

ATTACHMENT B Historic Resource Assessment

Heritage Landscapes LLC
Broadreach Planning & Design
Bridge Street Bicycle & Pedestrian Feasibility Study, Richmond, VT
Historic Resources Assessment
10 November 2009

Heritage Landscapes conducted a field inspection of the project area on November 5, 2009 to assess potential historic resources in the project area. The focus of this review was the immediate areas along Bridge Street, including features in the right-of-way and the adjacent portions of abutting properties. Should the breadth of proposed improvements be broader than assumed for this review, the impacts to adjacent structures and other elements should be re-reviewed.

The goal of this review was to identify additional existing historic resources along the Bridge Street corridor that could potentially be affected by bicycle and pedestrian improvements. The Bridge Street Bridge and Round Church are both listed on the National Register of Historic Places, and additional structures are listed on the State Register of Historic Places. During field review, several additional historic resources were identified in the project area. Specific historic resources identified during field review are addressed in the following paragraphs. While the additional historic resources discussed in this review may have historic value, they are not necessarily eligible for official listing as historic resources at the local, state, or federal level.

Cemetery

The Cemetery, located on the east side of Bridge Street, represents an intact historic resource. The Cemetery has retained its current size and location at least since 1869, when it appeared on the Beers Atlas for Richmond, and its historic integrity remains high. At the periphery, the Cemetery is visually contained by tree plantings; the trees along Bridge Street provide separation between the busy street and the historic cemetery landscape.

Too great an encroachment on the Cemetery would diminish the visual separation between the street and the cemetery, and undermine the Cemetery's character as an intact, contained, historic resource. Additionally, encroachment could endanger the integrity of several burial markers positioned on the slope adjacent to the road, roughly in line with the existing trees.



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Town Green

South of the Winooski River, the Round Church Green is an important historic resource, though the integrity of the Green has diminished slightly over time due to the loss of a portion of the landscape. The Round Church was built in 1812-1814 as a meetinghouse and place of worship, and the adjacent Green historically served as an important public landscape at the core of the community. The original western section, across Bridge Street from the Green core, is no longer legible as part of the common, though it is still town-owned. Considerable building setbacks and the position of residential walks terminating well before the street suggest the historic placement of the original Green.

Today, the Round Church Green is characterized by open lawn and trees both lining the street and scattered throughout the landscape. The Green serves as the hub around which activity takes place in this southern portion of the project area, and it is important to the legibility of the historic landscape. Therefore, impacts to the core Green should be avoided. If necessary, encroachments to the western parcel of the historic, original Green are preferable than to the existing, intact eastern parcel.



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Bridge Street Bridge

The Bridge Street Bridge over the Winooski River, a National Register-listed resource, is an important resource in the project area. Any proposed project should not adversely impact this historic structure.



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Retaining Walls

Retaining walls are positioned in several locations in the project area. South of the bridge, two retaining walls are found on the west side of the street. The more northerly wall, seen in the foreground in the following image, may have been historic. It has now been removed and is being replaced with a larger stone retaining wall. The second retaining wall, seen in the background of the image, does not appear to be historic.



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Additional Small-Scale Historic Resources

A dressed piece of marble is located at the southeast corner of Bridge Street and Huntington Road is a potentially historic feature. The stone may be a portion of historic curbing or a dismount used to assist riders when descending from their horses.



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ATTACHMENT C Archeological Resources Analysis

**Archaeological Resources Assessment for the Proposed Town of Richmond Bridge Street
Bicycle and Pedestrian Feasibility Study, Richmond, Chittenden County, Vermont**

Submitted to:

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Report No. 564

October 13, 2009

Archaeological Resources Assessment for the Proposed Town of Richmond Bridge Street Bicycle and Pedestrian Feasibility Study, Richmond, Chittenden County, Vermont

Project Description

The Town of Richmond will work with the landscape architectural firm of Broadreach Planning & Design to undertake a feasibility study for the proposed Richmond Bridge Street Bicycle and Pedestrian Feasibility Study, Richmond, Chittenden County, Vermont (Figure 1). The proposed project will see the construction of a multipurpose path in Richmond, Vermont, between Depot Street and Huntington Road. The proposed project area will include the Winooski River floodplain and adjacent terraces within the Town of Richmond.

The University of Vermont Consulting Archaeology Program (UVM CAP) conducted an Archaeological Resources Assessment (ARA) of the proposed project as part of the Section 106 permitting process and identified several landforms as sensitive for precontact Native American archaeological sites.

Study Goal

The goal of an ARA (or “review”) is to identify portions of a specific project’s Area of Potential Effects (APE) that have the potential for containing precontact and/or historic sites. An ARA is to be accomplished through a “background search” and a “field inspection” of the project area. For this study, reference materials were reviewed following established guidelines. Resources examined included the National Register of Historic Places (NRHP) files; the Historic Sites and Structures Survey; and the USGS master archaeological maps that accompany the Vermont Archaeological Inventory (VAI). Relevant town histories and nineteenth-century maps also were consulted. Based on the background research, general contexts were derived for precontact and historic resources in the study area.

Precontact Native American Site Potential

Several archaeological studies have been carried out in the general project area in the recent past, as part of unrelated development projects in the area, such as the replacement of the Bridge No. 31, the Bridge Street Bridge (Hartgen Archaeological Associates, Inc 2007; Kenny and Crock 2008), and work at the former Creamery Complex (Kenny and Crock 2009). Much of the discussion on archaeological site potential in the proposed project area stems from these studies.

The proposed project area covers an area that, in general, is recognized as archaeologically sensitive, since it borders the Winooski River, including the active floodplain and adjacent terraces. The Vermont Division for Historic Preservation’s “Environmental Predictive Model for Locating Archaeological Sites” identifies major alluvial floodplains, such as that of the Winooski River, as automatically reaching the sensitivity threshold requiring a site inspection. One reason for this is that major rivers in Vermont were major thoroughfares for

transportation between the Champlain Lowlands to the Connecticut River Drainage in the precontact era. High concentrations of precontact Native American sites have been identified along the banks of the Winooski River just downriver from the Town of Richmond. As a result, the probability for ancient Native American settlements located on these floodplains is high.

Although there are no known archaeological sites within the limits of the proposed project area, a search of the Vermont Archaeological Inventory (VAI) indicates that there are four reported archaeological sites within approximately 3.2 km (2 mi) of the current project area (Figure 2). A description of these four sites is presented in Table 1. Sites VT-CH-639 and VT-CH-864 both have precontact Native American components. One of these sites, VT-CH-864, is also located near the boundary between the level floodplain of the Winooski River and the beginning of the valley’s higher, geologically older terraces; similar topographic features are found within the proposed project’s Area of Potential Effects (APE). The VDHP Archaeological Information System Model indicates that the current project area is considered potentially sensitive for precontact Native American material. Several factors, principally the project area’s topography as well as its proximity to water and wetland resources, contribute to this assessment.

Table 1. Description of known archaeological sites (taken from Kenny & Crock 2009).

Site#	Type	Sub-Type	Time Period	Description
VT-CH-299	Historic	Ruin	Unknown	
VT-CH-639	Precontact	Unknown	Unknown	Lithic Debitage; Two Features
VT-CH-689	Historic	Cellar	Unknown	
VT-CH-864	Precontact Historic	Unknown Standing Structure	Unknown 19 th Century	Lithic Debitage Monitor Barn

Historic Period Site Potential

Several structures within the proposed project’s Area of Potential Effects, as diagrammed, are listed on the State Register of Historic Places. South of the Winooski River, structures located along Cochrane Road, and on the southeast corner junction of Bridge Street, Thompson Street, Huntington and Cochrane roads. North of the Winooski River, listed structures are located on Esplanade Street and off Bridge Street behind the Cemetery. This last structure is the old Farmer’s Co-op building. Finally, the steel truss, Bridge Street Bridge is listed on the State Register. The Bridge Street Bridge also was listed on the National Register for Historic Places in 1990. The other structure within the project APE is the Round Church located back on Bridge Street, one block south of the Winooski River, which is listed on both the State and National Registers.

Structures depicted on the historic 1857 Walling’ Map (Figure 3) and the historic 1869 Beers Atlas (Figure 4) do not include any structures that are no longer standing within the

proposed project area. The principal exception to this is the Steam Mill located on the south side of the Winooski River to the immediate southwest of the Bridge Street Bridge as depicted on the Walling's map (see Figure 3). By 1869 and the Beers Atlas, this structure is no longer depicted (see Figure 4). The most serious disturbance to historic properties within the proposed project area was the flood of the Winooski River in 1927. An aerial photograph of the Bridge Street Bridge crossing in Richmond shortly after the flood illustrates the degree of the damage caused by the flood (Figure 5). Both the north side of the river and especially the south side were heavily impacted by the flood, with isolated pockets of scouring throughout. One historic period building that may have been damaged by the flood was an apartment building located to the immediate southwest of the Bridge Street Bridge (see Figure 5). This apartment building was abandoned after the 1927 flood and finally razed in the 1940s. Whether this building was built upon the foundations of the "Steam Mill" depicted in the 1857 Walling's map is not known. Today, a small concrete foundation is located on the spot of the historic period Steam Mill and apartment building complex (Figure 6). At the time of the field inspection, a large trench was being excavated between the existing concrete foundation and Bridge Street for the placement of PVC piping.

Field Inspection

A field inspection of the proposed project's APE was undertaken on October 9, 2009 by Dr. Charles Knight, Assistant Director of the UVM CAP. The entire project area was walked and all archaeologically sensitive landforms were noted. Several large landforms were identified as archaeologically sensitive, due to their proximity to the Winooski River (Figure 7). Since the proposed project crosses active and ancient floodplains and terraces of the Winooski River, all areas of potentially intact soils within this area are archaeologically sensitive for precontact Native American sites. At the same time, the areas adjacent to the on and off ramps of the Bridge Street Bridge along Bridge Street are not archaeologically sensitive, due to extensive disturbances associated with the recent 2009 bridge replacement project and the 1927 flood that scoured this portion of the Winooski River floodplain. Scouring also occurred north of the Winooski River, such as along Esplanade Street where "the roadbed...was washed out to a depth of several feet" (Riggs 2007:381). Nonetheless, portions of the active floodplain not scoured by known flooding, and intact portions of the adjacent terraces, including residential yards, landscaped medians, and road right-of-ways, were identified as archaeologically sensitive (Figures 8-11).

Conclusions

The Town of Richmond will work with the landscape architectural firm of Broadreach Planning & Design to undertake a feasibility study for the proposed Richmond Bridge Street Bicycle and Pedestrian Feasibility Study, Richmond, Chittenden County, Vermont. The proposed project will see the construction of a multipurpose path in Richmond, Vermont, between Depot Street and Huntington Road. The proposed project area will include the Winooski River floodplain and adjacent terraces within the Town of Richmond. As part of the Section 106 permit review, the UVMCAP conducted a filed inspection along the proposed

project alignment and several areas of archaeological sensitivity were identified. Due to the large size of the proposed project limits, only major landforms within the project limits were identified as archaeologically sensitive. It must be noted that intact portions of residential yards along Bridge Street, especially south of the Winooski River on a high terrace also are archaeologically sensitive. As a result, a narrow, linear pedestrian path, even if it is kept within the existing right-of-way of Bridge Street may impact intact landforms and thus have the potential for disturbing intact archaeological sites. As a result, a Phase I site identification survey is recommended for those portions of the proposed project that fall within archaeologically sensitive areas.

