



Town of Starksboro

“Complete Streets”

Planning & Feasibility Study

FINAL REPORT
November, 2011

Prepared for
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Transportation Advisory Committee
Addison Regional Planning Commission
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Starksboro, VT 05487
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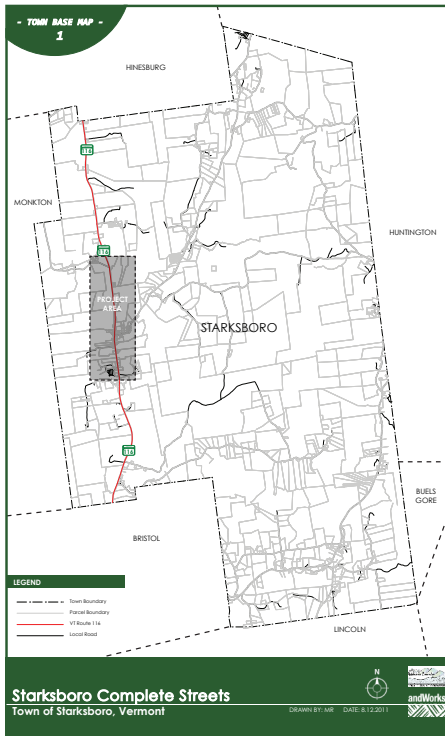


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Executive Summary



Town boundary with project area.

The purpose of the Starksboro Village “COMPLETE STREETS” Planning and Feasibility Study is to develop conceptual design alternatives that will achieve the project goals of improved pedestrian and bicycle safety (with an emphasis on children walking to and from school), traffic calming at designated gateways and streetscape enhancements. Alternatives were developed and evaluated through a public engagement process to determine the most feasible and most desirable way to proceed with and to lay out a plan for the Town to secure additional funding for construction.

The study area spans along VT RT. 116 from the intersection of States Prison Hollow Road in the north to the intersection of Brookside Drive in the south, and encompasses the Starksboro Historic District. The Town of Starksboro requested that the intersection of Parsonage Road and VT RT. 116, the entrance to the Town Library and the connection from Robinson Elementary School to the Starksboro Town Library and Town Offices be set as a priority for the project. This report lays the groundwork to further develop the project into final design and construction.

Based on the evaluation of existing conditions and professional expertise, as well as feedback and approval provided by the Town and the local community through an extensive public engagement process, it is recommended to proceed with a preferred solution that includes construction of a new “back lots” trail, which connects the school to the library and Town Offices, and includes a crosswalk and speed bump on Parsonage Road; signage and road striping at the intersection of Parsonage Road and VT RT. 116; two gateways on either end of the village with welcome signs, streetscape and traffic calming measures; and, an upgraded handicapped accessible drop off at the library. During the repaving of VT RT. 116, it is also recommended that the road width remain at 28', but that the travel lanes be reduced to 11', leaving 3' paved shoulders on either side for non-motorized activity.

The preferred alternatives meet the Purpose and Need Statement for this project and are feasible to permit and construct within a reasonable construction budget. Due to the nature of funding and the desire to link existing planned construction, it is recommended that the project elements be developed in phases. The library entrance and Parsonage Road improvements should be the Town's first priority because of available funding and the desire to link with the planned construction of a new park and ride. Work on the “back lots” trail should follow so that the trail can be operational in the spring when students again walk to and from different activities. The project gateways make up the last phase as more work

needs to be done to involve local artists in further developing the gateway concept(s).

Except for the gateways and “back lots” trail, most improvements are to be located within the municipal or state right-of-way. Approval by property owners along the “back lots” trail have already been requested or approved. No impacts to natural, historic or cultural resources are expected. Additional work that will be necessary in order to implement all recommendations prior to or during the next phase include the following:

- Communications with VTrans about extra paving at the Town Library and Parsonage Road.
- Working with local land owners where gateways are located to secure approval as well as plans for up-keep and maintenance.
- Plans for up-keep and maintenance of the proposed “back lots” trail.
- Input from local artists on gateway and existing fence designs.



View of Baptist Church on VT RT.
116 in Starksboro Village.

1.0 | Introduction

This report documents the project process and presents recommendations resulting from a **“COMPLETE STREETS”** approach to a Pedestrian and Bicycle Facilities Feasibility Study completed within the Town of Starksboro. The study was undertaken and completed by LandWorks with assistance from Consulting Archaeology Program at the University of Vermont and a committee from the Town of Starksboro. The project was funded by a grant awarded through the Vermont Agency of Transportation, Transportation Enhancement Program.

The purpose of this study is to develop conceptual design alternatives that will achieve the project goals of improved pedestrian and bicycle movement and safety, traffic calming, and streetscape enhancement, then determine the most feasible and desirable alternative with which to proceed and to lay the ground work to further develop this project into final design and construction.

