

Town of Richmond, Vermont

**Bridge Street Bicycle & Pedestrian  
Feasibility Study**

*Final Report*



*Submitted by:*

**Broadreach Planning & Design**

*In conjunction with*

**Lamoureux & Dickinson Consulting Engineers, Inc**

**Heritage Landscapes LLC.**

**University of Vermont Consulting Archeological Program**

April 26, 2010

## ACKNOWLEDGEMENTS

The Town of Richmond developed this report with financial assistance from the Chittenden County Metropolitan Planning Organization.

A Project Steering Committee provided invaluable assistance to the project team during the process of completing this report. The Project Steering Committee consisted of:

- Cathleen Gent, Richmond Town Planner (Richmond Project Manager)
- Gary Bressor, property owner
- Mark Fausel, Richmond Planning Commission
- Jon Kart, Richmond Selectboard/property owner
- Joe Miller, Richmond Police Department
- Dan Renaud, Richmond Planning Commission
- Martha Turner, Richmond Historical Society
- Michael Weisel, Richmond Town Engineer

The Richmond citizens and business owners also provided important input during the series of public work sessions and interviews the project team conducted during the course of the project.

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## INTRODUCTION

The Town of Richmond received a “Bridge Street Bicycle & Pedestrian Feasibility Study” Transportation Action Grant (TAG) from the Chittenden County Metropolitan Planning Organization. The purpose of this study was to develop streetscape design recommendations for improving pedestrian and bicycle circulation along the study area considering the following factors: safety, connectivity between village areas, utility infrastructure, existing community resources, economic development, character of the village, and natural resources along Bridge Street between Depot Street and Bridge Street’s southern end, and along Huntington Road between Bridge Street and Farr Street. The Study Area was generally along the roadways, but it extended off the roadways in certain areas, as **Map 1** shows. The Town of Richmond began this project in August of 2009 with the assistance of Broadreach Planning & Design; teamed with Lamoureux & Dickinson Consulting Engineers, Inc; Heritage Landscapes LLC; and the Consulting Archeological Program at UVM (BRPD collectively).

This report is formatted for double sided printing.

## EXISTING CONDITIONS

**Maps 2a and 2b** provide an overview of the existing conditions. **Appendix A** includes a more complete description of existing conditions.

The Bridge Street and Huntington Road right-of-ways within the Study Area are 3 rods wide,  $\pm 49$  feet. Specific survey data shows that the road is not always centered in the right-of-way, especially for the portion of Bridge Street between the railroad and the entrance to the Volunteers Green, just north of the bridge over the Winooski River.

Esplanade Street and Church Street are public roads that intersect with Bridge Street north of the Bridge Street bridge over the Winooski River (the bridge). Railroad Street and Jolina Court are two other roads that also intersect with Bridge Street just south of the railroad right-of-way. The Town possesses an easement for the right-of-way for Railroad Street over private land, but Jolina Court is a private road.

Bridge Street is approximately 24 feet wide between the railroad and Church Street with two 12-foot wide travel lanes between asphalt curbs. The southbound lane of Bridge Street widens by approximately 3 feet between Church Street and Esplanade Street so that the total roadway is approximately 27 feet wide with a 15-foot wide southbound lane and a 12-foot wide northbound lane. South of Esplanade Street to the Bridge Street bridge over the Winooski River, the road still maintains approximately a 26-foot width, but a variable-width gravel shoulder makes the road appear wider. The bridge itself is approximately 18 feet wide

with two 9-foot lanes. South of the bridge, the roadway is again approximately 24 feet wide with two twelve-foot travel lanes with a curb along the southbound lane.

The right-of-way width for Railroad Street, which runs west from Bridge Street, is twenty-five feet. The stakes indicating the right-of-way have been placed and the exact location of the right-of-way will have more definition as the development of a new market store on the northwest corner of Railroad Street and Bridge Street is completed. This work will include the installation of curbs and parking at least along the northern side of Railroad Street.

Church Street runs west from Bridge Street and currently has a sidewalk along the northern edge of the pavement. Other than the church at the corner of Church Street and Bridge Street, it is lined by residences. Esplanade Street also runs west from Bridge Street, but does not have a sidewalk along either side of the roadway, except for a small remnant of an old sidewalk that can still be seen in front of two houses. Esplanade Street is lined with residences, but also provides access to the Town sewage treatment plant.

Huntington Road west of the Bridge Street intersection is approximately 24 feet wide with two 12-foot travel lanes and a curb on the north side of the road.

The northwest corner of the Bridge Street/Huntington Road/Thompson Road/Cochran Road intersection has been widened to facilitate turns at higher speeds from Bridge Street to Huntington Road. The widening has taken the edges of the road out of the right-of-way as seen in **Map 2b**.

There is a continuous sidewalk along almost the entire length of the west side of Bridge Street in the Study Area. There is a break that extends from the northern end of the railroad right-of-way to the southern edge of Railroad Street. The sidewalk continues around the widened corner at Huntington Road west approximately 180 feet. There is no sidewalk on the south side of Huntington Road.

Overhead utility lines and poles line the west side of Bridge Street for most of the Study Area north of the Winooski River. Between Esplanade Street and Church Street, the utility poles are located in the street, adjacent to the west side curb. Sewer and water lines lie under the roadway mostly within the Bridge Street and Huntington Road rights-of-way. There are stormwater drains under the roadway.

Portions of the Study Area close to the Winooski River are located within the 100-year flood plain.

There are street trees on both sides of Bridge Street, but most of them lie along the east side.

The western portions of Volunteers Green and the property on the east side of the road across from Volunteers Green adjacent to the river are sensitive for archeological resources. South of the River, the open field north of the Round Church, Round Church Green, the lawn at the northeast corner of Bridge Street and Huntington Road, and the open/lawn area

on the north side of Huntington Road across from Farr Road are also sensitive for archeological resources.