Charles Knight, Ph.D.
Assistant Director

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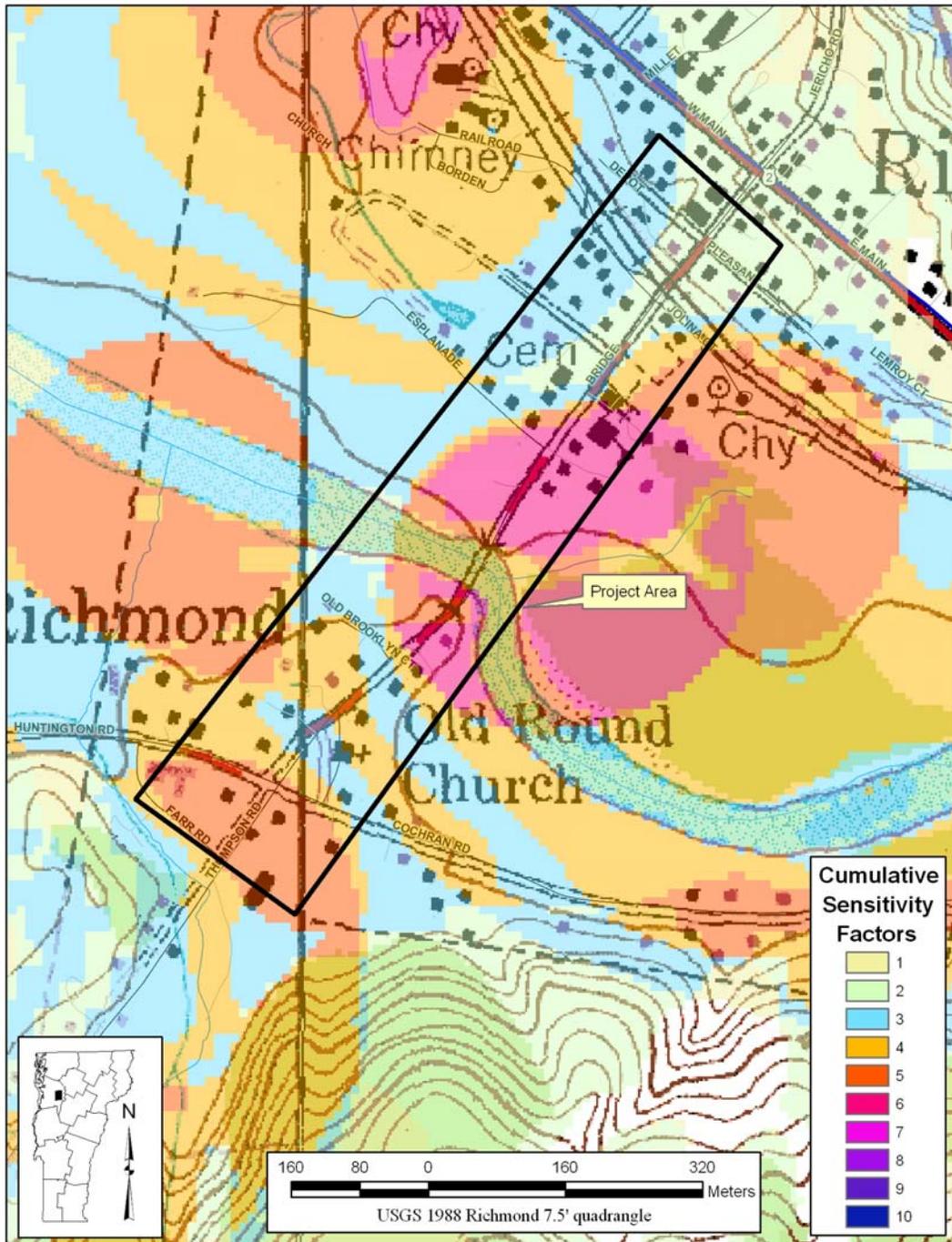


Figure 1. Map showing the location of the proposed Town of Richmond Bridge Street Bicycle and Pedestrian Feasibility Study in relation to archaeological sensitivity factors, Richmond, Chittenden County, Vermont.

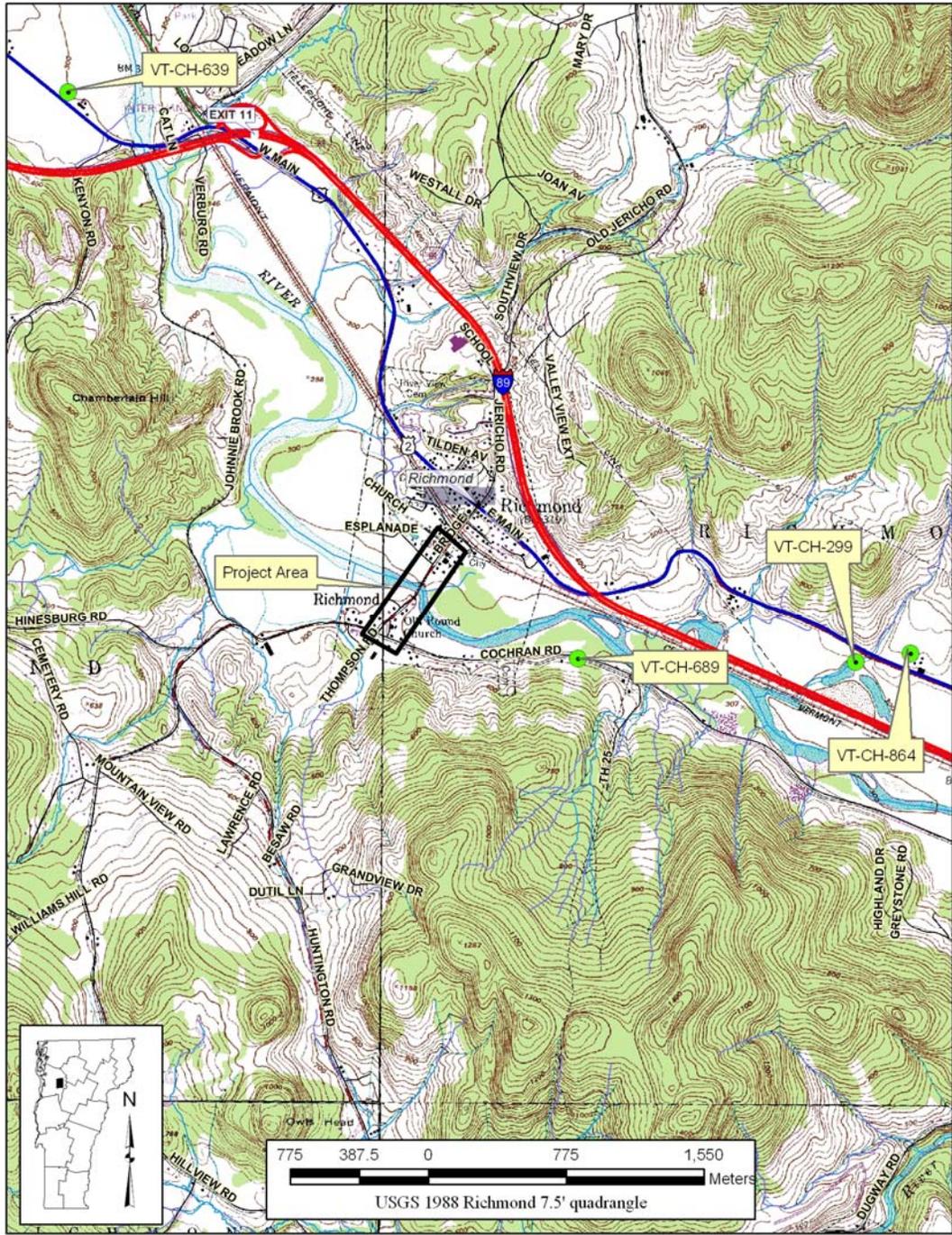


Figure 2. Map showing the location of the proposed Town of Richmond Bridge Street Bicycle and Pedestrian Feasibility Study area and nearby archaeological sites, Richmond, Chittenden County, Vermont.

RICHMOND

Town of Richmond

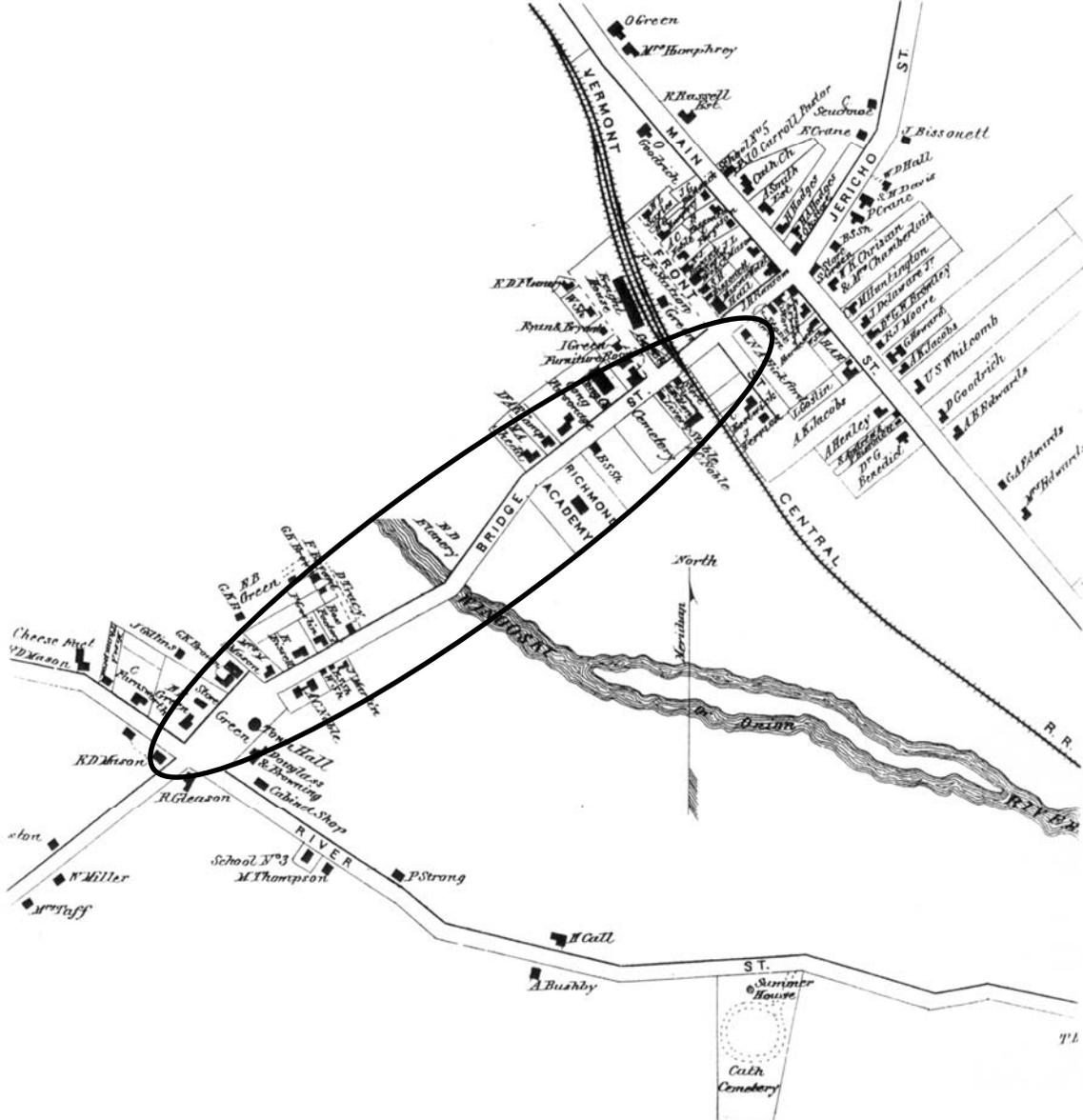


Figure 4. Historic 1869 Beers Atlas showing the project area of the proposed Bridge Street Bicycle and Pedestrian Feasibility Study Area, Richmond, Chittenden County, Vermont.

