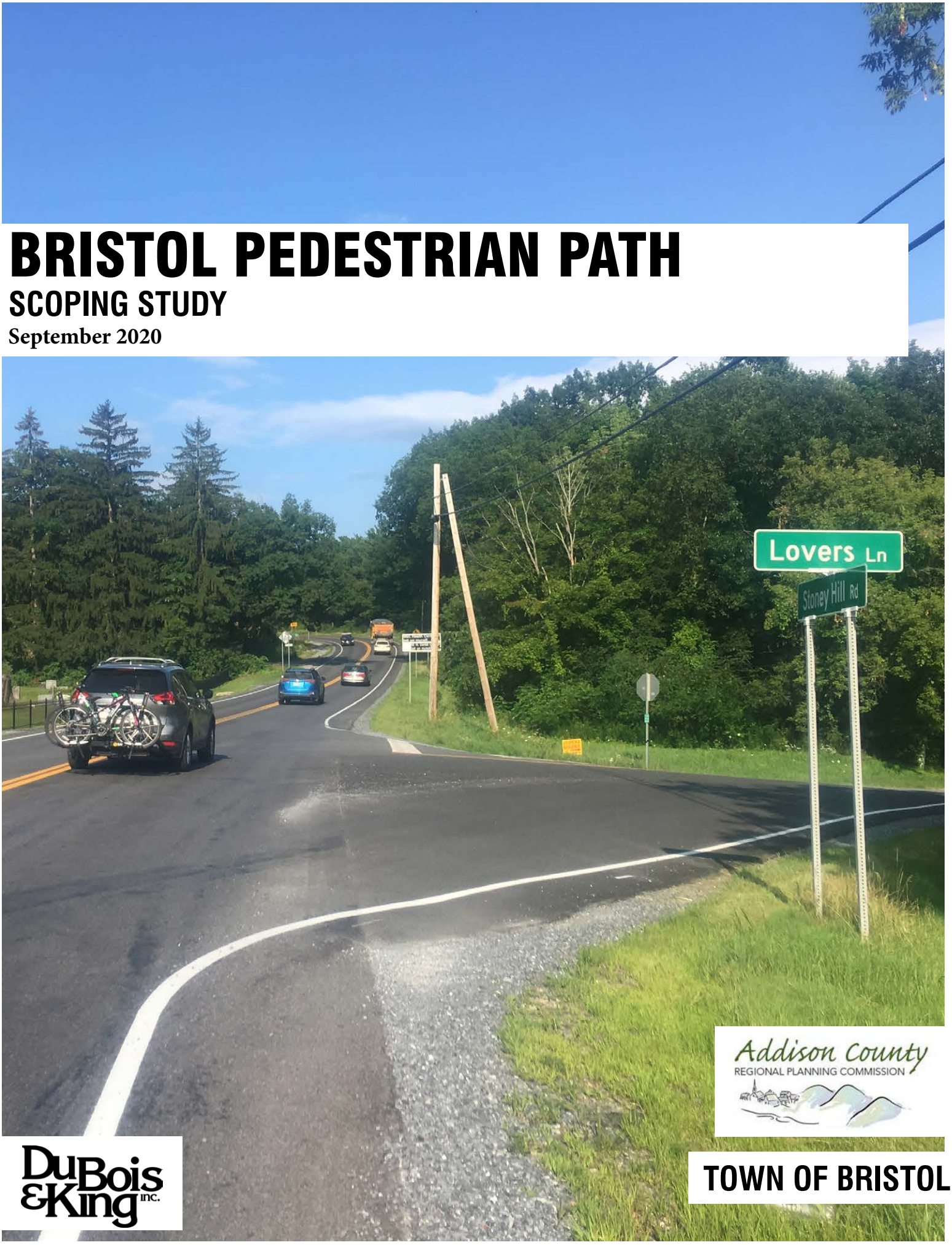
BRISTOL PEDESTRIAN PATH

SCOPING STUDY

September 2020



Addison County
REGIONAL PLANNING COMMISSION

DuBois & King inc.

TOWN OF BRISTOL

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Chapter 1. Introduction

This project is intended to provide the Town of Bristol with alternative designs and preliminary site research to develop a pedestrian pathway linking the Town Center and Bristol High School with current and future residential developments along Lovers Lane. This project was made possible by funding from the Addison County Regional Planning Commission (ACRPC).

This study provides a thorough examination of environmental, physical, and social opportunities and constraints throughout the project area. Three alternatives are provided to accomplish the goals of this study. Through dialog with the Town of Bristol and the Addison County Regional Planning Commission (ACRPC) a recommended alternative is provided that focuses on natural surface trail development due to strong public support and significantly lower costs for the Town of Bristol and regional partners.

Methodology

This study occurred from January to September 2020. The study process followed typical VTrans MAB scoping study procedures, with a period of site analysis and existing conditions inventory resulting in basemap and initial analysis.

During this initial phase, the COVID 19 pandemic and Vermont Governor Scott's Stay Home / Stay Safe orders and associated state of emergency rapidly modified public engagement efforts in order to reduce public physical proximities. This was done through remote video conferences, website documentation, social media advertising, and online polling.

Public engagement for this project consisted of two public meetings, both held online, and two related public surveys. Public access to draft documents, surveys, and links to video conferences was supported by the ACRPC's project website. The results of these public engagement efforts are documented in the appendices.

The scoping study team developed alternatives based on LiDAR contours, detailed site visits, and VCGI GIS databases. This inventory is documented in the existing conditions chapter of this document. Right of Way information was assumed based on nearby survey data acquired through consultation with the Town of Bristol and VTrans.

These initial alternatives were refined and updated through additional site visits and alignment review conducted by DuBois & King Staff in July of 2020.

Final alternatives were presented to the public in an online format and video conference in early August 2020, and a draft final report presented to the Bristol Selectboard on September 14th 2020.



Route 17 (Stony Hill Road) & Lovers Lane Intersection

Study Steering Committee

This study was guided by a steering committee comprised of the following members:

Ian Albison, Bristol CORE & Selectboard Member
Ashley Bishop, VTrans District 5 Project Manager
Valerie Capels, Bristol Town Administrator
Eric Cota, Bristol Public Works
Porter Knight, Bristol Trail Network (BTN)
Meridith McFarland, Bristol Recreation Director
Katie Raycroft-Meyer, ACRPC Community Planner
Mike Winslow, ACRPC Transportation Planner

Project Area and Background

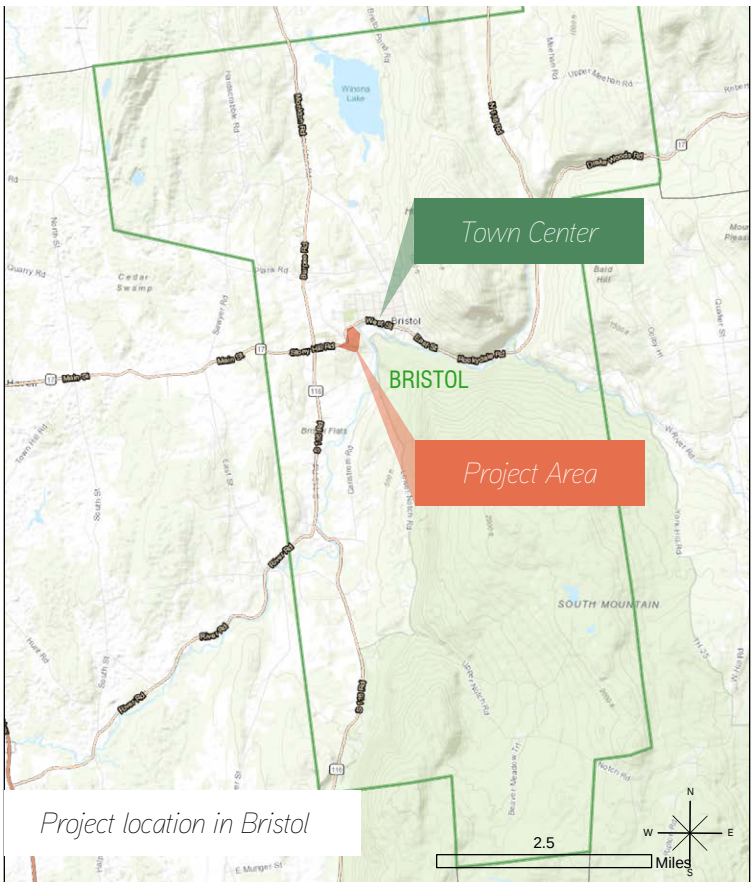
Bristol is located in Addison County, Vermont, within the Champlain Valley, nestled at the foot of the Green Mountains along the New Haven River.

The town enjoys active citizen participation in development of a robust trail network and recreation facilities, and a vibrant downtown. In recent years, more development has occurred outside of the traditional downtown core, particularly along Lovers Lane just Southwest of the Town Center. Though these residential developments lie less than a mile from the commercial and civic heart of the community, there is no safe way for these Bristol residents to walk or bicycle from their homes to the Town Center or High School.

Lovers Lane and the homes along the road lie in a valley below the town, near the New Haven River. Steep hillsides separate the Lovers Lane area from the town center located on a bluff above. This project has provided public engagement, site research, alternatives, and related cost estimates to support the Town of Bristol in developing a safe and pleasant pathway between Lovers Lane and Airport Drive. Such a project will ideally contribute to community safety, quality of life, and support active transportation and recreation in the community.



Project location in Vermont



Project location in Bristol

Chapter 2. Existing Conditions

Roadway Characteristics

Three public roadways are located within the project area. Route 17 forms the primary travel corridor with Lovers Lane and Airport Drive as adjacent roadways and intersections within the study. In order to develop a pathway design that compliments, and does not conflict with existing roadways and intersections, it is worth documenting the layout and character of these roadways.

Route 17 is a VTrans owned and operated roadway, until the intersection of Airport Drive, where it is considered a Class 1 roadway. This designation covers from Airport Drive eastward through downtown Bristol until half a mile east of Basin Street. This Class 1 designation gives the town more control and more maintenance responsibilities of this state highway. Between Lovers Lane and Airport Drive, the highway is comprised of two 12' travel lanes and 2-3' shoulders which ascend a hill while passing through two curves. Along the paved roadway, the average hill grade is 8 to 12%. As the highway ascends towards Airport Drive, a left hand turn pocket is introduced for eastbound traffic, widening the asphalt profile to approximately 40' (two 12' travel lanes and 12' turn lane with two 3' shoulders).

