116 crossing areas have been discussed;

1. At, or near the connection of Alternative B to the Norris Development sidewalk. This location is on the long sweeping curve in the road, with limited, but technically adequate sight distance. Vehicle speeds in this area often exceed the speed limit partially due to the fact that it is a speed transition zone, and partially because the visual environment towards the south lacks many of the cues that tell people to slow down, such as sidewalks, streetlights, curbs, pedestrians, parked cars, and/or buildings near the right of way (i.e. typical features of an urban or village setting). Therefore, in its current condition, a crossing is not recommended here.
2. A crossing at Buck Hill Road would connect Buck Hill to the sidewalk in the Norris Development or Alternative D, reducing much of the need for Alternative C. As noted above this location is well within the higher speed zone, thus a crosswalk alone is not recommended. Note that changing the speed limit here is not likely to have all the desired effect until the visual environment is brought in line with drivers expectations (per item 1 above).

Some additional measures that could be installed to help lower speeds, increase the visibility and/or improve safety of crosswalks include "gateway" features (signs, landscaping, etc.), lighting, curbed bulb-outs (to bring waiting pedestrians in better view of drivers), or a refuge island in the middle of the road. These features must be designed in such a way as to avoid impacts to plowing or drainage. Note that VTrans currently has jurisdiction in both these locations, and does not typically allow gateways within their right of way, and setting them too far back negates some of the desired benefits. VTrans also requires 14 feet of clear width (to the right of the centerline) for plowing on roads such as this. VTrans also follows strict crossing warrants based on location, speed, sight distance and expected pedestrian volume. These locations do not meet the warrants in their current condition. Another less obtrusive option for increasing safety is pedestrian activated rapid flashing beacons (RFB's). A prudent approach might be to build the sidewalk(s) first and consider the crosswalk when actual demand can be assessed.

3.2 | EVALUATION OF ALTERNATIVES

The following section presents the expected cost and potential impacts of each sidewalk alternative. A full comparison of alternative costs and impacts is shown in the Evaluation Matrix in Section 3.3., and Pros and Cons for each area alternative are listed in Section 3.4.

COST ESTIMATES

Detailed itemized cost estimates were developed for each alternative and are summarized in the Evaluation Matrix (Section 3.4). The itemized cost estimates are provided in Appendix F. These estimates consider most expected costs including engineering, construction, construction administration, and a 20% contingency.

Right-of-way costs are not included in the cost estimates, and are subject to negotiations with the individual property owners during the right of way phase of the final design, when impacts are more fully understood. Small impacts, particularly with projects that are perceived to benefit adjacent landowner, may receive "donations" of the necessary easements (permanent or temporary for construction). At the very least, legal costs will be incurred to execute the necessary property right transfers.

IMPACTS TO NATURAL AND CULTURAL RESOURCES

- Agricultural Lands: Most alignments are adjacent to existing roadways and / or are in previously disturbed and developed areas which negates the usefulness of prime agricultural soils. Given the presence of designated soils of prime and statewide (b) significance in the Project Area 2, however, would require further investigation and consultation with the state department of agriculture in the final design phase.
- Archeological Resources: As noted in the archeological report, areas that are previously disturbed and developed have little potential for remaining resources of this type. This would apply to all alignments except those in Area 2, where the alignments pass through undisturbed areas north of the Canal, and west of Stella Road.
- Historic Structures: None of the alternatives are near any historic structures identified in the historic resource report.
- Floodplains: Both alternatives in Area 2 infringe on the floodplain associated with the Laplatte River, although Alternative 2B impacts the flood plain to a greater degree.
- Rare, Threatened, and Endangered Species: There are no identified rare, threatened, and endangered species in any of the project areas.
- Right-of-Way: Both alternatives in Area 1 and 2 require some impact to the adjacent properties, however Alternative 1A and 2A have lower impacts that the other alternatives.
- Public Lands/ LCWF sites: There are no identified public park, wildlife or recreation lands in the project area except the Community School, which is not impacted by any of the alternatives.
- Streams: Only Area 2 includes mapped streams that may be impacted by either alternative, however these impacts may be avoided or mitigated in final design.
- Wetlands: There are potential (unmapped) wetlands in both Areas 1 & 2. The wide ditch in Area 1 exhibits the characteristics of a low quality Class 3 wetland (not connected to Class 1 or 2). The mapped streams and floodplain in Area 2 is likely to contain Class 2 wetlands. Further investigation is necessary to determine the presence and limits of wetlands in these areas.