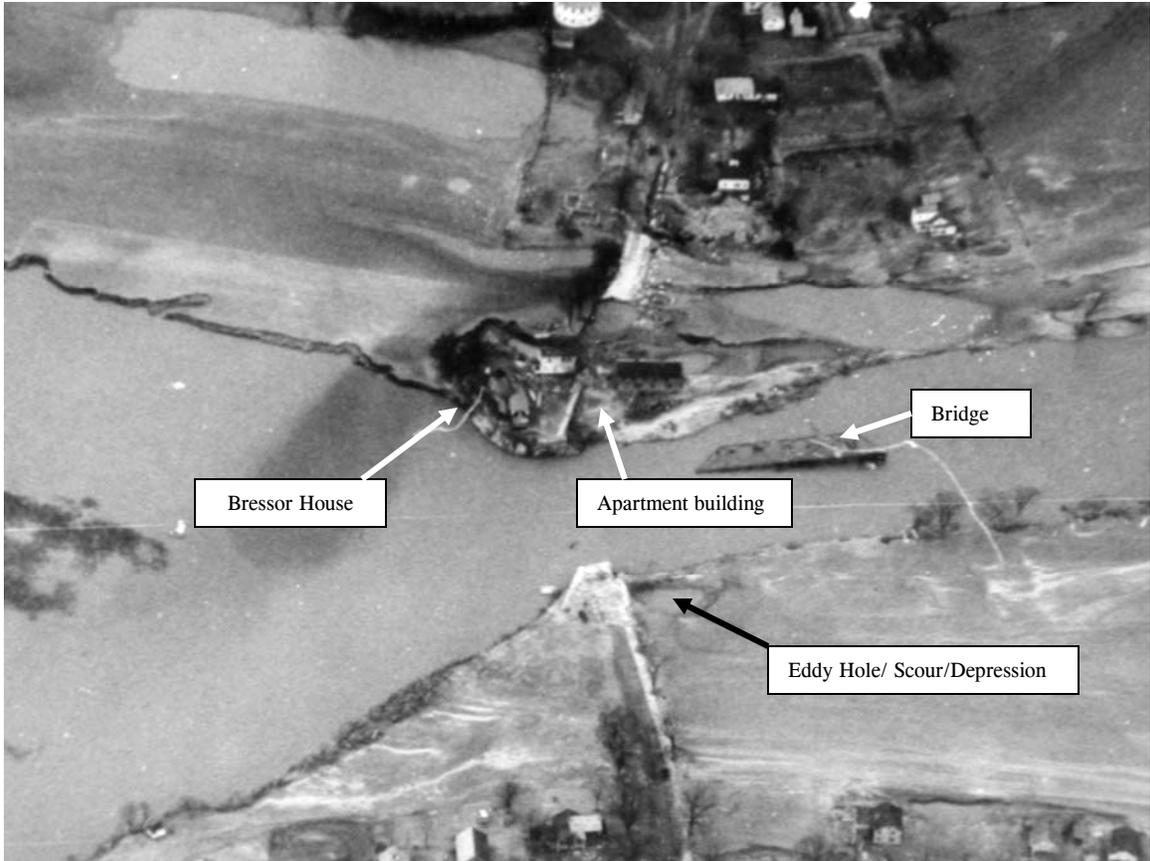


Figure 5. Aerial photograph of Richmond, Vermont, immediately after the flood of 1927 (taken from Kenny and Crock 2008).



Figure 6. Modern structure/foundation in the southwestern quadrant of the project area. This feature is located near the site of the late 19th to early 20th century apartment building (taken from Kenny and Crock 2008).

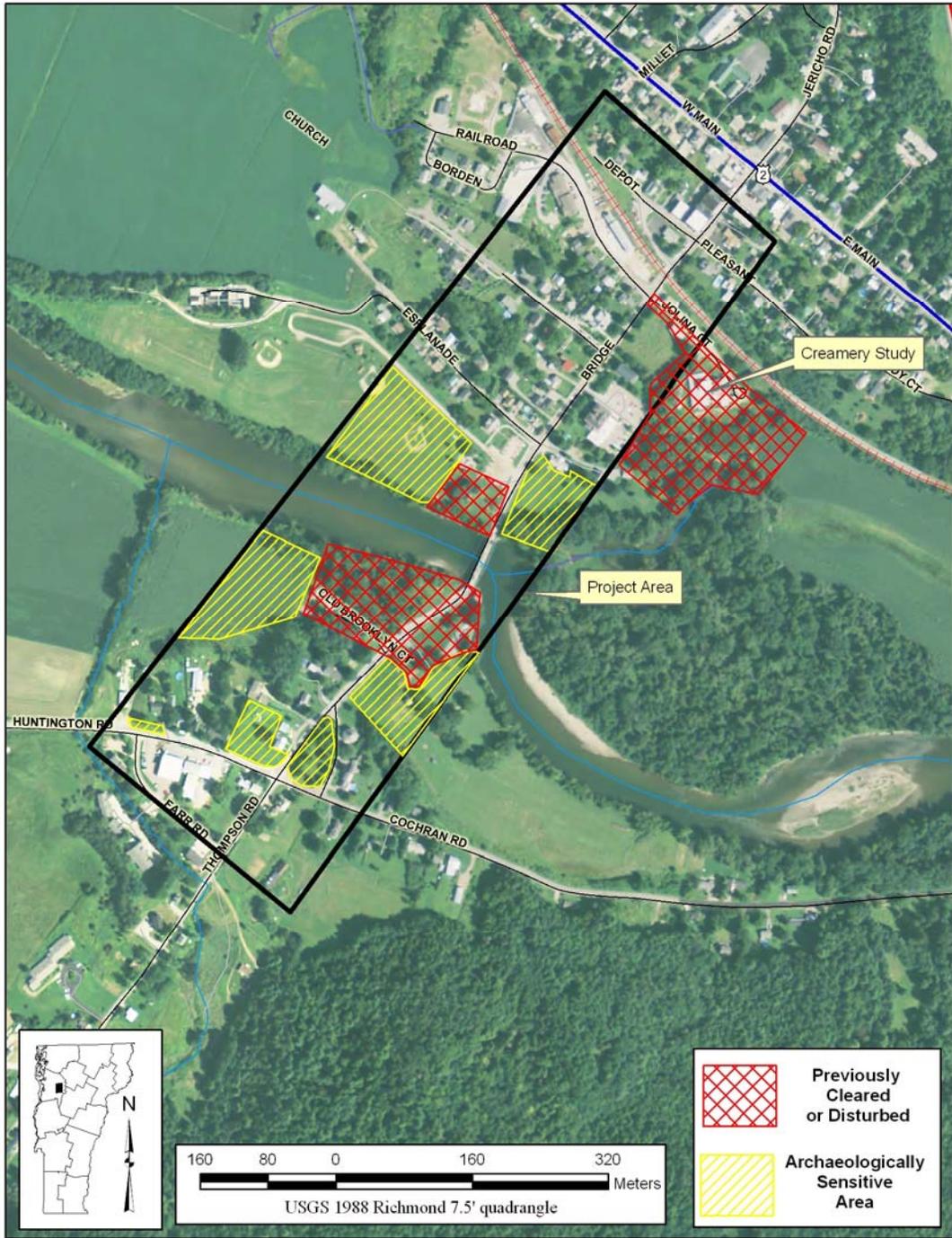


Figure 7. Map showing the archaeologically sensitive portions of the proposed Town of Richmond Bridge Street Bicycle and Pedestrian Feasibility Study, Richmond, Chittenden County, Vermont.



Figure 8. Aerial photograph of the general project area in 1937 (taken from Kenny and Crock 2008). North is at the top of the image.



Figure 9. Aerial photograph of the general project area in 1962 (taken from Kenny and Crock 2008). North is at the top of the image.



Figure 10. Aerial photograph of the general project area in 1974 (taken from Kenny and Crock 2008). North is at the top of the image.



Figure 11. Aerial photograph of the general project area in 1988 (taken from Kenny and Crock 2008). North is at the top of the image.

Appendix B

Preliminary Alternatives

(A description of all the alternatives initially considered as part of the review process)

Town of Richmond, Vermont

**Bridge Street Bicycle & Pedestrian
Feasibility Study**

Appendix B: Alternatives



Submitted by:

Broadreach Planning & Design

In conjunction with

Lamoureux & Dickinson Consulting Engineers, Inc

Heritage Landscapes LLC.

University of Vermont Consulting Archeological Program

February 26, 2010

INTRODUCTION

This memo describes potential alternatives for improving bicycle and pedestrian circulation along Bridge Street in Richmond Village. The information in this memo served as the basis for the public work session on January 19, 2010. It outlined a wide variety of options to be considered by the public. The project consultant expected that the public would condense, combine, or eliminate some of the alternatives so that a more concise set of recommendations could be developed for Bridge Street and the Study Area.

The alternatives are based on the following: Project Steering Committee meetings; Public stakeholders' session (11/5/09); meetings with individual business and property owners; Meeting with Richmond Area Business Association (RABA) Main Street Committee (10/21/09); planning *charrette* with project team (11/12/09). A much larger group of initial ideas discussed by the Project Steering Committee (PSC) provided the basis for the alternatives described in this memo; Attachment A, an earlier version of this document developed for the discussions with the PSC, includes a list of these initial alternative ideas.

Each of the alternatives, except for those presented in the last category, Other Alternatives, were meant to be single options that would not be combined with the other options in the category. Those items in the Other Alternatives category could be developed in conjunction with other alternatives within that category or the other categories.

In addition, there are some improvements that were presented as options for implementation, irrespective of whatever other alternatives are selected.

There are numerous assumptions which guide the consideration of roadway or other alternatives. These include:

- New crosswalks should be added on all side streets;
- A new sidewalk on the north side of Railroad Street should be installed as part of the new market development;
- No new on-street parallel parking along Bridge Street south of the railroad;
- Adequate pedestrian access and other improvements to the new Town parking lot close to Depot Street, north of the railroad;
- The current location of the roadway allows for some alternatives involving new sidewalks and widened roadway without the need to acquire right-of-way from individual property owners; and
- New crosswalks on Bridge Street, Railroad Street, and Jolina Court, when and if the two side streets are improved.

The idea of burying utilities along Bridge Street was brought up in several forums, including PSC meetings, conversations with property and business owners, and the public stakeholders meeting. That idea has merit, especially in the section of Bridge Street where utility poles are actually in the roadway (between Church Street and Esplanade).

The following figures and table are presented as part of this memo:

- **Figures 1 to 11** are each depicted in “Proposed Possible Cross Sections along Bridge Street & Huntington Road”;
- **Figure 12a** depicts the mapped alternatives for the north end of Bridge Street;
- **Figure 12b** depicts the mapped alternatives for the south end of Bridge Street; and
- **Table 4-1** provides a comparison of the different alternatives.

ROADWAY RIGHT-OF-WAY ALTERNATIVES

BRIDGE STREET (NORTH OF THE BRIDGE FROM THE NORTH END OF DEPOT STREET)

Alternative #1 – Restripe the existing 24-foot roadway surface to create two ten-foot travel lanes and, at a minimum, a two-foot wide paved shoulder on each side. Reclaim the green space between the sidewalk and the roadway for the section of road between Church Street and Esplanade. Repave the existing west side sidewalk with asphalt. Add additional street trees as appropriate. **Figure 1** shows the cross section for this Alternative.

Alternative #2 – Add up to two feet of additional pavement to the east side of the road to create a 26-foot wide roadway and repave/reclaim the roadway and/or restripe the road to create to ten-foot-travel lanes with a three-foot paved shoulder on each side of the pavement. Reclaim the green space between the sidewalk and the roadway for the section of road between Church Street and Esplanade. Reconstruct the existing sidewalk with concrete. Add additional street trees as appropriate. **Figure 2** shows the cross section for this Alternative.