The speed limit along Route 17 in the project area is 40 miles per hour, with an immediate drop to 30 mph east of Airport Drive. There are no pedestrian facilities along this stretch of highway, in no small part due to the steep slopes through the corridor. Existing Bristol Town sidewalk is located on the north side of Route 17, east of Airport Drive.

Airport Drive is a 24' wide roadway that connects Route 17 travelers to Bristol High School and public recreation fields. It crosses flat terrain north of Route 17, and currently there is no roadway striping or adjacent pedestrian facilities. The speed limit is 15 miles per hour. Public Right of Way (ROW) is approximately 50' wide.

Lovers Lane is an approximately 22' wide, paved roadway without any adjacent pedestrian facilities. It winds through a valley south of Route 17 and southwest of Bristol's downtown. The Public ROW is approximately 50' wide. The speed limit is 35 miles per hour.

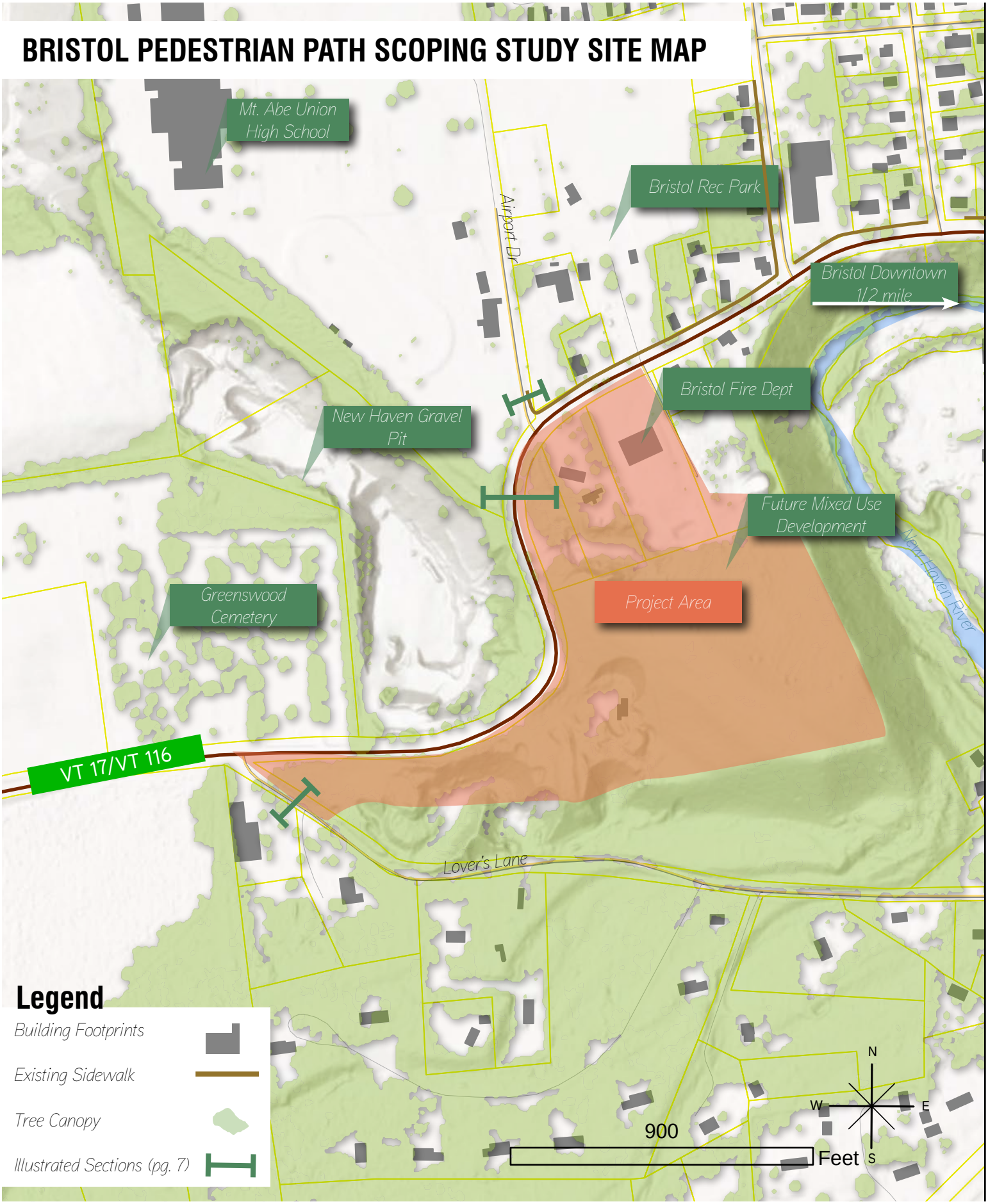


Route 17 west


Airport Drive north from Route 17 intersection.


Lover's Lane east from Route 17 intersection

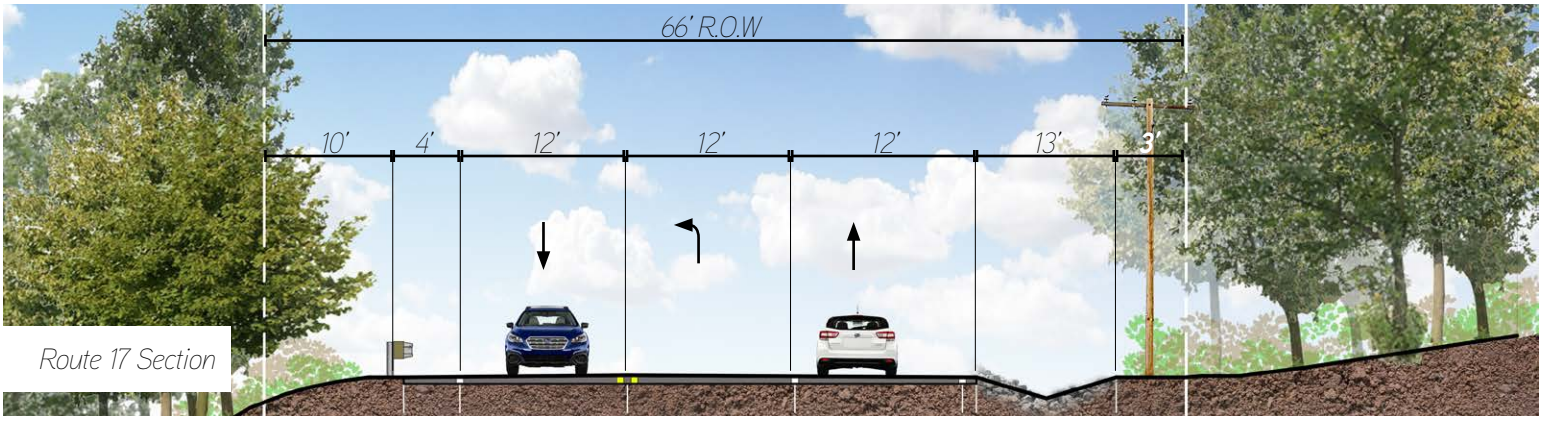
BRISTOL PEDESTRIAN PATH SCOPING STUDY SITE MAP



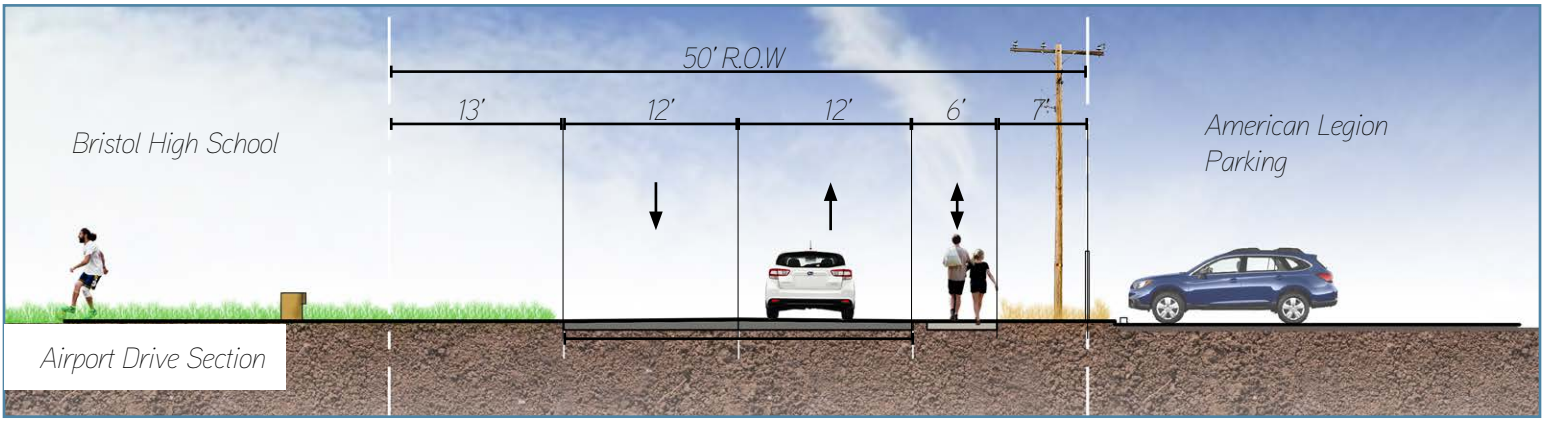
Right of Way

Original survey for Route 17 indicates that through this corridor the typical right of way width is 4 rods, or 66' wide. Without a meets and bounds survey, this width can be assumed to be centered on the centerline of the asphalt roadway. Any pedestrian pathways that utilize space within 33' of the roadway centerline can be assumed to be within the VTrans right of way. Full survey would be required to verify this assumption.