Lighting along Bridge Street and Huntington Road is supplied by cobra head lights attached to the utility poles. The spacing of the lighting is not consistent, as can be seen on **Map 2a**. Pedestrian scale lighting has been added to the end of Church Street and around the Town Center parking area, but the fixtures do not shield the light source or provide any degree of light cutoff that most lighting regulations now require.

There are a variety of regulatory and advisory signs along Bridge Street, including crosswalk warning signs located at each crosswalk for both directions of traffic on Bridge Street or Huntington Road.

There is considerable pedestrian traffic that uses the sidewalk on both sides of the Winooski River bridge, especially the north side. Many bicyclists, including children, ride on the sidewalk, which often creates conflicts between bicyclists and pedestrians, especially on the bridge and its approaches. When they have a destination, pedestrians and bicyclists are headed most often for:

- Volunteers Green;
- The adjacent bakery;
- Town Center, including the Town Library, Town Offices and Post Office;
- The Round Church;
- The businesses further north on Bridge Street; and
- The schools further to the north on Jericho Road.

Research included reviews of previous studies, with the most emphasis on:

- *RICHMOND PEDESTRIAN FACILITY FEASIBILITY STUDY*, Erik Sandblom, PC (ESPC) and Kathleen Ryan, Landscape Architect, January 2009
- *RICHMOND VILLAGE PARKING STUDY*, Resource Systems Group, Inc., 2007
- *RICHMOND DOWNTOWN STREETSCAPE*, Kathleen Ryan, Landscape Architect with Arnold and Scangas Architects and Julie Campoli, landscape Architects, September 1998

## RECOMMENDATIONS

### OVERVIEW

BRPD analyzed numerous alternate methods of improving bicycle and pedestrian circulation along Bridge Street and other portions of the Study Area. The study team developed, examined, and refined these alternatives into a set of recommendations after:

- Discussions at several Project Steering Committee meetings,
- Three public stakeholders' sessions,
- Meetings with individual business and property owners in the Study Area,
- A meeting with the Richmond Area Business Association (RABA) Main Street Committee, and
- A planning *charrette* with the project team and other professionals.

From this, BRPD assembled a set of recommendations for final consideration by the community. These recommendations are presented below for review and consideration. **Maps 3a** and **3b** show the general location of the recommendations. **Table 1** includes a summary of the relative costs and benefits of the recommendations. **Appendix B** includes a description of all of the initial alternatives considered for this project. **Table 1a** in **Appendix B** contains a summary of the relative costs and benefits for all of the initial alternatives. **Appendix C** contains an initial estimate of the probable construction costs associated with specific recommendations. By intent, this report does not offer comment regarding the specific costs associated with recommended alternatives, since public policy and budgeting decisions are best left to the elected officials and town administration for the Town of Richmond.

In addition to the recommendations described below, BRPD has prepared a list of improvements which should be developed within the corridor no matter which recommended improvements are finally developed, including:

- New crosswalks added on all side streets;
- A new sidewalk on the north side of Railroad Street installed as part of the new market development;
- Adequate pedestrian access and other improvements to the new Town-owned parking lot on a parcel on Depot Street, north of the railroad; and
- Four new crosswalks at the Bridge Street/Railroad Street/Jolina Court intersection.

After reviewing previous studies and current conditions, BRPD also recommends that there be no new on-street parallel parking along Bridge Street south of Jolina Court, as recommended in the 2007 Parking Study.



It appears that the current location of the roadway within the right-of-way allows for implementation of the recommendations involving new sidewalks and widened roadway without the need to acquire right-of-way from individual property owners.

Several participants in the alternative development and analysis process suggested the idea of burying the overhead utilities along Bridge Street between Church Street and Esplanade Street, but the cost of such work is most likely beyond the means of the Town, which would need to cover 100 percent of the cost. Past estimates of the cost to place overhead utilities underground have been approximately \$1,000,000 per mile, or approximately \$190 per foot. (I'm still working to get more information from GMP.)

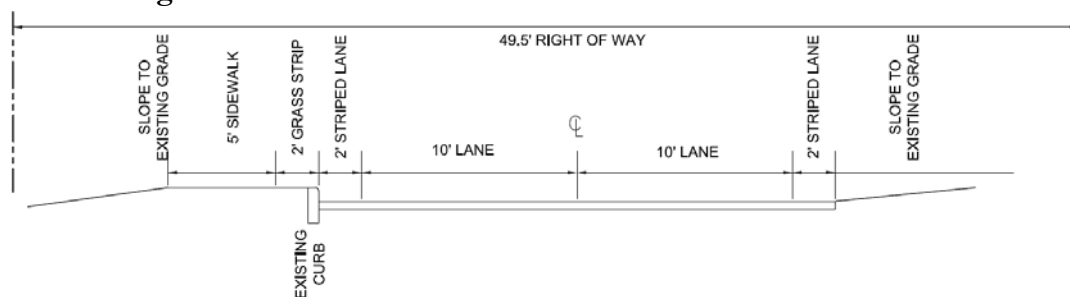
When more than one recommendation is appropriate for a particular portion of the Study Area, each is identified as either Phase 1 or Phase 2. Phase 1 recommendations should occur ideally within one year, with the Phase 2 and other recommendations occurring in the future as construction funding becomes available and conditions are right to proceed with them. Other than the Phase 1 recommendations, the Town can proceed with the implementation of the recommendations in whatever order makes the most sense in the future.

Most descriptions include an initial estimate of probable construction costs for the recommendation, or in some cases a group of recommendations. **Appendix C** includes details as to how these initial estimates were calculated. Each of the estimates assumes that engineering plans are prepared prior to the work being completed. These costs could be less if the work were to be completed by Town crews.

