Richmond Road
Pedestrian and Bicycle Scoping Study

Hinesburg, Vermont

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This scoping study was a collaborative effort of the Town staff, CCRPC, and Toole Design Group, who possessed a wealth of combined knowledge and expertise regarding project background, history, local insight, and existing conditions. Their valuable insight and assistance was instrumental in developing the implementation strategy.

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1.0 Introduction

1.1 Background

The Chittenden County Regional Planning Commission (CCRPC) and the Town of Hinesburg (Town) initiated this scoping study to analyze and evaluate alternatives for improving walking and bicycling conditions for a 1.5 mile study area on Richmond Road. This section of Richmond Road from Champlain Valley Union/Pond Road/Richmond Road/Mechanicsville Road intersection; to the North Road/Texas Hill Road intersection has been identified with the highest population density in the Town. The western terminus of the study area connects to the village sidewalk system and Champlain Valley Union (CVU) High School.

This report summarizes the findings of the study through robust public participation and outreach during the scoping study process.

1.2 Purpose and Need

The **purpose** of the *Richmond Road Pedestrian/Bicycle Feasibility Study* is to develop and evaluate alternatives for improving walking and bicycling conditions on Richmond Road from Champlain Valley Union Road/Pond Road/Richmond Road/Mechanicsville Road intersection; to the North Road/Texas Hill Road intersection.

The **need** of this project is to:

1. Create a preferred alternative for walking and bicycling on Richmond Road from the Champlain Valley Road/Pond Road/Richmond Road/Mechanicsville Road intersection to the North Road/Texas Hill Road intersection, approximately 1.5 miles.
2. Maximize safety for all users walking and bicycling in this corridor.
3. Support future walking and bicycling connections in the Town of Hinesburg.
4. Provide an estimate of the probable construction costs of the preferred alternative to serve as a basis for the Town to apply for grant applications.

1.3 Project Study Area

The proposed project study site location is shown in **Figure 1**.

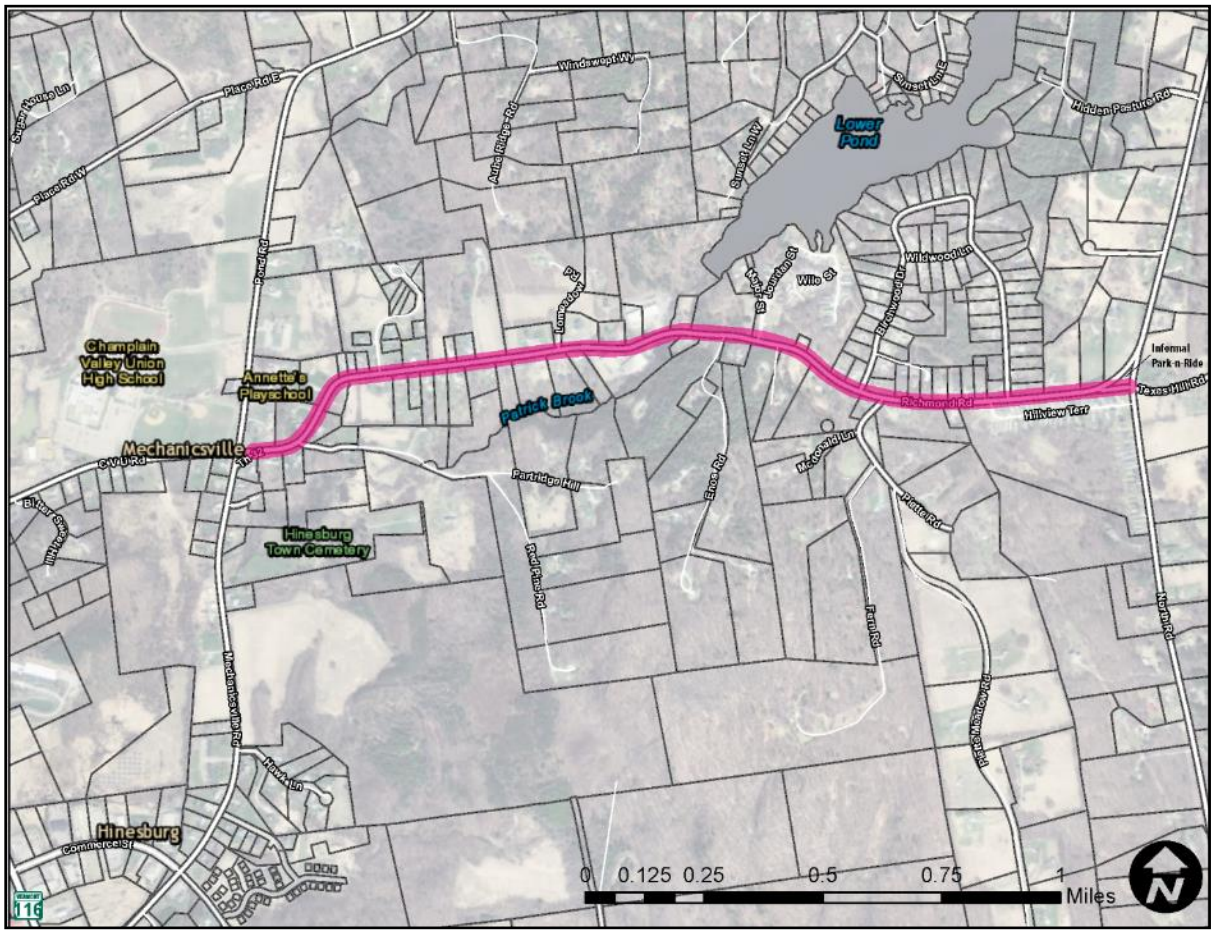

Figure 1: Study Area

1.4 Project Oversight

This scoping study project was conducted and coordinated with public involvement through workshops, presentations, and meetings.

