

**Town of Warren
Sugarbush Access Road Path Scoping Study
Warren STP BP15(13)**

Final Report



Submitted by:
Broadreach Planning & Design

In conjunction with
**Lamoureux & Dickinson Consulting Engineers
Heritage Landscapes, LLC
University of Vermont Consulting Archeology Program**

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This report has been formatted for double-sided printing.

Blank pages are intentional, so that the beginning of the report and the appendices can start on an odd numbered, right-side page.

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I. INTRODUCTION

A. OVERVIEW

This study is updating the feasibility of creating a path in the vicinity of the Sugarbush Access Road in the Town of Warren, Vermont (the Town). **Illustration 1** shows the location of the Study Area within the Town. The study area includes the land on either side of the road's right-of-way that might be suitable and appropriate for the location of a path. The Primary Study Area extends from the western end of the road at the intersection with Inferno and Village Roads to the intersection with Eurich Pond Road. **Illustration 2** shows the location of the Primary Study Area. The study will also examine the potential for the path in the secondary portion of the Study Area, along the rest of the Sugarbush Access Road, from the Eurich Pond Road intersection to its eastern end at Route 100. The level of detail accorded the secondary area is slightly less than that provided for the Primary Study Area.

Illustration 1: Study Location

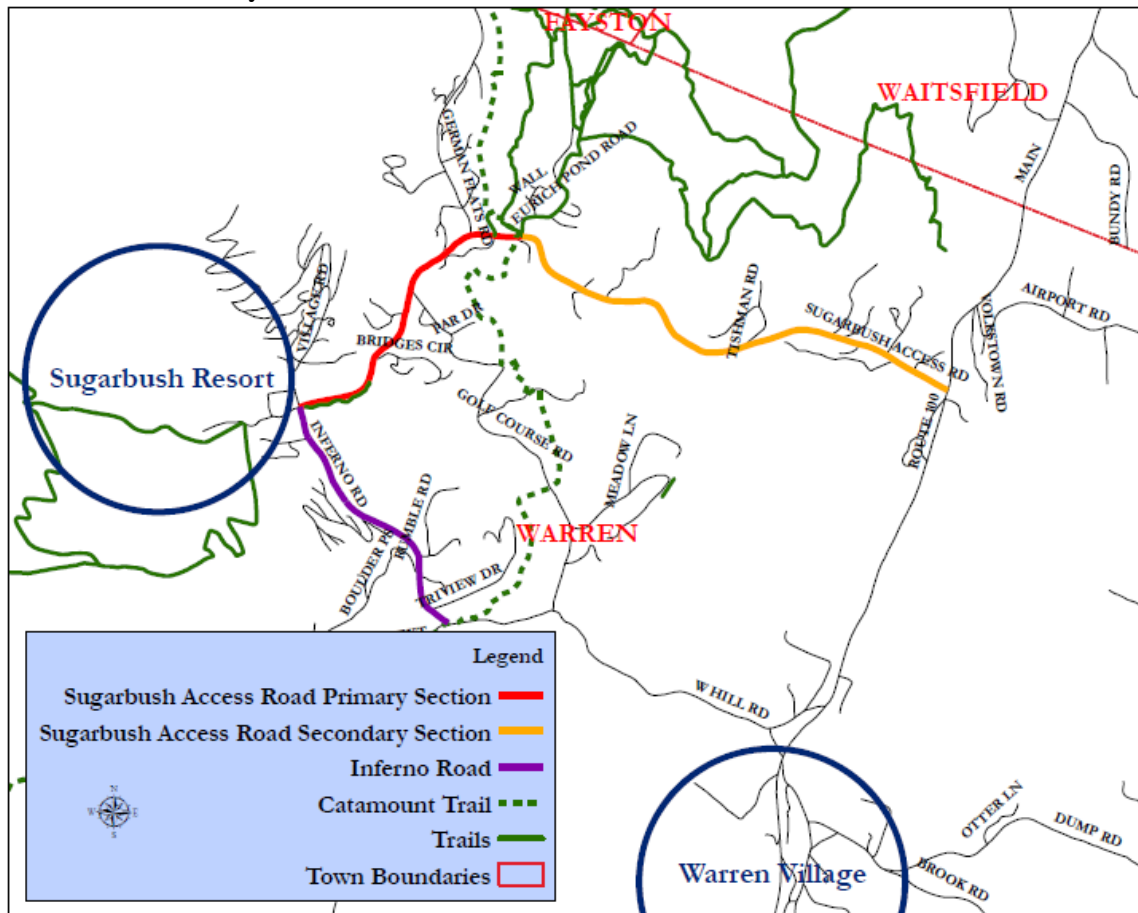
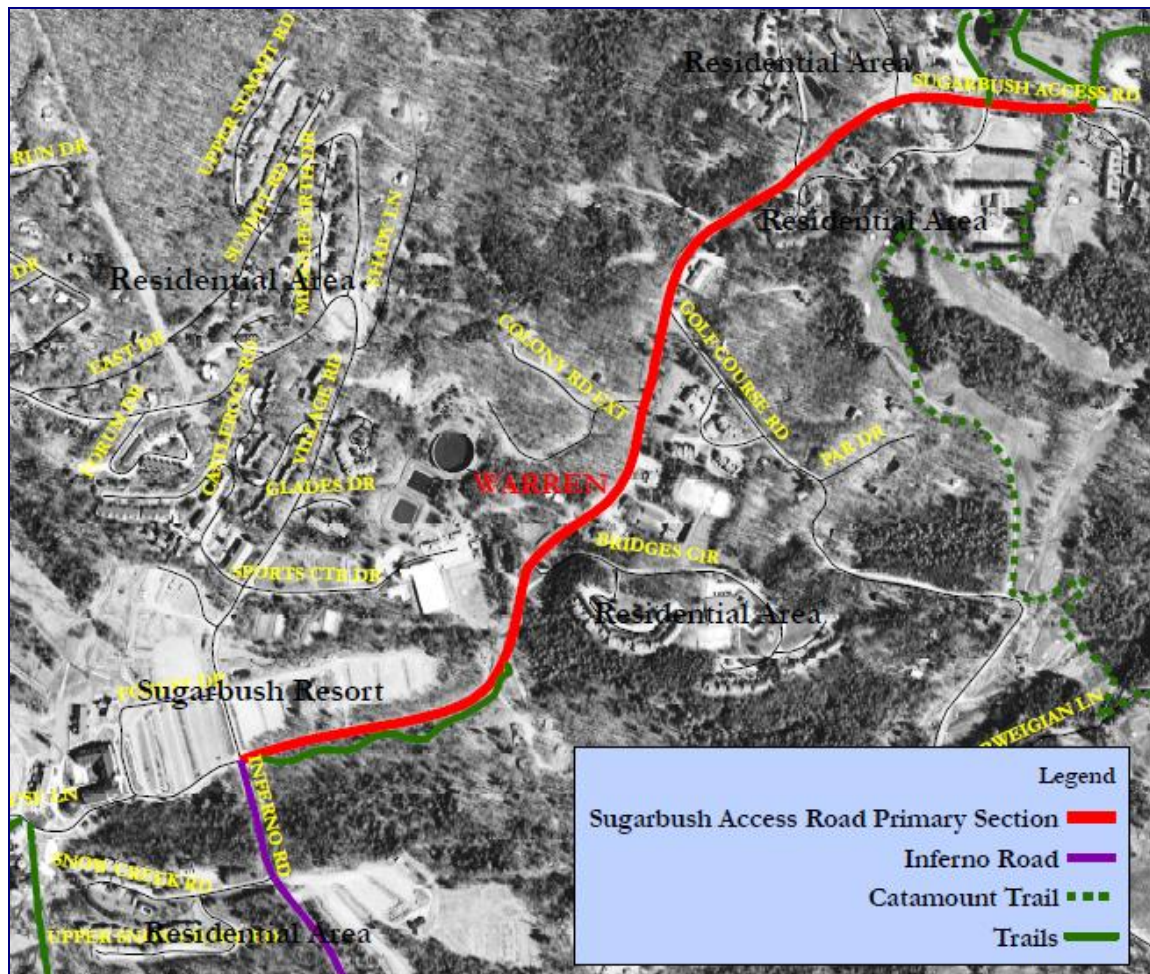


Illustration 2: Primary Study Area - East End at Eurich Pond Road



The Sugarbush Access Road Path Scoping Study builds on previous work that looked at the potential for creating a path alongside the road, as well as earlier discussions and efforts within the Town that considered the development of a Sugarbush Access Road path.

The Town received a grant from the Vermont Agency of Transportation (VTrans) to undertake this study. Town officials, after circulating a Request for Proposals, 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. The Town also assembled an Advisory Committee to guide the project.

During the first public work session for this project, the public expressed a desire to have the project extend even further to include Inferno Road. Subsequently, the Warren Selectboard authorized the BRPD Team to look at walking and bicycling improvements along Inferno Road as well.

This Final Report is the work of the Town officials, Advisory Committee, and the BRPD Team. It focuses on the final recommendations, the reasons they were selected, and information that will help the Town implement them.

To complete the study, the BRPD Team and the Advisory Committee,

- Examined the existing conditions,
- Identified as many alternative ways of adding a path along Sugarbush Access Road as possible,
- Examined and analyzed the alternatives, and
- Selected what appeared to be the most appropriate alternatives.

This process was performed with input from the Town of Warren Selectboard and the public at three key points during the work. The main text of this report provides a summary of the results of the study and the information used to reach them. Full size **Figures** are located at the end of the text, starting after Page 34. Reduced versions or portions of the figures are included within the text for convenience and general information. Because the scale of the **Illustrations** in the text is reduced, the details of the information can be difficult to discern. Readers are advised to look at the full size **Figures** at the end of the text to understand the details easily.

The main text of the report also includes an Executive Summary of the relevant existing condition information for Sugarbush Access Road. Readers that would like to fully understand the existing conditions in the Study Area can skip the Existing Conditions Executive Summary and go directly to **Appendix A**, which includes a more detailed discussion of the Sugarbush Access Road existing conditions that were examined during the first portion of the project. **Appendix B** includes a review of the different alternatives that were generated and analyzed during the study for Sugarbush Access Road. It also includes the reasons why several of them were not pursued. **Appendix C** includes the Inferno Road study. **Appendix D** includes a copy of notes from the public work sessions conducted by the Selectboard.

B. PURPOSE AND NEED

The purpose of the Sugarbush Access Road Path is to provide a non-motorized connection, especially for pedestrians, between Sugarbush Ski Resort, the surrounding residential development, and other existing walking and bicycling trails and facilities in Warren and the larger Mad River Valley. **Figure 1** graphically shows these connections.