Elements of the study included a project kick-off meeting with site visit; documentation of existing conditions through field visits and desktop studies; a local concerns meeting; development of several draft conceptual alignments; identification of right-of-way issues, utility conflicts and natural and cultural resources; an alternatives presentation; development of preliminary cost estimates and a project time line; and, preparation of this report with recommended, preferred improvements.

2.0 | Purpose and Need

Purpose and need statements, according to the Vermont Agency of Transportation, are the foundation to clearly stating a problem and are very important in justifying and defining a project. The “purpose” portion of the statement defines the goal(s) which the project will attain; and the “need” portion of the statement describes the inconsistencies and deficiencies present and why the project goal(s) should be accomplished. The following purpose and need statement for the Starksboro **“COMPLETE STREETS”** Planning and Feasibility Study was developed from an analysis of existing conditions, recommendations by local officials, public input and professional expertise, and include:



Pedestrians on Parsonage Road using roadway for travel

PURPOSE

- Developing pedestrian facilities and related improvements that provide orientation, safety, accessibility and comfort to walkers, bicyclists and other multi-modal users;
- Creating environments that are more accessible to each other for pedestrians, particularly in the Village Core e.g. Robinson Elementary School to Library, Town Offices and Community Garden;
- Developing bicycle and pedestrian improvements that will promote and encourage usage and ultimately reduce overall traffic speed in the project area; and
- Develop improvements that maintain the aesthetic value and character of the existing roadway, as well as the scenic and historic quality of the area.
- Develop improvements that connect, expand or enhance pedestrian and bicycle related projects along VT RT. 116 and surrounding towns.

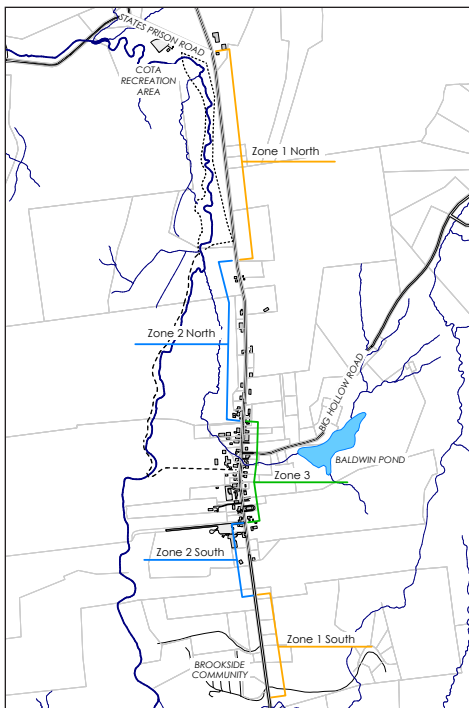
NEED

- *Location* - With it's proximity to key village destinations including the Cota Recreation area, Creekside Trail, Robinson Elementary School, the Brookside Community and the Town Office complex, including the library and community garden, the study area experiences a high amount of pedestrian, bicycle and other non-motorized traffic, especially young children walking from the school to the Town Office Complex.
- *Existing Roadway* - VT RT. 116 serves as the town's main street, but is also a major State Highway that experiences travel speeds of more than 50 mph, even though the speed limit is 35 mph through this area. Generally the pavement width throughout the project area (VT RT. 116) varies from 26' - 28' with two 12' travel lanes and a 2' shoulder. Over the years the top layer of pavement has been layed down smaller producing 11.5' lanes and intermittent 1' - 2' shoulders in some spots. Moreover at the entrances to the project area the road is long and linear which encourages higher vehicle speeds and increases the threat to pedestrians.
- *Lack of Pedestrian and Bicycle facilities* - The roads in the study area have no facilities for pedestrians and bicyclists such as paved shoulders or sidewalks. Because there are no shoulders people are forced to walk or bike in the travel lane of the highway, jeopardizing the safety of all users. This lack of facilities threatens safety and discourages walking and other alternative forms of transportation.

3.0 | Project Area and Existing Conditions

The project area spans approximately 10,300 ft. (1.96 miles) of Vermont Route 116 from its intersection in the south with Brookside Drive to its intersection in the north with States Prison Hollow Road. For the purposes of evaluating existing conditions within the project area, it was divided into the following 3 zones:

Project study zones



Zone 1: The Village Approach Zone is divided into two sections and is located at either end of the study area. They are the furthest points to the south (Brookside Dr.) and to the north (States Prison Hollow Rd.) and terminate at the Starksboro Historic District boundary line on either end. The northern portion of Zone 1 is approximately 3,457 feet, and the southern portion of Zone 1 is approximately 1,660 feet. Although Zone 1 makes up just over half of the project area (5,117 feet), it has the least amount of emphasis placed on it.

Zone 2: The Village Gateway Zone is located at the entrance of the Historic District on both ends (i.e. boundary of Zone 1) and terminates at Parsonage Road in the south (700 feet) and just north of the Post Office in the north (1,850 feet). Zone 2 makes up the next largest portion of the project at 2,550 feet and is important because it includes the two proposed gateways to the village.