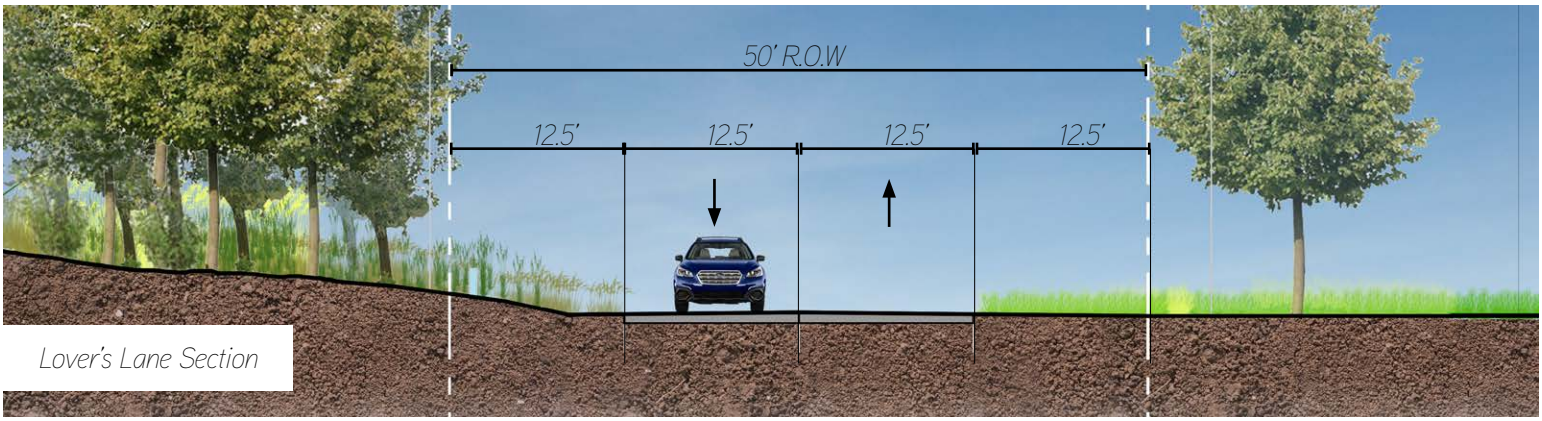
Mapped parcel lines indicate that the Right of Way for Lover's Lane is approximately 50 feet, and the existing Right of Way for Airport Drive may be greater, as the roadway lies within property owned by the Town of Bristol. The location of these graphic sections can be seen on the map on the preceding page.



Route 17 Section



Airport Drive Section



Lover's Lane Section

Land Use and Zoning

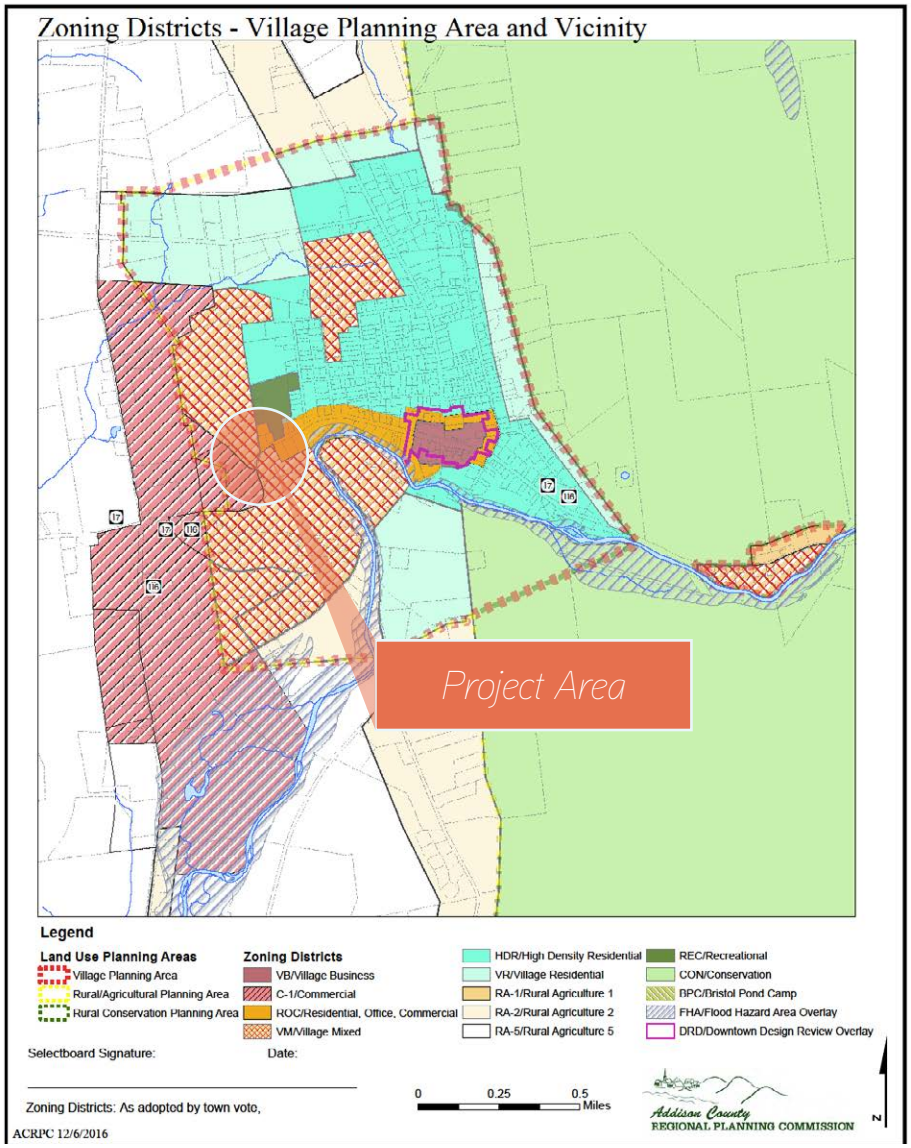
This project lies within Bristol's Village Land Use Planning area. Route 17's intersection with Lovers Lane forms a 'gateway' to Bristol. Land use is important to document for any pathway project to consider how changes might impact the character of the surrounding land and neighborhoods.

Route 17 creates a border between the two Bristol zoning districts. C-1 Commercial Zones lie to the west of Route 17 as it ascends the hill between Lovers Lane and Airport Drive, and Village Mixed Zoning applies to the areas south/southeast of Route 17, encompassing Lovers Lane.

The objective of the Village Mixed district is to promote opportunities and housing within easy reach of the walkable core of the village. Mixed use development including civic, educational, and light office use is permitted here alongside single and multi-family residential.

Commercial zoning to the North and West of Route 17, along with the roadway's broader context will continue to generate truck traffic and consistent use along the highway.

These existing and future land uses along Lovers Lane and Route 17 will generate many short distant trips to Downtown Bristol, and make a strong case for the need for safe and separated pedestrian and bicycle infrastructure through the project area.



Traffic Patterns

Traffic patterns help further inform pathway design to ensure alternatives will be the least disruptive to current traffic flow, and develop pathways that are as safe as possible for people walking and bicycling along them.

Traffic Volumes

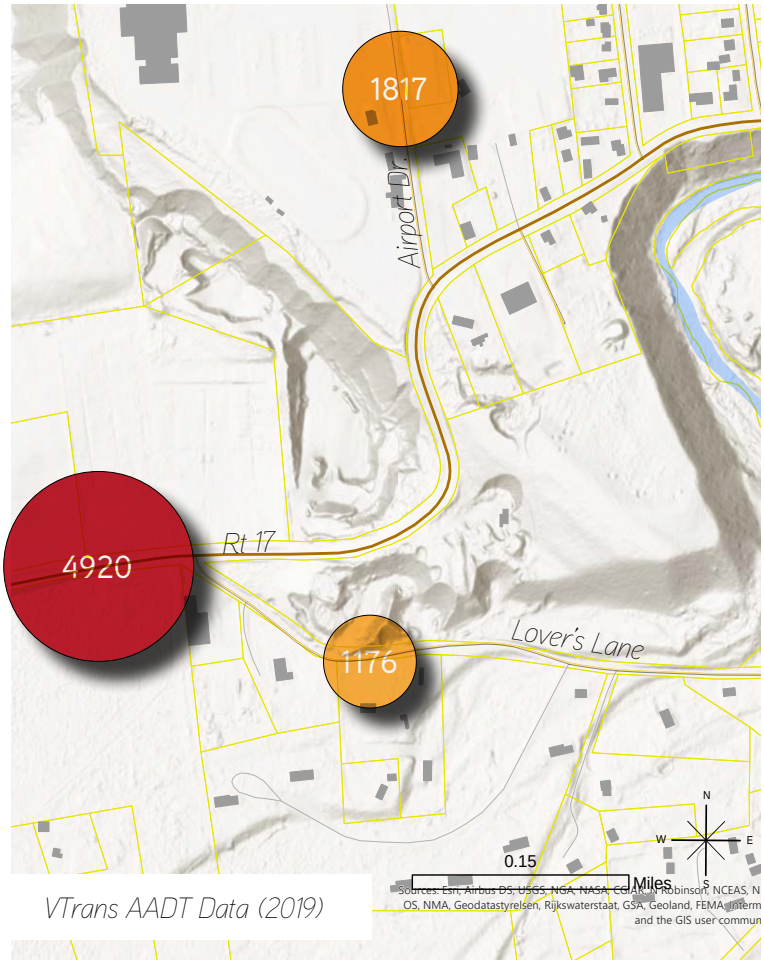
Reviewing the VTrans Transportation Data Management System reveals 2019 traffic counts for the project area. These volumes indicate a steady stream of traffic on Route 17, with 4920 AADT west of Lovers Lane, and 4565 AADT in downtown Bristol, just east of Airport Dr.

Airport Drive sees a larger traffic stream than Lovers Lane, with 2019 data recording an AADT of 1817 for Airport Drive, and 1176 AADT on Lovers Lane. Regular access to public recreation facilities and the High School likely account for this difference.