Needs for the improvements include:

- The presence of a bus route and stops along Sugarbush Access Road without adequate pedestrian access between the stops or bus rider origins or destinations;
- Frequent pedestrian activity along the shoulders and the edges of the pavement of Sugarbush Access Road, especially observed at its western end;

- The lack of definition as to where pedestrians should walk, especially at the western end;
- The one- to two-foot wide paved shoulders on Sugarbush Access Road create uncomfortable conditions for walkers, especially in the winter when snow can limit their ability to move off the paved portion of the road as trucks or vehicles pass nearby in the travel lane;
- The use of Sugarbush Access Road by over 3,900 vehicles daily during the busy winter months for the Sugarbush Resort; and
- The safety concerns of the Town, that prompted a request for a VTrans safety study of Sugarbush Access Road, which resulted in numerous recommendations to improve safety for motorists, but not for pedestrians or bicyclists.

C. ORIGINS, DESTINATIONS & TRAVEL PATTERNS

The primary destinations for walkers and bicyclists along Sugarbush Access Road are the Sugarbush Resort itself, Paradise Deli, the various inns along the road, and the trailheads near Eurich Pond Road, when walkers actually have a destination. Walking and bicycling trips start from Sugarbush Resort or the numerous residential and lodging units along and near the road, although many of the current walkers along the road are walking just to walk without having any particular destination. Route 100 and Warren Village further to the east will become destinations as elements of the Mad River Valley Active Transportation Plan get implemented creating easier and more convenient connections to them and other parts of the Valley.

D. LONG TERM PLAN

The Town understands that this project is a long-term endeavor that may take many years to fully complete. They anticipate that some sections might be developed individually over time, eventually leading to a complete path. They are also considering the possibility of initially developing a mowed grass, dirt, or mulch hiking trail along some or all of the preferred alignments. The Town would eventually improve the foot trail to be a full shared use path available to a wider range of users. These initial trails would follow ADA accessibility requirements for forest trails. They would also follow ADA accessibility requirements for vertical alignments of shared use paths. This would allow the future conversion to a full, ADA compliant shared use path to be accomplished with minimal modifications to the alignment; it would just need to focus on meeting ADA compliant cross grades and surface treatments.

Even though the initial development might be as a foot trail, the study and this final report include descriptions, analyses, and an initial estimate of probable construction cost of the recommended path alignment as a ten-foot wide, fully ADA accessible shared use path, so that the feasibility and potential impacts of such a path are evaluated now.

II. EXECUTIVE SUMMARY - EXISTING CONDITIONS

A. OVERVIEW

Appendix A contains a full description of the existing conditions in the Study Area in the Existing Conditions Report. The following text briefly summarizes aspects of the Existing Conditions Report in the Study Area that the BRPD Team found to be important in the development of the recommended alignment. **Figures 1a and 1b**, on Pages 37 and 38, provide graphic representations of the relevant existing conditions in the Study Area. **Readers who would like to more fully understand the existing conditions in the Study Area should read Appendix A instead of this Executive Summary to avoid reading information twice.**

B. TRANSPORTATION

1. SUGARBUSH ACCESS ROAD

The Sugarbush Access Road (Town Highway 5) is an approximately 3-mile long class 2 town road. It runs primarily east and west between Route 100 on the east and Inferno Road and the Sugarbush Resort parking area on the west. From the low point on the east end to the high point at the parking lot, it rises 760 feet, an average of a five and one fourth percent rise over the entire road. Individual sections are more or less steep than this average, and the road does not rise in one continuous climb, but rises and falls gradually upwards. The road pavement is between 22 and 24 feet wide, with a ten and one half-foot wide travel lane generally uphill on the north side and an eleven and one half-foot travel lane generally downhill on the south side. The paved shoulders vary from one to two feet wide.



Photo 1: Sugarbush Access Road looking west near the intersection with German Flats Road

The paved shoulders vary from one to two feet wide.

The posted speed limit on Sugarbush Access Road is 40 miles per hour (MPH) the entire length of the road. The Sugarbush Access Road right-of-way is four rods wide (66 feet), centered on the middle of the road. The latest available traffic counts from VTrans Continuous Traffic Counter W-062, located 0.2 miles west of the intersection of the Sugarbush Access Road and German Flats Road show that the average annual daily traffic rate for Sugarbush Access Road was 2,313 for July, 2016, but 3,952 for January 2015.

VTrans conducted a High Risk Rural Roads review of Sugarbush Access Road in June 4, 2013. The review noted the concerns of the Town representatives and made numerous recommendations on how the signage and markings along the road could be upgraded to address the concerns. VTrans has indicated to the Town that they will be working with them

in 2017 to implement the recommendations. **Attachment A-1** in **Appendix A** includes a copy of the review. Most of the upgrades involve new or replacement signage.

2. SUGARBUSH RESORT PARKING LOT PATH



Photo 2: The existing Sugarbush Trail

Sugarbush Resort constructed a gravel path on its property connecting the intersection of Sugarbush Access Road and Inferno Road with a relatively new parking area located in the southeast corner of the intersection about 500 feet east of Inferno Road. As seen in the photo on the left, the path is approximately ten feet wide and has a packed gravel surface that currently does not meet ADA standards. The slope of the entire path is at or about eight percent or less.

The path's west end starts on the south side of Sugarbush Access Road approximately 100 feet east of the intersection with Inferno Road. There is no direct link to the intersection. The path ends on the east at the driveway linking the parking area and Sugarbush Access Road. There is no direct link for path users to Sugarbush Access Road other than the driveway.

C. NATURAL RESOURCES

1. WATERCOURSES

Rice Brook flows under Sugarbush Access Road halfway between Inferno and German Flats Roads. It then continues to flow east downhill along the south side of Sugarbush Access Road. Clay Brook, a portion of which is listed as an impaired stream, flows east on the south side of the far western portion of Sugarbush Access Road. At its closest point, the impaired portion of Clay Brook is over 250' south of the access road. Clay Brook joins Rice Brook just west of Golf Course Road. Sterling Creek runs parallel to Sugarbush Access Road on the north side, crossing under Eurich Pond road before turning south and crossing under Sugarbush Access Road. **Figures 1a** and **1b** show the location of Rice and Clay Brooks, and Sterling Creek. Other minor, unnamed intermittent streams run down hill passing under Sugarbush Access Road via culverts, three of the culverts being larger than six feet in diameter. While the condition of the culverts has not been investigated by the State or the BRPD Team, the only sign of erosion near a culvert was the one at the intersection with Club Sugarbush Road North.

2. WETLANDS

Although there are several state listed wetland areas located in the vicinity of the Sugarbush Access Road, they are outside of the Primary Study Area and are widely separated from the

road. One is between Sports Center Drive and the Sugarbush resort sewage treatment plant, although this is approximately 500 feet uphill of the road. Another larger one is just east of the Sugarbush Inn parking lot, approximately 250 feet from the road. Smaller wetland areas not shown on the Vermont Agency of Natural Resources (VTANR) Environmental Interest Locator Map are present along the sides of the road as well as near streams and drainage ways. The most significant wetland area, in addition to the roadside ditch, is a low area on the north side of Sugarbush Access Road across from and east of Golf Course Road. **Figure 1a** shows the location of the smaller, closer wetland areas.

The BRPD Team considers these wetlands to be Class 2 because of their proximity and hydrological connections to the named and unnamed watercourses in the Study Area. This means that both the wetland and a 50-foot setback around the perimeter are protected by Vermont law and permits would be required to disturb either the wetland or the buffer area.

3. TOPOGRAPHY

The eastern end of Sugarbush Access Road is at an elevation of approximately 800 feet above sea level. The western end at the intersection with Inferno Road is at an elevation of approximately 1,560 feet above sea level. In several locations, the sides of the roads are very steep, with slopes either rising up or down away from the road. **Figures 1a** and **1b** show the locations where there are steep side slopes. In other locations, the sides of the road are just slightly higher or lower than the adjacent road.

There is an existing concrete retaining wall within the right-of-way at the Sugartree Bed & Breakfast. There is a well and other private utilities located behind the retaining wall.

4. FLORA & FAUNA

As the base photograph on **Figures 1a** and **1b** shows, trees line the Sugarbush Access Road at some distance from the edge of the pavement. There are only limited locations where there are open fields, lawns, parking, or buildings next to the road. Along these areas, there are individual trees that are prominent along the sides of the road. **Figures 1a** and **1b** show the location of these prominent individual trees.

The entire study area is considered to be habitat area for the endangered long-eared bat.

D. UTILITIES

1. OVERHEAD UTILITIES

Green Mountain Power (GMP) has three phase overhead power lines running along either the north or south side of Sugarbush Access Road, from where it crosses Rice Brook east to Route

100. GMP owns the poles. In addition, the poles appear to carry cable television and telephone wires. **Figures 1a** and **1b** show the location of the utility lines and poles.

2. UNDERGROUND UTILITIES

Figures 1a and **1b** show the approximate location of known underground utilities.

Two privately owned snowmaking water lines, one a force main, lie buried on the north side of Sugarbush Access Road between Inferno Road and the snowmaking building on the north side of the road, a distance of approximately 375 feet. The snowmaking water line continues along further east to Upper Pines Road. At that point, the water line leaves the Sugarbush Access Road right-of-way and heads northeast, first along Upper Pines Road and then through the forest down to the Sugarbush snow making pond.

3. STORMWATER

There are numerous stormwater facilities along Sugarbush Access Road, including small to large culverts under the road, drainage ditches alongside the road, and detention and retention ponds. **Figure 1a** and **1b** show the location of these facilities.

E. CULTURAL RESOURCES

The BRPD Team found that one property within the entire Study Area of the Sugarbush Access Road Path project is listed as historic resources in the Vermont Historic Sites and Structures Survey (VHSSS) and two others have the potential to be listed but have yet to be surveyed. These historic or potentially historic properties stand along the Sugarbush Access Road; they found no historic resources along other roads or in other areas of the project alternatives. The three historic or potentially historic properties are:

- 1248 Sugarbush Access Road - The Law, Phelon and Associate Real Estate: Constructed in c.1830, the 1-1/2-story broad gable Classic Cottage with c. 1920s wing stands back from the road and is separated by a short but steep embankment. A large historic tree grows to the south of the home very close to the road. The proximity of the historic tree to the road could cause the proposed shared use path to have an impact on these resources, so careful attention should be paid to placement and construction. This historic resource is listed on the VHSSS.
- 1828 Sugarbush Access Road: The c. mid-19th century 1-1/2-story Classic Cottage stands relatively close to the road. A historic tree grows to the south of the home, but has already been negatively impacted by utility lines extending through its canopy. The house and especially the tree could be affected by the project. A small white fence stands between the home and access road, but more research would be needed to determine if it or its placement is historic.