Zone 3: The Village Core Zone is located from the Post Office in the north to Parsonage Road in the south (i.e. between Zone 2). It spans approximately 2,000 feet and is the smallest zone in the project. However, Zone 3 contains the majority of the proposed alternatives.

Following are descriptions of the existing conditions present through each of the three zones. Please also refer to the “Existing Conditions” map in Appendix A.

Zone 1 - The Village Approach serves the outskirts of the village where the main use of the road is for commuter travel. Forest edges, farm fields and scattered rural residential development are present. The road surface is made up of 12' travel lanes with intermittent 1-2' shoulders with a speed limit of 50 miles per hour. The functional classification for VT RT. 116 is as a minor arterial with 3,000 plus vehicles per day. In the northern section of Zone 1 extended views can be found looking west over the Lewis Creek Riparian Zone, as well as some private farm land. The road has spans with no houses and straight lines that tend to promote

higher vehicle speeds. Also located in the northern section is the Cota recreation area and Creekside Loop Trailhead. The Cota recreational area is of great importance to the town and was noted in the Town plan as a point of interest that needed to be connected to the village core. An initial step in making this connection has been made as a foot bridge across the Lewis Creek from the Cota recreation trailhead has been installed allowing full access to the Town owned land.

The southern section of Zone 1 is located at the Brookside Community. Currently, there is no formal connection from this neighborhood to village destinations like the Robinson Elementary School and Town Offices. School children are forced to walk on a narrow path between the busy highway and a swale up to 3' deep in places. This creates a hazard for both pedestrians and vehicles.



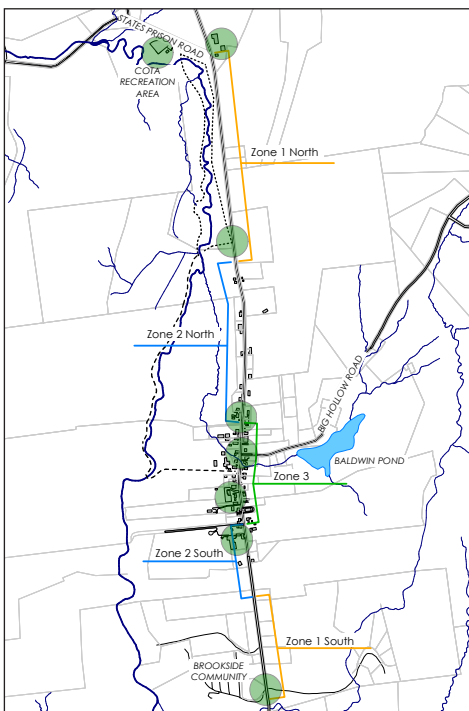
Zone 1 - Newly installed pedestrian foot bridge across the Lewis Creek from the Cota Recreation Area and trailhead

Zone 2 - The Village Gateway has the same road features as Zone 1 however the setback begins to change and the presence of buildings close to the road becomes more prevalent. The southern section contains Robinson Elementary School and Parsonage Road, which provides access to the school's recreation fields and parking. There is also the Town's Cemetery located on the east side of VT RT. 116. Both have chain-link fences that delineate the boundaries and make the road appear narrower. Many fields are present in the southern section of Zone 2 providing open views to the nearby mountain ranges, unlike the northern span of Zone 2 that is mostly confined by wooded areas. Other differences include the road being straighter in the southern section with good view lines, while the northern span has more turns that decrease viewing distance

and increase conflict with both pedestrians and bicyclists.

Zone 3 - The Village Core is the heart of Starksboro. This section is home to the Town Library, Town Offices, Community Garden, Commuter Parking Lot (currently being installed), Community Meeting House, Baptist Church and many private residences. The travel lane in this zone will vary from 12' to 11.5' depending on condition of surface. It appears that as each time the road has been repaved, the shoulder has diminished. This means the shoulder varies greatly from under 1' in some places to over 3' at driveway entrances and road intersections. The noncontinuous shoulder makes travel for pedestrians and bicyclists hazardous and unpredictable. The many drive entrances without definition from shoulder surface also add to the overall inability to walk around or bike through the Village Core.

Activity Centers



Location of Activity Center

Utilities are more prevalent in this zone with the east side of VT RT. 116 having multiple catch basins. These catch basins are currently set below the surface into rather uneven areas of the shoulder. This works well at managing the run off on the higher east side of the road, but it creates a hazard for pedestrians and bicyclists trying to use the road.

The Village Core with it's many residential buildings has a short setback from the right of way with some houses directly on what seems to be in the right-of-way. While this does a good job of constricting the feeling of the road and helping to slow vehicle traffic somewhat, it leaves minimal space for upgrades. This layout also allows for parking to occur on the shoulder while people come and go from their residences. Parking on the shoulder creates a hazardous situation for all users.