Alternative #3 – Add two feet of additional pavement to the east side of the road and repave/reclaim the roadway and/or restripe the road to create two ten-foot-travel lanes with a three-foot paved shoulder on each side of the pavement. Reclaim the green space between the sidewalk and the roadway for the section of road between Church Street and Esplanade. Add a sidewalk along the east side of the road adjacent to the curb between Pleasant Street and the Railroad Street intersection, using a retaining wall up to about five feet high between Pleasant Street and the Railroad as needed. Place the curb at grade in front of Sonoma Station to maintain the off street parking. Reconstruct the existing sidewalk on the west side of the street with concrete. Add additional street trees as appropriate. **Figure 3/4** shows the cross section for this Alternative.

Alternative #4 – Add two feet of additional pavement to the east side of the road and repave/reclaim the roadway and/or restripe the road to create two ten-foot-travel lanes with a three-foot paved shoulder on each side of the pavement. Reclaim the green space between the sidewalk and the roadway for the section of road between Church Street and Esplanade. Add a sidewalk along the east side of the road between Pleasant Street and the Town

Offices, with the sidewalk adjacent to the curb north of the railroad and with a two-foot green strip between the curb and the sidewalk south of Railroad Street. Place the sidewalk behind a curb in front of Sonoma Station and remove direct access from Bridge Street to the off street parking. Use two retaining walls, one between Pleasant Street and the Railroad as needed up to approximately five feet high and a smaller, dry laid stone retaining wall approximately one foot high along the edge of the cemetery. Reconstruct the existing sidewalk with concrete. Add additional street trees as appropriate. **Figure 3/4** shows the cross section for this Alternative.

Alternative #4a – The same as Alternative 4 except that the new sidewalk extends on the east side of Bridge Street to Esplanade, with a new crosswalk at the end of the sidewalk.

BRIDGE STREET (SOUTH OF THE BRIDGE)

Alternative #5 – Create a new curb four feet to the east of the existing west side curb to create a four-foot green space between the existing sidewalk and new curb. Add four feet of pavement on the east side of the roadway and restripe the road to create two ten-foot travel lanes and two four-foot paved shoulders. If needed, reclaim the road to shift the center crown as needed to coincide with the new center line of the roadway. Relocate the two utility poles on the east side of the road to the west side in the newly created green space. Add new street trees as possible. **Figure 5** shows the cross section for this Alternative.

Alternative #5a – This is the same as Alternative 5 except that instead of four feet added to Bridge Street, it adds two feet of pavement on the east side of the roadway and restripes the road to create two ten-foot travel lanes and two three-foot paved shoulders. **Figure 5a** shows the cross section for this Alternative.

Alternative #6 – Create a new curb two feet to the east of the existing west side curb to create a two-foot green space between the existing sidewalk and new curb. Add two feet of pavement on the east side of the roadway and restripe the road to create two ten-foot travel lanes and two four-foot paved shoulders. Add new street trees as possible. **Figure 6** shows the cross section for this Alternative.

(Alternative #6a) – This is the same as Alternative 6 except that Bridge Street is not widened and the existing pavement is restriped to create two ten-foot travel lanes and two three-foot paved shoulders. **Figure 6a** shows the cross section for this Alternative.

Alternative #7 – Restripe the existing 28-foot side roadway to create two ten-foot lanes with a four-foot shoulder on each side. Add new street trees as possible. **Figure 7** shows the cross section for this Alternative.

HUNTINGTON ROAD

Alternative #8 – Restripe the roadway to create two ten-foot lanes with a two-foot wide paved shoulder on either side. Extend the existing sidewalk on the north side of the street approximately 50 feet to the existing postboxes, which will need to be relocated further west. Add a crosswalk on Huntington Road at the end of the sidewalk, cutting through the existing curbed parking island. Close the center access point with a new curbing, leaving the eastern and western access points open. Add street trees as possible. **Figure 8** shows the cross section for this Alternative.

Alternative #9 – Restripe the road to create two ten-foot travel lanes with a two-foot wide paved shoulder on each side. Add a five-foot sidewalk on the south side of the road with a two-foot green strip between the sidewalk and the curb. Add street trees as possible. **Figure 9** shows the cross section for this Alternative.

Alternative # 10 – Add two feet of pavement to the south side of the roadway and restripe to create two ten-foot travel lanes with a three-foot wide paved shoulder on each side. Add street trees as possible. **Figure 10** shows the cross section for this Alternative.

Alternative #11 – Add two feet of pavement to the south side of the roadway and restripe to create two ten-foot travel lanes with a three-foot wide paved shoulder on each side. Add a curb on the south side of the road with an adjacent, five-foot sidewalk. Extend the sidewalk west to the edge of the existing commercial parking area. Continue the pedestrian way via striping through the parking area west to Farr Road. Add street trees as possible. **Figure 11** shows the cross section for this Alternative.

BRIDGE STREET: RAILROAD STREET TO RAILROAD

NOTE: These alternatives for that section between the railroad and Railroad Street on the west side of the road build on the choice of which width is most appropriate for the rest of Bridge Street.

Bridge Street Railroad Alternative #1 – Add a curb at the appropriate location. Add a five-foot wide, concrete sidewalk two feet behind the curb with a 2-foot wide grass strip between the walk and the curb. **Figure 12** shows the cross section for this alternative.

Bridge Street Railroad Alternative #2 – Add a curb at the appropriate location and back with a seven-foot concrete sidewalk. **Figure 13** shows the cross section for this alternative.

In order to create an overall friendlier environment for pedestrians and bicyclists on Bridge Street, it may be appropriate to consider the addition of small, pedestrian scale resting points. One alternative is suggested at this time to address this potential.

Mini Park Alternative #1 – Develop a small pedestrian seating area south of the railroad tracks on the west side of Bridge Street in front of the new market to take advantage of the views east towards Camels Hump.

BRIDGE STREET BY VOLUNTEERS GREEN

Bridge Street Volunteers Green Alternative #1 – Link the existing sidewalks on either side of the parking lot entrance via a painted crosswalk. Regrade the parking area to create a small rise to keep gravel and debris from flooding into the roadway during rainstorms. Add a new storm drain in the parking area to eliminate potential ponding that the regrading could cause.

Bridge Street Volunteers Green Alternative #2 – Link the existing sidewalks on either side of the parking lot entrance with a new concrete sidewalk placed at grade through the asphalt. Regrade the parking area to create a small rise to keep gravel and debris from flooding into the roadway during rainstorms. Add a new storm drain in the parking area to eliminate potential ponding that the regrading could cause.

Bridge Street Volunteers Green Alternative #3 – Link the existing sidewalks on either side of the parking lot entrance with a new raised concrete sidewalk. Regrade the parking lot entrance to gradually rise and fall to meet the grade of the new sidewalk. Add a new storm drain in the parking area.

BRIDGE STREET/HUNTINGTON ROAD INTERSECTION IMPROVEMENTS

Intersection Improvement Alternative #1 – Add street trees along the northwest corner of the intersection to begin to close in the intersection.

Intersection Improvement Alternative #2 – Reduce the turning radius of the turn from Cochran Road to Bridge Street at the southwest corner of the Round Church Green. This will reduce the overall amount of pavement in the intersection which leads to slower vehicular traffic and allows drivers more time to notice and react to pedestrians in and around the intersection.

Intersection Improvement Alternative #3 – Reduce the turning radius of the turn from Bridge Street to Huntington Road on the northwest corner of the intersection. This could bring the edge of the roadway back into the existing right-of-way and make it more difficult to make the turn at speed higher than the posted speed limit of 25 mph.

LIGHTING ALTERNATIVES FOR THE ENTIRE STUDY AREA

Lighting #1 – Maintain the existing cobra head light fixtures but add additional fixtures to create a more even lighting levels along the length of Bridge Street.

Lighting #2 – Replace the existing cobra head light fixtures with a more pedestrian scale light fixture to match as much as possible the light fixtures used on Church Street, mounted on the existing utility poles to create a more even yet lower height light level along the length of Bridge Street.

Lighting #3 – Replace the existing cobra head light fixtures with a more pedestrian scale light fixture that matches those already used on Church Street, mounted on new poles, to create a more even yet lower height light level along the length of Bridge Street.

OTHER ALTERNATIVES

The following four alternatives are meant to improve the overall condition of walking and bicycling on Esplanade. They are meant to address the anticipated increase in truck traffic going to and from the sewage treatment plant, to minimize the number of vehicles bringing park users that park on Esplanade, both of which create difficult walking and bicycling conditions on the street.

Esplanade Alternative #1 – Extend the existing concrete sidewalk on the south side of the east end of the street approximately 20 feet further west to the bakery access drive/entrance walk. Add a crosswalk diagonally across the street to the north side. Reconstruct the existing concrete sidewalk with a five-foot wide sidewalk to the west end of the street.

Esplanade Alternative #2 – Repave and widen Esplanade to a consistent minimum width of 20 feet to accommodate bicycle travel.

Volunteers Green Access Road Alternative #1 – Add head-in parking facing south along the side of the road, after confirming the acceptability of this addition with the adjacent land owners to the north. Add a crushed gravel path along the south side of the parking linking the west side of the park with the east side parking lot near Bridge Street.

Volunteers Green Access Road Alternative #2 – Upgrade the park road to 20 feet wide and provide a link to the sewer treatment plant. Add a crushed gravel pedestrian path along the south side of the road linking the west side of the park with the east side parking lot. Remove the link between Esplanade and the sewer treatment plant.

RIVER CROSSING

The current Bridge Street bridge across the Winooski River is approximately 18 feet wide, with nine-foot wide travel lanes in each direction. A five-foot wide sidewalk is cantilevered from the west side of the bridge. Bicycle access is poor across the bridge. For those comfortable doing it, one of the best ways to cross the road on a bicycle is to move to the center of the lane you are in and ride across the bridge - “taking the lane” and preventing motor vehicles to pass the bicycle on the bridge. The other way is to dismount move to the

sidewalk and walk the bicycle across the bridge. The most common way of crossing the bridge on bicycle appears to be riding on the sidewalk.

Few alternatives for crossing the river appear to be viable. To date, the following alternatives have been initially offered:

- Widening the sidewalk to six or eight feet wide;
- Constructing a new prefabricated, single span bicycle/pedestrian bridge to the west of the existing bridge; and
- Instigating a permanent pedestrian/bicycle ferry.

Each of these options appears to have at least one insurmountable obstacle that would keep it from being a feasible solution. However, there could be some unrealized potential in any of them, so they should be at least considered and discussed before being eliminated.

One last option, which is possible, is to provide “share the road” signs on the approaches to the bridge and/or other notices to bicyclists to dismount and use the sidewalk.