Project meetings and public involvement included the following:

- **Kickoff Meeting:** September 17, 2015 – TDG staff and Steering Committee Members met to discuss project scope, study area limits, conduct a site field visit and review the schedule.
- **Local Concerns Meeting:** November 5, 2015 – TDG staff facilitated a local concerns meeting. As an outcome of the meeting and site fieldwork, TDG crafted a project purpose and need statement based on local input and understanding of existing conditions.
- **Alternatives Presentation:** April 20, 2016 – TDG staff presented project alternatives to members of the public.
- **Report Presentation:** June 23, 2016 – CCRPC staff presented the preferred alternative concept and the findings of the Scoping Study to members of the public and Hinesburg Selectboard.

2.0 Existing Conditions

2.1 Site Characteristics

All base mapping for this scoping study was compiled from Geographic Information System (GIS) and orthographic imagery data as available from the CCRPC, State of Vermont, and the Town. No field survey was performed. Site fieldwork was conducted to field verify all topographic features within the project study area and subsequent fieldwork findings were added to the original base mapping.

There are currently no formal walking or bicycling facilities along the Richmond Road corridor, but a safe route for walkers and bicyclists is a priority in the Hinesburg Town Plan. As shown in Figure 1, CVU, the western terminus of the village sidewalk system, and residents along the Richmond Road corridor would benefit from a designated walking and biking facility.

According to the Vermont Agency of Transportation (VTrans) *High Crash Locations Sections and Intersections* report from 2008-2012, a 0.3 mile section of Richmond Road from CVU Road to east of Partridge Hill Road has been identified as a high crash location (HCL). Subsequently, each year has seen an increase in crashes: four in 2013, six in 2014 with one injury and eight in 2015 with seven injuries to date. This is a known walking and biking route in the Town of Hinesburg despite the lack of facilities. It is estimated that up to 30-40 users walk this corridor on a daily basis.

There is an existing 10-foot wide shared use path on the north side of Shelburne Falls Road that crosses VT Route 116 and continues on the north side of CVU Road to the intersection of Mechanicsville Road, Pond Road and Richmond Road. The shared use path crosses CVU Road to the west of the intersection connecting with the village sidewalk network on Mechanicsville Road. The CVU Road, Mechanicsville Road, Pond Road and Richmond Road intersection has four-way stop control except for an existing slip lane from Mechanicsville Road onto Richmond Road.

The approximate 1.5 mile study area includes rolling topography with a posted speed limit of 35 MPH. Richmond Road generally runs in an east-west direction. Within the study area, Richmond Road consists of two travel lanes. As shown in **Table 1,** the existing pavement width is 24-feet. The existing pavement and pavement markings are generally in good condition.

The intersection of Richmond Road/North Road/Texas Hill Road has a large radius southbound right-turn slip lane onto Richmond Road. The triangle created by the awkward road geometry functions as an informal park and ride within the Town. The intersection is stop-controlled on Richmond Road and Texas Hill Road. A yield sign is located for vehicles traveling north on North Road onto Richmond Road.

The shoulder widths on Richmond Road currently do not meet the *VT State Design Standards* for a rural major collector. However, given the natural resource and topography constraints on either side of the corridor as shown in **Figure 2**, the potential for widening is likely costly and not feasible, so off-road bicycle and walking routes should be considered. A designated walking and bicycling facility, such as a shared use path, would provide a low stress environment for walking and bicycling that is separate from motor vehicle traffic.

Table 1: Roadway Characteristics (source: VTrans Route Log Data)

Richmond Road	
Functional classification	Rural Major Collector
Jurisdiction	Town
Right-of-way width (feet)	49.5'*
Roadway width (feet)	24' (11' travel lanes, 1' shoulders)
Widths recommended by *VT State Design Standards*	11' travel lanes, 3' shoulders (to accommodate bicycles)
2012 AADT**	3600
Posted speed limit	35 MPH
***Vermont Ancient Roads Database** ****AADT= Average Annual Daily Traffic**	

Figure 2: Richmond Road approaching 695 Richmond Road looking west

2.2 Relevant Plans and Studies

The 2013 *Hinesburg Town Plan and the 2011 Highway Safety Improvement Program, Traffic Safety Section on Richmond Road* were consulted to ensure consistency with this study. There are a few noteworthy aspects in those plans specific to this study area:

- *Traffic Safety Section, Highway Safety Improvement Program Location Review*
    - The *Traffic Safety Section* report stated there were six crashes in the approximate location of Iroquois Manufacturing (695 Richmond Road) between 2007 and 2009. Recommendations from the report included the installation of warning signage in advance of the identified crash locations.

- *Hinesburg Town Plan*
    - The transportation chapter of the town plan recommends developing a sidewalk or recreation path system from CVU to Richmond Road to connect high density residential areas to existing village infrastructure. This would provide a designated low stress facility from the most densely populated area in Town and connect to CVU High School.

2.3 Existing Resources

This section assess existing resources. Each of the resource types specified in the *VTrans Project Scoping Manual* are addressed below. The data referenced in this section was obtained from the Vermont Center of Geographic Information, the Vermont Agency of Natural Resources (ANR) Atlas and BioFinder mapping programs, as well as site fieldwork verification. The following is a summary considered to be potential impacts by the improvements proposed for the project study area.

2.3.1 Parcel Data and Property Ownership

The majority of the Richmond Road parcels in the study area are private lots with single family residential structures. The exceptions are Iroquois Manufacturing and the Hillview Terrace mobile home community.

2.3.2 Natural Resources

Lakes/Ponds/Streams/Rivers

As shown in **Figure 3**, Patrick Brook flows south from Lower Pond which is located approximately in the center of the study area.

Wetlands

As shown in **Figure 3**, there are identified Class 2 wetlands. This detailed mapping throughout the Town has been incorporated by the State as part of the wetland advisory layer. Many of these identified wetlands occur on private property and have not been ground-truthed. It is recommended to perform a wetland delineation by a certified professional to confirm Class 2 wetland locations and boundary data.