Activity Centers:

Several activity centers or key destinations have been identified throughout the project area. Most of these are located within the Village Core (Zone 3) but some are located in other project zones. These high pedestrian activity locations include but are not limited to, The Cota Recreation Area, Horse n Rebel Market, Gallery and Grille, Starksboro Town Post Office, Lewis Creek Farm, the intersection with VT RT. 116 and Big Hollow Road, Starksboro Town Offices, Town Library, both Robinson Elementary School entrances (one off of Parsonage Road and the other off of VT RT 116) and the Brookside Community. Activity is highest in Zone 3 in the vicinity of the Town Offices and Town Library.

Past Studies:

In 1997 the Addison County Regional Planning Commission sponsored a Traffic Calming and Non-Vehicular Routes Study for the towns within the region. Included in the report was information specific to Starksboro, including an existing conditions analysis, recommendations, streetscape renderings, alternative road alignments and proposed project costs. This

study produced talk among residents in the town and sparked debate as to what character Starksboro wanted to project for the village into the future. Options put forth included an urban cross-section, incorporating a village length vegetated median, bike lanes, sidewalks and street plantings. It also included on-street parking in select areas. These alternatives were all taken into consideration in the development of design alternatives and the preparation of this report.



Left: View of Town Offices and location of proposed drop-off.
Top: View looking from school towards Town Offices.
Bottom: Existing utilities and restrictive set back.
 See appendix I for a full photo inventory

4.0 | Conceptual Alternatives

Conceptual alternatives were considered for all 3 zones that would meet the project purpose and need, as well as the desires of the community. Physical constraints, topography, available right-of-way, use, and potential impacts to surrounding properties were also considered in the development of the alternatives. The Vermont Pedestrian and Bicycle Facility Planning and Design Manual, the AASHTO Design Guide for the Development of Bicycle Facilities and Vermont State Standards were also reviewed to ensure compliance.

Several iterations were considered before a preferred option was approved by the Town and the people of Starksboro (see Appendix B, DRAFT Conceptual Alternatives). The preferred option was chosen because of the character of the town - Starksboro and its residents have a strong connection to the agrarian history and want that to come through in the design of their village. Therefore, the preferred conceptual plans and cross sections developed represent feasible options that can be implemented efficiently and effectively without impacting this notable character (see Appendix C, Preferred Conceptual Alternatives). The following provides a description of each of the alternatives, which are illustrated in Appendix C.

VT RT. 116 Design Features

- 11' travel lanes
- 3' paved shoulders
- 28' road surface

4.1 VT RT. 116 Roadway Modifications

Preferred roadway modifications to VT RT. 116 take into consideration the input from residents and were decided on by looking at multiple options each with a distinct character. These options varied from complete realignment with sidewalks and curbs to widening of the road surface to accommodate all potential users: vehicular, bicycle and pedestrian. After these different options were presented and openly discussed it emerged that the residents of Starksboro did not want to change the character of the roadway and in-turn the village itself. The Preferred option for the road surface therefore represents the strong desire to retain the current character present within the village while also providing needed upgrades to allow for safe multi-modal use of the travel surface. The upgrades include the reestablishment of a consistent 28' width paved road surface throughout the village core. By maintaining a consistent road width and distinct edge, confusion can be eliminated while still maintaining the character desired. The second feature proposed is to reduce the travel lane from the current 12' lane width down to the minimum allowed for this type of road which is 11'. Constricting the travel lane down 1' beginning at the

gateways will encourage vehicles to slowdown and respect the appropriate speed for the village. The combination of these two simple upgrades allows for the implementation of the final design feature a full 3' paved shoulder on each side of the road. By providing a consistent, uninterrupted 3' shoulder, a safe travel route for both bicycles and pedestrians can be provided. In conclusion by making these three relatively minor adjustments to the road surface the desire of the Town to maintain the current character is achieved in concurrence with the project goals of implementing a **"Complete Streets"** concept by providing safe travel options for all users of the road surface.

4.2 Gateways

Two gateways are proposed for the project area (see Appendix D). They are located along VT RT. 116 at the north and south boundary line of the Historic District. The gateways are used to welcome all visitors to the village and to alert drivers that pedestrians may be present throughout the area. The design of the gateway will also incorporate traffic calming measures to slow vehicular traffic before entering the Village Core and the main pedestrian area. This is accomplished by physically and visually narrowing the road surface and surrounding plantings.

Gateways - Preferred Option

The preferred option chosen for the Gateways will include travel lane changes from the current 12' down to 11' width. Also included is a welcome sign (see appendix D.6) that is incorporated into a fence detail that angles in towards the street, narrowing the visual perception of the road and creating a safer environment for all users. Street trees and plantings that follow the angle of the fence are also incorporated to further define the road and slow traffic.