**BRIDGE STREET (NORTH OF THE BRIDGE TO NORTH DEPOT STREET)**

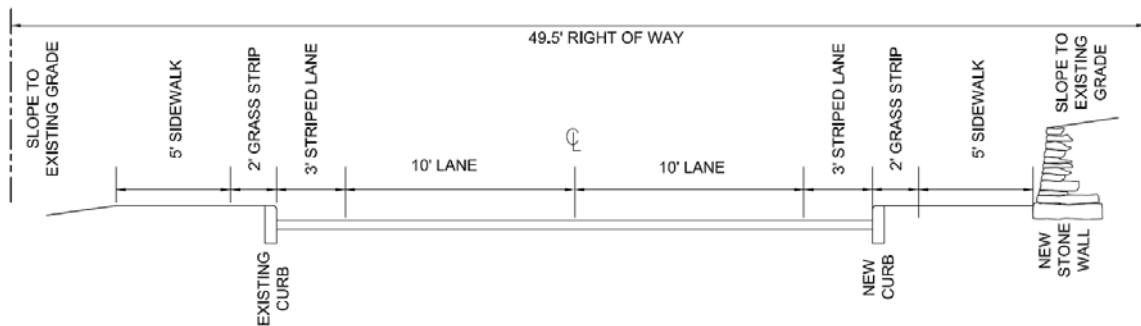
Recommendation #1: Phase 1 – Restripe the existing 24-foot roadway surface to create two ten-foot travel lanes and, at a minimum, a two-foot wide paved shoulder on each side. Reclaim the green space between the sidewalk and the roadway for the section of road between Church Street and Esplanade Street. Repave the existing west side sidewalk with asphalt. Add additional street trees as appropriate. **Figure 1** shows the cross section for this recommendation. Initial estimate of probable construction cost: \$51,000 with approximately \$600 for just the restriping.

**Figure 1: Recommendation #1 Cross Section**



**Recommendation #2: Phase 2** – 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 Street. Add a sidewalk along the east side of the road between Pleasant Street and the Town Center, 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 once the intersection becomes busier and/or Jolina Court serves as an access to developed property. 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 on the west side of the roadway with concrete. Add additional street trees as appropriate. **Figure 2** shows the cross section for this recommendation. **Figure 3** provides a suggestion of how the improvements would fit into the existing condition. Initial estimate of probable construction cost: \$80,000.

**Figure 2: Recommendation #2 Cross Section**



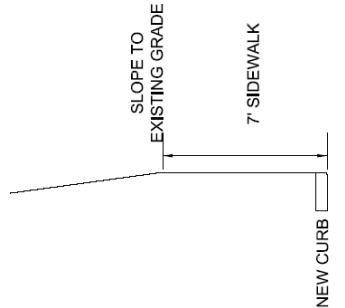
**Figure 3: Recommendation #2**



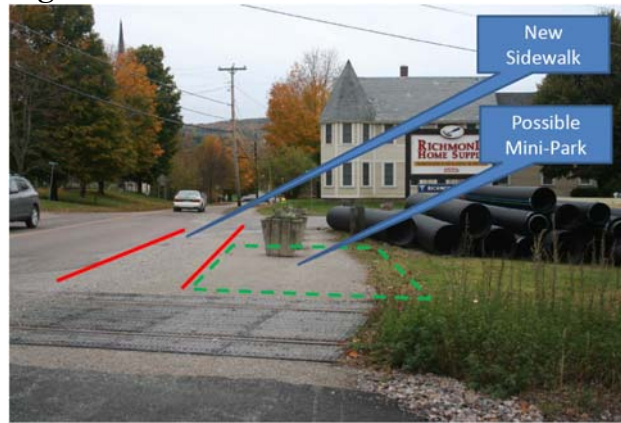
## BRIDGE STREET (RAILROAD STREET TO RAILROAD)

**Recommendation #3** – Add a curb at the appropriate location and back with a seven-foot concrete sidewalk. **Figure 4** shows the cross section for this recommendation. **Figure 5** provides a suggestion of how the improvements would fit into the existing condition. Initial estimate of probable construction cost: \$20,000.

**Figure 4: Recommendation #3 Cross Section**



**Figure 5: Recommendations #3 & #4**



**Recommendation #4** – 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. **Figure 5** shows the approximate location of the proposed mini-park. Initial estimate of probable construction cost: \$25,000 lump sum.

## ESPLANADE STREET

**Recommendation #5: Phase 2** – Extend the existing concrete sidewalk on the south side of the east end of Esplanade 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 four-foot wide sidewalk to the west end of the street. As possible, reclaim the former sidewalk on the north side of the street between the new crosswalk by the bakery and Bridge Street, so that there are sidewalks on both sides of the street to the bakery. **Figure 6** provides a suggestion of how the improvements would

fit into the existing condition. Initial estimate of probable construction cost, excluding the north side sidewalk connecting the crosswalk to Bridge Street: \$90,000.

**Figure 6: Recommendation #5**



#### BRIDGE STREET (BY VOLUNTEERS GREEN)

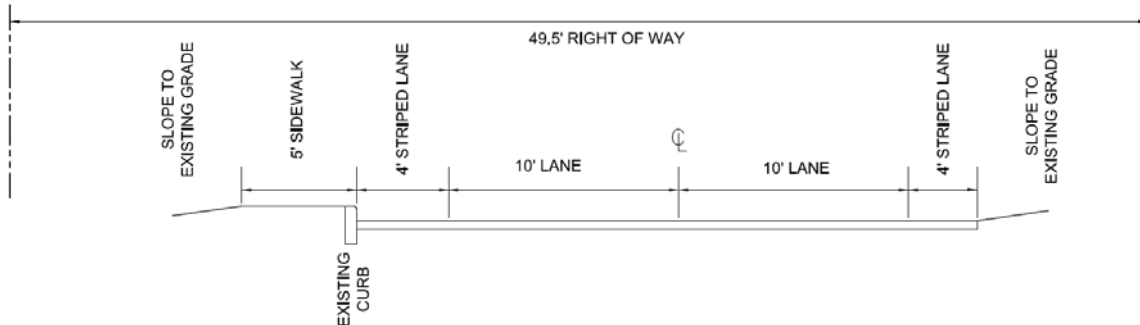
Recommendation #6 – Link the existing sidewalks on either side of the parking lot entrance with a new raised concrete sidewalk. Also, in a manner that conforms with FEMA and Richmond zoning regulations, regrade and pave the Town-owned parking area to gradually rise and fall to meet the grade of the new sidewalk to keep gravel and debris from flooding into the roadway during a rainstorm and add a new storm drain in the parking area to eliminate potential ponding that the regrading could cause. Initial estimate of probable construction cost: \$8,000.