River Corridors

As shown in **Figure 3**, the lateral area around Patrick Brook has been identified as a river corridor. This area is necessary to achieve and maintain a stable condition of the brook.

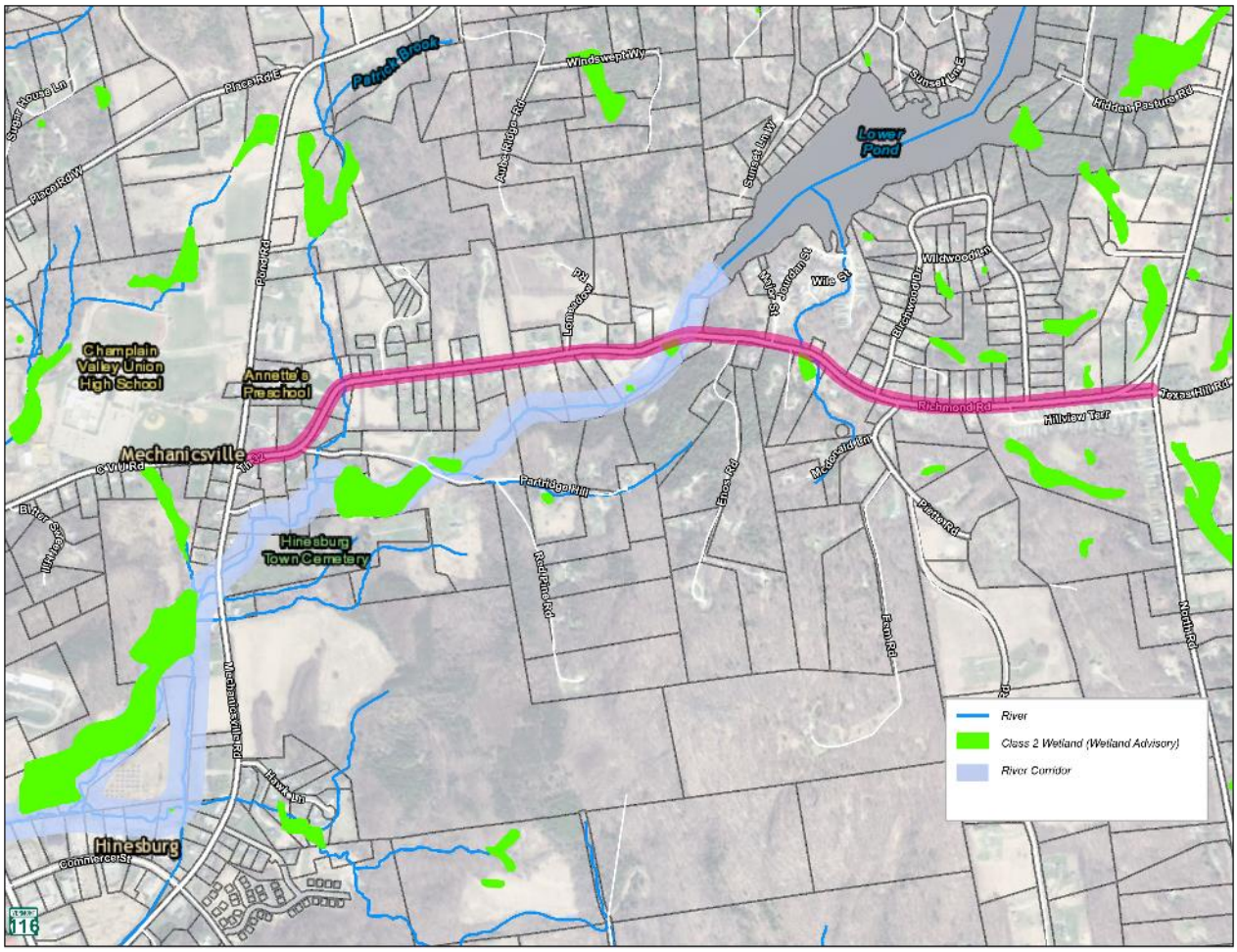

Figure 3: River Corridors, Streams, Wetlands

Agricultural Soils

As shown in **Figure 4**, much of the western portion of the study area is considered prime agricultural soil.

Forest Land

No forest lands have been identified within the study area.

Rare, Threatened, or Endangered Species

No rare, threatened or endangered species have been identified within the study area.