4.3 "Back lots" path

In response to feed back from the public at the local concerns meeting a "Back lots" path was developed to meet the needs of a village sidewalk without trying to fit one into the existing ROW. The "Back lots" path is first directed at school children and providing a safe route to and from Robinson Elementary School, home and the Town Office area with future connections to the Creekside Trail and Cota Recreation Area. This path will be maintained by the Town which will consist of mowing during the needed months and limited shovelling in the winter. The path is designed as a limited access limited maintenance grass path that will first be open during the school year, or November 1st to May 1st, while still allowing farm production during the summer. Until such time a formal path is constructed, it is anticipated

Gateway Design Features

- 35 MPH zone
- 11' Travel lane
- 3' paved shoulder
- Welcome sign
- Fence detail
- Street trees

"Back lots" Design Features

- Safe convenient access to and from school and Town offices.
- Low maintenance grass path
- Barbed wire fence crossings
- Designed to be open during the calender year allowing for farming during the summer.
- Imprint crosswalks at Parsonage road

that a natural worn path will emerge after years of use. When the path is eventually developed, low lying areas will be taken into account and avoided where possible. Where not possible gravel shall be brought in to fill the low section. If the path is well accepted and it is the desire of Starksboro to take it to the next level gravel can simply be set down over the existing hardened base.

“Back Lots” Path - Preferred Option

The preferred option for the “back lots” path (see Appendix E) will begin at the school entrance and follow the existing paved walkway around the parking lot to Parsonage Road. At this crossing there will be a painted crosswalk in order to reach the other side safely. The trail will cross over a barbed wire fence (see crossing options in Appendix E.2) and then cut directly north through the hay field. The path will cross one more fence before it turns east and then north again to parallel the back of the Town Office parking lot, terminating at the community garden.

4.4 Library Drop-Off

As part of the streetscape enhancements, the Town expressed interest in designing a handicapped accessible drop off for the Town Library. Recent upgrades to the entrance of the library including stone walls, gravel ramp and entrance plantings have upgraded the look and feel of the building and now make it apparent that a designed drop-off that fits in with the new entrance would enhance the building even further.

Library Drop-Off - Preferred Option

The preferred option (see Appendix F) uses a stone wall based on the design of the existing walls to create a level drop-off space on the east side of the path heading down to the Town Offices. The wall will also work as a barrier railing and a place to sit. This will still allow space for a car to pull in parallel to the road and fully open their doors to allow for access. The drop-off zone will continue out in front of the existing ramp allowing a handicapped user access to the front door. The design will also incorporate handicapped signage on the pavement along with striping to prevent vehicles from parking in the drop-off. Also included is a drainage plan that directs run-off away from the front of the town offices over to a new proposed rain garden on the north side of the Library. This would collect run off from the existing path and the proposed drop off.

Library Drop-off Design Features

- Handicapped access to Library Entrance
- Foul weather drop-off for all residents
- Controls drainage issue

4.5 Parsonage Road Intersection

The intersection with Parsonage Road and VT RT 116 causes

a conflict for all users of the space. Site lines are limited by nearby residences and there are no pavement markings, drivers trying to enter VT RT 116 accelerate at a quick pace. Working in combination with the "Back Lots" Path ensuring that this crossing is upgraded and safe will greatly impact the safety and enjoyment of all users. (see Appendix G)

Parsonage Road Intersection - Option 1

Option 1 takes into consideration the proposed upgrades to the paved surface and incorporates new pavement marking and signage to alert drivers of the intersection.

Parsonage Road Intersection - Option 2

Option 2 uses the same pavement markings but also includes a crosswalk from shoulder to shoulder across Parsonage Road. This aids in the visual slowing of vehicles both entering and leaving Parsonage Road.

Parsonage Road Intersection

- Designated walking zone for pedestrians to cross
- Striping to stop vehicles prior to entering the walking zone
- Signage alerting turning drivers to pedestrians around corner

5.0 Regional Connectivity

Starksboro is an important link in the overall connectivity of the region. The Route 116 corridor, specifically the portion extending between South Burlington and Bristol, serves as a distinctive bicycle corridor, attracting bike enthusiasts from near and far for the beautiful rural scenery and for unique destination points and attractions along the way. Situated approximately midway along this corridor, Starksboro serves as a strategic link for cyclists along this route including solo or independent cyclists and organized group bike tours. The proposed traffic calming improvements and increased shoulder width within the village create a safer experience for cyclists passing through the village. The proposed park and ride provides a starting destination for cyclists wishing to visit attractions along the corridor, while also expanding the diversity of routes or loops cyclists might explore in the surrounding area. Other public parking locations along this route include the park and ride at the intersection of Route 17 and 116; the parking area adjacent to Bristol's Bartlett Falls; public parking areas in Bristol village; and Huntington's park and ride at Big Hollow Road. Collectively these designated public parking areas support a potential network of cycling routes along Route 116 and in the surrounding area.

These improvements also serve to unite Starksboro's village center and attractions, such as Lewis Creek via the Creek Side trail and the Lewis Creek Farm stand, with popular cyclists attractions along the Route 116 corridor. Traveling south, these attractions include the Appalachian Gap bike route beginning at the intersection of Route 17 and 116; Mary's Restaurant; Bristol's highly acclaimed Bartlett Falls at the New Haven River; Lincoln's proposed bicycle route along the New Haven River; and the shopping, historic town center of Bristol village. Traveling

north these include dining and shopping amenities in Hinesburg center and South Burlington, which serves as a gateway to the endless attractions found in the Burlington area.

