

Rutland City
Killington Avenue Sidewalk Extension
Scoping Study

Final Report



Submitted by:

Broadreach Planning & Design

In conjunction with

Lamoureux & Dickinson Consulting Engineers

Heritage Landscapes LLC

University of Vermont Consulting Archaeology Program

August 8, 2014

I. INTRODUCTION

A. OVERVIEW

This study examined the best routing for additional sidewalks on at least one side of Killington Avenue between Butterfly Avenue and Stratton Road. **Figure 1** shows the location of the Study Area around Killington Avenue in Rutland City that is the focus of this study.

The City organized a Steering Committee of local elected officials, citizens, and City and regional planning commission staff to help direct the project. After circulating a Request for Proposals, the City selected a consulting team consisting of Broadreach Planning & Design, Lamoureux & Dickinson, Heritage Landscapes LLC and the University of Vermont Consulting Archeology Program (the BRPD Team) to assist them with the project.

This report is the product of the Steering Committee and the BRPD Team's work. It presents the recommendations of the Steering Committee and describes the process used to develop them.

B. PURPOSE AND NEED

The purpose of the extension of sidewalks on Killington Avenue is to provide better pedestrian connections to the existing City sidewalk system for the residents of Killington Avenue and the rest of the City, in order to provide better mobility for walkers of all ages and abilities.

Needs for the improvements include:

- The lack of sidewalks for at least a third of Killington Avenue;
- The existing bus service on Killington Avenue that lack adequate walking facilities to all of the places where the bus can stop;
- The use of Killington Avenue as a major residential collector road for motor vehicle traffic;
- The presence of sidewalks at either end of the section of Killington Avenue without sidewalks;
- Frequent pedestrian activity as evidenced through dirt paths created along portions of Killington Avenue that do not have sidewalks;
- The designation of Killington Avenue as a bicycle route that increases the potential for bicycle/pedestrian conflicts because of the lack of complete sidewalks; and

- The high rate of obesity in Rutland caused, in part, by the difficulty of incorporating regular physical activity into daily lives due, in part, to the lack of supporting facilities.

C. PROJECT DEVELOPMENT PROCESS

After an initial meeting with the Steering Committee, the BRPD Team began work on Task B of their scope of work - the analysis of existing conditions in the Study Area. At the end of the work on this Task, the BRPD Team produced an *Existing Conditions* summary describing in detail the existing conditions in the Study Area. **Appendix A** is a copy of the final *Existing Conditions* summary; the main body of this final report incorporates portions of the summary. Before moving to the next Task, the BRPD Team assisted with a public work session on June 2, 2014 at the Christ the King School gymnasium, two blocks from the Study Area to review the *Existing Conditions* summary and get further input on the issues and suggestions for possible solutions. It was well attended by local residents, who were very supportive of the project.

After the first public work session, the BRPD Team, again with assistance from the Steering Committee during a team work session, developed a set of alternative alignments for the sidewalk extension. The Steering Committee decided that the sidewalk should be continuous along at least one side of the street from S. Main Street to Stratton Road, so that users would not need to cross the road to be able to use the sidewalk. As part of the subsequent analysis after the work session, the BRPD Team reviewed the potential impacts, benefits and cost ranges for the various alternative and eliminated many of them. They summarized the numerous alternatives that they considered and analyzed in the *Alternatives* summary. The reasons some of the alternatives were not considered further is recorded in Table B-1 in the *Alternatives* summary. **Appendix B** is a copy of the Alternatives summary. After further reviewing and refining the alternatives with the Steering Committee, the BRPD Team assisted with an Alternatives public work session hosted by the Town on July 15, 2014 to review the alternatives and begin the selection of a preferred alignment.

At the public work session, the attendees came to agreement on a preferred alignment and the Steering Committee concurred. The BRPD then assembled a draft Final Report for final public review, scheduled for September 4, 2014.

D. REPORT ORGANIZATION

After this introduction, the report continues with the recommendations. Following the recommendations the report continues with an implementation section that includes phasing recommendations, initial estimates of potential construction costs and implementation suggestions.