- Secondary Structure at the Sugarbush Inn, 2440 Sugarbush Access Road: The c. mid-19th century two-story vernacular dwelling has a generous setback from the Sugarbush Access Road and the Sugarbush Inn drive could allow for construction of the multi-use path without impacting the historic resource.

F. EXISTING PERMITS

According to the VTANR Environmental Interest Locator Map, there are 19 properties along the route under the jurisdiction of an Act 250 permit, including the Sugarbush Resort. If the proposed path is located on any of the properties, the existing permit would need to be revised. Also according to the Locator Map, the only operational stormwater permit along the route is at Colony Road.

If any of the properties with Act 250 or operational storm permit are included in the recommended alignment of the proposed path, the permits would need to be reviewed and most likely amended. More information on which permits might need to be amended is located in Section **V. D. PERMITS AND EASEMENTS**.

G. OTHER EXISTING CONDITIONS INFORMATION

The BRPD Team reviewed other aspects of the existing conditions, but the information eventually proved to be less important in deciding what the most appropriate alignment of the path might be. This information is described in more detail in **Appendix A**. It includes information on:

- Archeological resources;
- Data on other roads, public and private, intersecting Sugarbush Access Road;
- Rare, threatened or endangered species,
- Wildlife corridors;
- Hazardous waste sites;
- Ponds and lakes;
- Transit services;
- Bicycle facilities;
- Trails;
- Recreation facilities;
- Open space;
- Public land;
- Municipal, regional, and state plans;
- Completed, approved, or anticipated development plans for adjacent parcels;
- Previous relevant transportation studies; and
- Zoning regulations.

III. RECOMMENDED ALIGNMENT

A. OVERVIEW

The recommended alignment would create a shared use path, primarily along the outer edges of the Sugarbush Access Road right-of-way, although the western-most section would be on Sugarbush property. The path would cross Sugarbush Access Road twice. The three sections of path would be connected by marked crosswalks on Sugarbush Access Road. With the installation of various signs discussed later in this document, these crosswalks will be able to meet the criteria outlined in the November 2016 VTrans guidelines for pedestrian crossing treatments.

The portion of the Sugarbush Access Road Path outside of the right-of-way would use the alignment of an existing gravel path on the Sugarbush Resort property near the intersection with Inferno Road. The exact location of the rest of the path within the Sugarbush Access Road right-of-way (ROW) would depend on specific grade, vegetative, and development conditions. It would in general be near the outer edges of the ROW. There would be a separation of at least eight to ten feet between the path and the edge of the existing pavement when possible. The path would be at or close to the level of the road, with greater variation only as needed to minimize grading and impacts to adjacent land uses and to meet required accessibility design requirements.

Additional crosswalks would provide access to destinations that lie on the opposite side of the ROW from the path. Each of the proposed locations for crosswalks has been examined to be sure that there is sufficient sight distances. This means there is enough distance for a driver to react to the presence of and stop for a pedestrian in a crosswalk, given the average speed of drivers on the road.

Each of the proposed location is acceptable. Despite this, the Town is concerned about the ability of drivers unfamiliar with the road to understand the need to stop for pedestrians in crosswalks and is interested in providing additional protections for pedestrians at some of the crosswalks, especially those that carry the path itself across Sugarbush Access Road.

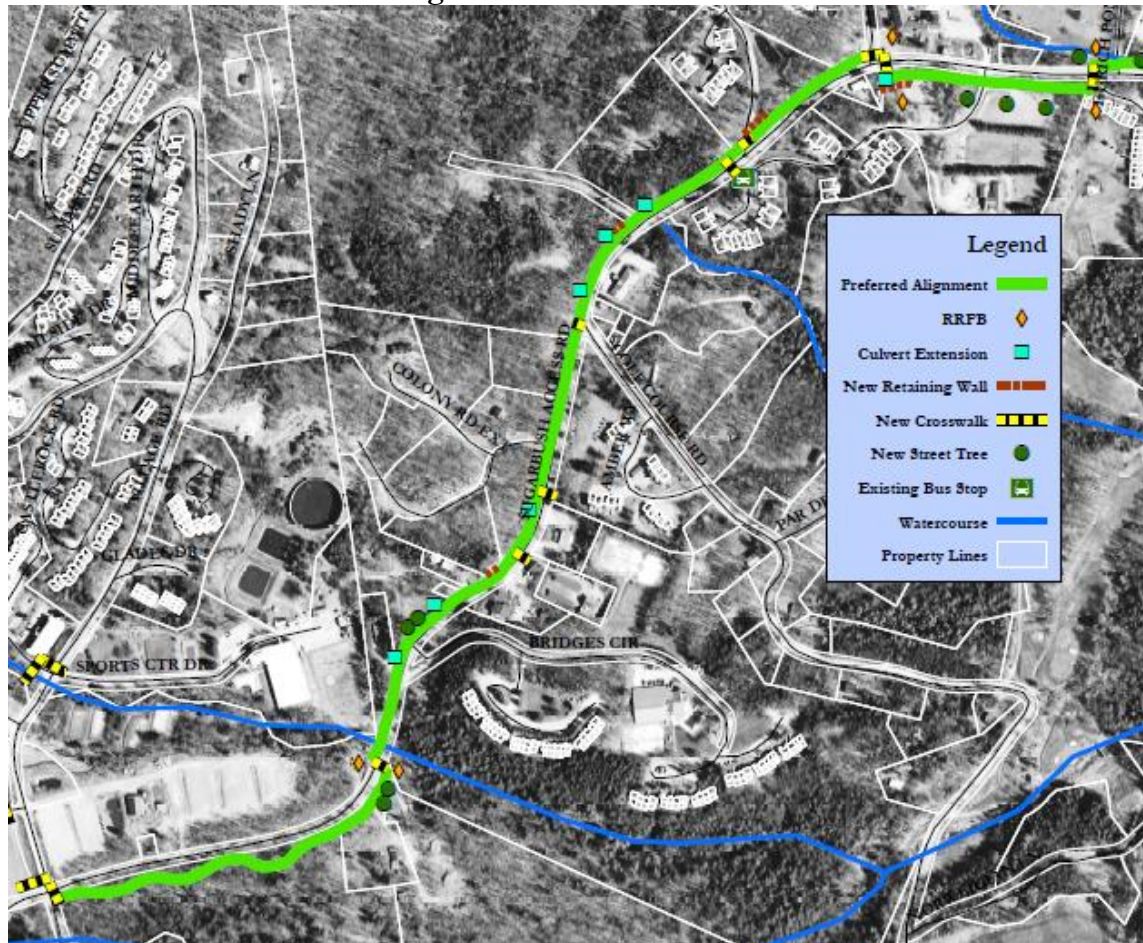
Figure 2 shows the recommended alignment of the path west of Eurich Pond Road in the Primary Study Area. **Figure 3**, page 39, summarizes the issues and impacts that will need to be addressed as part of the construction of this portion of the path in the preferred location. It also highlights some of the positive aspects of the alignment. **Figure 4**, page 40, shows the preferred alignment east of Eurich Pond Road, along with a summary of the issues and impacts associated with the route.

The description of the preferred alignment along Sugarbush Access Road in the following text starts at the west end at the intersection with Inferno Road and heads east. It is broken into four sections:

- Inferno Road to Paradise Deli, shown in orange;
- Paradise Deli to German Flats Road, shown in blue,
- German Flats Road to Eurich Pond Road, shown in purple, and
- Eurich Pond Road to Route 100, shown in yellow.

The narrative also includes a description of other related improvements that would be a part of the path project. **Illustration 3** is a portion of **Figure 2** that shows the preferred alignment in green within the Primary Study Area.

Illustration 3: The Preferred Alignment



B. INFERNO ROAD TO PARADISE DELI



Photo 3: The intersection of Sugarbush Access Road and Inferno Road to the left and Village Road to the right.

The path would start on the northwest corner of Sugarbush Access Road / Inferno Road, intersection – the upper right side of the photo on the left. The work on the path would include the addition of crosswalks on Inferno Road and the exit from the Sugarbush Resort Parking lot. The work could also include potential modifications to the intersection itself to make clear route for bicyclists, more noticeable and convenient crosswalks for pedestrians and easily understood movements for motorists. At a minimum, this would include adding a stop

sign on Inferno Road for the northbound traffic into the intersection. As a town road, the locations of stop signs placed for the path would require actions or approvals of the Selectboard.

At a maximum, it could involve adding a center median on the eastern approach of Sugarbush Access Road to the intersection. If the center median is added, the crosswalks would be added to Sugarbush Access Road and Village Road, because the center median would create a refuge island for pedestrians crossing Sugarbush Access Road. The center median would also change the alignment of the west bound lane on Sugarbush Access Road and the eastbound left turn lane out of the parking lot, so that driving directly west into the parking lot against traffic flow would no longer be the easy movement for motor vehicles that it is now. This median would require that the pavement radius from the Sugarbush Access Road onto Village Road be widened to allow for trucks turning.

The modification to the intersection would require studying how the modifications would also affect motor vehicle movements through the intersections, especially in the winter during periods of high traffic volume. Undertaking an intersection scoping study for this intersection is beyond the limits of this path study. Existing traffic studies for this intersection should be reexamined with this additional viewpoint, to see if any modifications can be easily made based on traffic data currently available. If insufficient data exists, new traffic counts that include bicycle and pedestrians movements should be done. These counts can then be used to update or redo an intersection study to see what types of modifications would benefit all users that will travel through the intersection.

Once past the Inferno Road intersection, the path would head east using the alignment of the existing gravel Sugarbush Resort Parking Lot Path on the south side of the road on Sugarbush Resort property outside of the ROW. The western end of the existing Sugarbush Path near the Inferno Road/Village Road intersection would be extended so that it clearly brings walkers and bicyclists to the intersection, where they could use the crosswalks to access the sidewalk along Village Road. The existing path would be slightly regraded as needed and the surface improved to meet ADA requirements for slope, cross slope and surface. **Illustration 4** shows what an ideal cross section of this portion of the path would look like, although the relationship of the path to existing grade could vary from this typical cross section.