UTILITY IMPACTS

- Area 1: The utility poles along Mechanicsville Road are very close to the edge of the Alternative A sidewalk alignment and some encroachment may result. This could be addressed by slight realignment and further reduction of the green strip, or by moving the poles. Alternative B may impact a pole guy wire, depending on the final alignment.
- Area 2: No utility impacts are expected in this area.

- Area 3: One utility pole is impacted by alignment Alternative A. Since it falls in the center of the sidewalk, moving the pole is recommended. The existing closed storm drainage system is also impacted in this area.

PERMITTING REQUIREMENTS

- Act 250: Given the existing Act 250 permits on the Redstone/Catamount parcel in Areas 2, associated alternatives would require amended permits before construction could begin.
- Section 401 Water Quality Certification: Given the potential impacts to the Canal and the mapped streams in Area 2, sidewalk construction may require a Section 401 Water Quality Certification. Review of the potential for a wetland in area 1 would also fall under this jurisdiction.
- Section 404 Army Corps of Engineers Permit: Given the potential presence of jurisdictional wetlands along the unnamed stream adjacent to areas 1 & 2, the associated alternatives will probably require a Section 404 Army Corps of Engineers permit.
- Stream Alteration Permit: Given the potential impacts to the unnamed stream adjacent to the area 2, the associated alternatives may require a Stream Alteration permit.
- Conditional Use Determination/Wetlands Permit: Given the potential presence of jurisdictional wetlands along the unnamed stream and floodplain in Area 2, the associated alternatives will probably require a Conditional Use Determination. The potential wetland in Area 1 likely only falls under USACE jurisdiction.
- Stormwater Discharge Permit: A stormwater permit is required if the project's new & redeveloped impervious surface area is greater than 1 acre. None of the alternatives would exceed this threshold and thus require a Stormwater Discharge Permit.
- Shoreland Encroachment: Not applicable
- Endangered and Threatened Species: Not applicable
- VTrans ROW Permit: Given the impacts that all alternatives have to VT116, a VTrans Section 1111 permit will be needed for all alternatives in Area 3.
- State Historic Preservation Office Clearance: Given the identification of potential archeological sensitivity in any undisturbed areas, any alternative should be coordinated with the State Historic Preservation Office to identify and minimize any potential adverse impacts to archeological resources.
- NEPA Category: Given the limited impacts to natural and cultural resources and lack of new roadway construction, the alternatives studied will likely be classified as a Categorical Exclusion.

3.3 | EVALUATION MATRIX

All of the anticipated costs, resource impacts, and permit requirements for each alternative have been summarized in the Alternatives Evaluation Matrix (Table 4) below.