Table 4-1: Comparison of Alternatives

Alternative	Positive Aspects	Negative Aspects	Relative Costs
Bridge Street North			
#1 - 10' travel lane & 2' paved shoulder	Minimal Construction; no cemetery impact	Minimal improvements for less experienced bicyclists; requires additional bicycle facility improvements	\$
#2 - 10' travel lane & 3' paved shoulder	Minimal cemetery impact; minimal construction; links two sides of the railroad	Requires pavement overlay	\$\$
#3 - 10' travel lane and 3' paved shoulder, new east side sidewalk to Railroad St.	Better pedestrian access south of railroad; links two sides of railroad; new stone wall sets off cemetery	Requires pavement overlay; impacts to edge of cemetery	\$\$\$
#4 - 10' travel lane and 3' paved shoulder, new east side sidewalk to Town Offices.	Better pedestrian access south of railroad with full link to Town offices; links two sides of railroad; new stone wall sets off cemetery	Requires pavement overlay; impacts to edge of cemetery	\$\$\$
Bridge Street South			
#5 - New 4' green space & 10' travel lane and 4' paved shoulders	Separates sidewalk from roadway; improves bicycle conditions; enhances views of Round Church	Extends roadway 4 feet to the east; requires pavement overlay; potential impacts to Round Church Green and archeological resources	\$\$\$
#6 - New 2' green space & 10' travel lane and 4' paved shoulders	Separates sidewalk from roadway; improves bicycle conditions;	Extends roadway 2 feet to the east; requires pavement overlay; potential impacts to Round Church Green and archeological resources	\$\$
#7 - 10' travel lane and 4' paved shoulders	Improves conditions for bicyclists; minimal costs		\$

Huntington Road			
#8 - 10' travel lanes and 2' paved shoulders	Minimal costs; Maintains existing road cross section	Minimal improvements for less experienced bicyclists; slight improvements for pedestrians.	\$
#9 - 10' travel lanes and 3' paved shoulders	Improves conditions for bicyclists; minimal improvements for pedestrians	Takes 2 feet of grass; requires pavement overlay	\$\$
#10 - 10' travel lanes and 3' paved shoulders & add curb and 5' sidewalk	Improves conditions for bicyclists; Improves conditions for pedestrians	Takes 7 feet of grass; requires pavement overlay	\$\$\$\$
#11 - 10' travel lanes and 3' paved shoulders & add 5' sidewalk with a two foot green space	Improves conditions for bicyclists; Improves conditions for pedestrians	Takes 9 feet of grass; requires pavement overlay	\$\$\$
Bridge Street Railroad			
#14 - curb & 5' sidewalk with green strip	Improves pedestrian circulation; creates separation between vehicles and pedestrians; defines corner and truck turning radius for Railroad Street	Ties block more to residential southern portion of Bridge Street rather than commercial northern portion	\$\$
#15 - curb & 7' sidewalk	Improves pedestrian circulation; creates a wider space for pedestrians adjacent to the road; defines corner and truck turning radius for Railroad Street; links two sides of the railroad		\$\$
Lighting Alternatives			
#1 - additional cobras	Creates consistent light levels	Does not enhance Village character or pedestrian circulation	\$
#2 - new fixtures on existing poles	Creates pedestrian scale lighting; adds to village character		\$\$
#3 - new fixtures on new poles	Creates consistent light levels; enhances pedestrian focus of roadway; enhances Village character	requires locating new posts and underground wiring in existing or newly created green strips	\$\$\$\$
Intersection Alternatives			
#1 Street Trees	Will eventually slow traffic		\$
#2 Reduce Radius	Assists pedestrian crossings; may slow traffic; provides easier turning for bicyclists	Could slow traffic and create slight vehicular back ups	\$

Other Alternatives			
Esplanade #1	Improves pedestrian circulation	Potentially changes character of street; uses lawn space for sidewalks; Potential floodplain permit issues	
Esplanade #2	Improves bicycle circulation	Potentially changes character of street; uses lawn space for sidewalks	
Park Access Road #1	Adds parking to park and removes parking pressure on Esplanade; creates defined pedestrian access through the park	Violates earlier agreement with Esplanade landowners; requires further discussion with land owners; uses more park land for parking; potential impacts to archeological resources; Floodplain permit requirements	
Park Access Road #2	Removes trucks sewage treatment trucks from Esplanade	Puts trucks in park; potential impacts to archeological resources; Floodplain permit requirements	
Mini Park #1	Creates pedestrian destination on south side of railroad tracks; allows enjoyment of eastern views down railroad corridor to Camels Hump	Requires use of private land; view from available location partially blocked by railroad signals	

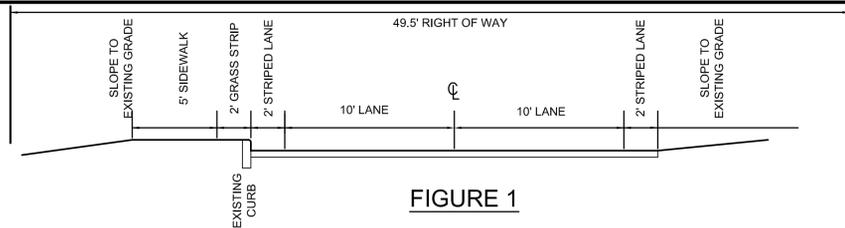


FIGURE 1

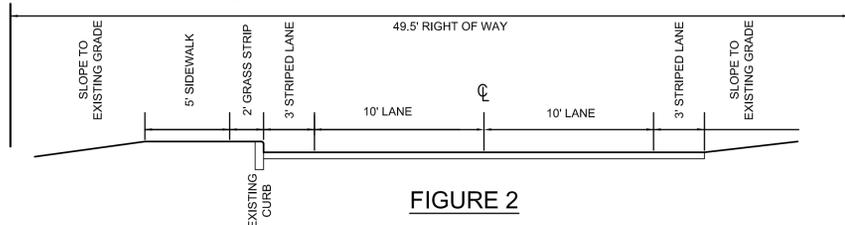


FIGURE 2

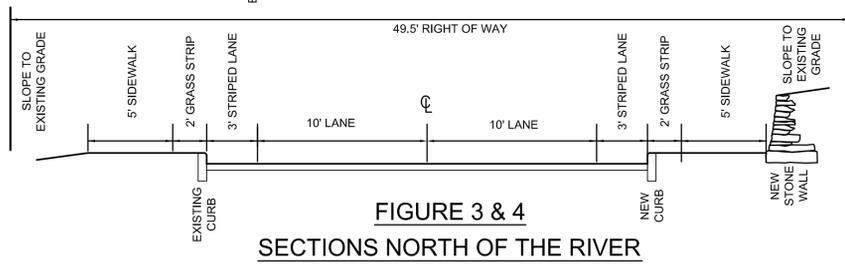


FIGURE 3 & 4
SECTIONS NORTH OF THE RIVER

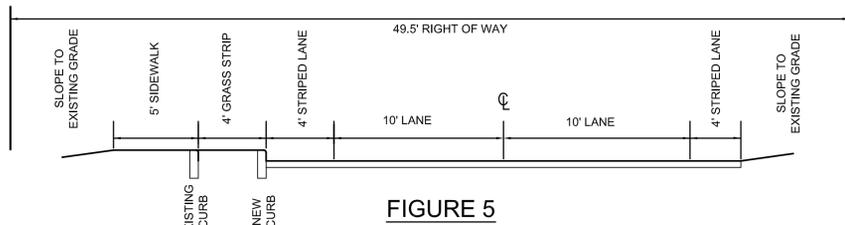


FIGURE 5

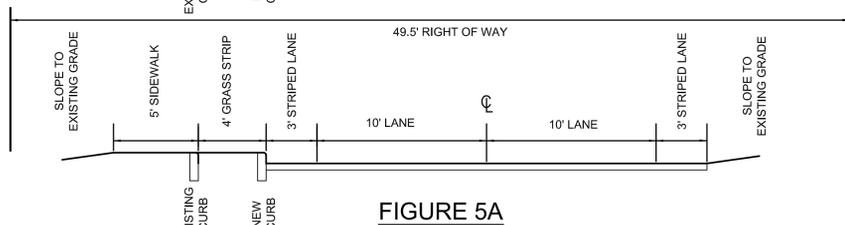


FIGURE 5A

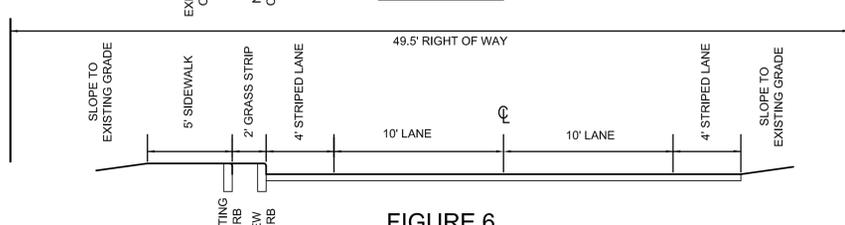


FIGURE 6

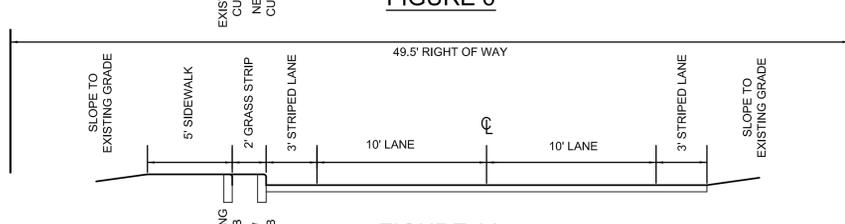


FIGURE 6A

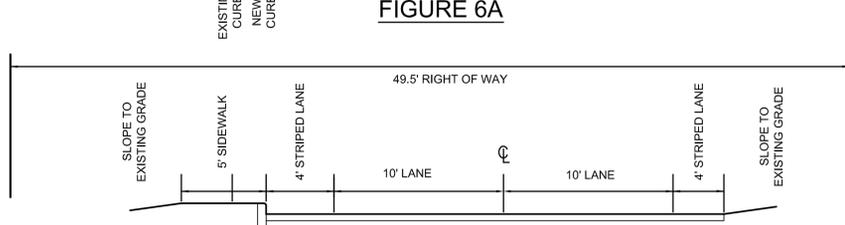


FIGURE 7

SECTIONS SOUTH OF THE RIVER

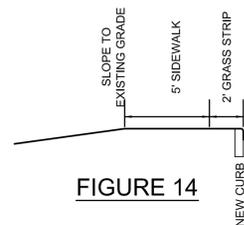


FIGURE 14

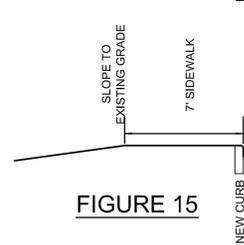


FIGURE 15

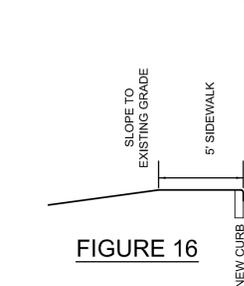


FIGURE 16

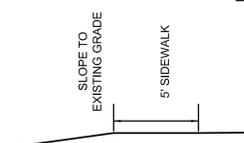


FIGURE 17

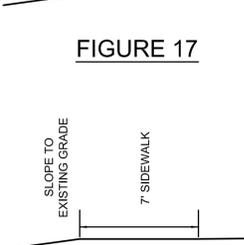


FIGURE 18

SECTIONS BETWEEN RAILROAD STREET AND DEPOT STREET

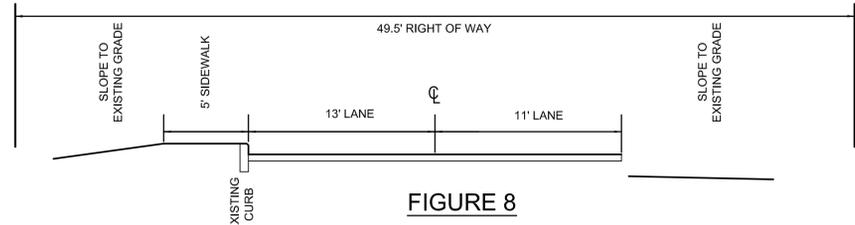
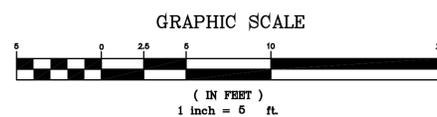