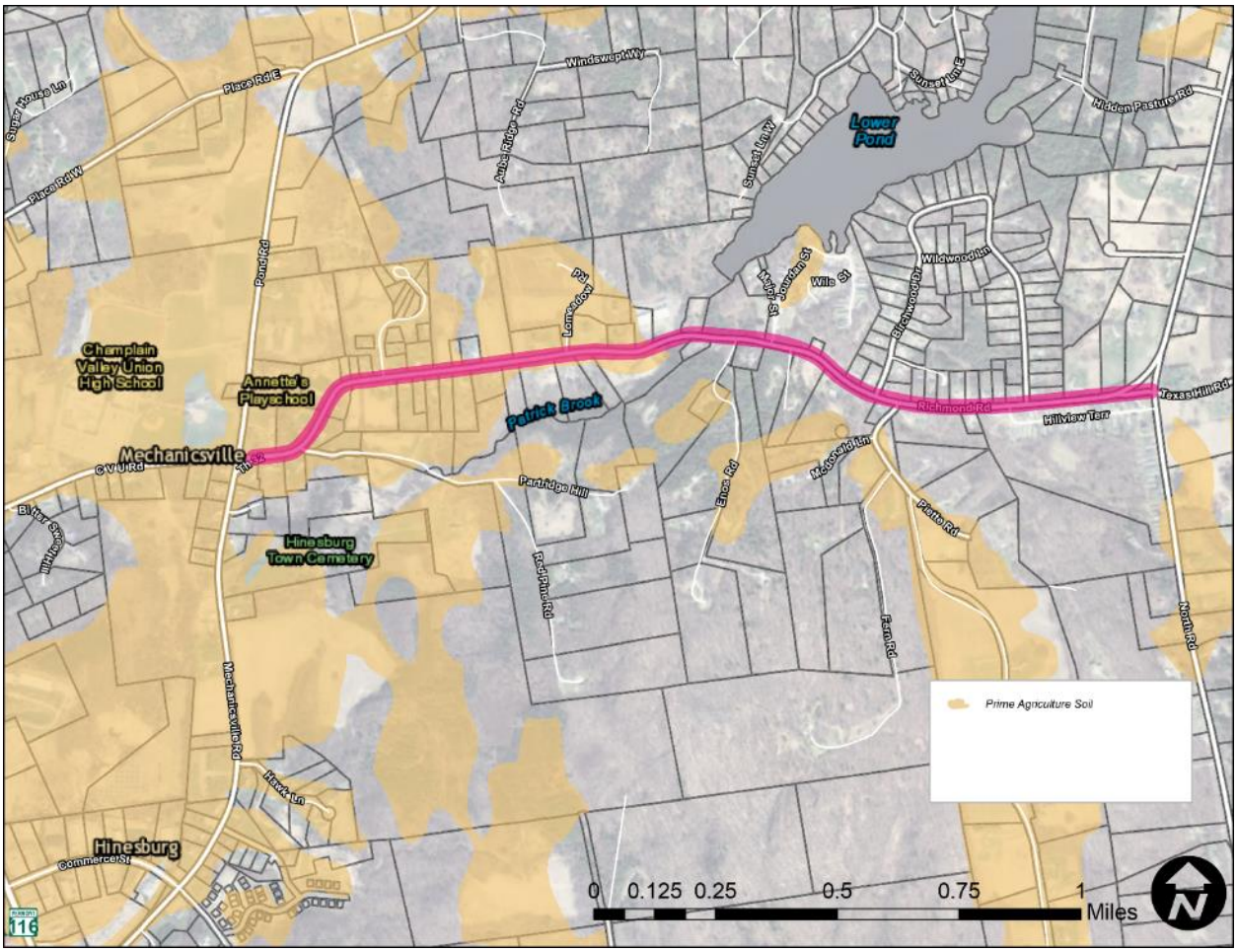

Figure 4: Prime Agricultural Soil

Habitat Zones

As shown in **Figure 5**, lower priority habitat blocks are identified on the north and south sides of the Richmond Road corridor study area. Within each habitat block area, core wildlife habitats have been identified, as well as wildlife corridors/linkage zones. A wildlife corridor/linkage area of importance in Hinesburg has been identified within the study area south of Lower Pond. These corridor and linkage areas provide connections between patches of significant wildlife habitats.