Recommendation #6a – Develop a parking lot plan, with striping for the front lot. Should parking continue to be an issue in the park, consider the potential expansion of the rear lot and the addition of parking along the access road in a manner that conforms with FEMA and Richmond zoning regulations, to minimize parking on Esplanade Street. Consider slightly widening the park access road, also in line with the floodplain regulations, and providing continual road maintenance to encourage the use of the park access road rather than Esplanade Street to reach the rear parking area. Add a wooden railing along the sewage treatment driveway, if allowed under the floodplain regulations, to minimize the ability to use it to access the rear parking area in Volunteers Green.

BRIDGE STREET (SOUTH OF THE BRIDGE)

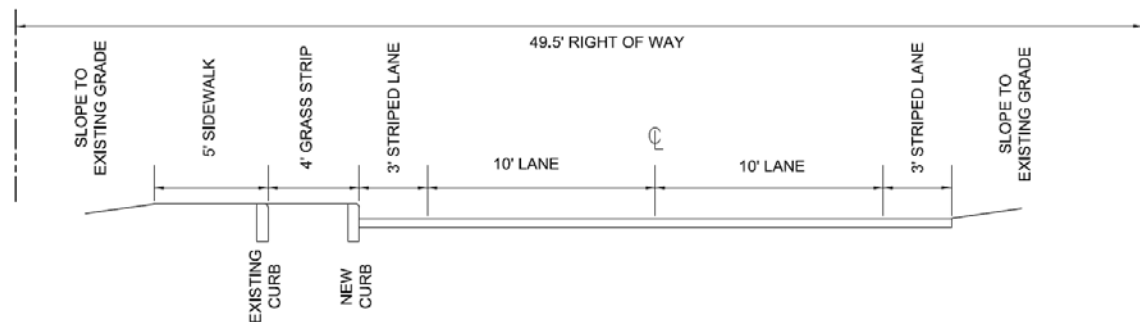
**Recommendation #7: Phase 1** – Restripe the existing 28-foot side roadway to create two ten-foot lanes with a four-foot shoulder on each side. Add new street trees as possible. **Figure 7** shows the cross section for this recommendation. Initial estimate of probable construction cost: \$1,600.

**Figure #7 Cross Section Recommendation 7:**

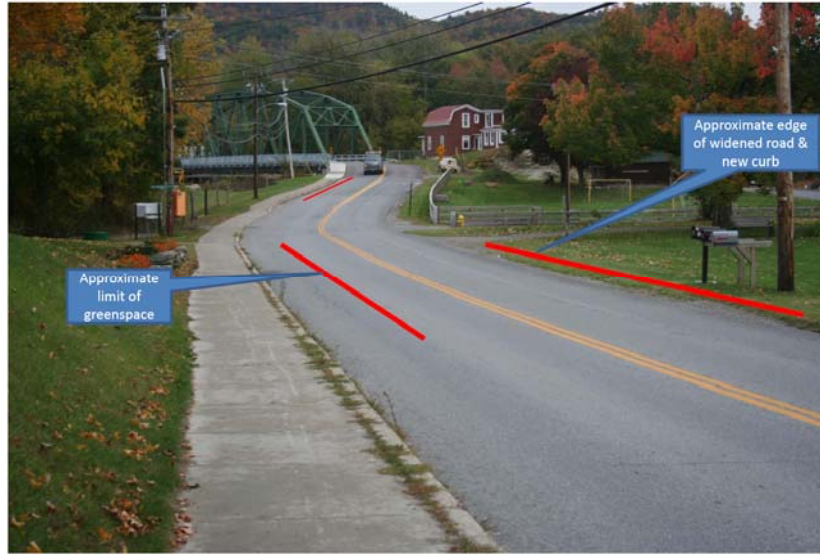


**Recommendation #8: Phase 2** – Create a new curb four feet to the east of the existing west side curb from the bridge to approximately the crosswalk to the Round Church Green to create a four-foot green space between the existing sidewalk and new curb. Add two feet of pavement and a curb on the east side of the roadway and restripe the road to create two ten-foot travel lanes and two three-foot paved shoulders. Install a new storm drain on the east side of the road at the low point between the bridge and Round Church Road. If needed, reclaim the road to shift the center crown 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 strip. Add new street trees as possible. **Figure 8** shows the cross section for this Recommendation. **Figure 9** provides a suggestion of how the improvements would fit into the existing condition. Initial estimate of probable construction cost for Recommendations #8 and #9 together: \$100,000.