FIGURE 8

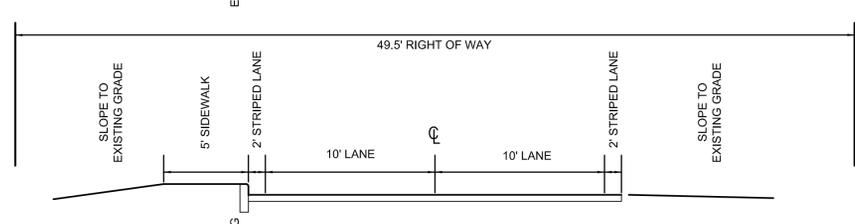


FIGURE 9

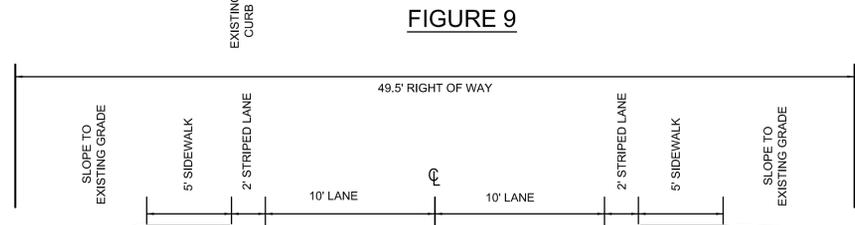


FIGURE 10

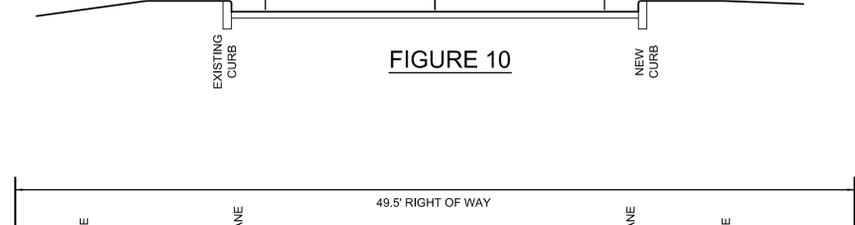


FIGURE 11

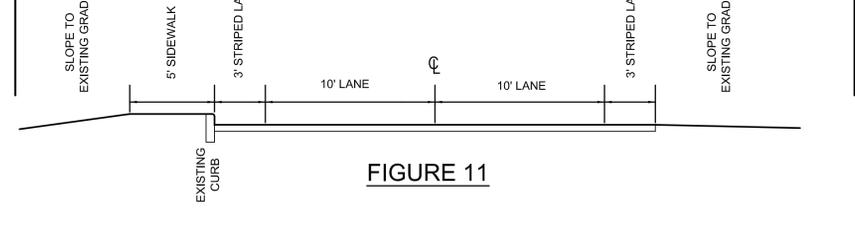


FIGURE 12

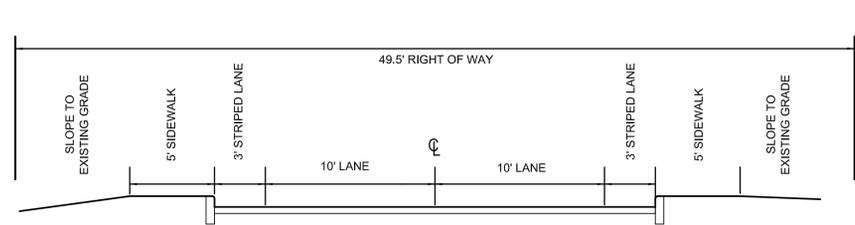


FIGURE 13

SECTIONS ALONG HUNTINGTON ROAD

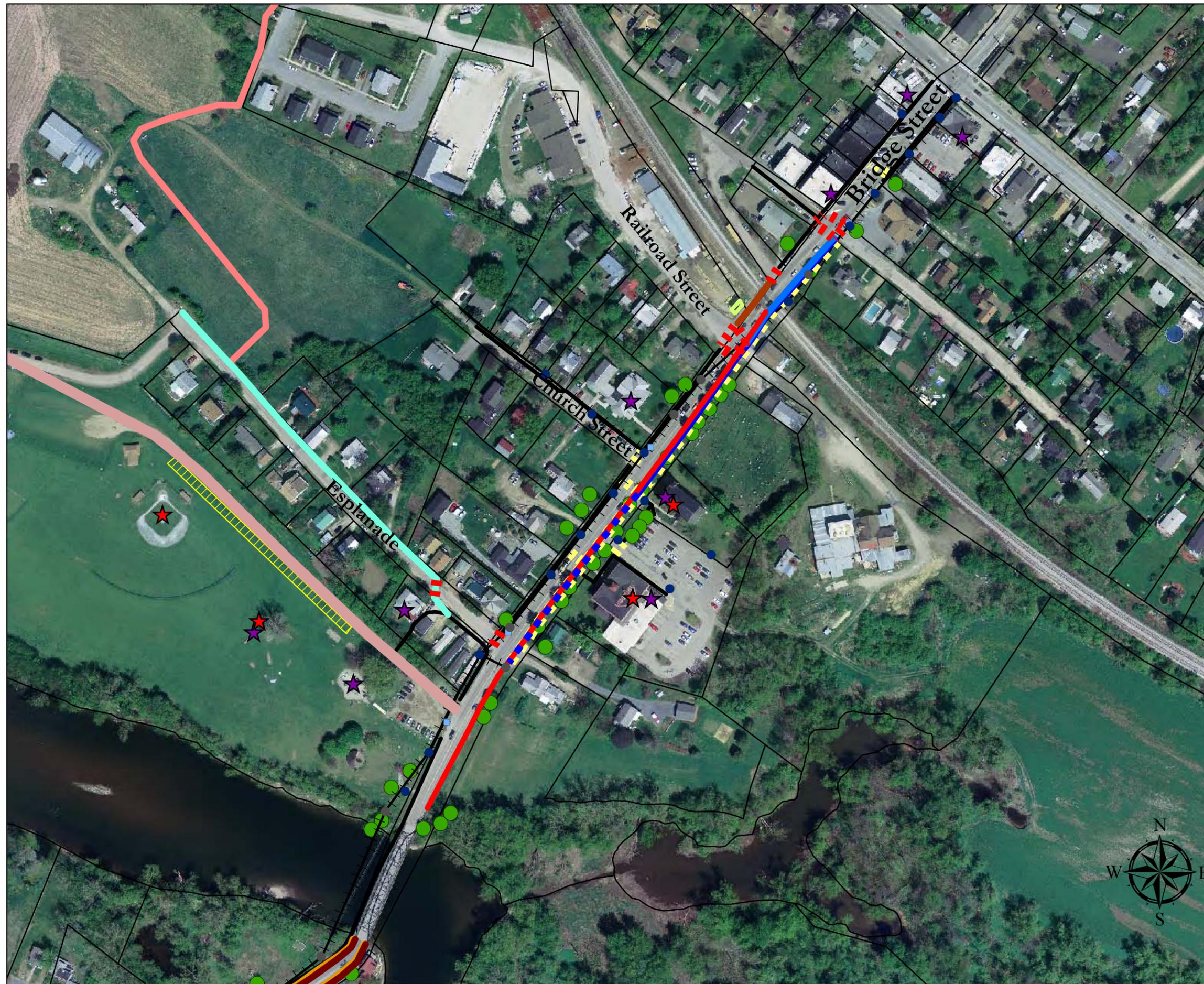


DATE	REVISIONS	BY	# OF SHEETS
THESE PLANS WITH LATEST REVISIONS SHOULD ONLY BE USED FOR THE PURPOSE SHOWN BELOW.			
<input checked="" type="checkbox"/>	SKETCH/CONCEPT		
<input type="checkbox"/>	PRELIMINARY		
<input type="checkbox"/>	FINAL		
<input type="checkbox"/>	CONTRACT		
BICYCLE & PEDESTRIAN FEASIBILITY STUDY			Proj. no. 09094
BRIDGE STREET RICHMOND, VERMONT			Survey ADP
PROPOSED POSSIBLE CROSS SECTIONS ALONG BRIDGE STREET & HUNTINGTON ROAD			Design --
			Drawn DLH
			Checked DLH / DJG
			Date 11-3-09
			Scale AS NOTED
			Sht. no. 3 OF 3

L LAMOUREUX & DICKINSON
Consulting Engineers, Inc.
14 Morse Drive
Essex Junction, VT 05452
Tel: 802-878-4450

Bridge Street Bicycle & Pedestrian Feasibility Study Richmond, Vermont

Alternatives North



Legend

- ▬▬▬ New Crosswalks
 - ▬ Alt 2
 - ▬ Alt 3
 - ▬ Alt 4
 - ▬ Alt 4a
 - ▬ Alt 5
 - ▬ Alt 6
 - ▬ Alt 7
 - ▬ Alt 8
 - ▬ Alt 9
 - ▬ Alt 10
 - ▬ Alt 11
 - ▬ Alt 12
 - ▬ Alt 13
 - ▬ Esplanade 1
 - ▬ Bike 1
 - ▬▬▬ Bike 2
 - ▬ Bridge Railroad
 - ▬ Park Road 2
 - ▬▬▬ Overhead Utility Line
 - Crosswalks
 - Street Trees
 - Sidewalks
 - MiniPark 1
 - Park road 1
 - Property Lines
 - ★ Bicycle Activity Center
 - ★ Pedestrian Activity Center
 - Utility Pole
 - Light Fixtures
 - Storm Drain Inlet
- C112210.sid**
- RGB**
- ▬ Red: Band_1
 - ▬ Green: Band_2
 - ▬ Blue: Band_3



BROADREACH
Planning & Design

PO Box 321
Charlotte, Vermont 05445
802-425-5061

Figure 19a

Bridge Street Bicycle & Pedestrian Feasibility Study Richmond, Vermont

Alternatives South



Legend

- | | |
|-----------------------|----------------------------|
| New Crosswalks | Crosswalks |
| Alt 2 | Street Trees |
| Alt 3 | Sidewalks |
| Alt 4 | MiniPark 1 |
| Alt 4a | Park road 1 |
| Alt 5 | Property Lines |
| Alt 6 | Bicycle Activity Center |
| Alt 7 | Pedestrian Activity Center |
| Alt 8 | Utility Pole |
| Alt 9 | Light Fixtures |
| Alt 10 | Storm Drain Inlet |
| Alt 11 | |
| Alt 12 | C112210.sid |
| Aalt 13 | RGB |
| Esplanade 1 | Red: Band_1 |
| Bike 1 | Green: Band_2 |
| Bike 2 | Blue: Band_3 |
| Bridge Railroad | |
| Park Road 2 | |
| Overhead Utility Line | |



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Figure 19b

ATTACHMENT A Initial Alternative Ideas

Town of Richmond, Vermont

**Bridge Street Bicycle & Pedestrian
Feasibility Study**

Task 4 Memo: Alternatives



Submitted by:

Broadreach Planning & Design

In conjunction with

Lamoureux & Dickinson Consulting Engineers, Inc

Heritage Landscapes LLC.

University of Vermont Consulting Archeological Program

December 9, 2009

INTRODUCTION

This memo describes potential alternatives for improving bicycle and pedestrian circulation along Bridge Street in Richmond Village. The information in this memo serves as the basis for the upcoming discussions of the Project Steering Committee (PSC) on December 17, 2009. It outlines a wide variety of options to be considered by the PSC, representing a larger number than will actually be presented at the next public work session on January 19, 2010. The project consultant expects that the PSC will condense, combine, or eliminate some of the alternatives so that a more reasonable set of options can be presented next month.

The alternatives are based on the following: Project Steering Committee meetings; Public stakeholders' session (11/5/09); meetings with individual business and property owners; Meeting with Richmond Area Business Association (RABA) Main Street Committee (10/21/09); planning charrette with project team (11/12/09).

Each of the alternatives, except for those presented in the last category, Other Alternatives, is meant to be a single option that is not combined with the other options in the category. Those items in the Other Alternatives category could be developed in conjunction with other alternatives within that category or the other categories.

In addition, there are some improvements that are presented as options for implementation, irrespective of whatever other alternatives are selected.

There are numerous assumptions which guide the consideration of roadway or other alternatives. These include:

- New crosswalks should be added on all side streets;
- A new sidewalk on the north side of Railroad Street should be installed as part of the new market development;
- No new on-street parallel parking along Bridge Street south of the railroad;
- Adequate pedestrian access and other improvements to the new Town parking lot close to Depot Street, north of the railroad;
- The current location of the roadway allows for some alternatives involving new sidewalks and widened roadway without the need to acquire right-of-way from individual property owners; and
- New crosswalks on Bridge Street, Railroad Street, and Jolina Court, when and if the two side streets are improved.