In addition, the proposed park and ride will serve commuters within the town of Starksboro and surrounding areas traveling to larger town centers such as Burlington, South Burlington and Middlebury. Whether commuters carpool or take advantage of the newly proposed ACTR bus route for Route 116 between Bristol and Burlington with stops in Starksboro and Hinesburg, ease of travel between village and town centers along this route will be improved for visitors and residents. These expanded transportation options will provide a greater sense of regional connectivity between town centers along the corridor.

6.0 | Street Trees and Vegetation

The Village of Starksboro has a well-developed, mature vegetated cover throughout most of the VT RT 116 corridor, which complements the agrarian character of this area. Over the years trees have been removed due to die back, natural events, and development without being replaced. While LandWorks presented options for street tree planting in earlier drafts, it was ultimately decided that they be excluded from the preferred option. However, the Town should encourage residents to plant front yard trees when embarking on any upgrades to their property. The Town may be able to encourage this by providing help with the planting of and possibly bulk purchasing of trees.

With the constraints on town and personal budgets, it is often difficult to defend the planting of trees. However, it has been shown that the initial investment and long term maintenance costs are repaid in multiples with the contribution that mature trees make toward creating an inviting, livable and economically vital community. A long-term view in cost benefits is needed in promoting this important amenity. The benefits of trees, which are listed below, are more fully explained in Landscape Guide for Vermont Roadways and Transportation Facilities, June 2002 available from the Vermont Agency of Transportation.

(<http://www.aot.state.vt.us/progdev/documents/design/vtrans%5flandscape%5fguide.pdf>)

Benefits

Vehicular Transportation Benefits

- Safety - street trees used in combination with signage and a proper road surface have been shown to slow traffic by narrowing the appearance of the roadway and defining the village setting. Slower traffic has been shown to result in fewer and less severe accidents.
- Wayfinding - Roadside trees or groups of trees can



Existing mature street tree along VT RT. 116 in Starksboro

serve as landmarks along the roadway, and even alert drivers to upcoming turns and crosswalks.

- Multi-modal - Pedestrians benefit from the summer shade and cooling of street trees. Street trees encourage pedestrian use by greatly improving their comfort.

Community Benefits

- Economic - Despite the difficulty of placing value on such intangible factors, research has determined that communities do better economically when they protect their existing trees and continue to plant new ones.
- Aesthetic and Quality of Life - Defining community character, defining the entrance or gateway to a village, screening, framing views, noise attenuation.

Ecological Benefits

- Air Quality
- Water Resources
- Cooling and Energy Savings
- Wildlife

Selection

Street tree selection should consider the site or location where the tree is to be installed, the soil type, growing conditions, overhead power lines, and set-back.

Where to Plant

Ideally, street trees are planted in the greenbelt that makes up the distance from the edge of the pavement to the ROW. This location provides a few benefits for the pedestrian such as horizontal and vertical separation from the roadway and a sheltering canopy. Working with the local residents, the Town should strive to make street trees/front yard trees an important part of every project.

7.0 | Right-of-Way (ROW)

Municipal and State right-of-ways (ROW) were reviewed through Town and State records to provide a basic understanding of the ROW limits. Boundary surveys were not completed, but the ROW shown on these drawings is from regional GIS data and is expected to be adequate for the purposes of planning; however, it will be necessary to confirm ROW limits during the construction phase to accurately locate preferred options relative to the ROW and existing features.

None of the proposed alternatives anticipate the need for permanent ROW changes; however, nearly all improvements will require temporary construction easements due to their design most significantly the gateways.

8.0 | Utility Impacts

The utilities in the project area that could be affected by this project include:

Drainage Facilities

Stormwater catch basins are located sparingly throughout the Village Core (Zone 3) with the majority along the east side of the road surface. The proposed repaving to a full 28' width may impact the drainage and height difference between grate and paved surface. On an individual basis, each catch basin will have to be reviewed to confirm whether it needs to be adjusted to ensure correct drainage and to allow for safe bicycle travel.

Water/Sewer

The Town of Starksboro does not have a municipal wastewater treatment system and will not be installing one in the near future. Water mains are located throughout the project area, but none were of consequence for the proposed improvements.

Electric/Telephone

Overhead power and communication lines alternate from the east and west side of the street throughout the project area. None of the preferred alternatives proposed in this report impact the lines or require the relocation of any utility poles.



Example of existing utilities

9.0 | Natural and Cultural Resources

The conceptual alternatives were reviewed for potential impacts to natural and cultural resources. Potential impacts were assessed through on-site observations, resource agency reviews, and review of resource mapping. There will be no impacts to surrounding natural and cultural resources (see Table 1. Project Constraint Summary). This is a preliminary assessment and it may be necessary to re-evaluate potential impacts to natural and cultural resources after a construction-ready design is completed. (see appendix H)

Wetlands

National Wetland Inventory (NWI) data in GIS format was obtained from the Vermont Center for Geographic Information (VCGI) to determine the possible location of wetlands in the study area. The Vermont Water Resource Board has adopted a particular set of these maps, available in digital format from VCGI, as the Vermont Significant Wetlands Inventory maps (VSWI).