The BRPD Team formatted the report for double-sided printing; blank pages are intentional.

E. EXISTING CONDITIONS

The sidewalks on the north side of Killington Avenue in Rutland City extend east from S. Main Street to Butterfly Avenue, with a small, old section of sidewalk on the east side of Butterfly Avenue. The north side sidewalk between East Avenue and Butterfly Avenue was recently replaced or newly installed. A sidewalk also extends east from S. Main Street on the south side of Killington Avenue to just west of Lafayette Street. The City recently removed an older, isolated section of sidewalk on the south side of Killington Avenue between Lafayette Street and Butterfly Avenue. There are no sidewalks east of Butterfly Avenue on either side of Killington Avenue, other than the short, old section. **Figure 2** shows the relevant aspects of the existing conditions along Killington Avenue.

Killington Avenue is a residential road approximately 22 feet wide, extending out to 23 feet in several locations. The City recently installed curbs along most of the road between Eastern Avenue and Stratton Road. The only exception is a small portion of roadway just west of the Moon Brook crossing. The current information that the BRPD Team has shows the Killington Street right-of-way at three rods or approximately 49.5 feet wide.

Moon Brook flows from the north to the south under Killington Avenue just to the west of the intersection with Ronaldo Ct. It passes under Killington Avenue via a six-foot diameter concrete culvert. **Illustration 1** shows the north side of the culvert. The State of Vermont has identified Moon Brook as an impaired waterway. Therefore, the State requires a greater level of storm water runoff retention and treatment than would otherwise be required. Small fish currently live in Moon Brook.

Illustration 1: Moon Brook flowing south under Killington Avenue



There is a mapped 100-year flood plain along Moon Brook. The elevation of the floodplain is higher than Killington Avenue in the vicinity of the culvert under the road. Based on storm events of recent history, including Tropical Storm Irene, the capacity of the culvert under Killington Avenue does not appear to be an issue. The floodplain, as recorded by the Federal Emergency Management Agency, appears to be too high to local officials and residents.

Utility poles line the north side of Killington Avenue east of Butterfly Avenue, mostly set about 4 feet back from the front of the curb.

Buried water lines lie on the north side of Killington Avenue. West of Ronaldo Court, the lines are buried approximately at the edge of the pavement. East of Ronaldo Court, the water lines are buried under the outer edges of the roadway itself. There are several water valves visible between the road and the edge of the right-of-way.

II. RECOMMENDATIONS

A. RECOMMENDED ALIGNMENT

The preferred alignment would place a five-foot-wide sidewalk approximately five feet from the new curb on the north side of the Killington Avenue right-of-way. **Figure 3** graphically shows the location of the preferred alignment. This alignment would leave the utility poles and mailboxes in their current location. The sidewalk would be approximately six feet in from the outer edge of the right-of-way. **Illustration 2** shows a typical cross section for the preferred alignment. **Illustration 3** shows a simulation of what the sidewalk might look like at its western end. (Note, the photo in the simulation was taken before the recent installation of curbs along this portion of Killington Avenue.)

Illustration 2: Typical Cross Section looking East

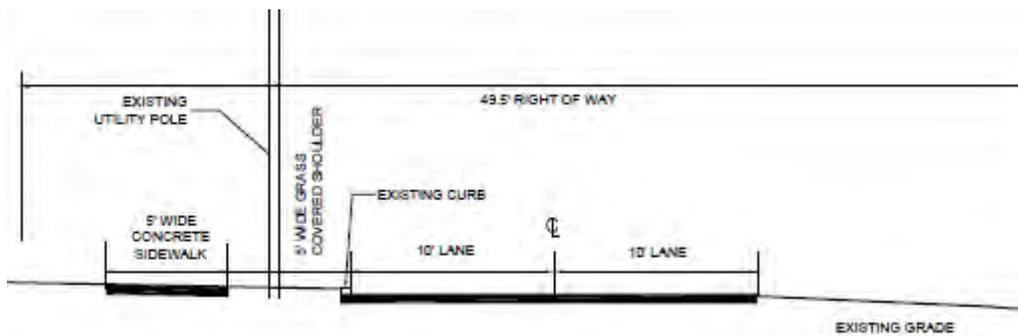


Illustration 3: Alternative 1 Photo Simulation Looking East



B. ISSUES

There are several areas where special conditions would need to be addressed. Starting at the west end and working east, the report briefly describes them in this section of the report. **Figure 4** shows the location of these various issues.