The idea of burying utilities along Bridge Street was brought up in several forums, including PSC meetings, conversations with property and business owners, and the public stakeholders meeting. That idea has merit, especially in the section of Bridge Street where utility poles are actually in the roadway (between Church Street and Esplanade).

The following figures and table are presented as part of this memo:

- **Figures 1 to 18** are each depicted in “Task 4 Memo Figures 1-18”
- **Figure 19a** depicts the mapped alternatives for the north end of Bridge Street
- **Figure 19b** depicts the mapped alternatives for the south end of Bridge Street
- **Table 4-1** provides a comparison of the different alternatives.

ROADWAY RIGHT-OF-WAY ALTERNATIVES

BRIDGE STREET (NORTH OF THE BRIDGE FROM THE NORTH END OF DEPOT STREET)

Alternative #1 – Restripe the existing 24-foot roadway surface to create two ten-foot travel lanes and, at a minimum, a two-foot wide paved shoulder on each side. Reclaim the green space between the sidewalk and the roadway for the section of road between Church Street and Esplanade. Repave the existing west side sidewalk with asphalt. Add additional street trees as appropriate. **Figure 1** shows the cross section for this Alternative.

Alternative #2 – Add up to two feet of additional pavement to the east side of the road to create a 26-foot wide roadway and restripe the road to create to ten-foot-travel lanes with a three-foot paved shoulder on each side of the pavement. Reclaim the green space between the sidewalk and the roadway for the section of road between Church Street and Esplanade. Reconstruct the existing sidewalk with concrete. Add additional street trees as appropriate. **Figure 2** shows the cross section for this Alternative.

Alternative #3 – Add two feet of additional pavement to the east side of the road and restripe the road to create to ten-foot-travel lanes with a three-foot paved shoulder on each side of the pavement. Reclaim the green space between the sidewalk and the roadway for the section of road between Church Street and Esplanade. Add a sidewalk along the east side of the road adjacent to the curb between Pleasant Street and the Railroad Street intersection, using a retaining wall between Pleasant Street and the Railroad as needed. Place the curb at grade in front of the Sonoma Station to maintain the off street parking. Reconstruct the existing sidewalk with concrete. Add additional street trees as appropriate. **Figure 3** shows the cross section for this Alternative.

Alternative #4 – Add two feet of additional pavement to the east side of the road and restripe the road to create to ten-foot-travel lanes with a three-foot paved shoulder on each side of the pavement. Reclaim the green space between the sidewalk and the roadway for the section of road between Church Street and Esplanade. Add a sidewalk along the east side of the road between Pleasant Street and the Town Offices, with the sidewalk adjacent to the curb north of the railroad and with a two-foot green strip between the curb and the sidewalk south of the railroad. Place the sidewalk behind a curb in front of the Sonoma Station and remove direct access from Bridge Street to the off street parking. Use two retaining walls, one between Pleasant Street and the Railroad as needed and a smaller, dry laid stone retaining wall along the edge of the cemetery. Reconstruct the existing

sidewalk with concrete. Add additional street trees as appropriate. **Figure 4** shows the cross section for this Alternative.

Alternative #4a – The same as Alternative 4 except that the new sidewalk extends on the east side of Bridge Street to Esplanade, with a new crosswalk at the end of the sidewalk.

BRIDGE STREET (SOUTH OF THE BRIDGE)

Alternative #5 – Create a new curb four feet to the east of the existing west side curb to create a four-foot green space between the existing sidewalk and new curb. Add two feet of pavement on the east side of the roadway and restripe the road to create two ten-foot travel lanes and two three-foot paved shoulders. Relocate the two utility poles on the east side of the road to the west side in the newly created green space. Add new street trees as possible. **Figure 5** shows the cross section for this Alternative.

Alternative #6 – Create a new curb two feet to the east of the existing west side curb to create a two-foot green space between the existing sidewalk and new curb. Add two feet of pavement on the east side of the roadway and restripe the road to create two ten-foot travel lanes and two four-foot paved shoulders. Add new street trees as possible. **Figure 6** shows the cross section for this Alternative.

Alternative #7 – Restripe the existing 28-foot side roadway to create two ten-foot lanes with a four-foot shoulder on each side. Add new street trees as possible. **Figure 7** shows the cross section for this Alternative.

HUNTINGTON ROAD

Alternative #8 – Maintain the roadway as it is, with two 12-foot lanes. Add a new sidewalk on the south side of the road, separated by a green space at least three feet wide. Extend the existing sidewalk on the north side of the road an additional 50 feet to approximately the existing postboxes, which will need to be relocated further west. Add a crosswalk on Huntington Road at the end of the sidewalk, cutting through the existing curbed parking island. Close the center access point with new curbing, leaving the eastern and western access points open. Add street trees as possible. **Figure 8** shows the cross section for this Alternative.

Alternative #9 – Restripe the roadway to create two ten-foot lanes with a two-foot wide paved shoulder on either side. Add street trees as possible. **Figure 9** shows the cross section for this Alternative.

Alternative # 10 – Restripe the roadway to create two ten-foot lanes with a two-foot wide paved shoulder on either side. Add a curb on the south side of the road with a five-foot wide sidewalk adjacent to it. Close the center access point with new curbing, leaving the eastern and western access points open and extend the sidewalk west through the parking islands to Farr Road. Add street trees as possible. **Figure 10** shows the cross section for this Alternative.

Alternative #11 – Add two feet of pavement to the south side of the roadway and restripe to create two ten-foot travel lanes with a three-foot wide paved shoulder on each side. Add street trees as possible. **Figure 11** shows the cross section for this Alternative.

Alternative #12 – Add two feet of pavement to the south side of the roadway and restripe to create two ten-foot travel lanes with a three-foot wide paved shoulder on each side. Add a curb on the south side of the road with an adjacent, five-foot sidewalk. Extend the sidewalk west to the edge of the existing commercial parking area. Continue the pedestrian way via striping through the parking area west to Farr Road. Add street trees as possible. **Figure 12** shows the cross section for this Alternative.

Alternative #13 – Add two feet of pavement to the south side of the roadway and restripe to create two ten-foot travel lanes with a three-foot wide paved shoulder on each side. Add a curb and a five-foot sidewalk on the south side of the road with a two-foot green strip between the sidewalk and the curb. Add street trees as possible. **Figure 13** shows the cross section for this Alternative.

BRIDGE STREET: RAILROAD STREET TO RAILROAD

NOTE: These alternatives for that section between the railroad and Railroad Street on the west side of the road build on the choice of which width is most appropriate for the rest of Bridge Street.

Bridge Street Railroad Alternative #1 – Add a curb at the appropriate location. Add a five-foot wide, concrete sidewalk two feet behind the curb with a 2-foot wide grass strip between the walk and the curb. **Figure 14** shows the cross section for this alternative.

Bridge Street Railroad Alternative #2 – Add a curb at the appropriate location and back with a seven-foot concrete sidewalk. **Figure 15** shows the cross section for this alternative.

Bridge Street Railroad Alternative #3 – Add a curb at the appropriate location and back with a five-foot concrete sidewalk with no separation between the sidewalk and the curb. **Figure 16** shows the cross section for this alternative.

Bridge Street Railroad Alternative #4 – Add a five-foot concrete sidewalk at the same elevation as the roadway, with no curb separating the road pavement and the sidewalk. **Figure 17** shows the cross section for this alternative.

Bridge Street Railroad Alternative #5 – Add a seven-foot concrete sidewalk at the same elevation as the roadway, with no curb separating the road pavement and the sidewalk. **Figure 18** shows the cross section for this alternative.

BRIDGE STREET BY VOLUNTEER PARK

Bridge Street Volunteer Park Alternative #1 – Link the existing sidewalks on either side of the parking lot entrance via a painted crosswalk. Regrade the parking area to create a small rise to keep

gravel and debris from flooding into the roadway during rainstorm. Add a new storm drain in the parking area to eliminate potential ponding that the regarding could cause.

Bridge Street Volunteer Park Alternative #2 – Link the existing sidewalks on either side of the parking lot entrance with a new concrete sidewalk placed at grade through the asphalt. Regrade the parking area to create a small rise to keep gravel and debris from flooding into the roadway during rainstorm. Add a new storm drain in the parking area to eliminate potential ponding that the regarding could cause.

Bridge Street Volunteer Park Alternative #3 – Link the existing sidewalks on either side of the parking lot entrance with a new raised concrete sidewalk. Regrade the parking lot entrance to gradually rise and fall to meet the grade of the new sidewalk. Add a new storm drain in the parking area.

LIGHTING ALTERNATIVES FOR THE ENTIRE STUDY AREA

Lighting #1 – Maintain the existing cobra head light fixtures but add additional fixture to create a more even lighting levels along the length of Bridge Street.

Lighting #2 – Maintain the existing cobra head light fixtures but add additional smaller, more pedestrian scale light fixtures to the existing utility poles to create a more even yet lower light level along the length of Bridge Street.

Lighting #3 – Replace the existing cobra head light fixtures with a more pedestrian scale light fixture to match as much as possible the light fixtures used on Church Street, mounted on the existing utility poles to create a more even yet lower height light level along the length of Bridge Street.

Lighting #4 – Replace the existing cobra head light fixtures with a more pedestrian scale light fixture that matches those already used on Church Street, mounted on new poles, to create a more even yet lower height light level along the length of Bridge Street.

BRIDGE STREET/HUNTINGTON ROAD INTERSECTION IMPROVEMENTS

Intersection Improvement Alternative #1 – Add a center median to provide a pedestrian refuge between travel lanes and to slow vehicular traffic on the curve.

Intersection Improvement Alternative #2 – Reduce the curve radius to bring at least the curb and edge of the pavement back within the existing right of way, creating a tighter turn for vehicles which could slow travel speed on the curve.

Intersection Improvement Alternative #3 – Construct a roundabout at the intersection, which would slow the traffic around the curve, provide a gateway into the Village area, and create a safer situation for bicyclists and pedestrians.

OTHER ALTERNATIVES

Bicycle Alternative #1 – Improve and extend the existing bike path linking Volunteers Park, Esplanade, and Church Street to link with Railroad Street via the field to the northwest of the existing housing units on Borden Lane (at end of Railroad Street) and the end of Church Street. Explore options for routing the path along Railroad Street to Bridge Street or finding an existing agricultural crossing of the railroad west of Bridge Street that could be used to bring the path to the north side of the railroad tracks.

Bicycle Alternative #2 – Add a shared use path along the east side of Bridge Street between Esplanade and Pleasant Street. Use two retaining walls, one between Pleasant Street and the Railroad as needed and a dry laid stone retaining wall along the edge of the cemetery. Add additional street trees as appropriate.

Esplanade Alternative #1 – Extend the existing concrete sidewalk on the south side of the east end of the street approximately 20 feet further west to the bakery access drive/entrance walk. Add a crosswalk diagonally across the street to the north side. Reconstruct the existing concrete sidewalk with a five-foot wide sidewalk to the west end of the street.

Esplanade Alternative #2 – Repave and widen Esplanade to a consistent 20 feet wide to accommodate bicycle travel.

Park Access Road Alternative #1 – Add head-in parking facing south along the side of the road, after confirming the acceptability of this addition with the adjacent land owners to the north. Add a crushed gravel path along the south side of the parking linking the west side of the park with the east side parking lot near Bridge Street.

Park Access Road Alternative #2 – Upgrade the park road to 20 feet wide and provide a link to the sewer treatment plant. Add a crushed gravel pedestrian path along the south side of the road linking the west side of the park with the east side parking lot. Remove the link between Esplanade and the sewer treatment plant.