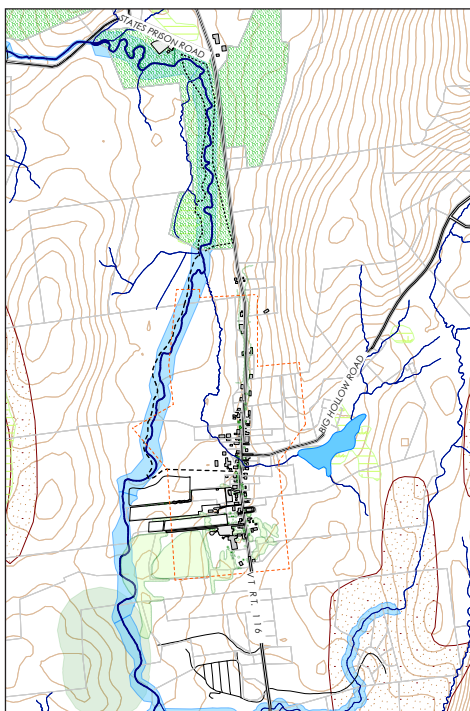
Wetlands are classified into three categories by the Vermont Wetland Rules. The first two classes (Class I and Class II) are considered "significant" and are protected by the Vermont Wetland Rules. All uses which are not allowed in Class I and II wetlands require review by the Vermont Agency of Natural Resources Wetlands Office through a Conditional Use Determination. Class III wetlands are either considered not significant for producing any wetland functions or have not been mapped on the NWI maps. Class III wetlands are not protected under the Vermont Wetland Rule, but may be protected by other federal, state or local regulation.

The NWI data source obtained from VCGI identifies Class I and Class II wetlands that are regulated. According to this GIS data, there are no wetlands of any class that will be effected by the proposed upgrades.

Significant Habitat

The GIS data Layer ENDANGER, obtained from VCGI, indicates the known presence of rare, threatened or endangered species and significant communities. These rare plants and animals are tracked because they have particular habitat requirements, are at the edges of their ranges, are vulnerable to disturbance or collection or have difficulty reproducing. According to this data, there is one hot spot located at the Robinson Elementary School.

Archaeologic and Historic Resource map (see appendix H)



However, there will be no effect on the community as identified by VCGI GIS data since the proposed improvements are located in an area already developed or disturbed. (see Natural and Cultural Resources Map in appendix H)

Flood Hazards

This project is not located in the 100-year flood zone of the Lewis Creek. The improvements considered in this study (i.e. gateways) typically do not inhibit water flow and do not have a significant impact on flood capacity.

Surface Waters

There is one stream located just south of the Big Hollow/VT RT. 116 intersection. The stream is channeled by the property owner and routed into a culvert under the road. The proposed improvements (repaving of the road) should not effect the stream and it's current path, and VTrans will take any necessary precautions.

Hazardous Wastes

According to the **Vermont Active Hazardous Sites List** offered by the Vermont Department of Conservation and Waste Management Division (DECWMD), as well as the EnvironHazmat_HAZSITES GIS layer, which is produced by the Vermont Center for Geographic Information and originated by the DECWMD, there is one known hazardous material site located within the project limits. This site located at the old general store does not interfere with the proposed upgrades and will not be adversely affected.

Archaeologic and Historic Resources

An archeological and historic resource assessment was completed by The University of Vermont Consulting Archaeology Program (UVM CAP), to evaluate potential cultural impacts by this project. The study sought to identify any previously recorded National Register (NR) eligible archeological resources in the direct vicinity of the study corridor and assessed the archeological sensitivity of all areas falling within the project. The final report submitted by UVM CAP concludes that although much of the project area is located in regions listed under the Vermont Register of Historic Places, there are no pre contact sites (previously found archaeological sensitive material) within the project area or any other reasons to assume the presence of historic or archaeological sensitive material within the proposed construction area. It is important to note, however that if the project does change and pursue further enhancements a further archaeological and historic review may be necessary. The full UVM CAP report can be found in Appendix H.

Public Land

The GIS data layer CONSPUB obtained from VCGI identifies publicly owned lands or protected lands. Public lands are likely to be maintained with a minimal degree of land development, and may allow multiple uses such as logging and recreation access. According to this data, the only publicly owned or protected lands within the study area are those of the Fire station and gravel pit and the Cota Recreational area. No proposed improvements will impact these public lands except to enhance public access.

Conclusion

Natural and cultural resources are minimal or non-existent in the project area and the project is permissible from a local, State and Federal perspective.