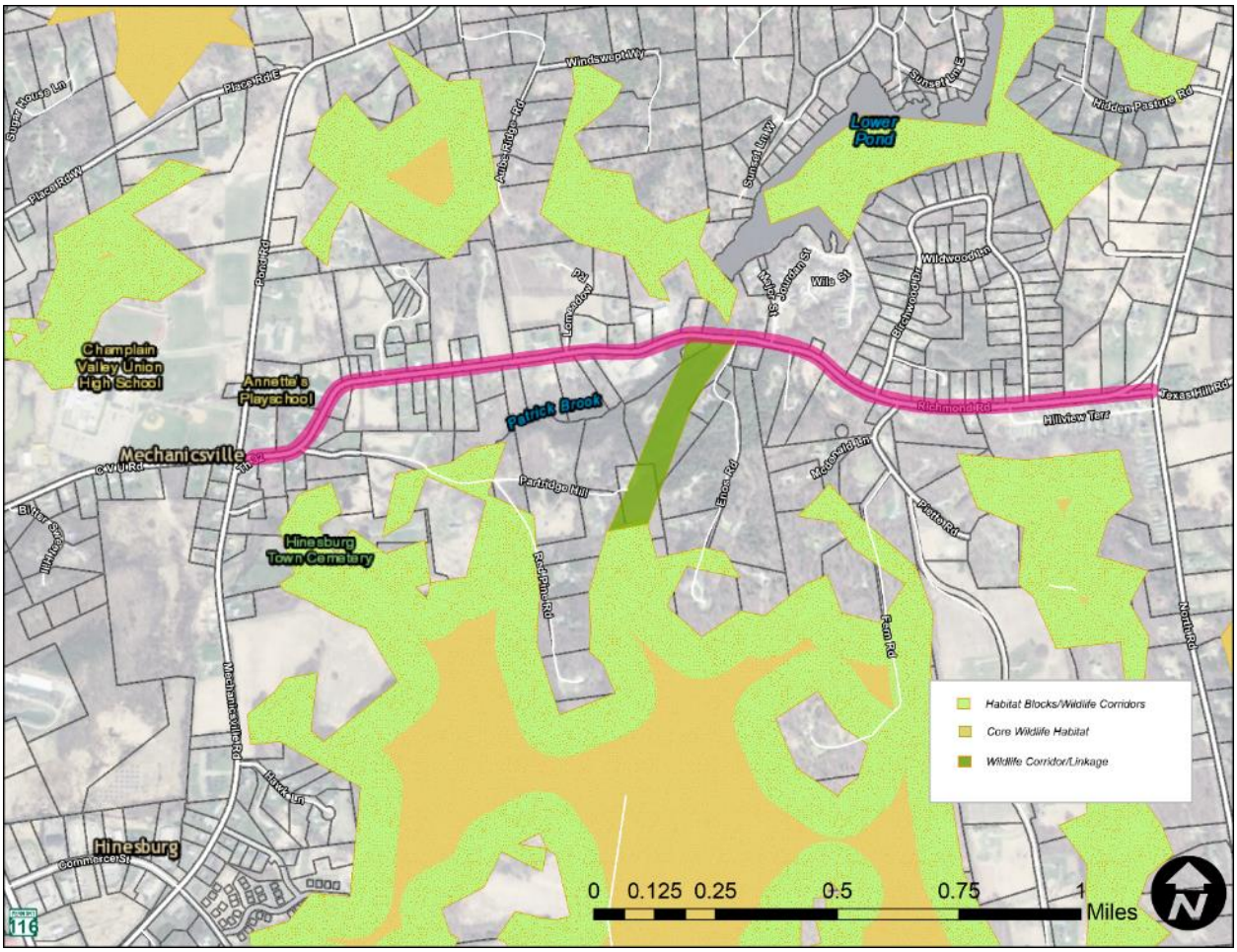

Figure 5: Habitat Zones

2.3.3 Built Environment

Hazardous Wastes
As shown in **Figure 6**, parcels containing Iroquois Manufacturing and several residential parcels are noted as hazardous waste sites by the Agency of Natural Resources.

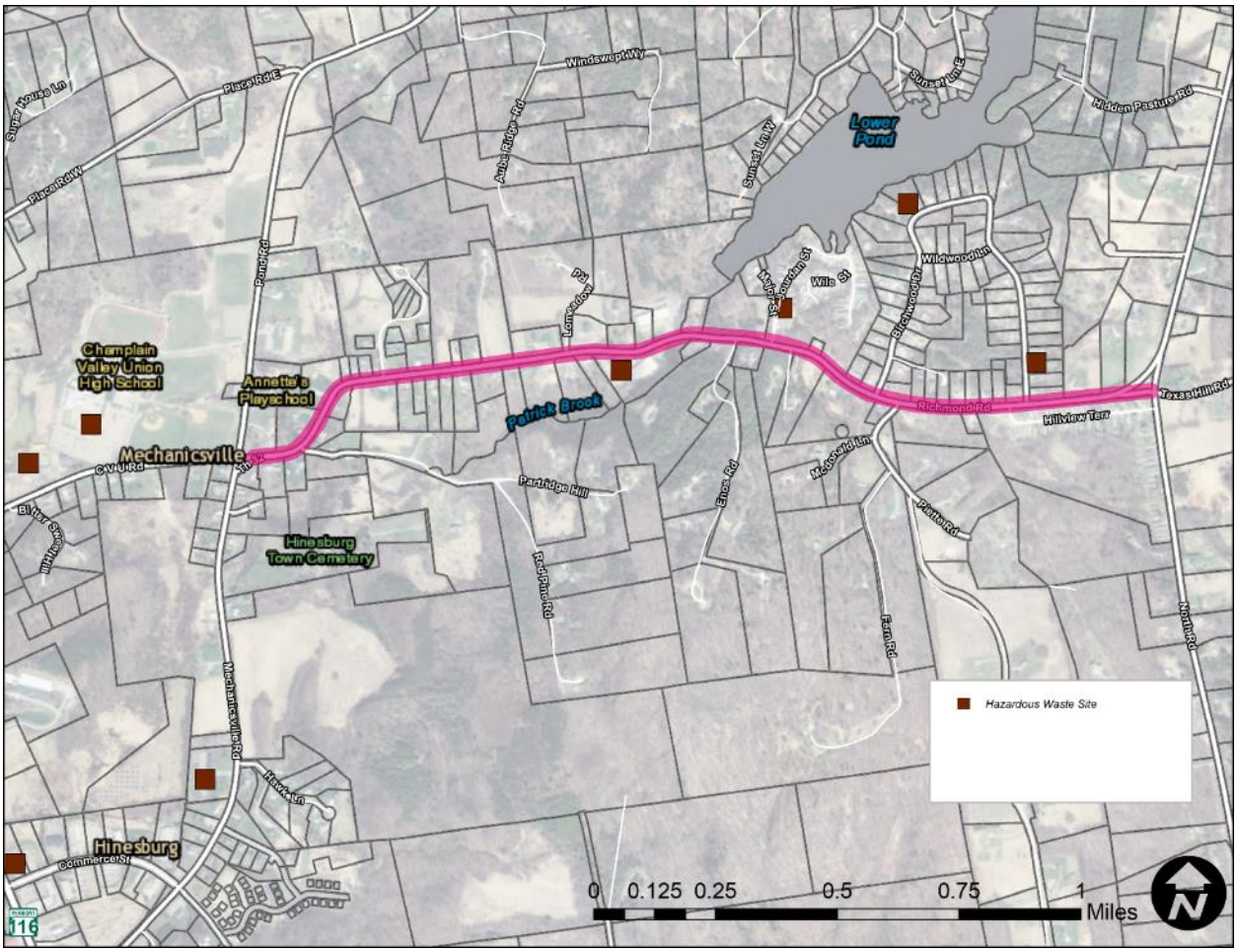

Figure 6: Hazardous Waste Sites

2.3.4 Cultural Resources

Historic

The term 'historic sites' includes prehistoric and historic districts, sites, buildings, structures, or objects listed in, or eligible for, the National Register of Historic Places[1]. There are no historic sites identified within the study area.

Archeological

An Archaeological Resources Assessment (ARA) is not being conducted as part of this study. Since the area is already developed and has been previously disturbed, it is not considered to have historic or pre-contact sensitivity.

[1] FHWA Section 4(f) Tutorial. http://www.environment.fhwa.dot.gov/section4f/properties.aspx. Accessed December 2015.

Architectural
Mechanicsville and the Village center contain the highest concentration of historically significant buildings. Outside of these areas, buildings and structures can be dated from the 19th century and early 20th century. The 2013 *Hinesburg Town Plan* encourages the development, preservation and enhancement of the town's village and rural areas, and its walkability.

Section 4(f) and 6(f) properties
Section 4(f) properties include 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.