The fire hydrant on the east side of Butterfly Avenue at the corner with Killington Avenue would be able to stay in its current location.

The garden and small brick edging on the west side of the first driveway east of Butterfly Avenue would need to be shortened by approximately three feet to make way for the sidewalk. The fence seen on the left in **Illustration 3** on the east side of the first driveway is approximately six feet away from the utility pole, so there would be enough room for the sidewalk to go between the pole and the fence without the need to move either. The gardens on the outside of the fence would need to be shortened towards the fence to allow room for the sidewalk.

The drainage inlet approximately 175 feet west of Moon Brook would need to be revised as part of the preferred alignment. The inlet could be relocated to the south to lie in the green space between the sidewalk and the street with an extension under the sidewalk to the catch basin, or the sidewalk could bridge over the existing paved drainage way leading to the existing inlet. The specific treatment of the inlet could be determined during initial design work on the sidewalk.

The crossing of Moon Brook would be done via a at grade boardwalk. The crossing would have a six-foot clearance between the railings. It would keep the sidewalk at the same elevation as the road. **Illustration 4** shows a cross section through the crossing, looking east. **Illustration 5** shows a visualization of how the crossing might look, looking west. It shows a wooden surface, but the surface could also be asphalt. The Boardwalk would not place additional fill in the floodplain.

Illustration 4: Cross Section through Moon Brook Crossing Looking West

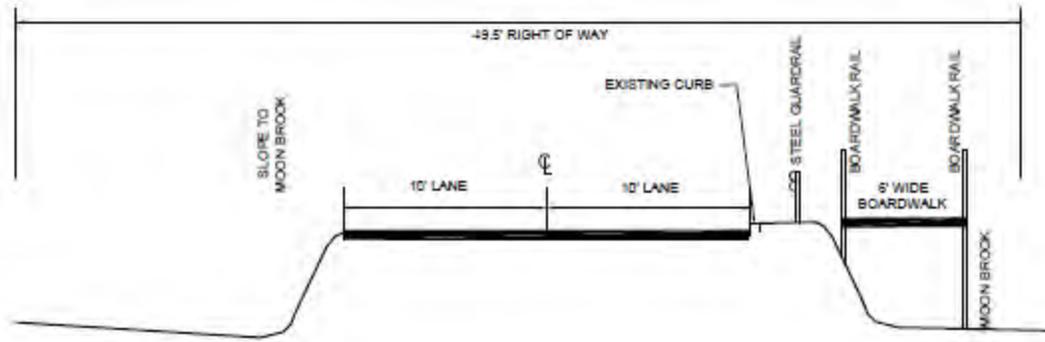


Illustration 5: Moon Brook Crossing Visualization Looking East



The boardwalk would actually shift very slightly to the north so that the short section of sidewalk at the eastern side would lie outside of the utility pole and fire hydrant on

the western corner of Ronaldo Court. **Illustration 6** shows this area. The sidewalk would be on the right side of the utility pole. It would meet the road pavement after the end of the curb. The first utility pole east of Ronaldo Court is located about seven feet behind the new curbs on Killington Avenue, further away from the curb than the rest of the utility poles along the street. Placing the sidewalk behind this pole would push the sidewalk to the outer edges of the right-of-way and require the removal of shrubs. Additionally, to avoid disturbing an existing stairway to the front of the first house east of Ronaldo Court, the sidewalk would need to have a significant curve in it. Consequently, the sidewalk would be routed in front of this particular pole, placing the sidewalk about two feet away from the curb in this location.

**Illustration 6: The Northwest Corner of Killington Avenue and Ronaldo Court
Looking West**



The construction of the sidewalk and boardwalk west of Ronaldo Court would need to pay attention to potential impacts to the buried water line and the potential for encountering water valves.