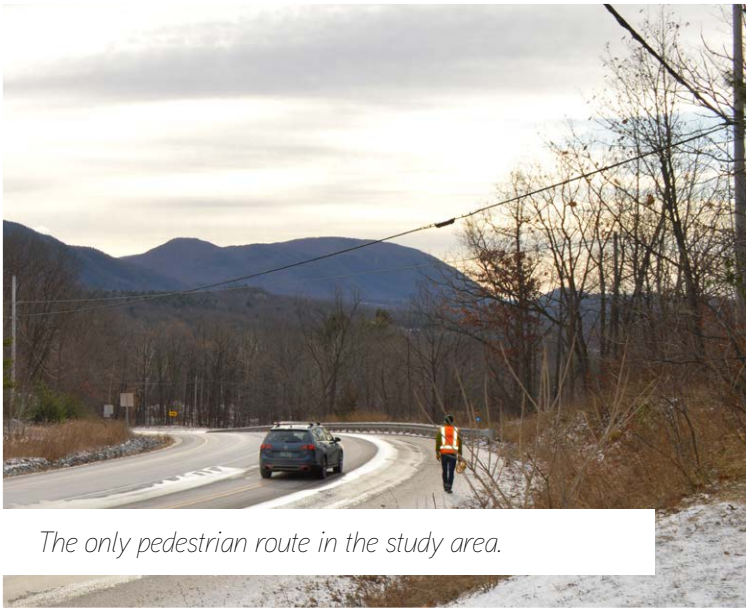
These volumes are higher than elsewhere in the measured Bristol roadway network, with the next highest volume being North Street measured at 1502 AADT in 2019.

Less than a quarter mile west of the Lovers Lane and Route 17 intersection lies the Vermont Route 17 and 116 intersection. This all-way stop controlled intersection and regional destinations accessible from it contribute to the overall traffic flow in the area.

These relatively high volumes of motorized traffic illustrate a need for safe non-motorized transit connections in the project area.



VTrans AADT Data (2019)



The only pedestrian route in the study area.

Crash Data

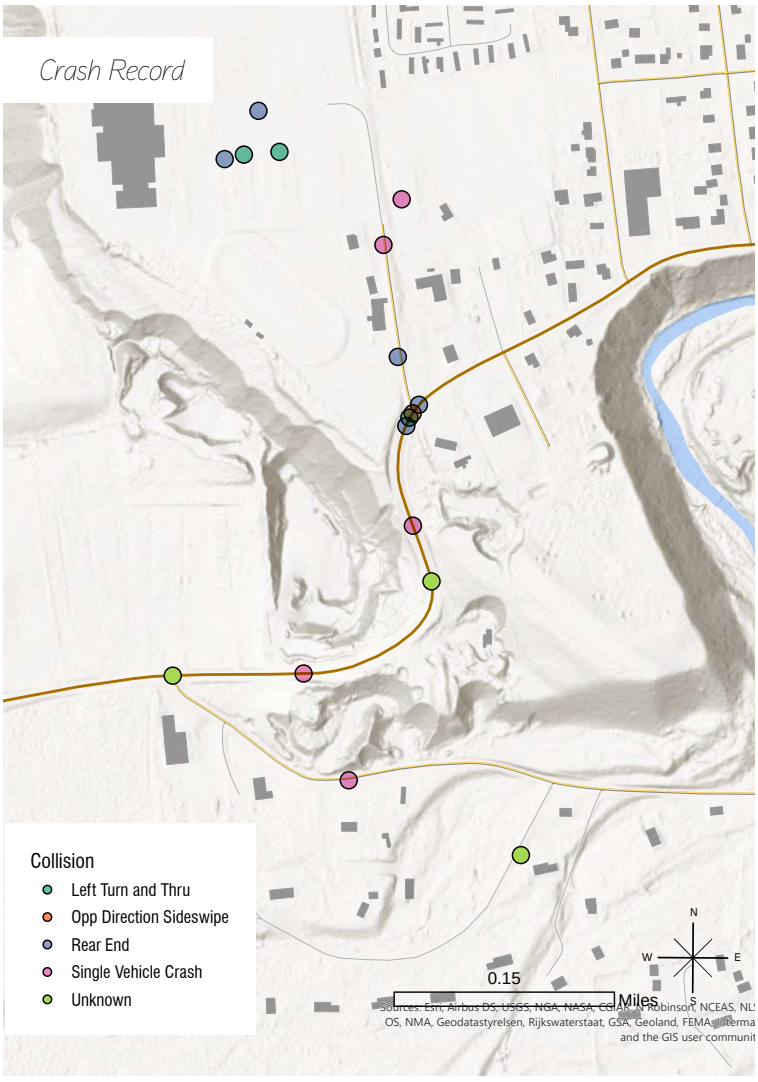
Crash data was reviewed for the last 5 years (2015-2020) via VTrans' online Crash Query Tool and the VTrans Crash Report System. There were 16 reported crashes in the project area, with 13 resulting in property damage only (no injuries or fatalities) and of 3 of unknown severity.

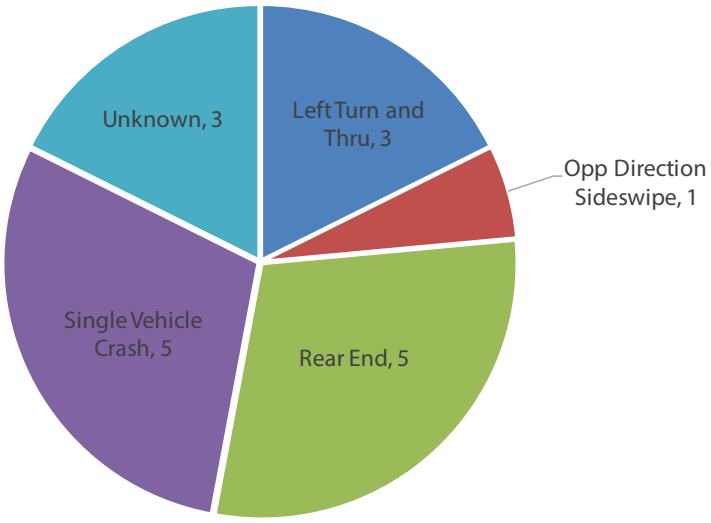
There are a cluster of crashes at the Airport Drive and Route 17 intersection and in the high school parking lot. The crash reports show that many of these crashes occurred during the condensed periods of time at the beginning or end of the school day, when drivers may be anxious to get in and out of school. Of these crashes, 5 were rear ends, which are symptomatic of congestion or stop-go traffic, most likely related to the school hour traffic patterns. The other crashes in this area, including left turn and throughs (often referred to as "T-bones") and the sideswipe at the Route 17 and Airport Drive intersection, are typically associated with confusion about right-of-way when making a turn or aggressive driving.

There are also several single vehicle crashes throughout the project area, which can be related to distracted driving, speeding, or weather conditions.

There are no VTrans high crash location segments or high crash intersections within this project area.

The crash cluster at the intersection of Airport Dr. and Route 17 points to a potential need for safe pedestrian infrastructure and improved roadway design connecting any future bike/ped path improvements with the High School and Bristol Recreation Facilities.





Crash Record by Type

Bicycle & Pedestrian Facilities

Community investments in bicycle and pedestrian pathways should compliment the existing use patterns and locations of sidewalks, pathways, and trails elsewhere in the community. The available data on use patterns and existing bike/ped facilities are documented here.

Counts

VTrans hosts records of manual and automated bicycle and pedestrian counts. In the project area, there is one count, located at Airport Drive and Route 17 intersection, which was recorded by manual observation. Five non-motorized road users were counted at this location in 2013, all moving in the same direction during morning commute hours. However, half a mile to the east, in Bristol Town Center during the same time, 61 bikes and peds were counted, pointing to significant activity centers adjacent to the study area.

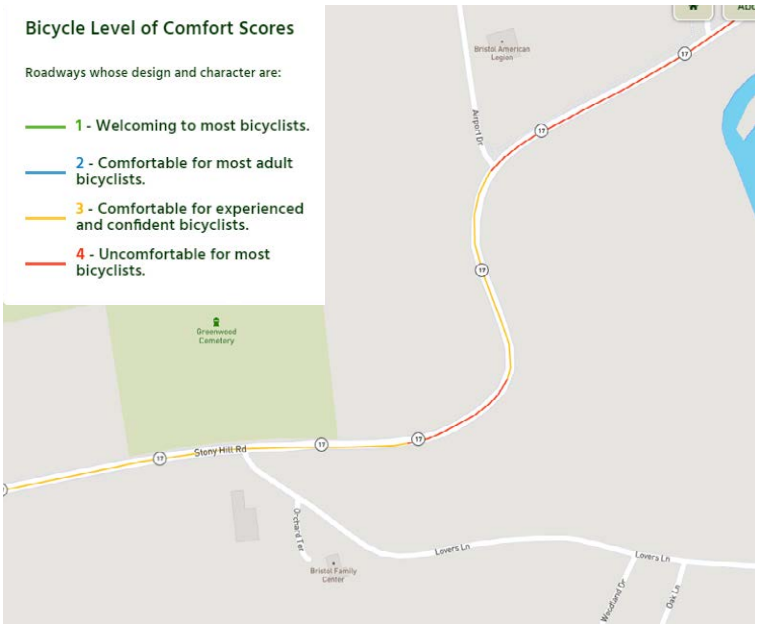
Pedestrian Facilities

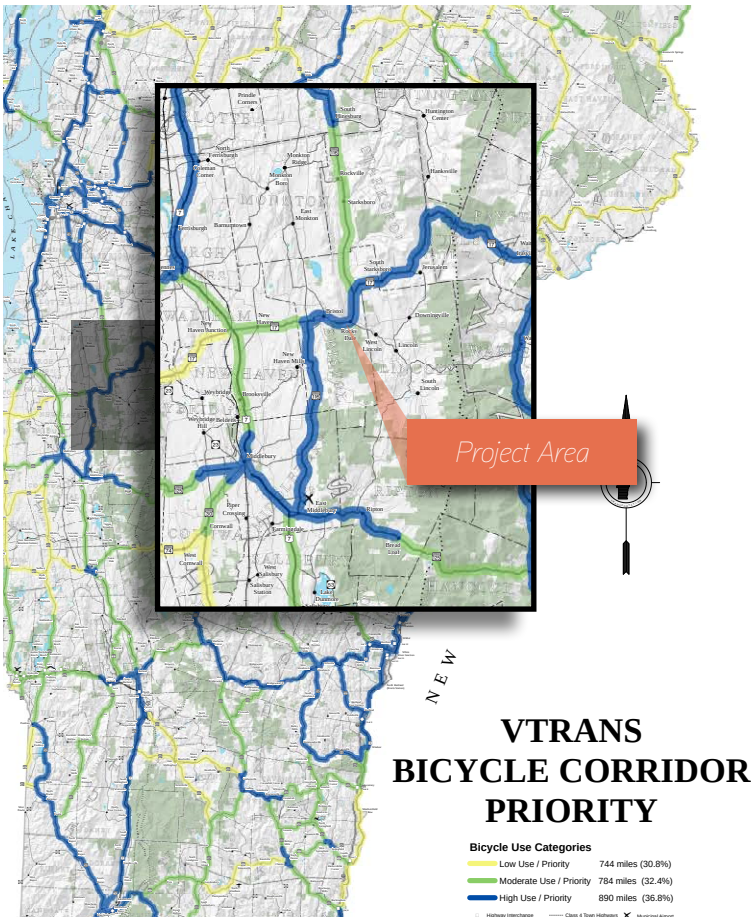
An existing sidewalk wraps onto Airport Dr from the north side of Route 17, connecting this intersection with downtown Bristol. No other dedicated pedestrian facilities are present. People who want or need to walk to Bristol Downtown from Lovers Lane must either walk a long detour around South street, or utilize the 2-3' shoulders on Route 17. As a point of reference, minimum ADA accessible sidewalks should be at least 5' wide, with 6' being preferable.