**Figure 8: Recommendation #8 Cross Section**

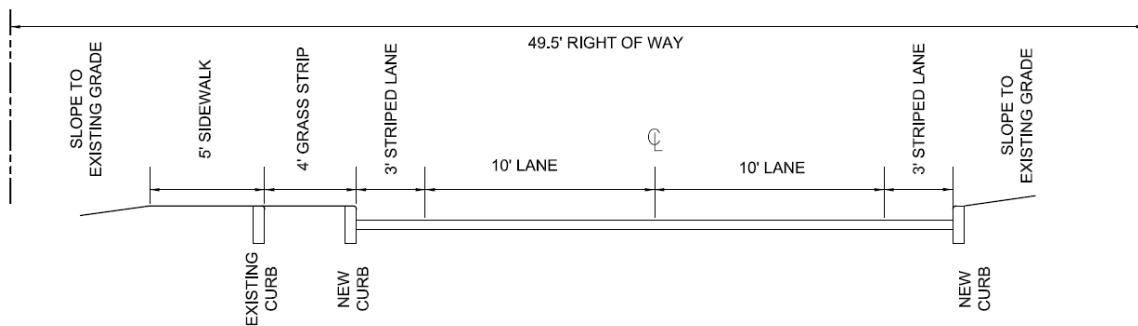


**Figure 9: Recommendation #8**

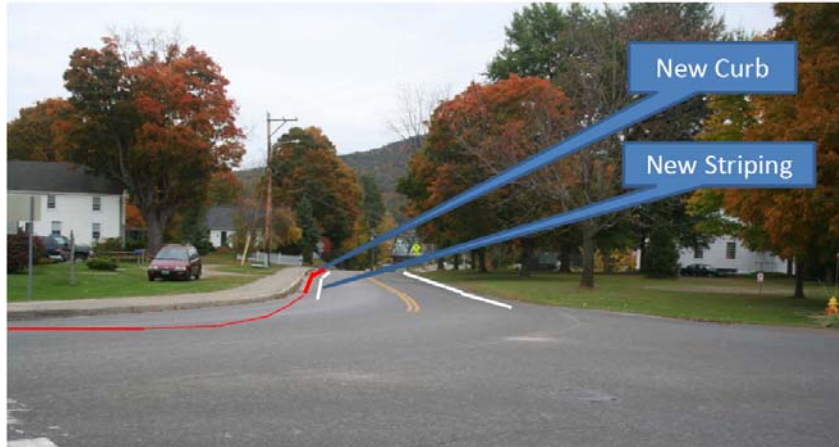


Recommendation #9: Phase 2 – Create a new curb two feet to the east of the existing west side curb from approximately the crosswalk to the Round Church Green to the intersection with Huntington Road to create a two-foot green space between the existing sidewalk and new curb. Add a 20-foot long transition from the four foot green strip to the north to the two foot green strip. Restripe the road to create two ten-foot travel lanes and two three-foot paved shoulders. Add new street trees as possible. **Figure 10** shows the cross section for this Recommendation. **Figure 11** provides a suggestion of how the improvements would fit into the existing condition. Initial estimate of probable construction cost for Recommendations #8 and #9 together: \$100,000.

**Figure 10: Recommendation #9 Cross Section**



**Figure 11: Recommendation #9**



*BRIDGE STREET/HUNTINGTON ROAD INTERSECTION*

Recommendation #10 - Add street trees along the northwest corner of the intersection to begin to close in the intersection. Initial estimate of probable construction: \$3,500.

Recommendation #11 – Reduce the turning radius of the turn from Cochran Road to Bridge Street at the southwest corner of the Round Church Green to be more of a standard intersection as described in the Richmond Public Works Specifications. 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. It will also induce more drivers heading west on Cochran Road to actually stop at the stop sign. Figure 15 provides a suggestion of how the improvements would fit into the existing condition. Initial estimate of probable construction cost for Recommendations #11 and #12 together: \$10,000.

**Figure 12: Recommendation #11**



Recommendation #12 – Reduce the turning radius of the turn from Bridge Street to Huntington Road on the north west 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. **Figure 13** provides a suggestion of how the improvements would fit into the existing condition. Initial estimate of probable construction cost for Recommendations #11 and #12 together: \$10,000.

**Figure 13: Recommendation #12**

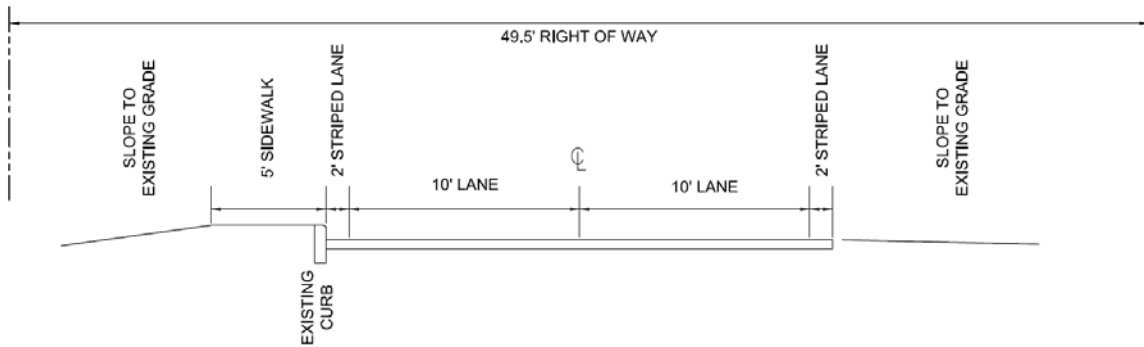


## HUNTINGTON ROAD

Recommendation #13: Phase 1 – 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 70 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 for the small shopping area. Close the center access point to this shopping area with a new curbing, leaving just the eastern and western access points open. Add street trees as possible. **Figure 14** shows the cross section for this Recommendation. **Figure 15** provides a suggestion of how the improvements would fit into the existing condition. Initial estimate of probable construction cost for Recommendation 13: \$15,000 with approximately \$650 for just the restriping.