Mini-Park Alternative #1 – Develop a small pedestrian seating area south of the railroad tracks on the west side of Bridge Street in front of the new market to take advantage of the views east towards Camels Hump.

RIVER CROSSING

The current Bridge Street bridge across the Winooski River is approximately 20 feet wide, with ten-foot wide travel lanes in each direction. A five-foot wide sidewalk is cantilevered from the west side of the bridge. Bicycle access is poor across the bridge. For those comfortable doing it, one of the best ways to cross the road on a bicycle is to move to the center of the lane you are in and ride across the bridge - “taking the lane” and preventing motor vehicles to pass the bicycle on the bridge. The

other way is to dismount move to the sidewalk and walk the bicycle across the bridge. The most common way of crossing the bridge on bicycle appears to be riding on the sidewalk.

Few alternatives for crossing the river appear to be viable. To date, the following alternatives have been initially offered:

- Widening the sidewalk to six or eight feet wide;
- Constructing a new prefabricated, single span bicycle/pedestrian bridge to the west of the existing bridge; and
- Instigating a permanent pedestrian/bicycle ferry.

Each of these options appears to have at least one insurmountable obstacle that would keep it from being a feasible solution. However, there could be some unrealized potential in any of them, so they should be at least considered and discussed before being eliminated.

One last option, which is possible, is to provide “share the road” signs on the approaches to the bridge and/or other notices to bicyclists to dismount and use the sidewalk.

Appendix C

Initial Estimate of Probable Construction Costs

Recommendation #1: Restriping and Asphalt Sidewalk

Item	Quantity	Units	Unit Cost	Total
New 5-foot Wide Sidewalk with Granite Curb		LF	\$90	\$0
New 7-foot Wide Sidewalk		LF	\$125	\$0
New Granite Curb	390	LF	\$30	\$11,700
Pavement Excavation	15	CY	\$25	\$375
Common Excavation	45	CY	\$12	\$540
Topsoil	60	CY	\$32	\$1,920
Basecourse		CY	\$30	\$0
Bituminous Asphalt	345	SY	\$60	\$20,700
Restriping	1370	LF	\$0.40	\$548
Crosswalk		LF	\$20	\$0
Cold Planing		SY	\$2	\$0
Concrete Retaining Wall		CF	\$20	\$0
Stone Retaining Wall		SF	\$35	\$0
Street Tree	15	Each	\$250	\$3,750
Sub Total				\$39,533
Engineering				\$5,930
Municipal Project Manager				\$1,977
Contingency				\$5,930
Total (in 2010 Dollars)				\$53,370

Recommendation #2: New Sidewalk on the East Side

Item	Quantity	Units	Unit Cost	Total
New 5-foot Wide Sidewalk	600	LF	\$90	\$54,000
New 7-foot Wide Sidewalk		LF	\$125	\$0
New Granite Curb	560	LF	\$30	\$16,800
Pavement Excavation		CY	\$25	\$0
Common Excavation	350	CY	\$12	\$4,200
Topsoil		CY	\$32	\$0
Basecourse	306	CY	\$30	\$9,180
Bituminous Asphalt	525	SY	\$60	\$31,500
Restriping	1370	LF	\$0.40	\$548
Crosswalk		LF	\$20	\$0
Cold Planing		SY	\$2	\$0
Concrete Retaining Wall	450	CF	\$20	\$9,000
Stone Retaining Wall	200	SF	\$35	\$7,000
Street Tree	4	Each	\$250	\$1,000
Sub Total				\$133,228
Engineering 15%				\$19,984
Municipal Project Manager 5%				\$6,661
Contingency 15%				\$19,984
Total (in 2010 Dollars)				\$179,858

Recommendation #3: Railroad to Railroad Street

Item	Quantity	Units	Unit Cost	Total
New 5-foot Wide Sidewalk with Granite Curb		LF	\$90	\$0
New 7-foot Wide Sidewalk	95	LF	\$125	\$11,875
New Granite Curb	95	LF	\$30	\$2,850
Pavement Excavation		CY	\$25	\$0
Common Excavation		CY	\$12	\$0
Topsoil		CY	\$32	\$0
Basecourse		CY	\$30	\$0
Bituminous Asphalt		SY	\$60	\$0
Restriping		LF	\$0.40	\$0
Crosswalk		LF	\$20	\$0
Cold Planing		SY	\$2	\$0
Concrete Retaining Wall		CF	\$20	\$0
Stone Retaining Wall		SF	\$35	\$0
Street Tree		Each	\$250	\$0
Sub Total				\$14,725
Engineering				\$2,209
Municipal Project Manager				\$736
Contingency				\$2,209
Total (in 2010 Dollars)				\$19,879

Recommendation #5: Esplanade
Street Sidewalk

Item	Quantity	Units	Unit Cost	Total
New 5-foot Wide Sidewalk	730	LF	\$90	\$65,700
New 7-foot Wide Sidewalk		LF	\$125	\$0
New Granite Curb		LF	\$30	\$0
Pavement Excavation		CY	\$25	\$0
Common Excavation		CY	\$12	\$0
Topsoil		CY	\$32	\$0
Basecourse		CY	\$30	\$0
Bituminous Asphalt		SY	\$60	\$0
Restriping		LF	\$0.40	\$0
Crosswalk	26	LF	\$20	\$520
Cold Planing		SY	\$2	\$0
Concrete Retaining Wall		CF	\$20	\$0
Stone Retaining Wall		SF	\$35	\$0
Street Tree		Each	\$250	\$0
Sub Total				\$66,220
Engineering				\$9,933
Municipal Project Manager				\$3,311
Contingency				\$9,933
Total (in 2010 Dollars)				\$89,397

Recommendation #6: Rasied Sidewalk at Volunteers Green

Item	Quantity	Units	Unit Cost	Total
New 5-foot Wide Sidewalk	40	LF	\$180	\$7,200
New 7-foot Wide Sidewalk		LF	\$125	\$0
New Granite Curb		LF	\$30	\$0
Pavement Excavation		CY	\$25	\$0
Common Excavation		CY	\$12	\$0
Topsoil		CY	\$32	\$0
Basecourse		CY	\$30	\$0
Bituminous Asphalt		SY	\$60	\$0
Restriping		LF	\$0.40	\$0
Crosswalk		LF	\$20	\$0
Cold Planing		SY	\$2	\$0
Concrete Retaining Wall		CF	\$20	\$0
Stone Retaining Wall		SF	\$35	\$0
Street Tree		Each	\$250	\$0
Sub Total				\$7,200
Engineering				\$1,080
Municipal Project Manager				\$360
Contingency				\$1,080
Total (in 2010 Dollars)				\$9,720

Recommendation #7: South Bridge Street
Restriping

Item	Quantity	Units	Unit Cost	Total
New 5-foot Wide Sidewalk		LF	\$90	\$0
New 7-foot Wide Sidewalk		LF	\$125	\$0
New Granite Curb		LF	\$30	\$0
Pavement Excavation		CY	\$25	\$0
Common Excavation		CY	\$12	\$0
Topsoil		CY	\$32	\$0
Basecourse		CY	\$30	\$0
Bituminous Asphalt		SY	\$60	\$0
Restriping	4000	LF	\$0.40	\$1,600
Crosswalk		LF	\$20	\$0
Cold Planing		SY	\$2	\$0
Concrete Retaining Wall		CF	\$20	\$0
Stone Retaining Wall		SF	\$35	\$0
Street Tree		Each	\$250	\$0
Sub Total				\$1,600
Engineering				\$0
Municipal Project Manager				\$0
Contingency				\$0
Total (in 2010 Dollars)				\$1,600

Recommendations #8 & 9: Widening
South Bridge Street

Item	Quantity	Units	Unit Cost	Total
New 5-foot Wide Sidewalk		LF	\$90	\$0
New 7-foot Wide Sidewalk		LF	\$125	\$0
New Granite Curb	1010	LF	\$30	\$30,300
Pavement Excavation	45	CY	\$25	\$1,125
Common Excavation	325	CY	\$12	\$3,900
Topsoil	220	CY	\$32	\$7,040
Basecourse	120	CY	\$30	\$3,600
Bituminous Asphalt	315	SY	\$60	\$18,900
Restriping	4000	LF	\$0.40	\$1,600
Crosswalk	60	LF	\$20	\$1,200
Cold Planing	3275	SY	\$2	\$6,550
Concrete Retaining Wall		CF	\$20	\$0
Stone Retaining Wall		SF	\$25	\$0
Street Tree		Each	\$250	\$0
Sub Total				\$74,215
Engineering 15%				\$11,132
Municipal Project Manager 5%				\$3,711
Contingency 15%				\$11,132
Total (in 2010 Dollars)				\$100,190

New storm inlet and connection to existing storm drains not included.

Recommendations #10, 11, & 12: Reducing Intersection Speeds

Item	Quantity	Units	Unit Cost	Total
New 5-foot Wide Sidewalk		LF	\$90	\$0
New 7-foot Wide Sidewalk		LF	\$125	\$0
New Granite Curb	92	LF	\$30	\$2,760
Pavement Excavation	13	CY	\$25	\$325
Common Excavation	70	CY	\$12	\$840
Topsoil	100	CY	\$32	\$3,200
Basecourse		CY	\$30	\$0
Bituminous Asphalt		SY	\$60	\$0
Restriping		LF	\$0.40	\$0
Crosswalk		LF	\$20	\$0
Cold Planing		SY	\$2	\$0
Concrete Retaining Wall		CF	\$20	\$0
Stone Retaining Wall		SF	\$35	\$0
Street Tree	12	Each	\$250	\$3,000
Sub Total				\$10,125
Engineering 15%				\$1,519
Municipal Project Manager 5%				\$506
Contingency 15%				\$1,519
Total (in 2010 Dollars)				\$13,669

Recommendations#13: Huntington Restriping and North Sidewalk

Item	Quantity	Units	Unit Cost	Total
New 5-foot Wide Sidewalk	70	LF	\$90	\$6,300
New 7-foot Wide Sidewalk		LF	\$125	\$0
New Granite Curb	145	LF	\$30	\$4,350
Pavement Excavation	5	CY	\$25	\$125
Common Excavation		CY	\$12	\$0
Topsoil	15	CY	\$32	\$480
Basecourse		CY	\$30	\$0
Bituminous Asphalt		SY	\$60	\$0
Restriping	1600	LF	\$0.40	\$640
Crosswalk		LF	\$20	\$0
Cold Planing		SY	\$2	\$0
Concrete Retaining Wall		CF	\$20	\$0
Stone Retaining Wall		SF	\$35	\$0
Street Tree		Each	\$250	\$0
Sub Total				\$11,895
Engineering 15%				\$1,784
Municipal Project Manager 5%				\$595
Contingency 15%				\$1,784
Total (in 2010 Dollars)				\$16,058

Recommendations#14: Huntington Road Widening and South Sidewalk

Item	Quantity	Units	Unit Cost	Total
New 5-foot Wide Sidewalk	165	LF	\$90	\$14,850
New 7-foot Wide Sidewalk		LF	\$125	\$0
New Granite Curb	165	LF	\$30	\$4,950
Pavement Excavation	12	CY	\$25	\$300
Common Excavation	70	CY	\$12	\$840
Topsoil		CY	\$32	\$0
Basecourse	80	CY	\$30	\$2,400
Bituminous Asphalt	118	SY	\$60	\$7,080
Restriping	1590	LF	\$0.40	\$636
Crosswalk		LF	\$20	\$0
Cold Planing	1470	SY	\$2	\$2,940
Concrete Retaining Wall		CF	\$20	\$0
Stone Retaining Wall		SF	\$25	\$0
Street Tree		Each	\$250	\$0
Sub Total				\$33,996
Engineering 15%				\$5,099
Municipal Project Manager 5%				\$1,700
Contingency 15%				\$5,099
Total (in 2010 Dollars)				\$45,895



Chittenden County
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Organization

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