Bicycle Facilities & Conditions

Though Route 17 maintains 2-3' shoulders through this corridor, these widths are insufficient to safely accommodate people who ride bicycles. 2012 AASHTO guidance indicates that dedicated bicycle facilities should typically be 5' wide, and 4' in constrained circumstances.

Currently, VTrans has identified this section of Route 17, eastward through Lincoln and the Green Mountains as a high-priority bicycle corridor.



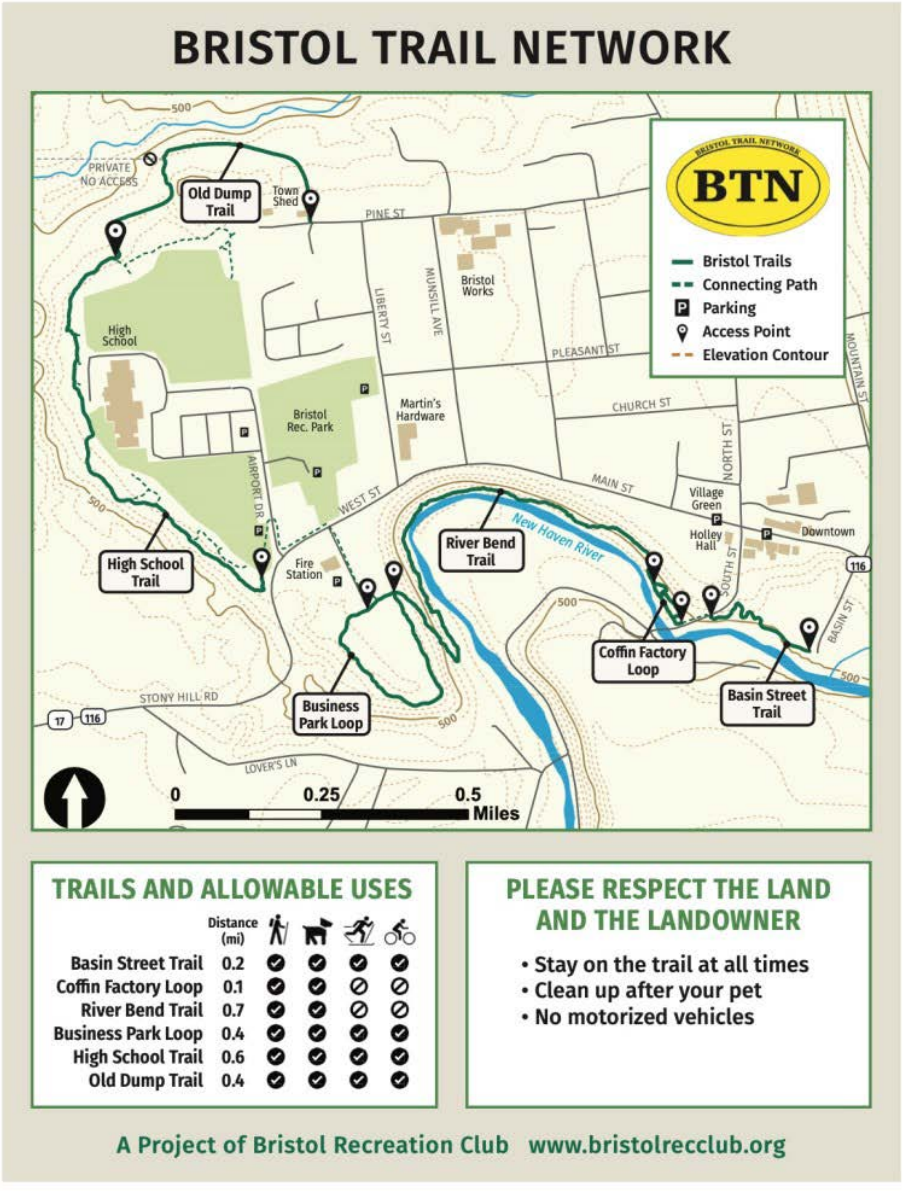


In addition, VTrans has completed a bicycle level of comfort analysis for their roadways, and in 2018 identified the segment of Route 17 between Lovers Lane and Airport Dr. as uncomfortable for most cyclists or comfortable only for strong and confident cyclists, particularly in the uphill direction.

Bristol Trail Network

The Bristol Trail Network (BTN) is a project of the Bristol Recreation Club, a 501c3 all-volunteer organization dedicated to promoting outdoor recreation in Bristol. The Bristol Rec Club launched the BTN in 2017 to create and maintain trails around Bristol, with approximately 3 miles of trail currently in place. The BTN supports the Town in grant writing, planning, design, and construction efforts related to public trails within the community. Completed in early 2020, the map on this page illustrates the current extents of the Bristol Trail Network.

Some of the existing trails are immediately adjacent to the project area, and enhancing connections between existing and future trails/paths would improve the overall value of the network.



BRISTOL PEDESTRIAN PATH SCOPING STUDY SLOPE MAP



Landscape Characteristics

Route 17 ascends a steep hillside slope that connects the Lake Champlain Valley to the west with Bristol's plateau at the foot of the Green Mountains. The slope map on the preceding page illustrates potential challenges with routing a future separate pathway or trail through the steep slopes created by existing and former gravel extraction, as well as the banks of the New Haven River.

Streetscape

Route 17's streetscape improvements are limited to basic traffic safety elements such as shoulders, guardrails, and painted lanes. Electric utility poles line the south/east side of Route 17. Rock cobble lined drainage swales are located on either side of Route 17 as it crests the hill. Guardrails are present on the outside of both curves that ascend this hillside.

The streetscape elements of Lovers Lane and Airport Drive are limited to drainage swales and roadway signage. The overall context of the project area includes Bristol Recreation fields, residential development, wooded lands, the New Haven gravel pit and Greenswood cemetery.

Adjacent Lands

This project considers path alignments that lie within the VTrans right of way, as well as those that could utilize adjacent private lands. Coordination with landowners will be crucial if use of any amount of private property is to be utilized for a future project.

There are currently discussions between the Stony Hill /Livingston property owners and the town of Bristol to permit a new development that would include office and multi-family residential uses on site.

This development may provide an ideal opportunity for public private partnership to develop a pedestrian path connecting the town of Bristol's existing pedestrian infrastructure with the Lovers Lane residences and future development on site. The map on the following page illustrates land ownership within the project area.

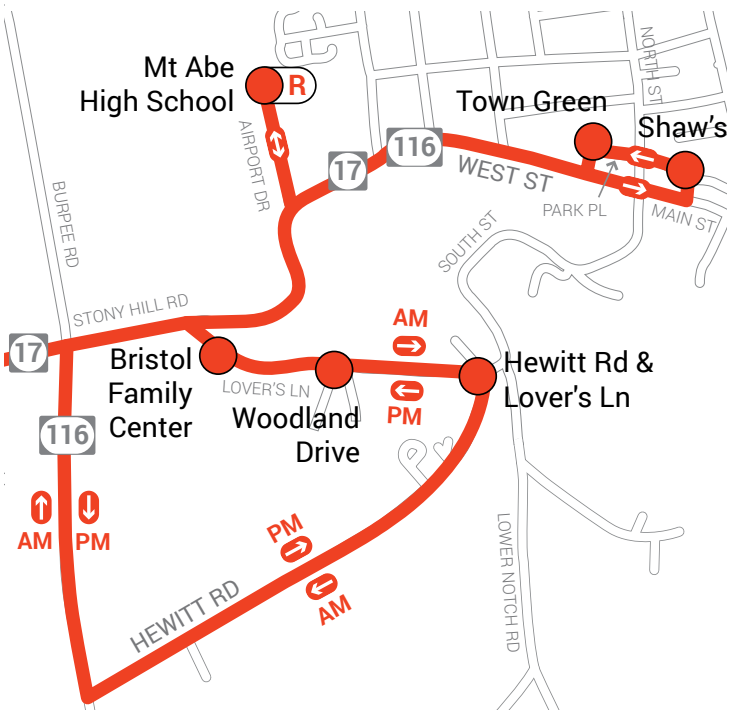
Public Transit

Bristol is served by Tri-Valley Transit (formerly ACTR). Both the Tritown and 116 Commuter lines reach the town. The TriTown operates fare free within the project area, providing stop at the Bristol Family Center & Woodland Drive intersections on Lovers Lane, and utilizes Route 17 to connect these stops with downtown Bristol and Mt. Abe High School.

The 116 Commuter line connects Bristol with Middlebury to the south and Burlington to the north. Both stops for this line are located downtown.

The development of a path connecting Lovers Lane to Downtown Bristol and Mt. Abe High School would expand access to public transit for residents.

Bristol Fare-Free Zone



Bristol Tri Town Route through Project Area

ADJACENT LANDOWNERSHIP



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and th

Existing Utilities

The identification of utility locations through a project area is a crucial component of ensuring that projects are as cost effective as possible. Moving telephone poles and underground drains, culverts, or cables is very expensive, and worth avoiding wherever possible.

Electric

Along Route 17, the South side of the roadway hosts a series of electrical utility poles which parallel the road. These overhead utilities cross Route 17 just west of Airport Drive, and then connect north towards the High School and east towards the town center. Electric utility boxes are located at the intersection of Airport Drive and Route 17. The map on the following page illustrates the general layout of overhead utilities in the study area.

Wastewater

There are no mapped underground wastewater utilities in the area, as the Town of Bristol operates at this time on septic systems only. Individual residences and businesses each maintain their own septic fields on site.