East of the utility pole, the sidewalk would shift away from the road to resume its typical location about five feet from the curb. The grade rises on both sides of the two driveways serving the second house east of Ronaldo Court. The sidewalk would need to cut into the slopes to spread out the raise in grade to attempt to keep the driveway close to a maximum of eight percent. (Because the sidewalk is being built adjacent to an existing road with a slope greater than eight percent in this location, the sidewalk can exceed the eight percent typical maximum.) This would be easily accomplished on the western side of the driveways. On the eastern side the grade rises at approximately 33 percent. To meet an eight percent slope, the sidewalk

would need to have a rise spread out over about 50 feet. The exact length of the rise can be determined when there is more accurate grade information that should be gathered during the development of construction drawings.

Two recently planted crab apple trees on the third property east of Ronaldo Court would need to be relocated or replaced outside of the right-of-way to allow placement of the sidewalk back in its typical location. Also on this property is a hitching stone that appears to be historic. The sidewalk should be able to be installed to the north of the stone's existing location, putting it in the green space between the sidewalk and the curb.

On the east side of Brookview Lane, several sections of old iron fence are located along the edge of the right-of-way. There appears to be enough room between the utility pole and the fence sections to allow the placement of the sidewalk without disturbing the fence sections.

On the parcel west of Meadowbrook Road, the grade drops away from the new curb. In this location, the sidewalk would be placed slightly lower than the curb using a combination of cutting and filling to minimize the disturbances outside of the right-of-way on the adjacent property.

Most of the existing trees along the right-of-way between Meadowbrook Road and Stratton Road would need to be trimmed so that their branches don't hit walkers on the sidewalk. The trees themselves should not need to be moved. They are far enough away from the sidewalk that the installation of the sidewalk should not disturb them, but the construction drawings should note that the contractor should take special care to cleanly cut tree roots that are encountered during the installation of the sidewalk.

A storm drain inlet close to the corner of Killington Avenue and Stratton Road will need to be relocated, or the sidewalk slightly rerouted to avoid it. The inlet lies within the proposed alignment of the sidewalk.

B. OTHER IMPROVEMENTS

As part of the sidewalk extension, the Town should consider adding street trees as part of the work. Street trees added within the green space would, as they grow, begin to enclose the road. This has been shown to help slow motorists and residents have noted that excessive speeds of drivers is one of the reasons for needing the sidewalks along the road. The trees would help to address the larger problem. **Figure 2** shows potential locations for additional street trees along Killington Avenue. Trees planted on the north side under the utility wires should mature at between 15 and 20 feet to avoid conflicts with the overhead wires.

As the sidewalks are installed, the City should also consider adding crosswalk markings on Butterfly Avenue, Ronaldo Court and Meadowbrook Road to facilitate pedestrian crossings of these road.

C. RATIONAL

The preferred alignment on the north side of Killington Avenue meets the purpose and need for this project.

Since the City has already upgraded much of the sidewalk on the north side of Killington, including a new portion of sidewalk between LaFayette Avenue to Butterfly Avenue, extending the sidewalk on the north side of Killington Avenue would include less new sidewalk than extending it on the south side. This makes the north side alignment less expensive than the either of the south side alignments. The participants at the second public work session reviewing the alternatives cited this as a major consideration in their preference.

The north side alignment would also include less disturbance along the road, since there would be only two locations where any cutting and filling would be needed to create a level area for the sidewalk. The north side alignment would allow mailboxes on both sides of the street to remain in their current locations.

The crossing preference would limit the decline in the sidewalk, which could be a problem in the winter if ice or snow accumulated on the sidewalk. The participants at the second public work session also thought the level crossing presented a cleaner image than the bridge at a lower elevation. The Moon Brook boardwalk crossing also eliminated the issue of filling in the floodplain associated with the culvert alternative.