TABLE 4: ALTERNATIVES EVALUATION MATRIX

			Area 1		Area 2		Area 3			
		No Build	Alt A	Alt B	Alt A	Alt B	Alt A	Alt B	Alt C	Alt D
COST	Preliminary Cost Estimate	$0	$140,000	$50,000	$410,000	$380,000	$140,000	$150,000	$150,000	$180,000
IMPACTS	Agricultural Lands	No	No	No	Prime / Statewide	Prime / Statewide	No	No	No	No
	Archaeological	No	No	No	Slight	Slight	No	No	No	No
	Historic Structures/Sites	No	No	No	No	No	No	No	No	No
	Floodplain	No	No	No	Yes	Yes	No	No	No	No
	Rare, Threatened & Endangered Species	No	No	No	No	No	M	No	No	No
	Right of Way	No	Yes	Yes	Yes	Yes	No	Minor	No	No
	Public Lands / LWCF	No	No	No	No	No	No	No	No	No
	Wetlands	No	Potential	No	Potential	Potential	No	No	No	No
	Utilities	No	3-4 poles	No	No	No	1 pole	No	No	No
PERMITS	Act 250	No	No	No	Yes	Yes	No	No	No	No
	401 Water Quality	No	Potential	No	Potential	Potential	No	No	No	No
	404 Corps of Engineers Permit	No	Potential	No	Potential	Potential	No	No	No	No
	Stream Alteration	No	No	No	Potential	Potential	No	No	No	No
	Wetland Permit	No	Potential	No	Potential	Potential	No	No	No	No
	Storm Water Discharge	No	No	No	No	No	No	No	No	No
	Shoreland Encroachment	No	No	No	No	No	No	No	No	No
	Endangered & Threatened Species	No	No	No	No	No	No	No	No	No
	VTrans ROW Permit	No	No	No	No	No	Yes	Yes	Yes	Yes
	State Historic Preservation Office Clearance	No	No	No	No	No	No	No	No	No
	NEPA Category	None	CE	CE	CE	CE	CE	CE	CE	CE

Notes: Some low potential for impacts and permits exists for wetland resouces until formal delineation occurs
Cost does not include ROW

3.4 | DISCUSSION OF ALTERNATIVE

The following section compares the various alternatives and discusses the pros & cons for each.

AREA 1

Alternative A minimizes the disturbance to the adjoining property, it is straighter, more compact, and urban in design. However, it is significantly higher in cost due to the requirement for a new closed drainage system and curbing. It is very close to the road and utility poles, at least one of which must be moved. It eliminates the drainage swale and its associated stormwater treatment capabilities. This alternative would have slightly higher ongoing maintenance costs as well due to the new drainage system.

Alternative B offers a more pleasant offset from road, and is more in keeping with the character and offset of the adjacent existing sidewalks. While it still avoids the flatter/higher/more developable area of the adjacent property it does have significantly more area of impact.

AREA 2

Both alternatives have 3 common beginning and end points: connecting to existing sidewalks in the Farmall Drive development, along VT116 and crossing Charlotte Road to Green Street. Thus the differences are mainly in the way that each alternative skirts the Redstone development at the former cheese plant's southwest corner.

Alternative A stays closer to the existing driveway avoiding more stream crossings, and other potential resources in undisturbed areas. However it is more restrictive to the Redstone development – particularly at the turn between the loading area and the mapped stream, and removes the screening hedge along driveway.

Alternative B provides a greater setback from Redstone development, and is thus less restrictive. It impacts the floodplain, has 2 more stream crossings, and additional property impacts.

AREA 3

Alternative A directly serves approximately 15 residences and one restaurant on the northeast side, however it requires a potentially dangerous crossing on the curve to reach the Norris Development (24 units), and does not serve the existing homes on the south side. Alternative A also informally serves New South Farm Road and potentially Buck Hill via primitive trails (non-public, non ADA accessible).

Alternative B directly serves 11 residences and the future Norris development, but conversely doesn't serve northeast side well. Note that crossing VT116 to Buck Hill Road from the Norris access road is not recommended without significant traffic calming measures. This alternative also has slightly more challenging terrain, with a steep slope along some portions of it.

Alternative C (assuming A is built as well) completes formal and safe access to Buck Hill Road, but doubles the cost compared to A alone. Some significant cut and fill is required to fit the sidewalk into the hillside, including some ledge removal.

Alternative D (assuming B is built as well) is most likely to serve Buck Hill Rd residents, as the Norris Development has its own internal sidewalk leading to the village. This alternative is viable only if speed and crossing safety can be adequately addressed.