Section 6(f) properties are properties acquired with Land and Water Conservation Act funds be coordinated with the Department of Interior. Usually replacement in kind is required.[2]

There are no 4(f) properties within the study area.

There are no 6(f) properties within the study area

[2] Section 6(f) Land and Water Conservation Act. http://www.fhwa.dot.gov/wadiv/envir/section6f.cfm. Accessed November 2015.

3.0 Concept Alternatives

3.1 Improvement Recommendations

This section describes the concept alternatives developed for the Richmond Road Pedestrian and Bicycle Scoping Study. Alternatives were developed to meet the project purpose and need, and to respond to public input summarized in **Appendix A**. The conceptual alternative plans are provided in **Appendix B**.

Whether traveling by foot or wheel, well design shared use paths can provide direct and comfortable routes to places of employment, recreation, education, and other desired destinations. The term shared use path refers to a low-stress bikeway that is physically separated from motorized vehicular traffic by an open space or barrier. These facilities are typically found within an existing roadway right-of-way or within an independent right-of-way. Research has shown many people are interested in traveling by walking or bicycling for transportation purposes, however are dissuaded by stressful interactions with motor vehicles.

Designing with these principles in mind, a shared use path facility was considered as a design alternative for the Richmond Road corridor. In addition to a shared use path, the core improvement recommendations below, are included in each alternative;

- Provide ADA- compliant ramps and high-visibility crosswalk pavement markings across all intersecting roadways;
- Provide centerline pavement markings on the proposed shared use path to indicate directional separation;
    - Additional compliant warning signage to alert users of changes in slope. Refer to **Figure 7;**
    - Additional signage reminding users of proper path etiquette, such as announcing when engaging in a passing maneuver may further assist in reducing conflicts;
- Provide a bridge structure over Patrick Brook;
- Provide and identify stormwater management treatment areas;
- Provide landscape tree plantings as approved by the Town (outside the existing right-of-way); and
- Reconstruct all driveway aprons to accommodate the shared use path crossings.

Figure 7: W7-5 Bicycle hill warning signage

3.2 Alternative 1

The proposed Alternative 1 includes an 8 foot wide bituminous concrete shared use path with a 2-5 foot wide buffer on the northside of Richmond Road. Refer to **Figure 8** for the proposed Alternative 1 cross section. Additional improvements for consideration along this segment would include;

- Providing an enhanced crossing with a Rectangular Rapid Flashing Beacon, signage, and pavement marking improvements from the proposed northside path for users to access the informal park and ride at the eastern terminus of the study area; and
- Study the intersection of Richmond Road and North Road to identify the potential for removing the slip lane onto Richmond Road traveling west (Long Term).

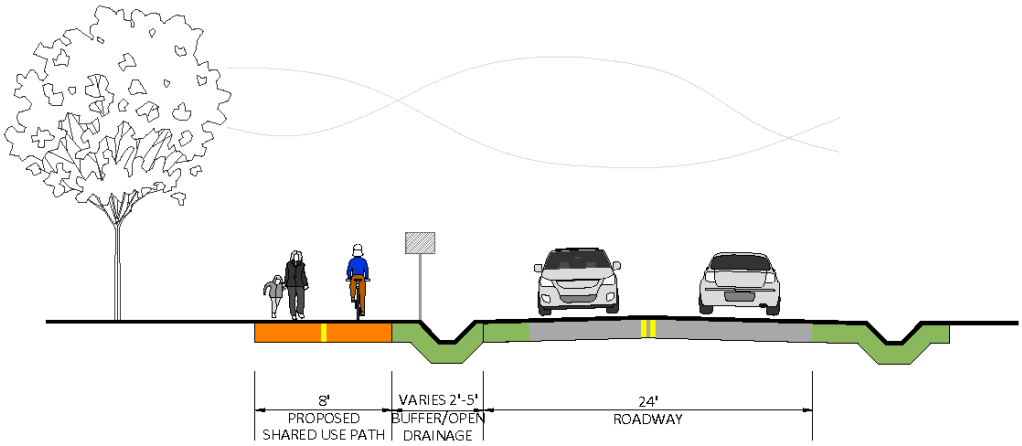

Figure 8: Alternative 1 cross section

The general path alignment would be contained within the existing right-of-way along the northern edge of Richmond Road. Key impacts with the Alternative 1 alignment include;

- In the proximity of 56 Pond Road (CVU Road/Mechanicsville Road/Richmond Road/Pond Road intersection), the proposed path alignment may require subsurface drainage systems, site

grading, and potentially a small retaining wall due to an existing open swale system and challenging site grades in this location;
- In the proximity of 129 Richmond Road, the proposed path alignment would be approximately 9 feet from the existing building structure;
- In the proximity of 175 Richmond Road, the proposed path alignment would be approximately 11 feet from the existing building structure;
- In the proximity of 225 Richmond Road, a new culvert will be needed to accommodate the shared use path and buffer width;
- A total of 14 utility poles may need to be relocated to accommodate the shared use path and buffer width;
- A total of 1 hydrant may need to be relocated to accommodate the shared use path and buffer width;
- In the proximity of 884 Richmond Road, a new culvert will be needed to accommodate the shared use path and buffer width;
- In the proximity of 695 Richmond Road, the existing rock outcropping will need to excavated to accommodate the shared use path and buffer width; and
- Throughout the study area, a combination of closed and open drainage systems may be needed to treat the new impervious facility according to the Vermont Agency of Natural Resources (ANR) Stormwater Management Manual, latest edition.

3.2.1 Alternative 1A

Based on steering committee input and public feedback, a variation of Alternative 1 was evaluated. Alternative 1A includes a 6 foot wide concrete sidewalk with a 7 foot buffer on the northside of the corridor and shared lane pavement markings including signage improvements. Alternative 1A would include many of the core improvement recommendations documented in Alternative 1 and would also have similar construction impacts and permitting requirements. Refer to **Table 2** Evaluation Matrix.