Illustration 4: Ideal Cross Section of the Off-Road Path

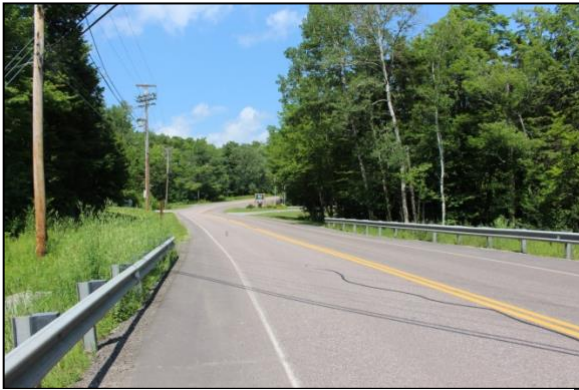
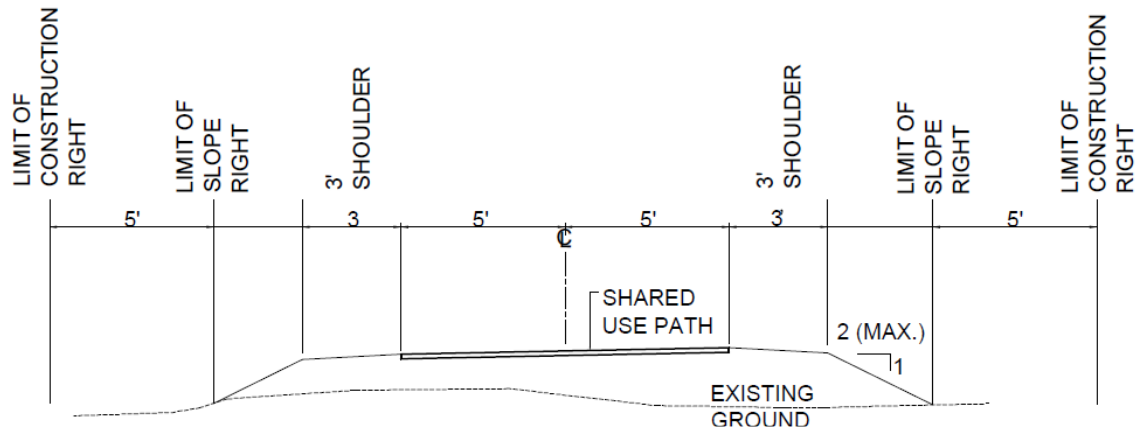


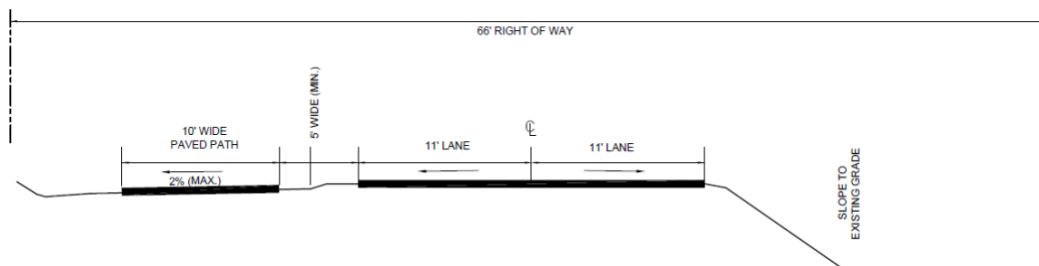
Photo 4: Looking east on Sugarbush Access Road close to proposed crosswalk

The eastern end of the existing Sugarbush Path would be extended as well to bring users to Sugarbush Access Road. At the road, a crosswalk would take users to the north side of the road, assisted by a Rectangular Rapid Flashing Beacon (RRFB). On the north side of the road, the path would continue northeast near the outer edge of the Sugarbush Access Road ROW, seen in the first photo on the left. The path would lie on the outside of the utility poles, which would remain in their current locations. **Illustration 5** provides a

schematic cross section of what the path would be like in this location. The shift in the path alignment from the south side to the north side of the road is necessary due to the very steep slopes on the south side of Sugarbush Access Road east of the end of the existing Sugarbush Resort Parking Lot Path.

The Sugarbush Access Road Path would cross Rice Brook via a new prefabricated bridge approximately 100 feet long. The bridge would be placed on foundations rather than abutments located away from the sides of the brook, leaving the banks undisturbed.

Illustration 5: Typical Cross Section of Path with No Drainage Ditch Between the Path and the Road



On the east side of Rice Brook, the path would move gradually uphill at less than a five percent slope for approximately 500 feet. At that point, the slope of the path would increase to about eight percent to match the slope of the adjacent road and the goal to stay within the ROW. **Illustration 5** provides a generalized cross section for this portion of the path.



Photo 5: Utility boxes and vaults near Sugarbush Access Road

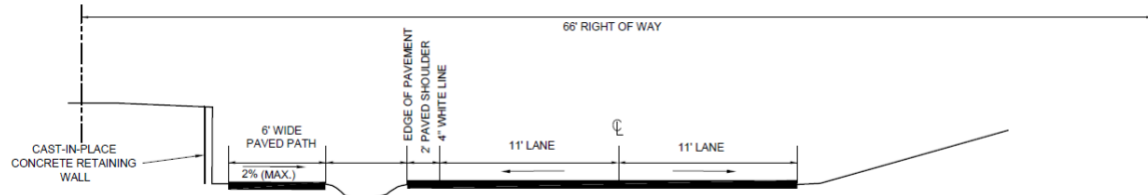
Near the Waitsfield Telecom property, as the picture on the left shows, there are several electrical and telephone boxes and underground utility manholes at the edge of the ROW. To avoid them, the path would curve between the utility boxes and the utility pole, moving closer to the road. This alignment shift avoids both the surface utility boxes but also misses several underground utility vaults. The path would shift further away from the road again after crossing the adjacent access drive to the Waitsfield Telecom property.



Photo 6: Retaining wall in front of Sugartree Bed & Breakfast

In front of the Sugartree Bed & Breakfast, the path would be again shift closer to the road and be narrowed to six feet wide to fit between the existing retaining wall within the ROW and the edge of the road pavement. The photo on the left shows a picture of the retaining wall and its proximity to the road. The mailbox would need to be moved. Keeping the retaining wall in place, despite the fact that it is in the ROW, would also avoid disturbing an existing well and other private utilities located behind the retaining wall. **Illustration 6** shows a cross section of the path at this location. The reduction of the path width below eight feet wide would require a Design Exception, a process that VTtrans has noted is somewhat undefined.

Illustration 6: Cross Section at Existing Retaining Wall



Past the existing retaining wall, a new retaining wall approximately 100 feet long and an average of approximately three feet high would be introduced to create a level area close to the road for the path, which would revert to at least an eight-foot width, if not a full ten feet wide. The road would still be separated from the roadway by a green space, but it would contain a drainage ditch to accommodate runoff. The path is near the peak of a hill at this location, so the drainage ditch would not need to carry significant stormwater runoff from further up the roadway.

Past the retaining wall, the path would continue to the Paradise Deli; the drainage would be shifted to the outside of the path via a culvert. The cross section would revert to one that would be similar to that shown in **Illustration 5**. On the west side of the deli, there would be a crosswalk on Sugarbush Access Road to allow path users traveling east to reach the deli via a crossing that would have good sight distances in both directions.

C. PARADISE DELI TO GERMAN FLATS ROAD

The path would continue eastward past the Paradise Deli, separated from the roadway by a green space with the drainage ditch on the outer edge of the ROW. **Illustration 5** provides a schematic cross section of what the path would be like in this location. Because there is insufficient sight distance for a crosswalk directly in front of the deli, a second crosswalk would be added east of the deli to bring path users headed west across Sugarbush Access Road to the Deli.



Photo 7: The Sugarbush Access Road looking west near Sugar Lodge at Sugarbush - off the picture to the left

East of the intersection with Golf Course Road, the existing drainage ditch gets larger and deeper, as seen the photo on the left, to the point that it is not really a ditch anymore, but just a wide flat wetland area. The path would be closer to the road in this location to avoid significant changes to the drainage ditch and wetland in low area. The path in this area would be similar to the schematic cross section shown in **Illustration 5** except that it would be necessary for the Town to create a small retaining wall, most likely of precast concrete blocks or gabions, along the

edge of the ditch to provide adequate level room for the path. The retaining wall would be located outside of the wetland and have minimal impact on the overall the carrying capacity

of the ditch and wetland. Because of the anticipated height of the retaining wall, a fence or railing would be needed at the top.



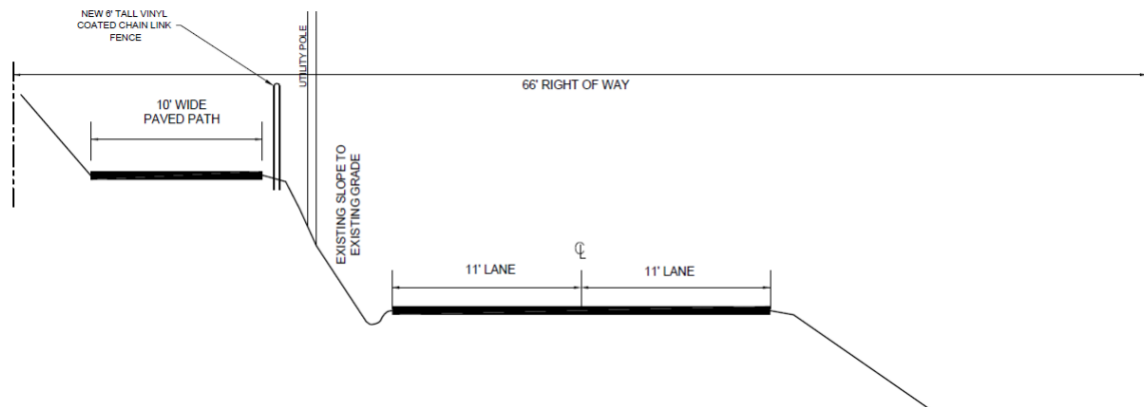
Photo 8: Sugarbush Access Road looking east; Club Sugarbush South is on the right, with white building in the background

As the path approaches the western end of Club Sugarbush Road South, the path would gradually ascend to the rise on the north side of the road, seen on the left side of the road in the picture on the left, to avoid excessive cuts to existing grade. This would put the utility poles between the path and the road. There is sufficient room between the current utility pole location and the edge of the adjacent trees for the path. The poles would stay in their current location to avoid removing trees at the edge of the ROW.

Illustration 7 shows a schematic cross

section of the path in this location.