**Figure 14: Recommendation #13 Cross Section**

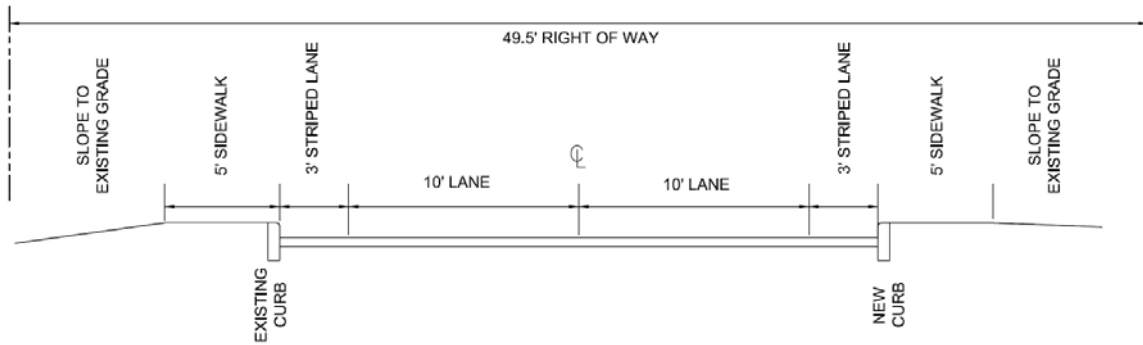


**Figure 15: Recommendation #13**

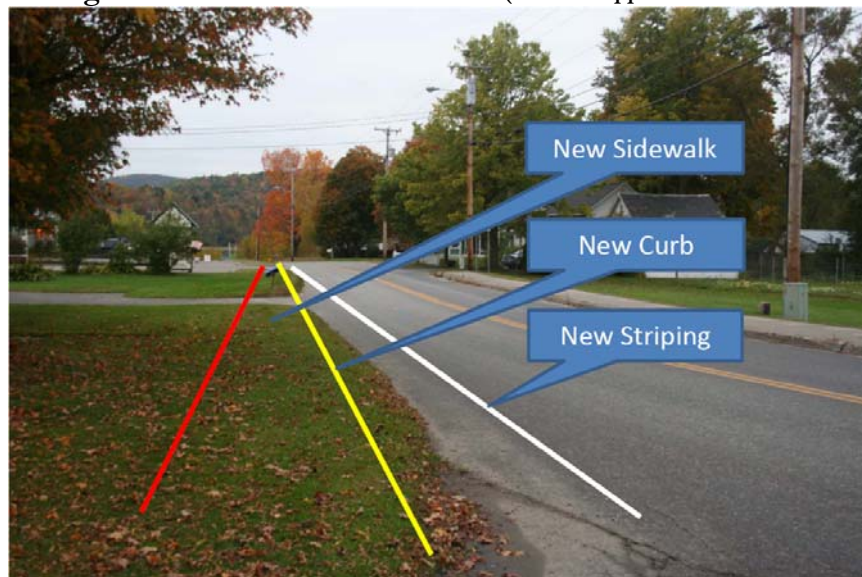


**Recommendation #14: Phase 2** – Add two feet of pavement to the south side of the roadway and restripe to create two ten-foot travel lanes with a three-foot wide paved shoulder on each side. Add a curb on the south side of the road with an adjacent, five-foot sidewalk. The existing mailbox will need to be moved. 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 16** shows the cross section for this Recommendation. **Figure 17** provides a suggestion of how the improvements would fit into the existing condition. Initial estimate of probable construction cost for Recommendations #14: \$46,000.

**Figure 16: Recommendation #14 Cross Section**



**Figure 17: Recommendation #14 (Views is opposite of the Cross Section)**



## LIGHTING

Recommendation #15 – Replace the existing cobra head light fixtures with a more pedestrian scale light fixture mounted on the existing utility poles to create a more even yet lower height light level along the length of Bridge Street. The new fixtures should match the general look of the light fixtures used on Church Street and in the Town Center but should meet today’s efficiency and light pollution standards.

## RAILROAD STREET

Because the Town of Richmond has a 24-foot wide easement for a street right-of-way only on Railroad Street, no recommendations are offered in this report for improving circulation for bicyclists or pedestrians. The development of the new grocery market includes provisions for a sidewalk generally along the store on the north side of Railroad Street. After this sidewalk has been installed for a period, the Town may wish to review the desirability of adding a new sidewalk to the south side of Railroad Street. If the review finds that a

sidewalk would be appropriate, the Town would need to work with private landowners on the south side of Railroad Street since the public 24-foot right-of-way will not accommodate such a sidewalk within the right-of-way.

## RIVER CROSSING

The current 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 from passing 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, if any, alternatives for crossing the river appear to be viable. To date, the following alternatives have been 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.

## IMPLEMENTATION

Based on this study and the ESPC study completed in 2009, the Town of Richmond intends to prepare a village streetscape plan that will include a set of final designs for sidewalk and street improvements on the entire length of Bridge Street, Jericho Road, and East Main Street. Future sidewalk and road construction will be based on those final designs. The final engineering work and construction for new or replacement sidewalks and bicycle facility improvements will need to be coordinated with the work being done on its sewer, stormwater, and water lines. The plans for the sewer, stormwater, and water lines projects should take into account the final Selectboard decisions for bicycle and pedestrian improvements. They should also consider ways to maximize the sustainable construction practices and techniques, including the following suggestions:

- Design and construct Phase 1 improvements or other roadway upgrades for easy implementation of future phases of improvements.
- Combine implementation of recommendations with other work being done in the right-of-way or Study Area to minimize duplication of work and maximize the benefits of public spending.
- Recycle the existing asphalt in the roadway, as possible, for repaving work.
- Use demolition material, such as that generated by the removal of the additional pavement between Church Street and Esplanade Street, as fill and base course material for other nearby projects.
- Use native plants that require no additional watering once established for street tree and green space plantings.
- Reuse existing signs as appropriate after improvements are implemented.
- Contract with local businesses that can supply as many goods as possible that are produced locally.

### *DESIGN STANDARDS*

The roadway widening should be done in accordance to the current Town Public Works Specifications.