3.2.2 Evaluation Matrix

All of the anticipated costs, resource impacts, and permit requirements for Alternative 1 and 1A have been summarized in the evaluation matrices below in **Table 2**.

Table 2: Evaluation Matrix; Alternative 1 and Alternative 1A

Item	Shared-Use Path Alternative 1 (North)	Sidewalk, Markings & Signage Alternative 1A (North)
Construction Characteristics		
Facility Length	7,200 LF	7,200 LF
Facility Width	8 FT	6 FT
Buffer Width	Varies 2-5 FT	Varies 5-7 FT
Proposed Surface	Bituminous Concrete	Concrete
Terrain	Rolling natural slopes	Rolling natural slopes
Shared Use Bridge	Yes	Yes
Potential Impacts		
Agricultural Lands	None, Previously Disturbed	None, Previously Disturbed
Archeological Impacts	None	None
Class 2 Wetland Impacts	Potentially (Need delineation)	Potentially (Need delineation)
Floodplain	None	None
Historic Property Impacts	None	None
Rare, Threatened, Endangered	None	None
Right-of-Way Impacts	Easements Required	Easements Required
Trees- Removed/Replaced	Yes	Yes
Utility Impacts- Aerial	None	None
Utility Impacts- Underground	None	None
Permits		
ACT 250	No	No
401 Water Quality	No	No
NEPA	Categorical Exclusion	Categorical Exclusion
404 Corps of Engineer Permit	Yes	Yes
ANR Wetlands	No	No
Stream Alteration	Yes, bridge construction	Yes, bridge construction
Conditional Use Determination	Yes	Yes
Stormwater Discharge	Yes, construction >1 acre	Yes, construction >1 acre
Shoreland Encroachment	No	No
Archeological- Phase 1B	No	No
Section 106 / Historic	No	No
VTRANS Access Permit	No	No
Opinion of Probable Construction Costs		
Conceptual Cost Estimate	$2,485,000	$2,250,000

3.2.3 Opinion of Probable Construction Costs

The opinion of probable construction costs for Alternative 1 is approximately $2,485,000. The opinion of probable construction costs for Alternative 1A is approximately $2,250,000. The cost estimates were developed from the concept alternative plans and account for the anticipated construction costs which

include engineering, construction, construction administration, annual maintenance costs, and a 25% contingency. The table of unit costs associated with developing a sidewalk or shared use path facility does not account for construction administration or permitting requirements. The detailed itemized opinion of probable construction costs are provided in **Appendix C**. The unit cost data was applied from VTrans 5 year average price list.

3.3 Alternative 2

The proposed Alternative 2 includes an 8 foot wide bituminous concrete shared use path with a 2-5 foot wide buffer on the southside of Richmond Road. Refer to **Figure 9** for the proposed Alternative 2 cross section. Additional improvements for consideration along this segment would include;

- Study the intersection of Mechanicsville Road and Richmond Road to identify the potential for removing the right turn slip lane onto Richmond Road (Long Term); and
- Providing curb radii reductions at the existing driveways of the Iroquois Manufacturing property.

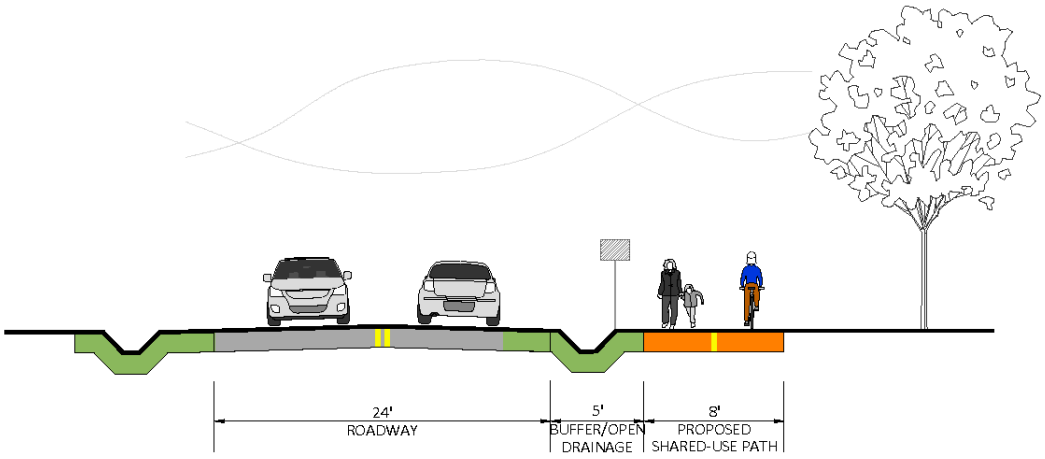

Figure 9: Alternative 2 cross section

Alternative 2 would provide increased access and a dedicated facility for both pedestrian and bicycle users. The general path alignment would be contained within the existing right-of-way along the southern edge of Richmond Road. Key impacts with the Alternative 2 alignment include;

- In the proximity of 114 Richmond Road, the proposed path alignment would be approximately 7 feet from the existing building structure;
- In the proximity of 178 Richmond Road, the proposed path alignment would be approximately 5 feet from the existing building structure;
- In the proximity of 496 Richmond Road, the proposed path alignment would be approximately 4 feet from the existing building structure;
- In the proximity of Hillview Terrace, the proposed path alignment would range 3-12 feet from the existing building structures;
- The southside path alignment would impact the current staging area adjacent to Richmond Road for the Iroquois Manufacturing Company;
- In the proximity of 178 and 274 Richmond Road, a new culvert will be needed to accommodate the shared use path and buffer width;

- In the proximity of 884 Richmond Road, a new culvert will be needed to accommodate the shared use path and buffer width;
- A total of 3 utility poles may need to be relocated to accommodate the shared use path and buffer width; and
- Throughout the study area, a combination of closed and open drainage systems may be needed to treat the new impervious facility according to the Vermont Agency of Natural Resources (ANR) Stormwater Management Manual, latest edition.