Illustration 7: Typical Cross Section of the Path Elevated above the Adjacent Roadway



The path would descend this rise at the outer edges of the right-of-way, still keeping to the outside of the utility poles. Past this point, the path would rise and fall with the grade adjacent to the road, rather than stay with the grade of the road itself. The difference between the elevation of the road and the path is less than five feet until the intersection with Club Sugarbush Road North. East of this intersection, a retaining wall would be used to keep the path relatively level with the road while minimizing the fill needed to do so. The grade of the path would be too steep if it were to remain at the elevation of the existing grade at the edge of the ROW rather than the grade of the road.

Near German Flats Road, the path would shift slightly closer to the road to be between the utility poles and the Sugarbush Access Road pavement. At the intersection, the path would cross German Flats Road via a new crosswalk at the stop sign. The realignment closer to the road would serve to bring the path to the proper location for the crosswalk on German Flats Road.

D. GERMAN FLATS ROAD TO EURICH POND ROAD

East of German Flats Road, the path would cross Sugarbush Access Road via another crosswalk at the intersection. A pedestrian-activated RRFB would assist users in the crosswalk. The switch to the south side of the road is part of the preferred alignment to eliminate potential impacts to the historic house and tree on the north side of the road east of Sugarbush Inn.

On the south side of the road, the path would be located on the area currently occupied by a portion of the road and shoulder. To create this area, the roadway would be shifted to the north. The shift would begin at a point close to the east end of the Sugarbush Resort rental office parking area on the south side of the road and extend east approximately 190 feet to end near the steps leading down to the Club Sugarbush South storage shed. The north side of the road would be shifted into the edge of the drainage ditch, which would be narrowed

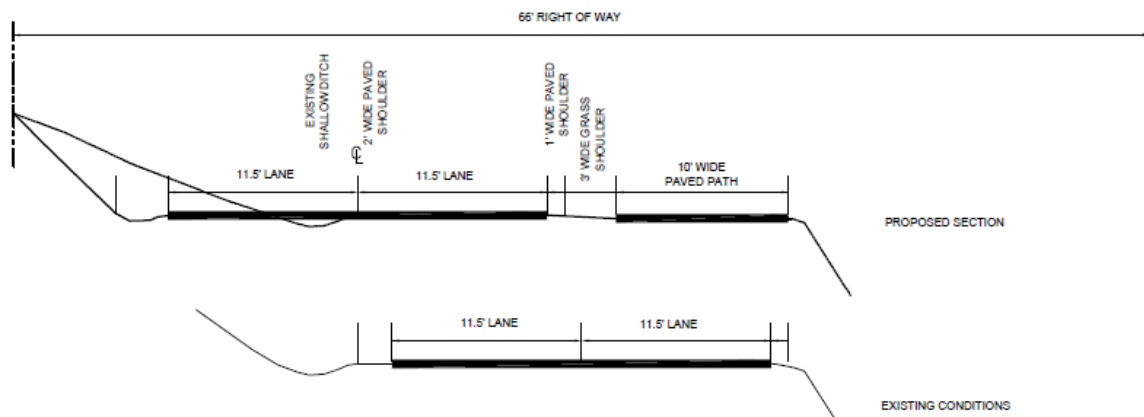


Photo 9: Sugarbush Access Road looking east at the intersection with German Flats Road

but not eliminated. The road shift, including the shift in the drainage ditch, would require a cut into the slope on the north side of the road seen in the photo on the left, along with a shift in the existing shallow drainage ditch. It would also be deepened as well as widened if necessary. The road in the new location would have two one-foot wide shoulders and two 11.5-foot wide travel lanes, leaving room for the shared use path on the south side. The path would be separated from the road by a three-foot wide grass strip.

Illustration 8 shows a schematic cross section of the relocated road with the path, along with a cross section of the existing road for comparison.

Illustration 8: Cross Section with Relocated Roadway and New Path

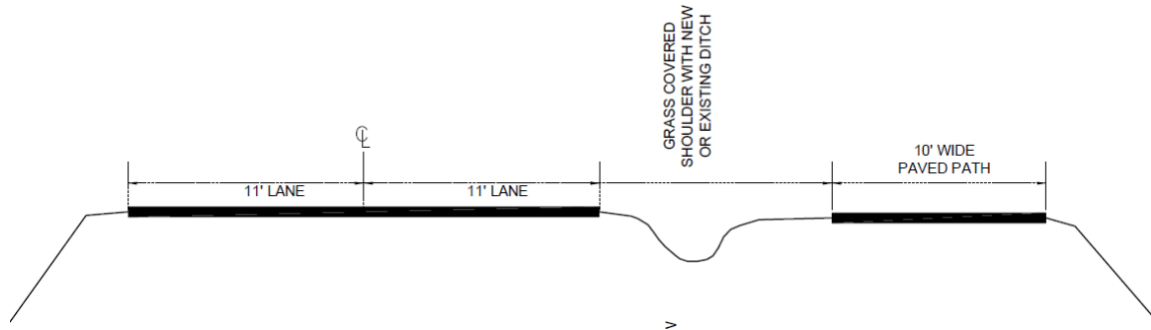


Past the stairs, the slope becomes much more gradual and there is room to put the path on existing grade, with a bit of grading or a small retaining wall. The addition of the path east of

the stairs would require the removal of the trees close to the road, as seen in the photo on Page 17.

The path would cross Club Sugarbush South Drive near the outer edges of the Sugarbush Access Road ROW. It would continue on the south side of Sugarbush Access Road to Sterling Ridge Road, at a slightly lower elevation than the road itself. Once again, the path would be sloped away from the road, and the runoff from the road would be allowed to sheet flow across the path. **Illustration 9** shows a typical cross section of the road in this location.

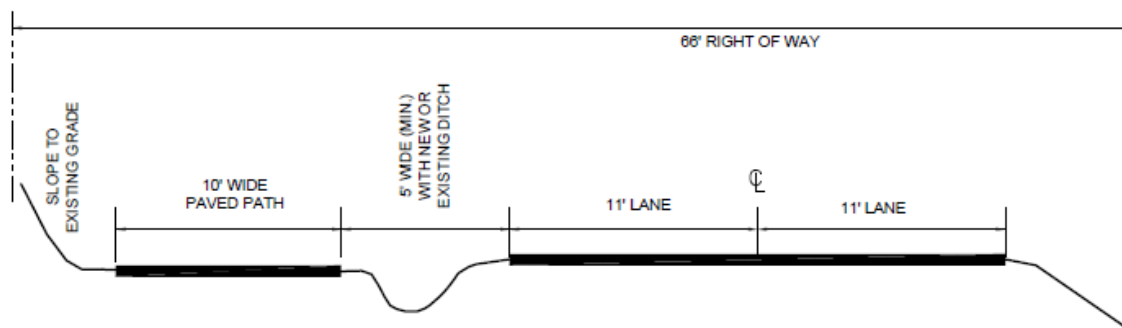
Illustration 9: Typical Cross Section of the Path Adjacent to the West Side of the Road



Just to the west of Sterling Ridge Road, the path would cross Sugarbush Access Road via a crosswalk back to the north side. This crossing would include a RRFB to assist those using the crosswalk. Although the site distance would be good at this crossing location for motorists in both directions, those coming from the east would be approaching it after a long uphill climb and might not focus on pedestrians in a crosswalk.

On the north side of the road, the path would turn east again and lie on the outer edges of the right-of-way for the short distance south to Eurich Pond Road. The cross section would be similar to that shown in **Illustration 10**. There would be a drainage swale with a new rain garden between the road and the path.

Illustration 10: Typical Cross Section of the Path Separated from the Road by a Drainage Ditch



E. EURICH POND ROAD TO ROUTE 100

Starting on the south side of Eurich Pond Road, the path would continue east within the Sugarbush Access Road ROW relatively close to the edge of Sugarbush Access Road. The Alpine Options sign would need to be relocated outside of the right-of-way. The path would be benched into the side slope leading down to the Sterling Creek at an elevation a foot or so lower than the elevation of the road. Illustration 5 shows a schematic cross section of what the path would look like in this location, but with the path slightly lower than shown. The lone old maple tree on the slope would be removed.

Close to the eastern property line of the Alpine Options parcel, as the path moves into the curve in the road, it would shift away and slightly up from the road, lying close to the edge of the trees at the outer edge of the right-of-way. The drainage ditch that begins along the road in this area would be between the path and the road, as **Illustration 10** shows.



Photo 10: Sugarbush Access Road looking east at the eastern end of Alpine Options parcel

The edge of the forest moves closer to the road, at this location, as the photo on the left shows. To create enough room for the path and maintain the required clear zone and drainage ditch between the road and the path, the edge of the forest would need to be trimmed back approximately twelve feet. The exact limit of tree cutting would be determined during the preparation of Conceptual Plans for the project. As the road, straightens, the edge of the forest again recedes from the road, creating an open area for the path on the outside edge

of the right-of-way. There would be sufficient clearance for utility poles from the path to allow them to remain in their current locations, placing them between the path and the road.



Photo 11: Sugarbush Access Road looking east at the intersection with Collins Road

At the intersection with Collins Road, shown in the photo to the left, the path would lie on the outside of the drainage ditch. The single tree on the north side of the road would need to be removed.

Illustration 10 shows what the cross section of the path would be like, except that the path could go outside of the right-of-way along the edge of the existing rip rap east of Collins Road. The rip rap would be modified at the bottom of the hill to create a small constructed wetland area to receive and treat the runoff prior to discharge into

the stream. The stream itself would be crossed via a boardwalk adjacent to the roadway in the right-of-way.

On the east side of the stream, the path would move uphill relatively close to the edge of pavement, with the drainage swale and utility poles on the outside, close to the outer edges of the right-of-way, similar to the cross section seen in **Illustration 5**. At the top of the hill near Fortna Road, the old red maple tree would need to be removed and the fire hydrant on the private Sugarbush Resort snow-making waterline relocated.