The overall cost of the three different Moon Brook crossings, the boardwalk, a bridge and a new box culvert, were relatively close in their initial cost estimates. The City might opt to review this recommendation again, when more detailed grade and subsurface information is available. If either of the other two alternatives are subsequently determined to be a better option, they should be installed so that the overall look of the crossing is similar to that shown in **Illustration 5**, with the sidewalk level with the road.

III. IMPLEMENTATION

A. PHASING

There are minimal possibilities for phasing the preferred sidewalk alignment along the north side of Killington Avenue. It may be possible to extend the existing sidewalk east from Butterfly Avenue to Ronaldo Court and include the installation of

the Moon Brook Crossing as an initial phase. The second phase would extend the sidewalk further east to Stratton Road.

B. INITIAL ESTIMATE OF PROBABLE CONSTRUCTION COSTS

The BRPD Consulting Team has prepared an initial estimate of probable construction costs for the proposed sidewalk alignment and Moon Brook crossing. The overall cost of the entire project would be approximately \$375,000. **Table 1** provides basic cost information.

The BRPD Team based the initial estimate on the Illustrations and Figures contained in this report. The numbers should be considered as guides in how much funding might be needed to construct the preferred alignment. The initial costs estimates are based on having the project completed by an independent contractor. The City might be able to realize savings by constructing the portions of the sidewalk or shared use path with its own road crews.

Table 1: Initial Opinion of Probable Construction Costs

Item	Quantity	Unit	Unit Cost	Total
Five-Foot Wide Concrete Sidewalk	1,250	LF	\$180	\$225,000
New Six-Foot Wide Boardwalk	350	SF	\$55	\$19,250
Cast-in-Place Concrete Abutment	2	EA	\$15,000	\$30,000
Rehab Catch Basin	2	EA	\$1,500.00	\$3,000
Street Trees	15	EA	\$300	\$4,500
New Painted Crosswalk	60	LF	\$7	\$420
			Sub Total	\$282,170
Engineering (12%)				\$33,860
MPM (5%)				\$14,109
Contingency (15%)				\$42,326
			Total	\$372,464

C. PERMITS

D. FUNDING

Funding for the preferred alignment, including the Moon Brook crossing might be able to be secured from a variety of sources. Below is a list of various funding sources that could be used to help with the implementation of the recommendations, including:

- Transportation Alternatives Program (TA Funds): TA funds can be used to increase bicycle and pedestrian mobility. These funds will cover a maximum of 80 percent of the project with the remaining portions most likely coming from the project sponsoring organization. TA funds are distributed in Vermont through a competitive grant program.
- Bicycle and Pedestrian Program: These State funds cover specific bicycle and pedestrian improvement projects and are provided via a competitive grant program.
- Bonds: The Town could opt to use bonds to generate funds to undertake one or all of the phases at once.

A new online tool developed by a partnership between the Alliance for Biking and Walking and the League of American Bicyclists helps find potential federal funding sources for alternative transportation projects. The site can be reached at <http://bit.ly/11xhEtr>.

Other funding sources may be available for the construction of the path, including:

- Potential health grants promoting healthy living;
-
- The Robert Wood Johnson Foundation (see <http://www.rwjf.org/content/rwjf/en/grants/search.html?k=walking&d=&l=>);
- MCI/Worldcom Royalty Donation Program (For this and several subsequent ideas, see: <http://www.americantrails.org/resources/funding/TipsFund.html>); and
- Moon Brook crossing sponsorships (and possibly naming rights);