3.3.1 Alternative 2A

Based on steering committee input and public feedback, a variation of Alternative 2 was evaluated. Alternative 2A includes a 6 foot wide concrete sidewalk with a 7 foot buffer on the southside of the corridor and shared lane pavement markings including signage improvements. Alternative 2A would include many of the core improvement recommendations documented in Alternative 2 and would also have similar construction impacts and permitting requirements. Refer to **Table 3** Evaluation Matrix.

3.3.2 Evaluation Matrix

All of the anticipated costs, resource impacts, and permit requirements for Alternative 2 and 2A have been summarized in the evaluation matrices below in **Table 3**.

Table 3: Evaluation Matrix; Alternative 2 and Alternative 2A

Item	Shared-Use Path Alternative 2 (South)	Sidewalk, Markings & Signage Alternative 2A (South)
Construction Characteristics		
Facility Length	7,050 LF	7,050 LF
Facility Width	8 FT	6 FT
Buffer Width	Varies 2-5 FT	Varies 5-7 FT
Proposed Surface	Bituminous Concrete	Concrete
Terrain	Rolling natural slopes	Rolling natural slopes
Shared Use Bridge	Yes	Yes
Potential Impacts		
Agricultural Lands	None, Previously Disturbed	None, Previously Disturbed
Archeological Impacts	None	None
Class 2 Wetland Impacts	Yes	Yes
Floodplain	None	None
Historic Property Impacts	None	None
Rare, Threatened, Endangered	None	None
Right-of-Way Impacts	Easements Required	Easements Required
Trees- Removed/Replaced	Yes	Yes
Utility Impacts- Aerial	None	None
Utility Impacts- Underground	Yes	Yes
Permits		
ACT 250	No	No
401 Water Quality	No	No
NEPA	Categorical Exclusion	Categorical Exclusion
404 Corps of Engineer Permit	Yes	Yes
ANR Wetlands	No	No
Stream Alteration	Yes, bridge construction	Yes, bridge construction
Conditional Use Determination	Yes	Yes
Stormwater Discharge	Yes, construction >1 acre	Yes, construction >1 acre
Shoreland Encroachment	No	No
Archeological- Phase 1B	No	No
Section 106 / Historic	No	No
VTRANS Access Permit	No	No
Opinion of Probable Construction Costs		
Conceptual Cost Estimate	$2,273,000	$2,100,000

3.3.3 Opinion of Probable Construction Costs

The opinion of probable construction costs for Alternative 2 is approximately $2,273,000. The opinion of probable construction costs for Alternative 2A is approximately $2,100,000. The cost estimate was developed from the concept alternative plans and account for the anticipated construction costs which include engineering, construction, construction administration, annual maintenance costs, and a 25%

contingency. The table of unit costs associated with developing a sidewalk or shared use path facility does not account for construction administration or permitting requirements. The detailed itemized opinion of probable construction costs are provided in **Appendix C**. The unit cost data was applied from VTrans 5 year average price list.

3.4 Additional Alternative

An additional alternative was studied based on steering committee input and public feedback. A hybrid variation was evaluated using the shared use path alignments from Alternative 1 and Alternative 2. Applying the key impacts identified in Alternative 1 and Alternative 2, a hybrid path option was considered using the northside path alignment from the CVU Road/Mechanicsville Road/Pond Road/Richmond Road intersection until approximately the Iroquois Manufacturing property. A proposed crosswalk would cross Richmond Road and continue with the southside pathway alignment until the North Road/Texas Hill Road intersection. Approximate crossing sight distances were taken in the field to identify the need for the proposed crossing location. Based on field measurements, horizontal, and vertical curvature of Richmond Road, the only locations where a crossing would be feasible between Orchard Commons Road to Lomeadow Road. Based on this designated crossing location, the hybrid alternative would not lessen the impacts identified in Alternative 1 or Alternative 2. The hybrid alternative does add a new impact of a proposed uncontrolled crossing of Richmond Road. Therefore, based on observed motor vehicle speeds and general topography, the viability of this hybrid alternative was removed from consideration.

3.5 Maintenance

Pedestrian and bicycle facilities require routine maintenance to ensure they provide safe walking and bicycling conditions. In addition to current maintenance needs, there are two other maintenance activities that are essential to maintain walking and bicycling facilities. These activities include general maintenance of snow removal, sweeping, mowing/pruning/trimming vegetation, and pavement preservation maintenance activities such as pavement sealing or patching. Maintenance activities are broken out below to document anticipated summer and winter activities.

Summer Maintenance Activities:

- Striping Pavement Markings
- Pavement Repairs (Crack sealing, Patching)
- Culvert/Drainage Maintenance
- Sweeping
- Signage
- Bridge maintenance
- Mowing

Winter Maintenance Activities:

- Plowing
- Sanding/Salting

The Town would need to determine whether or not to remove snow from the path and a formal maintenance agreement is recommended.

4.0 Project Summary

4.1 Conclusion

The Richmond Road Pedestrian and Bicycle Scoping Study was prepared at the request of the CCRPC and the Town of Hinesburg to analyze and evaluate all concept alternatives for pedestrian and bicycle improvements for the Richmond Road project study area. This report presents existing conditions data, conceptual design alternatives, a preferred conceptual design alternative, and opinion of probable construction costs for the project study area.

Evaluating design impacts, input from public involvement through workshops, presentations, and meetings; Alternative 1 has been identified as the recommended preferred alternative. At the conclusion of the public participation and outreach process, in which the findings of this report were presented and reviewed, the Hinesburg Selectboard also identified Alternative 1 preferred design alternative for the project study area.

The proposed recommendations alternative align with the transportation goals in the Hinesburg Town Plan, 2013 and will continue to develop walking and bicycling infrastructure within the community.