Illustration 5 (REPEAT): Typical Cross Section of Path with No Drainage Ditch Between the Path and the Road

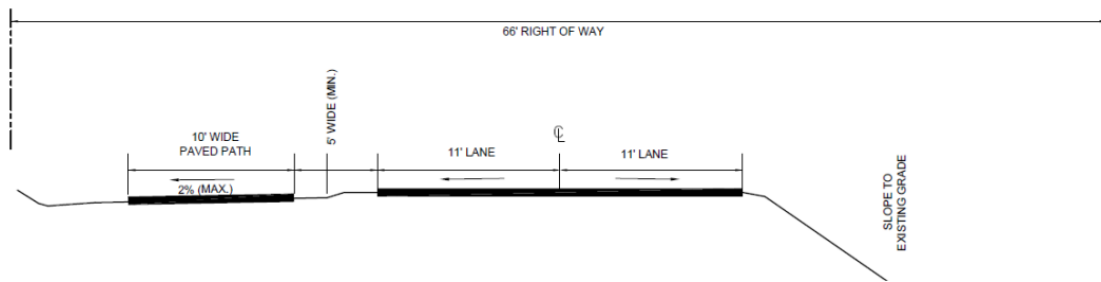


Photo 12: Barn temporarily located on I-beam supports at historic property adjacent to the road

East of Fortna Road, the path would remain close to the road, similar again to the cross section as shown in **Illustration 5**. The next change in the path would occur as it reaches the historic house with several historic maple trees close to the road, as well as a barn, seen in the photo on the left. The barn has been temporarily located within the ROW on I-beam supports for several years. The barn would need to be relocated, at a minimum, outside of the ROW but preferably to its final location. The path would continue to the existing driveway, seen just past the barn in the photo on the right, close to the road.

On the east side of the driveway, the path would be narrowed to a four-foot width to fit between the edge of the existing road pavement and the slope of the adjacent slight hill, as seen in the photo on the right. The hill might be shortened a bit by the addition of a retaining wall, but the cut would be small to minimize or eliminate any significant damage to the roots of the existing maple tree at the top of the slope. The path would be raised six to eight inches higher than the roadway and a curb added to provide a better separation between the road and the path.



Photo 13: Sugarbush Access Road looking east at the historic property on Sugarbush Access Road

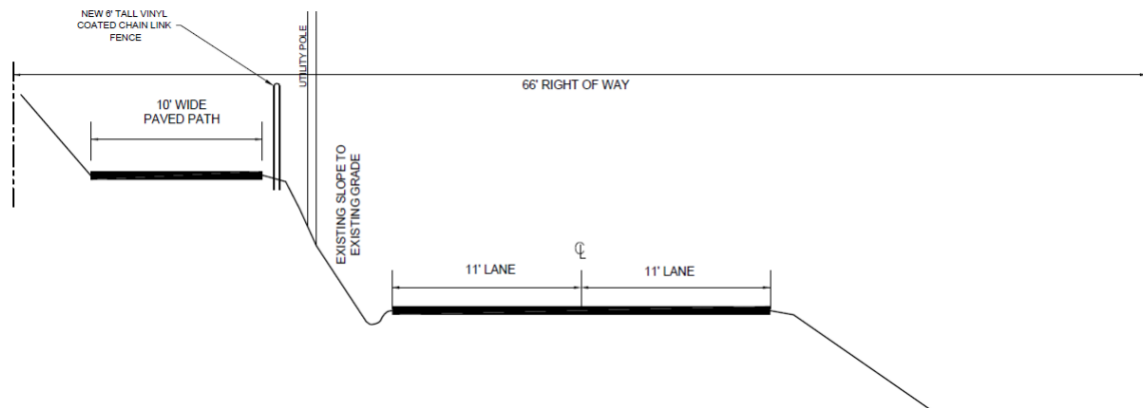
South of the historic house, the path would continue close to the edge of the pavement around the next curve and beyond the next residential driveway to the south. After the driveway, the path would move away from the road and onto a small terrace, which can be seen in the photo to the right, initially only a few feet above the road. The path would be at the outside edge of the right-of-way with the utility poles between it and the road. **Illustration 7** shows a typical section of the trail in this area, located above the roadway.



Photo 14: Sugarbush Access Road looking east at the curve east of the historic property

As the path continues south, it would remain above the roadway by 10 to 20 feet at the outside edge of the right-of-way. The schematic cross section in **Illustration 7** still represents the path in this area. It would remain in this position as it travels east downhill to approximately across from the Terra Rossa parking lot entrance, where it would once more come down to the level of the roadway. The push braces for the utility poles along the elevated section may need to be reconfigured to allow the path to pass between the actual utility pole and the outside edge of the right-of-way.

Illustration 7 (REPEAT): Typical Cross Section of the Path Elevated above the Adjacent Roadway



The path would lie just inside the right-of-way for the remainder of the route down the hill, close to or possibly in the edge of the trees along the side of the road. The existing drainage ditch would be between the path and the pavement. **Illustration 10** again shows the typical cross section for this portion of the path. The path would end at the intersection of Sugarbush Access Road with Route 100.

F. Water Line Trail

The Water Line trail would be an additional trail leading downhill towards Route 100. It would create a new footpath adjacent to Upper Pines Road and then over the alignment of the snow making water line heading downhill northeast to the snow making pond. The footpath would extend southward to the nearby Mad River Path parking area. **Figure 4** shows the alignment of this side trail.

This footpath would stay within the existing cleared space over and near the existing opening over the water line. The grades along the line would exceed those allowed by ADA requirements for a shared use path, so this alternative would need to remain a footpath that would meet ADA trail standards but not shared use path standards.

G. ADDITIONAL FEATURES

1. STORMWATER MANAGEMENT

The path will generate more stormwater runoff when it is completed. Realizing that the project would ultimately generate greater than one acre of new impervious surface, stormwater retention/treatment would be required. To compensate for at least part of the additional stormwater, the plan includes the suggestion for the addition of numerous rain gardens within the existing stormwater management system. These would be facilities of various sizes that hold and treat stormwater and assist in the percolation of some of the stormwater into the ground. **Figures 3 and 4** show the suggested locations for the rain gardens.

The Town would like to use the concept of a rain garden as the primary means of treating the increase in stormwater because it is also concerned about the overall aesthetics of the road with the additional path adjacent to it, because tourism is such a large part of the Town's economy. The precise design, type, and size of the rain gardens, and other possible facilities that might be needed to meet the overall increase in stormwater runoff would need to be determined during Final Design for the project, and would depend on the stormwater regulations at that time.

2. CROSSWALK

To reach destinations that are on the other side of the road from the path, users would need to cross Sugarbush Access Road. The volume of motor vehicles and the 40 MPH speed limit could make the crossing difficult. The 40 MPH speed limit requires a stopping sight distance of approximately 250 feet.

The recommended alignment includes proposed locations for ten new crosswalks. **Figures 2, 3, and 4** show the proposed locations. In addition to the three crosswalks needed where the path crosses the road, additional crosswalks are recommended at the Paradise Deli, Golf Course Road, and the middle intersection of Club Sugarbush for the bus stop. Each of the location has been analyzed for adequate sight distance in both directions and each meets the

requirements, but sometimes with minimal additional sight distance available. None of the suggested crosswalk locations would currently meet crosswalk warrants, because there is currently little to no pedestrian traffic crossing the road at anyone location and there are no receiving facilities on either side of the roads because the path does not exist. It is anticipated that once the path is constructed, there will be a need for the crosswalks, so they have been included in the overall recommendations. The BRPD Team recommends that even initially when the path might only be a footpath, the Town should work to add trail crosswalks and associated signage, even if unmarked on the road, to at least the locations where the footpath itself crosses roads.

Two crosswalks are ultimately suggested at Paradise Deli, because the sight distance is not sufficient directly in front of the deli for a single crosswalk. Consequently, one is proposed west of the deli and one east of the deli to capture path users from both directions. A crosswalk is not suggested at Terra Rossa because there is insufficient sight distance to the west, and not adequate space on the south side of the road to add a path back to the restaurant if the crosswalk is located further east.

To make the crossing easier and to increase the safety of the users, the Town would like to use Rectangular Rapid Flashing Beacon (RRFB) for the crosswalks that carry the trail itself across Sugarbush Access Road, due to the traffic levels, access speeds, drivers unfamiliar with the road, and numerous horizontal and vertical curves, even though there is at least minimally sufficient sight distance.

RRFB are typical yellow crosswalk signs that have two bright white lights underneath them that begin to flash rapidly when a button is pressed by the walker as they enter the crosswalk. The lights flash for just a short amount of time as the walker is crossing the road. they soon stop and remain dark until the next walker pushes the activation button. **Illustration 7** shows an image of a solar powered rectangular rapid flashing beacon (RRFB). Smaller models are also available.

Illustration 7: Solar Powered Rectangular Rapid Flashing Beacon



The Town can make its final decision as to whether these signs would be beneficial during the design phase of the project, after updated traffic and speed counts are completed, with the

understanding that the overuse of these reduces their effectiveness. **Figures 2 and 3** show the locations where the Town is considering the use of RRFBs. Every crosswalk with an RRFB would require four signs, one on each side of the road facing in both directions.

3. TREES

The recommendations for the Sugarbush Access Road Path include the planting of several street trees. The trees are recommended to either create more shade for the path, or to replace individual trees that would be removed as part of the path development. **Figures 2 and 4** show the recommended location for street trees.

4. PARKING

The Sugarbush Resort has indicated that several of its parking areas could be available as trailhead parking spots. **Figures 2 and 3** show the location of the parking areas that would be usable by trail users.

IV. SUGARBUSH ACCESS ROAD PATH ISSUES

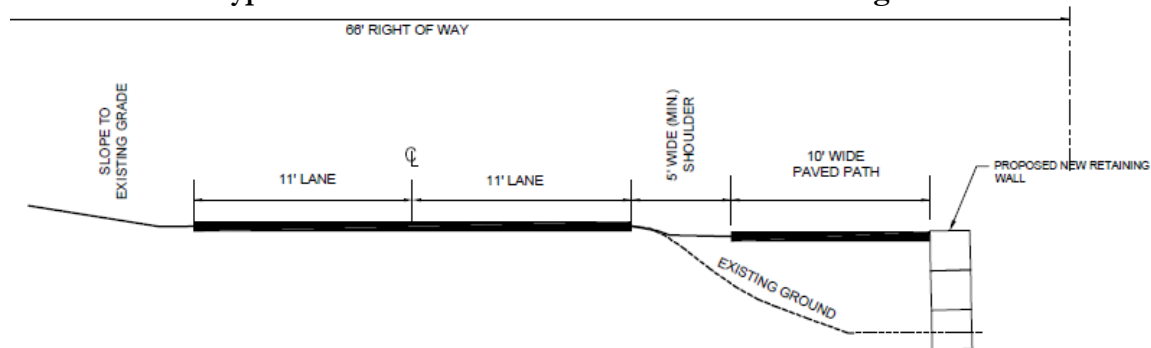
A. GRADING

There are portions of the route where there are steep slopes near or at the edges of the Sugarbush Access Road pavement, some going up and some going down. For those areas where the slope goes up, a road-side ditch would be created between the road and the path if one does not already exist. Either a retaining wall would be constructed on the outside of the path to minimize cutting further back into the slope, or the bank would be sloped back at a 2:1 slope (2 feet horizontal to 1 foot vertical) if the existing grade and vegetation up the slope would allow it. For those portions where the ground drops away from the road, such as near the intersection with Club Sugarbush Road North, the path would be supported by a retaining wall. **Illustration 12** shows a typical cross section of the situation where the slope drops away from the road. The same detail would apply when the path is located on the north side of the road and requires a retaining wall.