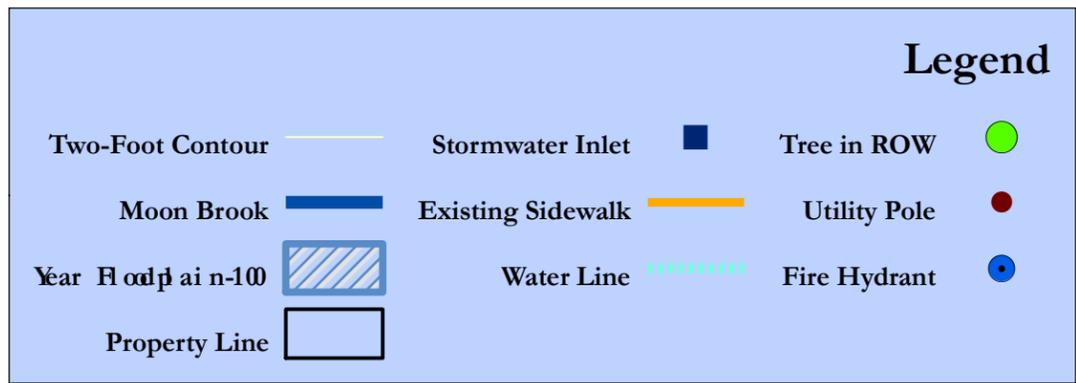
Even other potential sources exist. Some additional resources that may provide insight into additional funds include:

<http://www.americantrails.org/resources/funding/Funding.html>,
<http://rlch.org/>, and
<http://atfiles.org/files/pdf/bicentennialsourcebook.pdf>.

E. PROCEDURES

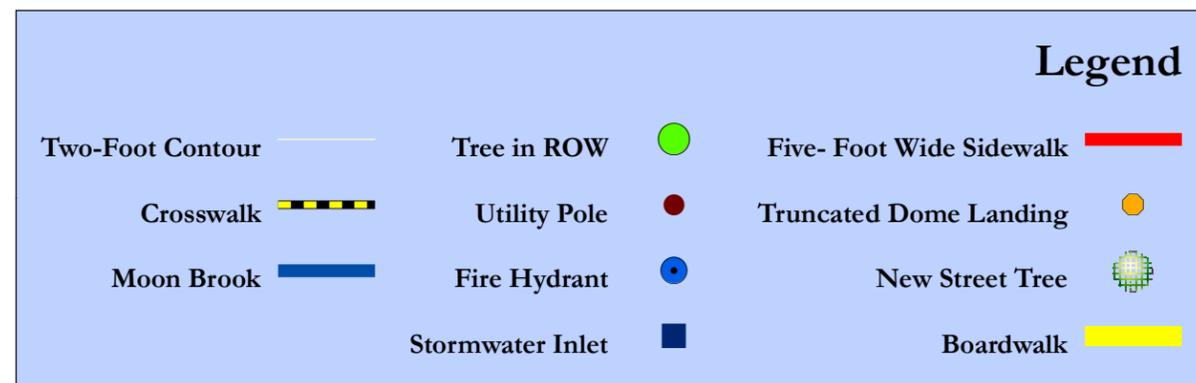