Current Town Public Works Specifications call for a minimum of a 30 foot radius at heavily traveled streets. This can serve as a guide as to the radius to use when reconstructing the Bridge Street/Huntington Road and Bridge Street/Cochran Road intersections.

The Town Public Works Specifications call for street trees to be planted outside of the right-of-way. To maximize the traffic calming affects of street trees, BRPD recommends consideration of allowing street trees to be planted within the right-of-way in certain situations.

It appears the Public Work Specifications also only allow concrete sidewalks. The Town may need to verify that it is acceptable to replace the existing asphalt sidewalk on Bridge Street with another asphalt sidewalk for the Phase 1 or whether a concrete sidewalk will be required.

### *INITIAL ESTIMATES OF PROBABLE CONSTRUCTION COSTS*

**Table 2** provides a summary of the projects costs for each of the recommendations. **Appendix C** provides more details on the initial estimates of probable construction costs.

**Table 2** does not provide a cost estimate for Recommendation #15, upgraded lighting because the specific number of light fixtures is not certain at this time. Recent research for light fixtures that meet the requirements outlined in Recommendation #15 shows:

- An LED light fixture would be approximately \$1,000.
- A wall bracket light fixture to mount on a pole would be approximately \$250.
- A cast iron 12-foot lamp post to match those currently in place would be approximately \$2,000.
- Each fixture mounted on a pole would cost approximately \$1,250, excluding the labor and wiring.
- A free standing light fixture would cost approximately \$3,000, excluding labor and wiring, which would most likely be much more than the pole mounted fixture because it would be new buried wiring.

**Table 1: Comparison of Recommendations**

Recommendation	Positive Aspects	Negative Aspects	Relative Costs
<b>Bridge Street North</b>			
#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 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	\$\$\$
#3 - 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	Ties this section of Bridge Street more to the commercial block to the north with no separation between the sidewalk and the curb rather than the residential block to the south with a green space between the curb and the sidewalk.	\$\$
#4 - Mini Park	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	
<b>Esplanade Street</b>			
#5 New Sidewalk	Improves pedestrian circulation	Potentially changes character of street; uses lawn space for sidewalks; Floodplain permit requirements	
<b>Bridge Street South</b>			
#7- 10' travel lane and 4' paved shoulders	Improves conditions for bicyclists; minimal costs		\$
#8 - New 4' green space & 10' travel lane and 3' paved shoulders	Separates sidewalk from roadway; improves bicycle conditions; enhances views of Round Church	Extends roadway 2 feet to the east; requires pavement overlay; minimal potential for impacts to Round Church Green and archeological resources	\$\$\$
#9 - New 2' green space & 10' travel lane and 3' paved shoulders	Separates sidewalk from roadway; improves bicycle conditions	Maintains existing roadway width to the east; may require pavement overlay;	\$\$
<b>Intersection Alternatives</b>			
#10 - Add Street Trees	Will eventually slow traffic	Could place street trees in public right-of-way, contrary to public works specifications	\$
#11 - Lessen Cochran Road Turn	Will slow traffic; provides easier turning for bicyclists	Could create slight vehicular back ups	\$
#12 - Lessen Huntington Road Curve	Assists pedestrian crossings: will slow traffic to speeds closer to posted speed limit ; provides easier turning for bicyclists	Could create slight vehicular back ups on Bridge Street	\$
<b>Huntington Road</b>			
#13- 10' travel lane and 2' paved shoulder with sidewalk extension	Minimal costs; Maintains existing road cross section	Minimal improvements for less experienced bicyclists; slight improvements for pedestrians.	\$
#14 - 10' travel lanes and 3' paved shoulders & add curb and 5' sidewalk	Improves conditions for bicyclists; Improves conditions for pedestrians	Removes 7 feet of grass; requires pavement overlay	\$\$\$\$
<b>Lighting Alternatives</b>			
#15	Create pedestrian scale lighting; add to village character		\$\$

**Table 2: Summary of Initial Estimates of Probable Construction Costs**

<b>Recommendation</b>	<b>Initial Estimate of Probable Construction Cost</b>
#1 - 10' travel lane & 2' paved shoulder	\$51,000
#2 - 10' travel lane and 3' paved shoulder, new east side sidewalk to Town Offices.	\$80,000
#3 - Curb & 7' sidewalk	\$20,000
#4 - Mini Park	\$20,000
#5 New Sidewalk on Esplanade Street	\$90,000
#6 - Raised Sidewalk at Volunteers Green	\$8,000
#7- 10' travel lane and 4' paved shoulders	\$1,600
#8/#9 - New 4' or 2' green space & 10' travel lane and 3' paved shoulders	\$92,000
#10/#11/#12 - Street Trees & reduce turning radii	\$10,000
#13- 10' travel lane and 2' paved shoulder with sidewalk extension	\$14,000
#14 - 10' travel lanes and 3' paved shoulders & add curb and 5' sidewalk	\$46,000
<b>Total</b>	<b>\$432,600</b>





**Bridge Street  
Bicycle & Pedestrian  
Feasibility Study**  
Richmond, Vermont  
**Study Area  
and  
Analysis Sections**  
Map 1

**Legend**

-  Study Area
-  Bridge Street North
-  Bridge Street South
-  Bridge Street Railroad
-  Huntington Road
-  Intersection
-  Esplanade
-  Volunteers Green Road
-  Property Lines



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



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Consulting Archeological Program





**Bridge Street  
Bicycle & Pedestrian  
Feasibility Study**  
Richmond, Vermont  
**Existing Conditions  
North Section**  
Map 2a