B. ADA COMPLIANCE

Compliance with ADA requirements is a significant consideration for this project. Ultimately, the goal is the creation of an ADA accessible shared use path that is at least eight feet wide and preferably ten-feet wide. This would include a surface treatment that meets ADA standards for firmness and suitability for wheelchairs and other walking aids. An initial temporary facility, however, might just be a soft surface footpath that complies only with ADA trail requirements.

Illustration 12: Typical Cross Section of the Path with a Retaining Wall



The layout of these alternatives includes working to meet the maximum running grade requirements of the ADA regulations for shared use paths, even if only for an initial soft surface footpath. The maximum running grade requirements stipulate how steep a shared use path can be. Focusing on meeting this requirement would allow the subsequent upgrading of the footpath to a shared use path over time without the need to realign the path to another location to meet the running grade requirements.

A significant provision of the ADA maximum running grade allows construction of a new facility adjacent to an existing roadway to follow the grade of the existing roadway, even if the existing roadway exceeds the allowable running grade. In all cases, the ADA mandated cross-slope of the new facility must be met. Other new constructed facilities must meet the running grade requirements of ADA.

C. CULVERTS

Figures 1a and **1b** show that numerous culverts pass under Sugarbush Access Road. Several of these culverts might need to be extended where the path runs closer to the road. The extensions should be done so as to maintain or increase the overall capacity of the culvert. They should also not worsen the environmental suitability of the culverts. **Figures 3** and **4** show which culverts would need to be extended.

V. IMPLEMENTATION

A. PHASING

The BRPD Team suggests that, if needed, the project could be divided into the four sections that were used to describe it above. VTrans requirements mandate that each phase must stand on its own as a viable trail that would not require the addition of other phases to be useful. This ensures that if only one phase is ever constructed, it would still be a usable improvement for walkers and bicyclists. With this in mind, the four phases are suggested because they each provide a link between important destinations identified during the examination of existing conditions.

The BRPD Team suggests names for the phases that do not imply any order of construction. The first three phases coming from the west could each serve as an independent path on its own, each links an existing crossroad with another existing crossroad or an important destination along the road. While they could be developed in any order, most likely it would be best to instigate them starting at the west end with the Orange Phase and moving further east with each phase.

- Orange Phase: Inferno Road to Paradise Deli,
- Blue Phase: Paradise Deli to German Flats Road,
- Pink Phase: German Flats Road to Eurich Pond Road, and
- Yellow (Future) Phase: Eurich Pond Road to Route 100.

Figures 3 and 4, show the location of the phases. **Illustration 13** shows the Primary Study Areas with the phases colored as noted above.

B. TRAFFIC MANAGEMENT PLAN

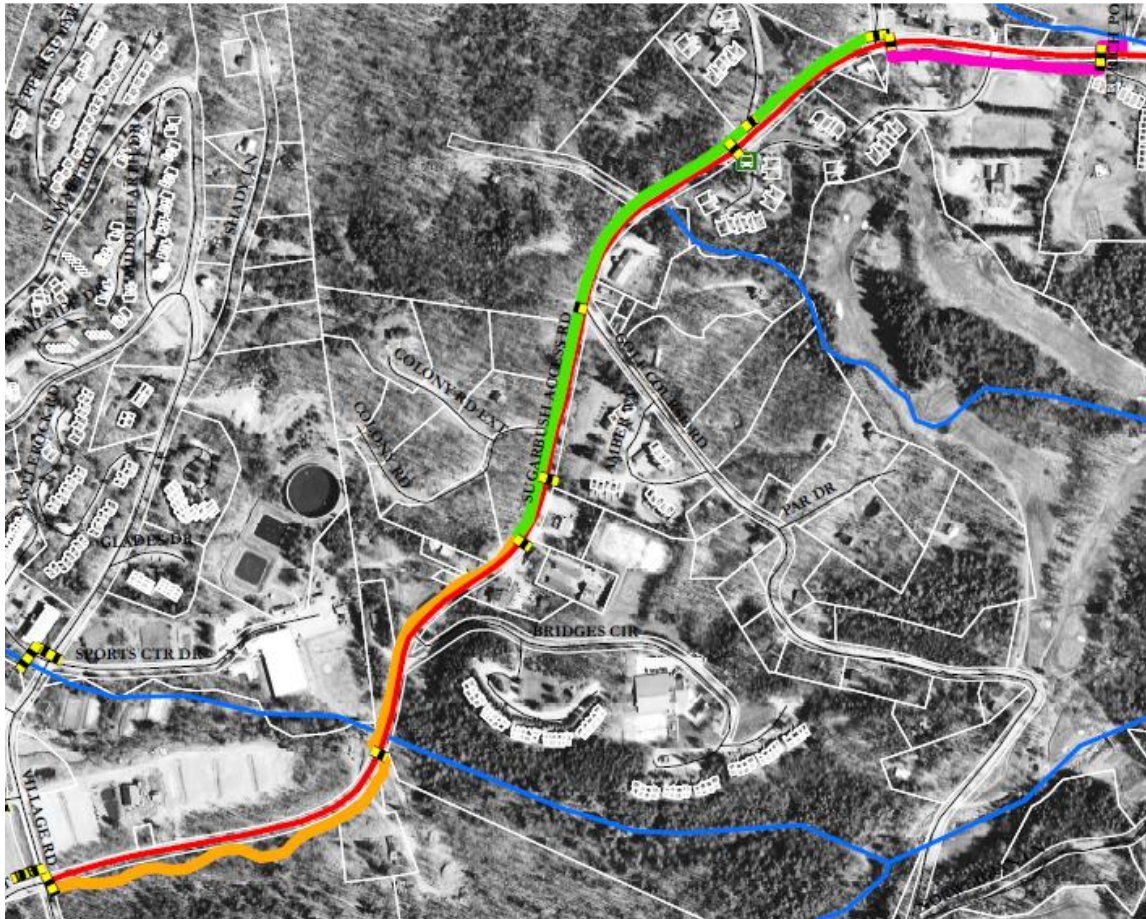
The Town would need to develop a Traffic Management Plan with the design drawings to address pedestrian and bicycle and motor vehicular traffic during construction. Construction of the path along the north side of Sugarbush Access Road would require managing through traffic and the access to multiple residential and commercial properties. The width of the Sugarbush Access Road right-of-way allows the path to be located away from the road, minimizing construction impacts on the traffic in either direction. If the construction contractor wishes to build the path in a different order than the project plans indicate, and the town is amenable to that, the contractor will need to prepare an updated Traffic Control Plan, taking into account vehicles and pedestrians.

C. INITIAL ESTIMATE OF PROBABLE CONSTRUCTION COSTS

The BRPD Consulting Team has prepared an initial estimate of probable construction costs for the proposed shared use path alignment, including the installation of signage, new stormwater infrastructure and street trees, as well as the design and project management.

The overall cost of a shared use path for the entire Primary Study Area project would be approximately \$1,740,000. The cost of the Orange Phase would be approximately \$745,000; the Blue Phase would be approximately \$755,000; the Pink Phase would be approximately \$240,000. The Yellow Phase by itself would be approximately \$2,300,000. **Tables 1, 2, and 3** provide basic cost information for the Orange, Blue and Pink phases.

Illustration 13: Proposed Path Phases in the Primary Study Area



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. They are in 2017 dollars; costs could increase by five to ten percent a year. The initial costs estimates are based on having the project constructed completely by an independent contractor rather than through a Force Account as part of the Town's funding match.

Table 1: Initial Estimate of Probable Construction Costs -

Inferno Road to Paradise Deli - Orange Phase

Item	Unit	Quantity	Unit Cost	Cost
Common Excavation	CY	950	\$23	\$21,850
Ten-Foot Wide Pavement	TON	350	\$100	\$35,000
Center Island/Road Widening	LS	1	\$75,000	\$75,000
Fine Graded Crushed Stone	CY	1700	\$50	\$85,000
Uniformed Traffic Officer	HR	40	\$90	\$3,600
Flaggers	HR	160	\$30	\$4,800
Mobilization / Demobilization	LS	1	\$62,000	\$62,000
Traffic Control	LS	1	\$2,000	\$2,000
Painted Crosswalk	LF	96	\$5	\$480
Rain Garden	EACH	2	\$15,000	\$30,000
RRFB per Intersection	EACH	1	\$10,000	\$10,000
Detectable Warning Surface	SF	80	\$55	\$4,400
Traffic Signs	SF	40	\$17	\$680
Cast in Place Foundation	EACH	2	\$15,000	\$30,000
Eleven Foot Wide Bridge	SF	1100	\$95	\$104,500
Retaining Wall	SY	500	\$12	\$6,000
Trees	EACH	4	\$400	\$1,600
24" Culvert	LF	20	\$90	\$1,800
SUBTOTAL				\$478,710
Contingency @15%	Est.			\$71,807
Engineering @ 15%	Est			\$71,807
Project Management @ 10%	Est			\$47,871
Construction Oversight @ 15%	Est			\$71,807
TOTAL				\$742,001

Table 2: Initial Estimate of Probable Construction Costs -

Paradise Deli to German Flats Road - Blue Phase

Item	Unit	Quantity	Unit Cost	Cost
Common Excavation	CY	870	\$23	\$20,010
Ten-Foot Wide Pavement	TON	320	\$100	\$32,000
Fine Graded Crushed Stone	CY	1550	\$50	\$77,500
Uniformed Traffic Control	HR	60	\$90	\$5,400
Flaggers	HR	200	\$30	\$6,000
Mobilization / Demobilization	LS	1	\$61,000	\$61,000
Traffic Control	LS	1	\$4,000	\$4,000
Painted Crosswalk	LF	96	\$5	\$480
Rain Garden	EACH	3	\$15,000	\$45,000
Cast in Place Abutment	EACH	2	\$15,000	\$30,000
Eleven Foot Wide Boardwalk	SF	2090	\$85	\$177,650
Retaining Wall	SY	36	\$500	\$18,000
Detectable Warning Surface	SF	80	\$55	\$4,400
Traffic Signs	SF	30	\$17	\$510
24" Culvert	LF	50	\$90	\$4,500
SUBTOTAL				\$486,450
Contingency @ 15%	Est.			\$72,968
Engineering @ 15%	Est			\$72,968
Project Management @ 10%	Est			\$48,645
Construction Oversight @ 15%	Est			\$72,968
TOTAL				\$753,998