Table 1. Project Constraint Summary

	<i>Not Present</i>	<i>Minimal or No Impact</i>	<i>Further Study May be Necessary</i>
Natural/Cultural Resource			
Wetlands	X		
Significant Habitat		X	
Flood Hazard	X		
Historic Resources		X	
Hazardous Waste Sites		X	
Archaeological Resources	X		
Public Land		X	
Utilities			
Drainage Facilities		X	
Water/Sewer		X	
Electric/Telephone		X	

10.0 | Phasing

Table 2. Phasing Chart

The suggested timing of the enhancements proposed on the plan and in this report is indicated in the implementation table that follows.

	<i>Phase 1</i>	<i>Phase 2</i>	<i>Phase 3</i>
<i>Preferred Upgrades</i>			
Roadway Modificatons		X	
Gateways			X
"Back lots" trail		X	
Library Drop-Off	X		
Parsonage Road Intersection	X		

11.0 | Preliminary Cost Estimates

The preliminary cost estimate for the conceptual designs is presented in Table 3 on the following pages. It is important to note that none of these specific improvements have been engineered, so the costs for the schematic designs are based only on current quotes from respective retail companies, engineering firms, VT Agency of Transportation and a comparison with similar projects. When fully engineered and implemented they may vary considerably from this initial estimate. Moreover, at this point in the design development, there is no need for right-of-way or property acquisition. If, during the development of construction documents, this should become necessary, it is entirely possible that the final, built costs of the project could be as much as twice the current estimates. However, the preliminary estimates will provide the town with reasonable figures to use for planning purposes, including budgeting for infrastructure replacement costs and maintenance. Although regional and state funding may be used for the development of the project, maintenance of the facilities including winter snow and ice remains the responsibility of the town. A good rule of thumb, according to the VTrans Bicycle & Pedestrian Manual, is that 3-5% of infrastructure replacement costs should be spent on annual maintenance (e.g. if you spend \$100,000 to construct the enhancements, then \$5,000 should be budgeted for maintenance each year).

Table 3. Preliminary cost estimate

Estimate of Probable Costs			
ITEM	SIZE / QUANTITY	UNIT PRICE (installed)	TOTAL PRICE
LIBRARY ENTRANCE			
Rain Garden - Perennial Garden, 12" Deep with Overflow Outlet (Plantings 30" o.c., 1 gallon)	1	\$1,750.00 ea	\$1,750
Stone Retaining Wall - 2'-6" Dry-laid Fieldstone with Aggregate Backfill / Base	105	\$40.00 sff	\$4,200
Drop-off Area Fill at Retaining Wall	504	\$6.00 cy	\$3,024
Fine Grading at Grass Swale and Stone Wall	160	\$1.20 sy	\$192
Drainage Culvert at Existing Paved Path (Cut existing paving and repair)	1	\$200.00 ea	\$200
Reseeded Lawn (hydroseeding) at Rain Garden Area, Stone Wall, & Swale	1,740	\$0.15 sf	\$261
Pavement Marking at Drop-off Area	130	\$1.50 lf	\$195
Pedestrian Drop-off Sign - MUTCD Metal Sign	2	\$100.00 ea	\$200
Drop-off Area No Parking Sign - MUTCD Metal Sign	1	\$100.00 ea	\$100
		Subtotal	\$10,122
PARSONAGE ROAD INTERSECTION			
8' Painted Crosswalk (Striped)	40	\$1.50 lf	\$60
Pavement Marking at Stop Sign (24")	10	\$1.10 lf	\$11
Pedestrian Crossing Sign - MUTCD Metal Sign	3	\$100.00 ea	\$300
		Subtotal	\$371
BACK LOTS PATH			
7' Painted Crosswalk (Striped)	20	\$1.50 lf	\$30
Fence Break at Barbed Wire Fence	2	\$1,000.00 ea	\$2,000
Option 1: Wood Stairs - Pressure Treated	2	\$600.00 ea	
Option 2: Wood Kissing Gate - Cedar (Wheelchair Accessible)	2	\$1,000.00 ea	
Sign at Driveway for Children - MUTCD Metal Sign	2	\$100.00 ea	\$200
6' Gravel Path at Drop-off Area	1,260	\$2.50 sf	\$3,150
Optional: Painted Asphalt Speed Bump with MUTCD Metal Sign	1	\$325.00 ea	\$325
Optional: Pavement Marking at Parking Lot to Gravel Path		\$1.50 lf	\$0
		Subtotal	\$5,705
GATEWAYS NORTH & SOUTH			
"Welcome" Sign - 8' Wood Sign Integrated with Wood Rail Fence	2	\$3,500.00 ea	\$7,000
"Safe Travels" Sign - 8' Wood Sign Integrated with Wood Rail Fence	2	\$3,500.00 ea	\$7,000
Cedar Split Rail Fence - 10' Sections (North-8 Sections; South-8 Sections)	16	\$160.00 ea	\$2,560
Street Trees (2-2 1/2" cal.)	17	\$500.00 ea	\$8,500
		Subtotal	\$34,240
		Construction Subtotal	\$50,438
		10% Contingency	\$5,044
		10% Engineering/Planning/Design	\$5,044
TOTAL			\$60,526

Note: Not included- Fencing, patio, street signs