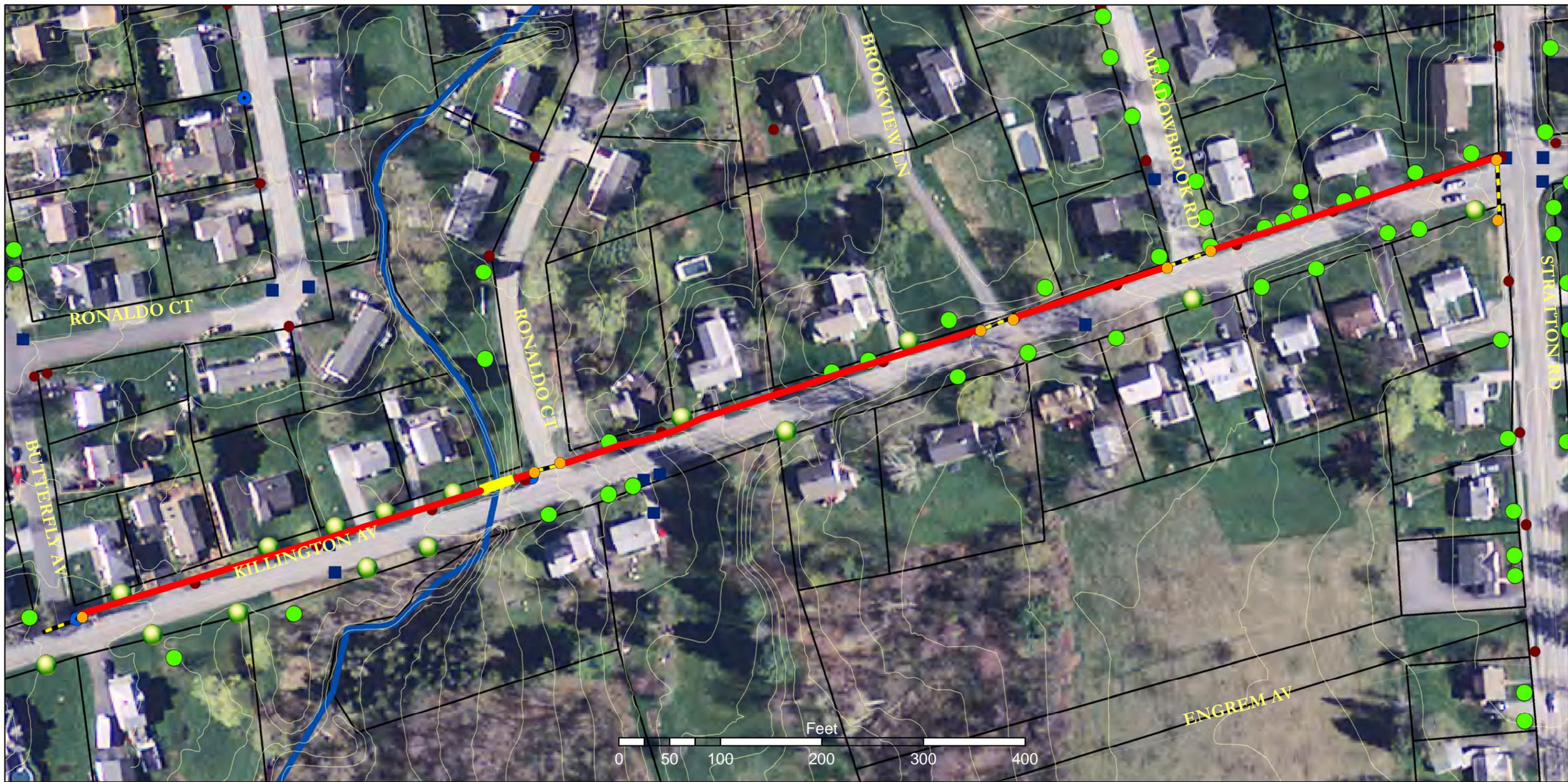
As a first step towards implementing the recommendations of this study, the Board of Alderman should accept and endorse the report. It will be difficult to proceed with securing other State or Federal grants without this endorsement. Once the report is endorsed by the City, the Department of Public Works could undertake these steps:

- Start considering and applying for funding opportunities through grants, bonding or other sources the Town considers appropriate.
- Keep the City residents, especially those along Killington Avenue, informed on the process of implementing the recommendations.
- Hire a consultant if needed to assist with the design of the sidewalk, looking in particular at the relocation of drain inlets and the types of foundations or abutments needed for the Moon Brook crossing.
- Move forward as possible with construction.



**Killington Avenue Sidewalk Extension
Scoping Study**
Rutland City, Vermont
**Existing
Conditions**

August 18, 2014 Figure 2



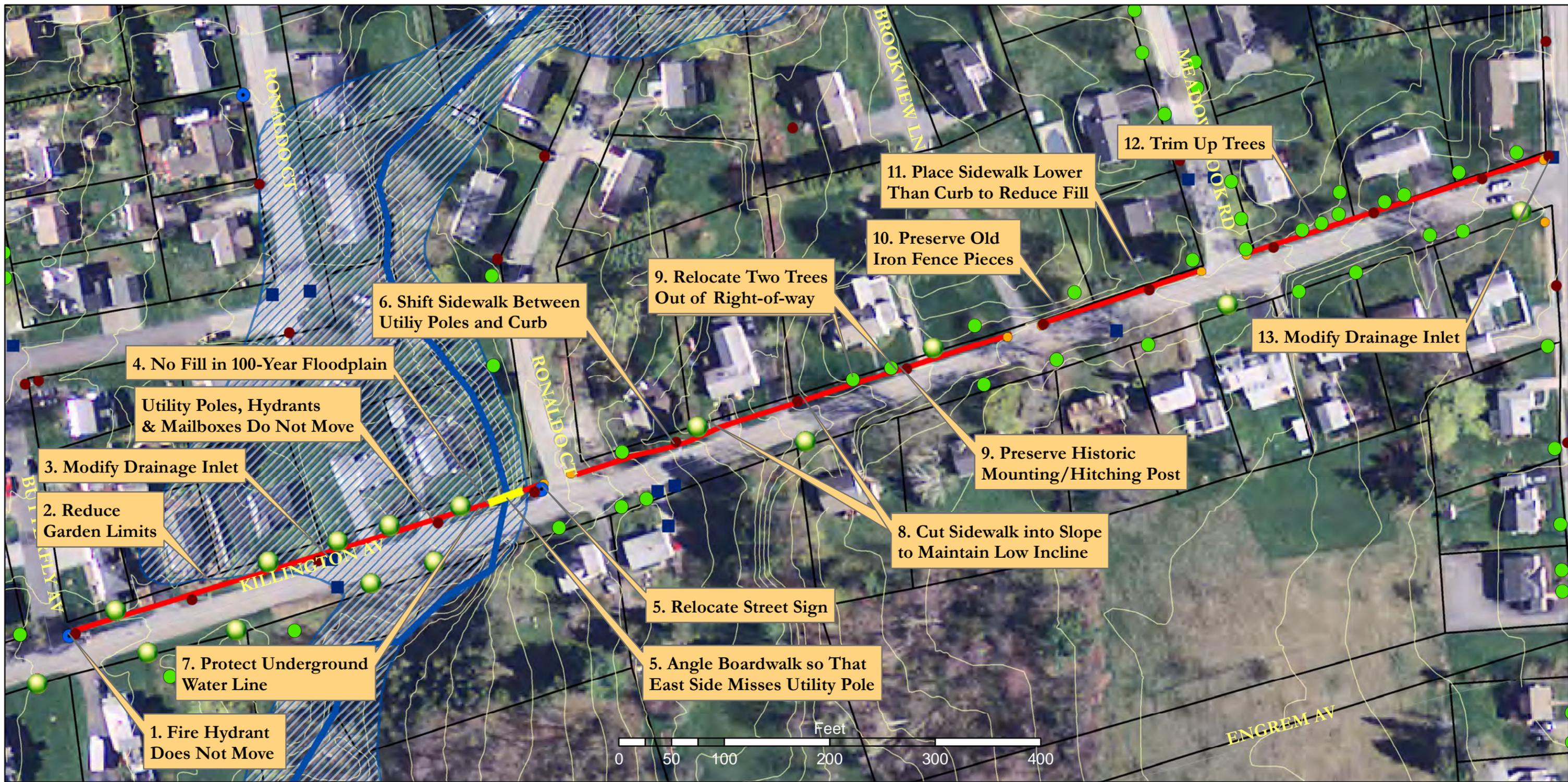
Killington Avenue Sidewalk Extension
Scoping Study
 Rutland City, Vermont
Preferred Alignment
 August 18, 2014

BROADREACH
 Planning & Design

LD

Heritage Landscapes
 Preservation Landscape Architects & Planners

Figure 3



Numbers on notes relate to corresponding numbers in section II.B of the text.

Legend					
Moon Brook	Blue line	Tree in ROW	Green circle	Five-Foot Wide Concrete Sidewalk	Red line
Year Floodplain-100	Blue hatched area	Fire Hydrant	Blue circle	Truncated Dome Landing	Orange circle
Two-Foot Contour	Yellow line	Utility Pole	Red circle	Boardwalk	Yellow line
Property Line	Black outline	Stormwater Inlet	Blue square	New Street Tree	Green grid icon

Killington Avenue Sidewalk Extension Scoping Study

Rutland City, Vermont
Issues






Heritage Landscapes
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August 18, 2014

Figure 4