Table 3: Initial Estimate of Probable Construction Costs -

German Flats Road to Eurich Pond Road - Pink Phase

Item	Unit	Quantity	Unit Cost	Cost
Common Excavation	CY	490	\$23	\$11,270
Pavement	TON	130	\$100	\$13,000
Dense Graded Crushed Stone	CY	600	\$50	\$30,000
Road Shift Retaining Wall & Extras	LS	1	\$50,000	\$50,000
Uniformed Traffic Control	HR	40	\$90	\$3,600
Flaggers	HR	160	\$30	\$4,800
Mobilization / Demobilization	LS	1	\$13,000	\$13,000
Traffic Control	LS	1	\$3,000	\$3,000
Painted Crosswalk	LF	48	\$5	\$240
Trees	EACH	4	\$400	\$1,600
RRFB Per Intersection	EACH	2	\$10,000	\$20,000
Traffic Signs	SF	30	\$17	\$510
Detectable Warning Surface	SF	40	\$55	\$2,200
SUBTOTAL				\$153,220
Contingency @ 15%	Est.			\$22,983
Engineering @ 15%	Est			\$22,983
Project Management @ 10%	Est			\$15,322
Construction Oversight @ 15%	Est			\$22,983
TOTAL				\$237,491

D. PERMITS, EASEMENTS, AND APPROVALS

1. EASEMENTS

The proposed path alignment lies mostly within the existing Sugarbush Access Road ROW. For the western most portion of the path that lies outside of the ROW, the Town will need to obtain a permanent easement from Sugarbush Resort. The Town will also need to obtain temporary slope and construction easements from Sugarbush Resort. The Town may also need permanent and temporary slope and construction easements from other property owners depending on the final design. The temporary easements would allow short-term disturbance of the properties in order to construct the project, install erosion control measures and project demarcation fence.

2. ACT 250

The Town will need to work with the Sugarbush Resort to amend the Act 250 permit for the parcel on which the path is located to allow the change of the path from an informal gravel path to a more formalized shared use path. With most the rest of the work on the project

anticipated to lie within the Sugarbush Access Road ROW, the Town should not need to amend the other 18 Act 250 permits along the road to develop the path. The path itself shouldn't require an Act 250 report, based on current interpretations of the regulations.

3. STORMWATER

The project should not impact the stormwater runoff from Colony project, the only active Operational Storm Permit in the Study Area, or the other properties, except the Sugarbush Resort parcel with the Parking Lot Path. However, this project would ultimately create more than an acre of new impervious surface, so it would need its own stormwater runoff permit under current regulations. During final design, storm drainage computations would be required to refine and design the treatment methods included with these recommendations based on the actual design of the path construction details.

The proposed bridge across Rice Brook would not require a stream alteration permit since the abutments, or foundations, would be clear of the stream. The culvert extensions typically would not trigger Stream Alteration Permits either, but this would need to be verified by the path design team.

4. WETLANDS & WATERCOURSES

The path would fall within the buffer of the wetland identified on the north side of Sugarbush Access Road across from Golf Course Road, but should not disturb the wetland itself. A wetland permit would be needed to construct the path in the buffer area which extends into and across the Sugarbush Access Road ROW. This would require the delineation of the actual boundary of the wetland in the vicinity of the path. This wetland appears to be Class 2, so if any fill needs to be placed in the wetland itself, the Vermont Wetland permit would possibly need to be augmented by a United States Army Corps of Engineers Permit.

5. DESIGN EXCEPTION

There are two locations along the proposed alignment of the Sugarbush Access Road Path where the width of the path would need to be reduced to less than eight feet. The two locations are adjacent to:

- The retaining wall at the Sugartree Bed & Breakfast, and
- The barn, house, and historic trees at 1248 Sugarbush Access Road.

VTrans has indicated that the actual process of obtaining a design exception is somewhat vague and the design team would need to work with the Town and VTrans to define and then undertake the process of getting the design exceptions.

When design of the path starts, the Town should re-verify the need for the design exceptions to see if conditions have changed sufficiently to make one or both no longer necessary.

6. TREE CLEARING

The design team would determine the actual limits of tree clearing during the design process. Once the limits are known, the impacts of the clearing would need to be verified. It is assumed that the clearing work would need to occur in the winter months when the potential to disturb long-eared or other bat species would be minimal. The Town and design team would need to review the actual need for and details of the tree clearing process with the Vermont Department of Fish and Wildlife.

7. UTILITY RELOCATION

Sugarbush Resort, which owns the snow making water line on which the fire hydrants that need to be relocated are placed, has indicated that it sees no problems with the relocation process, as long as they are able to review and revise the details of the work.

The BRPD Team does not anticipate the need of other utility relocations as part of the development of this project.

E. TIMELINE WITH SHORT-TERM AND INTERIM IMPROVEMENTS

The timeline for the construction of the complete Sugarbush Access Road path could be long, although individual phases could be completed in three to five years.

The first step towards the development of the path would be the endorsement of the recommendations of this report by the Town of Warren Selectboard. Endorsement would simply mean that they agree that the alignment described in this report would be a viable and at this time the most appropriate way to develop a path along Sugarbush Access Road. It would not commit the Town to expending funds to advance the trail.

If the Town would like to initiate the preferred alignment as a footpath, it should begin to layout the path in the field, noting where it will be necessary to extend culverts or add small retaining walls to create level areas adjacent to the road. The Mad Rive Path Association, Mad River Riders, or even the Mad River Valley Planning District might be able to assist with or partner with the Town on this process. The Town could then begin to mow the path alignment to demark its location in the field. The Town could make a decision as to what level of road crossing demarcations it would like to use and then move towards installing them, at least at the locations where the path itself crosses roadways. This could include pavement markings, along with roadside and trailside signage. If possible, some public celebration of the opening of each segment of the trail would help to publicize its existence and help initiate its use.

The Town might also be able to undertake other preparations for the path through other projects. The Town is planning on replacing at least one culvert along Sugarbush Access Road in the near future. It is one of the culverts that will need to be extended to accommodate the path. The replacement work on the culvert could include the extension work, so that it is

ready when the path implementation starts and the funding for the work would not need to come from the path design and construction funding.

When Sugarbush Access Road is repaved in the future, the Town could implement the shift in the road near German Flats Road if the path has not yet been constructed. This would create the level area needed for the path on the south side of the road, making it easier to eventually install the path itself at a future date. Repaving work on the road could also include other widening as possible to create a better paved shoulder for walkers in the short term and bicyclist in the long term.

Subsequent to the development of the trail or the extension for culverts, the Town could follow the course describe below towards the eventual implementation of the full shared use path.

- Select the most appropriate phase(s) to undertake and begin work on them - open time line.
- Secure the necessary funding for the first phase to be undertaken from local and outside sources, working with the potential funding options listed below as well as others that may become available in the future - open time line.
- Undertake additional planning and design work as needed to finalize the layout and details of the preferred alignment in the first phase - 12 to 18 months.
- Obtain permits, prepare bid documents, and award project - 6 to 12 months.
- Move forward with the construction or implementation of the first phase variable, but likely 4 to 6 months.
- Work with the community to determine which phase(s) might be next and decide if it is possible to move ahead with the full recommendation or just the more easily developed interim foot path and follow similar steps to reach implementation - no time line.

F. FUNDING

Funding for the preferred alignment 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:

- VTrans Transportation Alternatives Program (TA Funds): the VTrans 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. The maximum size of a grant under this program is currently \$300,000.
- VTrans Bicycle and Pedestrian Program: These federal funds managed by the State cover specific bicycle and pedestrian improvement projects and are provided via a competitive grant program. In 2015, VTrans had approximately \$4 million available

for these grants, with no specific limit as to how much each grant could be. Each grant required a 20 percent match from the municipality.

- Bonds: The Village could opt to use bonds to generate funds to undertake the project.
- Vermont Community and Urban Forestry Council Grants (Caring for Canopies): These grants are awarded to municipalities to aid in conducting a street tree inventory and plan, as well as funding of street tree plantings. The grants range in size from \$500 to \$5,000 and require a 50 percent match.
- Vermont Building Communities Grant Program: These grants are sponsored by the Department of Buildings and General Services and can be up to \$25,000. The communities or not-for-profits that are eligible to receive the grants must provide funds to match 100 percent of the grant. The goal of the program is to promote stimulation or retention of opportunities for regional economic development of Vermont communities.

An 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/11xbEtr>.

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

- Potential health grants promoting healthy living;
- The Robert Wood Johnson Foundation; and
- MCI/Worldcom Royalty Donation Program (For this and several subsequent ideas, see:
<http://www.americantrails.org/resources/funding/TipsFund.html>).

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>.

G. MAINTENANCE

The Town will need to make a decision as to which types of users it would like to encourage during the winter months. If they would like it to be available for walkers year round, they will need to make arrangements to plow the path. Because it will be ten feet wide for most of its length, it could be plowed with a plow on the front of a small pickup truck. If the Town wants to favor cross country skiers or snowshoers, then it would not need to plow the path.

The Town will eventually need to resurface the path. The frequency of resurfacing varies by the type of surface initially installed. Most paths have one of two types of surfaces, asphalt or hard packed crushed stone. The maintenance costs of the two different surfaces vary. Asphalt surface is typically less expensive to maintain on yearly basis but does need a new surface in anywhere from 5 to 20 years, depending on how well it was initially constructed, the amount of use it gets and the types of weather conditions it endures. The gravel surface usually needs more maintenance on a yearly basis to stay in good bicycling and walking condition. If the asphalt surface lasts for at least 15 years, its maintenance is typically less expensive when averaged on a yearly basis than a gravel surface.

A wise general rule is to budget approximately five percent of the total construction cost as a yearly maintenance cost, which, if accumulated annually, could pay for reconstruction of the shared use path when it eventually becomes necessary. These funds can also cover the replacement of signs as they age and become less visible to path and road users.

The addition of a center median on Sugarbush Access Road at the Inferno Road/Village Road intersection will create challenges for the Town snow plow crews. The widening of the turning radius should be completed so that there is sufficient room in the turning lane for the plows to operate easily. The eastbound lane might also need to be widened, or a wider gravel shoulder added to make sure that snow plows can also operate easily in the opposite direction

APPENDIX A
EXISTING CONDITIONS

APPENDIX B

ALTERNATIVES

APPENDIX C
INFERNO ROAD TRAIL STUDY

APPENDIX D
PUBLIC ENGAGEMENT NOTES