Stormwater

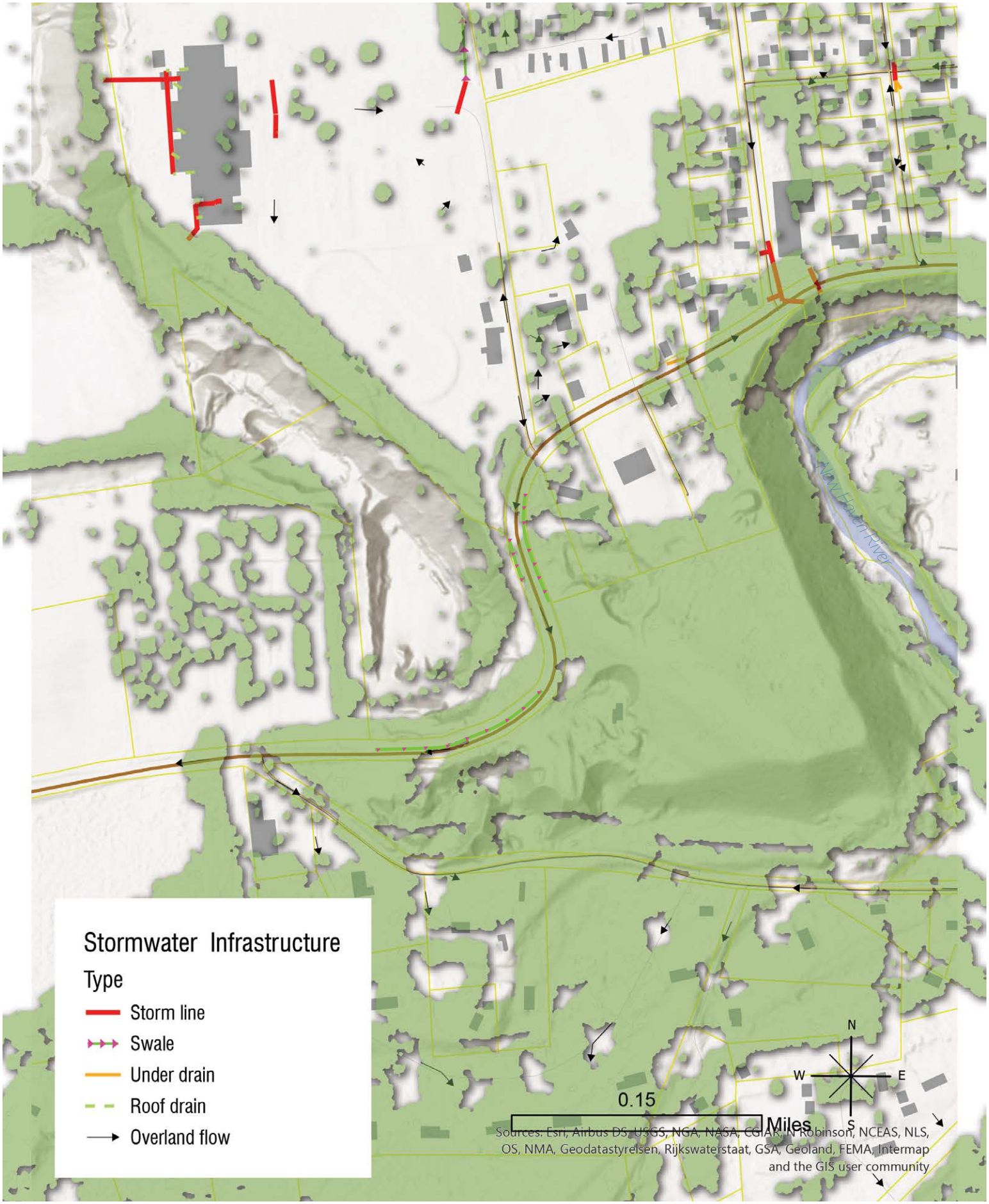
Route 17 contains multiple cross drains to handle water flow in large storm events in the area, but outside of these features, there are no major stormwater facilities in the project area. In addition, a hardened stormwater channel has been built at the top of the Route 17 hill on the northeastern side of the roadway. This rip-rap lined channel occupies a majority of the VTrans Right of Way adjacent to the travel lanes and shoulder.

More stormwater infrastructure is likely as development occurs on adjacent parcels.



Utility Poles Along Route 17


New Haven River
Overhead Utilities
Overhead Utilities
Utility Poles
0.15
Miles
N
W
E
S
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community


New Haven River
Stormwater Infrastructure
Type
Storm line
Swale
Under drain
Roof drain
Overland flow
N
W
E
S
0.15
Miles
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Water

There are underground water pipelines servicing existing residences and businesses in Bristol. A functioning fire hydrant is located at the northwest corner of the Airport Dr. / Route 17 intersection. No digital records have been located of these utilities, but a historic water pipe has been identified by Bristol Public Works to the northwest of Route 17 between Airport Drive and Lovers Lane.

Environmental Resources

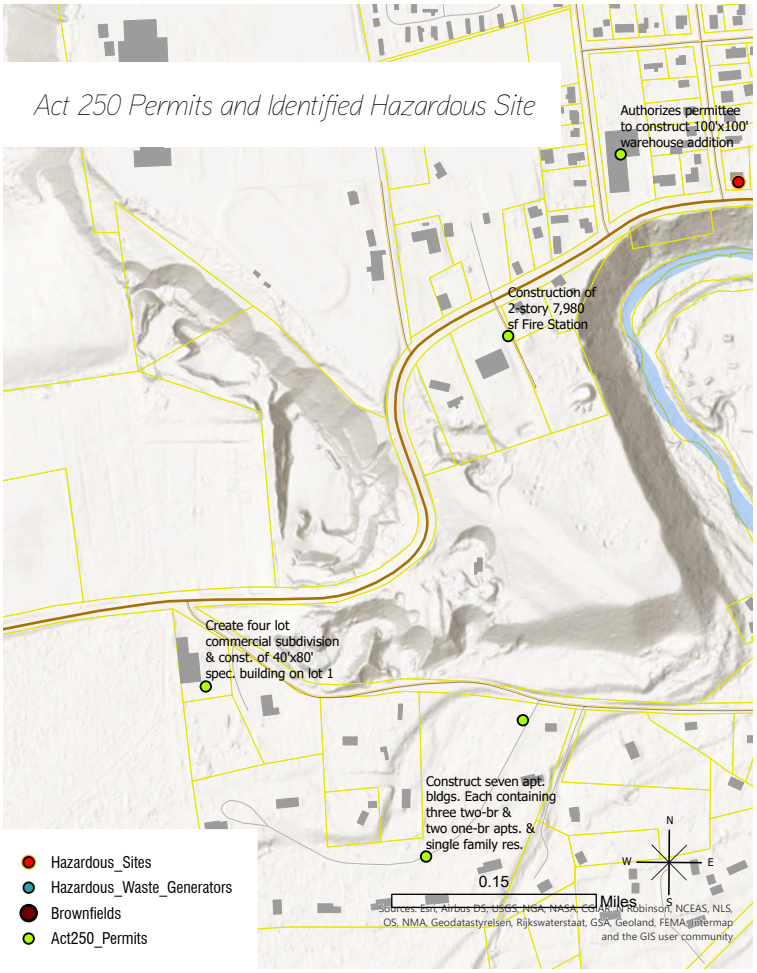
The Vermont Agency of Natural Resources Atlas was reviewed to identify relevant hazardous waste sites and significant natural resources in the project area. A table summarizing natural resource findings is included on the following page.

The most notable findings in this review were the occurrence of a state-identified threatened species around Lovers Lane. The majority of other factors, such as wetlands, floodplains, and hazardous wastes did not deliver findings that are likely to affect the future of permitting a pedestrian pathway as outlined in this project. Future study may be warranted during the implementation phase of this project.

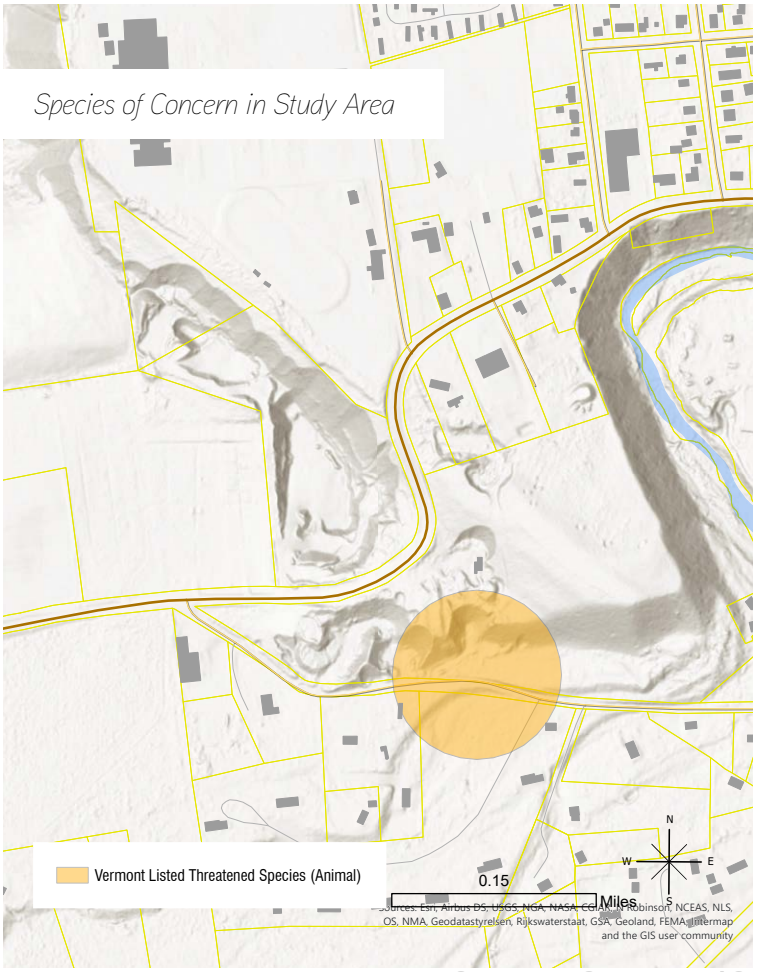
Worth noting is that the Vermont Department of Environmental Conservation maintains a hazardous waste database which records reported soil contamination events. The records of this database within the study area are noted in the map at right. Based on this data, no active hazardous waste sites are present. Only one report exists for a treated Underground Storage Tank at Bristol Mobil, slightly east of Airport Dr.