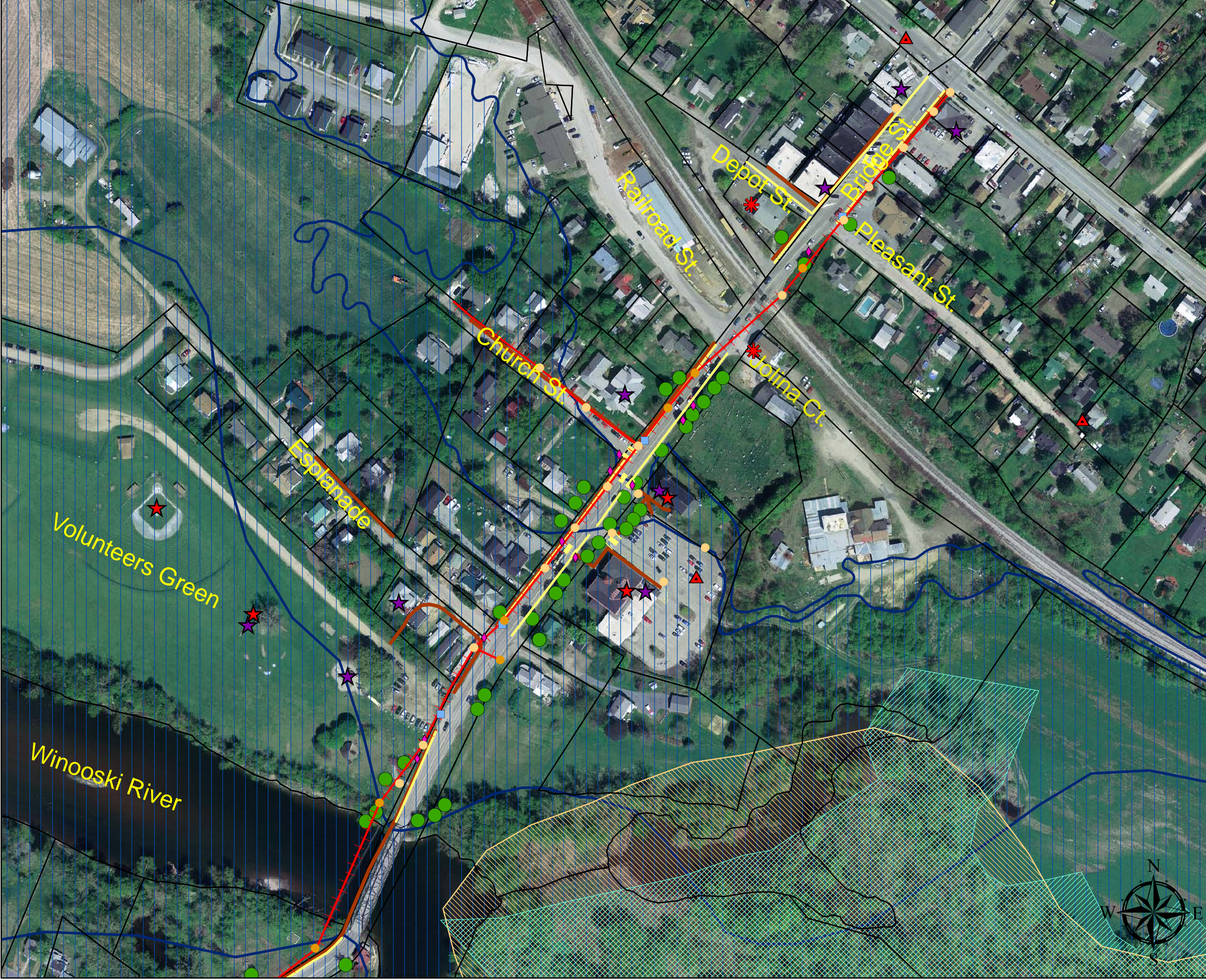
**Legend**

-  Bicycle Activity Center
-  Pedestrian Activity Center
-  Utility Pole
-  Light Fixtures
-  Signs
-  Storm Drain Inlet
-  Overhead Utility Line
-  Curbs
-  Crosswalks
-  Street Trees
-  Sidewalks
-  Hazardous Waste Site
-  Underground Storage Tank
-  Property Lines
-  Vermont State Wetlands
-  Significant Natural Comm.
-  100/500 Year Flood Plain

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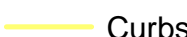





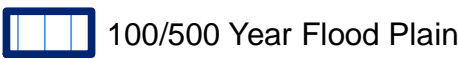


# Bridge Street Bicycle & Pedestrian Feasibility Study

Richmond, Vermont

## Existing Conditions South Section

Map 2b

### Legend

-  Bicycle Activity Center
-  Pedestrian Activity Center
-  Utility Pole
-  Light Fixtures
-  Signs
-  Storm Drain Inlet
-  Overhead Utility Line
-  Curbs
-  Crosswalks
-  Street Trees
-  Sidewalks
-  Hazardous Waste Site
-  Underground Storage Tank
-  100/500 Year Flood Plain
-  Vermont State Wetlands
-  Significant Natural Comm.
-  Property Lines

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**Bridge Street  
Bicycle & Pedestrian  
Feasibility Study**  
Richmond, Vermont  
**Recommendations**  
North Section  
Map 3a

**Legend**

- New Crosswalks
- Recommendation #1
- Recommendation #2
- Recommendation #3
- Recommendation #4
- Recommendation #5
- Recommendation #6
- New Street Trees
- Existing Crosswalks
- Existing Street Trees
- Existing Sidewalks
- Property Lines



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# Bridge Street Bicycle & Pedestrian Feasibility Study

Richmond, Vermont  
Recommendations  
South Section  
Map 3b

## Legend

- ■ ■ New Crosswalks
- Recommendation #7
- Recommendation #8
- Recommendation #11
- Recommendation #12
- Recommendation #14
- New Street Trees
- ■ ■ ■ ■ Existing Crosswalks
- Existing Sidewalks
- Existing Street Trees
- Property Lines



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