A table of notable findings is included on the following page.

Act 250 Permits and Identified Hazardous Site



Species of Concern in Study Area



Potential Resources	Presence/Absence in Study Area
Wetlands	Project will not involve construction in known or mapped wetlands. Final project alignments should be inspected by wetlands professionals to identify any vernal pools or wetlands not present in current GIS data. A wetlands project from 1991 is present in the western portion of the study area.
Lakes/Ponds/ Streams/Rivers	The New Haven River runs on the other side of the bluff from the project area, but does not impact the project area.
Floodplains	100 year floodplains are absent from the study area. This project should not require a risk analysis for increase in 100 year flood water surface elevations.
Endangered / Threatened Species	A State identified threatened species has been identified adjacent to the project area, centered on the western side of Lover's Lane.
Stormwater	Stormwater infrastructure in the project area is limited to VTrans facility stormwater facilities.
Hazardous Wastes	Adjacent to the project area is a single treated underground storage tank.
Water Quality	No sole source aquifers have been designated in Vermont at this time. https://www3.epa.gov/region1/eco/drinkwater/pc_solesource_aquifer.html No impaired waters are present in official data layers and this project is unlikely to impact impaired waters. The adjacent New Haven River is listed as a stressed water.
Soils/Agricultural lands	Soils on the upper bench of the project area are identified as Colton gravelly sandy loam and is classified as farmland of statewide importance. Elsewhere in the project area, slopes keep similar soils from being considered prime farmland. Prime and statewide agricultural soils are considered under Act 250.
Archaeological/4f lands	An archaeological resource assessment was completed as part of this project and identified three specific areas that would require additional archaeological investigations should any alternative involve earth moving within them.
Noise Impacts	This project should not create any additional noise impacts to the surrounding area. As an active transportation facility, it has potential to reduce aggregate noise in the area.



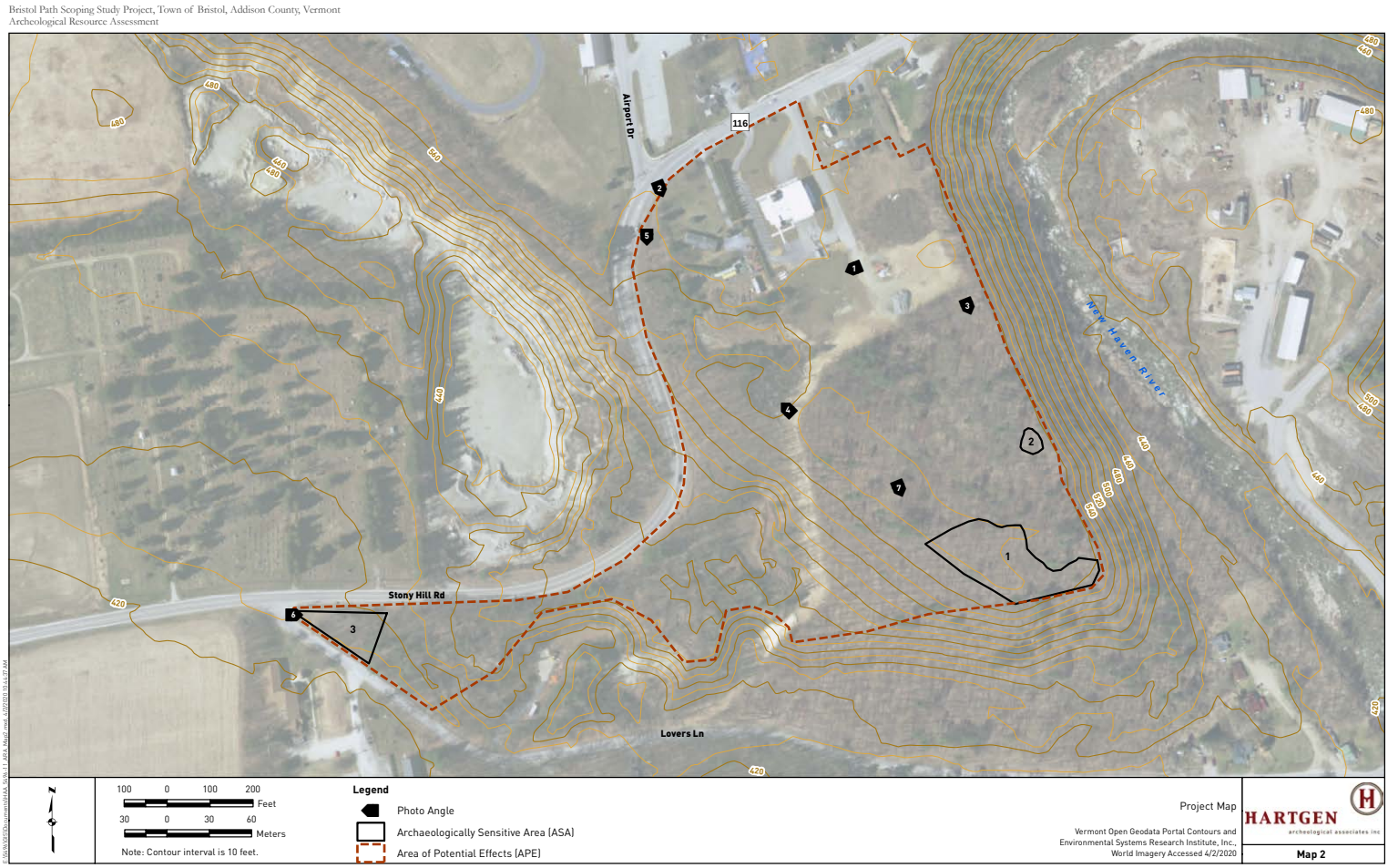
Cultural Resources

An archaeological resource assessment was completed as part of this project and identified three specific areas that would require additional archaeological investigations should any alternative involve earth moving within them.

These areas are identified as archaeologically sensitive areas 1, 2 and 3 below. Any alternatives that would impact these areas must also include more in depth archaeological research to ensure that the alternative does not impact sensitive cultural and archaeological resources.

Should alternatives impact any of these areas, the area impacted would be subject to shovel testing - an archaeological investigation, excavating, by hand 50cm pits every 10 meters. The result of this investigation would then determine what, if any additional archaeological work is needed. A rough estimate for shovel excavation in area 3 is $3400. This area is identified for impacts as it is the only one impacted by any of the alternatives proposed in this document.

The full archaeological resource assessment is included with this document in the appendix.



Chapter 3. Purpose and Need

Purpose

The purpose of the Bristol Pedestrian Path Scoping Study is to develop a safe transportation facility to link the Lovers Lane area of Bristol with Downtown, Mt. Abe Union High School, and the Bristol Trail Network. This facility is intended to serve both transportation and recreation purposes. When complete, the path will provide residents, businesses, and visitors to Bristol with an alternative to driving their car to community destinations.

Need

There is a need to provide a safe, comfortable, and direct option for walking and bicycling between Lovers Lane and Bristol Downtown. Beyond existing populations through the single and multi-family residential developments along Lovers Lane, there are planned developments off of both Route 17 and Lovers Lane that will increase the number of residents looking to access Downtown, the Bristol Trail Network and Mt Abe Union High School. This anticipated population growth only strengthens the need to create a safer route for walking and bicycling. Current conditions along Vermont State Route 17 are not conducive to public safety.

There is additional value and desire for this project to serve a recreational and quality of life function as well, as the project's location has the potential to connect to, and expand the broader Bristol Trail Network, a public network of trails, sidewalks, and pathways which offer residents and visitors alike excellent opportunities to hike, bike and connect to nature.



Route 17 Roadside Conditions

Chapter 4. Alternatives

Methodology

Several alternatives were developed based on site opportunities and constraints, as well as public input received throughout the process. The alternatives were developed with consideration given to public and stakeholder interest in a off-highway corridor option, as well as discussions with potentially affected landowners.

Initial alternative alignments were developed based on existing conditions documentation, and ground-truthed by a secondary site visit to review precise topography, soil quality and types, and to improve the accuracy of power pole, stormwater drainage, and other relevant site details.

This documentation illustrates these alternatives in both plan and section view, along with typical corridor photography.

Alternative 0 - No Build

The no build alternative requires no investment or further action from the Town of Bristol, ACRPC, VTrans, or Bristol Trail Network. A no build option will require residents of the Lovers Lane area to access downtown Bristol, Mt. Abe Union High School, and the Bristol Trail Network by walking on the shoulder of Route 17.

This alternative does little to support walking or bicycling as transportation throughout the town of Bristol and creates unsafe conditions for those who have no other option than walking or riding a bicycle for transportation.



No build alternative

Alternative 1

This design comprises a 2256' long, 10' wide shared use asphalt pathway that roughly parallels the alignment of Route 17 between the Firehouse Drive intersection and Lovers Lane. The pathway would be located on the southern / eastern side of the roadway.

Alternative 1 Opportunities

As proposed, this option could be the most universally accessible pathway, as it is the only proposed pathway that would have a paved surface for its entire length.

Because of the paved surface, Alternative 1 has the potential to be a year-round accessible path, should the Town of Bristol or Bristol Trail Network have the capacity to clear snow in winter months.

This alternative would also impact the least amount of private land, and remain within the VTrans Right-Of-Way whenever possible. Where it impacts private property, it does so within 10-20' of the edge of properties.

Alternative 1 Constraints

As proposed, this option will be significantly more expensive than others developed within this scoping study. Due to existing VTrans stormwater facilities and steep side slopes, the Alternative 1 alignment will require several lengths of costly retaining wall to be constructed alongside the pathway. As proposed, this alternative also must relocate several power poles to avoid more significant and costly earthworks.

This alternative would impact one of the archaeologically sensitive areas within the project area, and would require certified cultural resource experts to dig test pits through the approximately 200 sf area before the project could be approved for construction with any federal or state funding. These impacts to an archaeologically sensitive area are included out of a need to provide connectivity to Lovers Lane roadway while still maintaining ADA-compliant slopes. Alignments that would avoid this sensitive area would exceed 12% slopes, which could jeopardize the federal funding that would be needed for a project of this scale.



Alternative 1 Concept Corridor



Alternative 1 Potential - Boulevard Trail, Logan UT

VTrans Feedback

VTrans feedback regarding this alignment indicated a need to address drainage, winter operations, and pedestrian protection within Alternative 1.

All stormwater drainage from a pathway within or adjacent to the VTrans Right of Way must drain off of the state roadway at all times, and not contribute to stormwater loads. Protection of users on this pathway must be considered. All cost estimates for this alternative include a full length guardrail for this very reason. Snow clearing of this pathway would be the responsibility of the municipality.

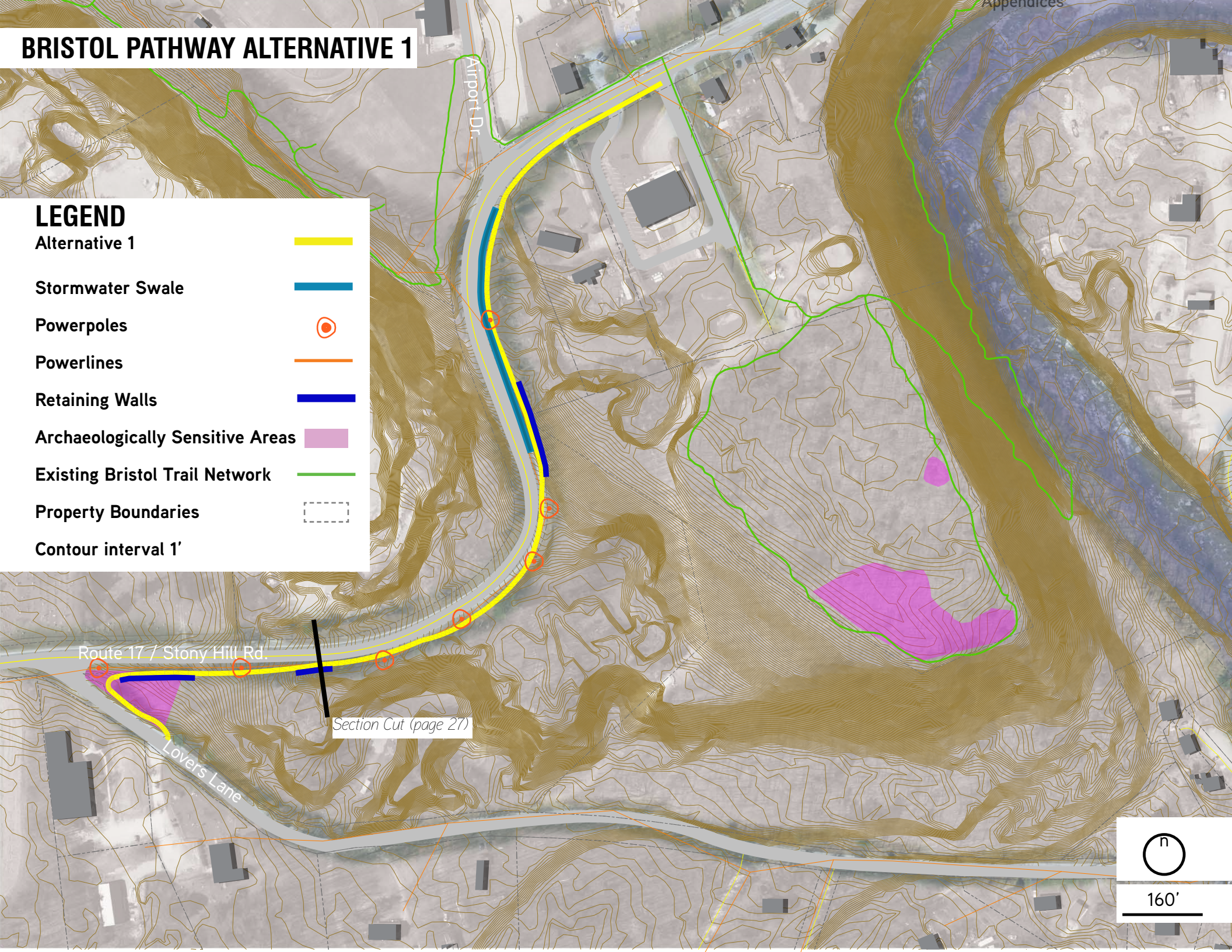
Alternative 1 Cost and Variations

The Bristol Selectboard indicated a desire to review variations on this alignment that could be completed for a reduction in price. The appendix of this document contains estimated cost for a 10' wide asphalt pathway ($1.8M), a 5' wide concrete sidewalk ($1.0M) and a 5' wide aggregate stone walkway ($646K).

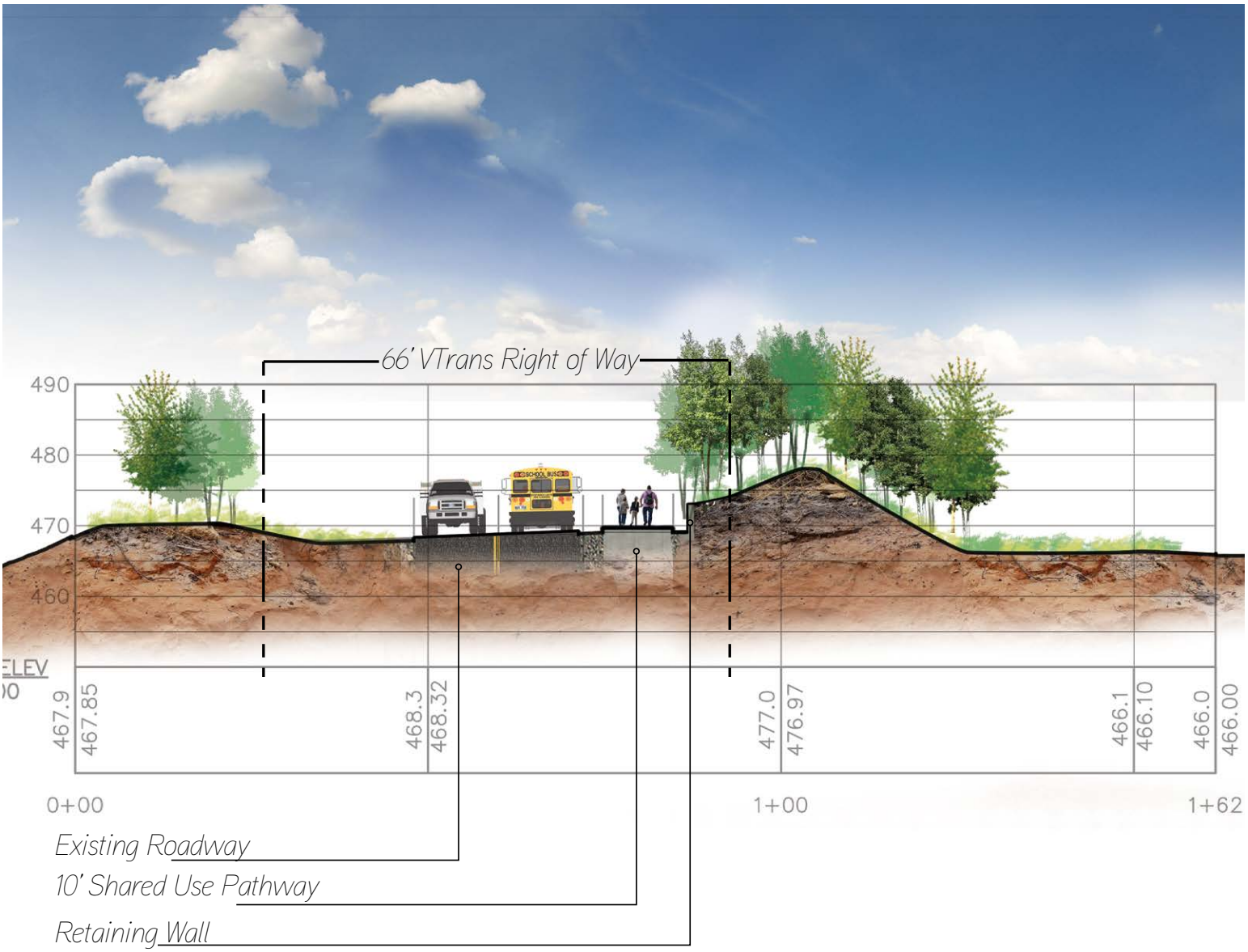
It should be noted that as a reduced width pathway, the design would not accommodate two way traffic on bicycle. As a aggregate stone walkway, though this design represents the most cost-effective method to achieve this alignment, maintenance costs would be significantly higher and the path would offer challenges to clearing of snow in the winter months.

Note that these cost estimates are planning level accuracy only, and include a 25% contingency cost to account for details not captured at this level of study.

BRISTOL PATHWAY ALTERNATIVE 1



Alternative 1 Typical Section



Alternative 2

Alternative 2 is a 1760' long, 3-5' wide hand and machine built natural-surface corridor connecting the existing Bristol Trail Network trails behind the Bristol Firehouse to Lovers Lane. The trail would be constructed with sustainable trail construction techniques and maintain an average grade of less than 10%, but would not be accessible to all due to the rugged nature of the terrain. Maximum grades would not exceed 15% for lengths of more than 200'at a time.

Alternative 2 Opportunities

This alignment is constructed primarily on lands that have low development value due to steep slopes. These slopes are not too steep to support hiking and mountain biking trails.

This option along with Alternative 3 represent opportunities to work with private landownership and the Bristol Trail Network to develop natural surface connectors that could link Lovers Lane with downtown at a much lower cost than a paved trail.

Alternative 2 Constraints

The segment of this alternative which parallels Route 17 does so (along with Alternative 1) due to severe slope constraints. Due to numerous steep slopes covered in mature trees and stony soils, immediately south of the roadway at this location, this alternative may need to either impact VTrans Right of Way at this location, or anticipate higher than average construction costs immediately outside of the Right of Way.

This area is labeled "Area of Construction Challenge" on the alternative layout map on page 29.

This pathway would not be constructed to Americans with Disability Act (ADA) standards and would have some limitations on funding sources due to the inability to build to those standards.

Alternative 2 Cost

This trail alignment is estimated to cost approximately $22k through contract with a professional trail builder. Volunteer support of trail building could likely reduce this cost to the Town.

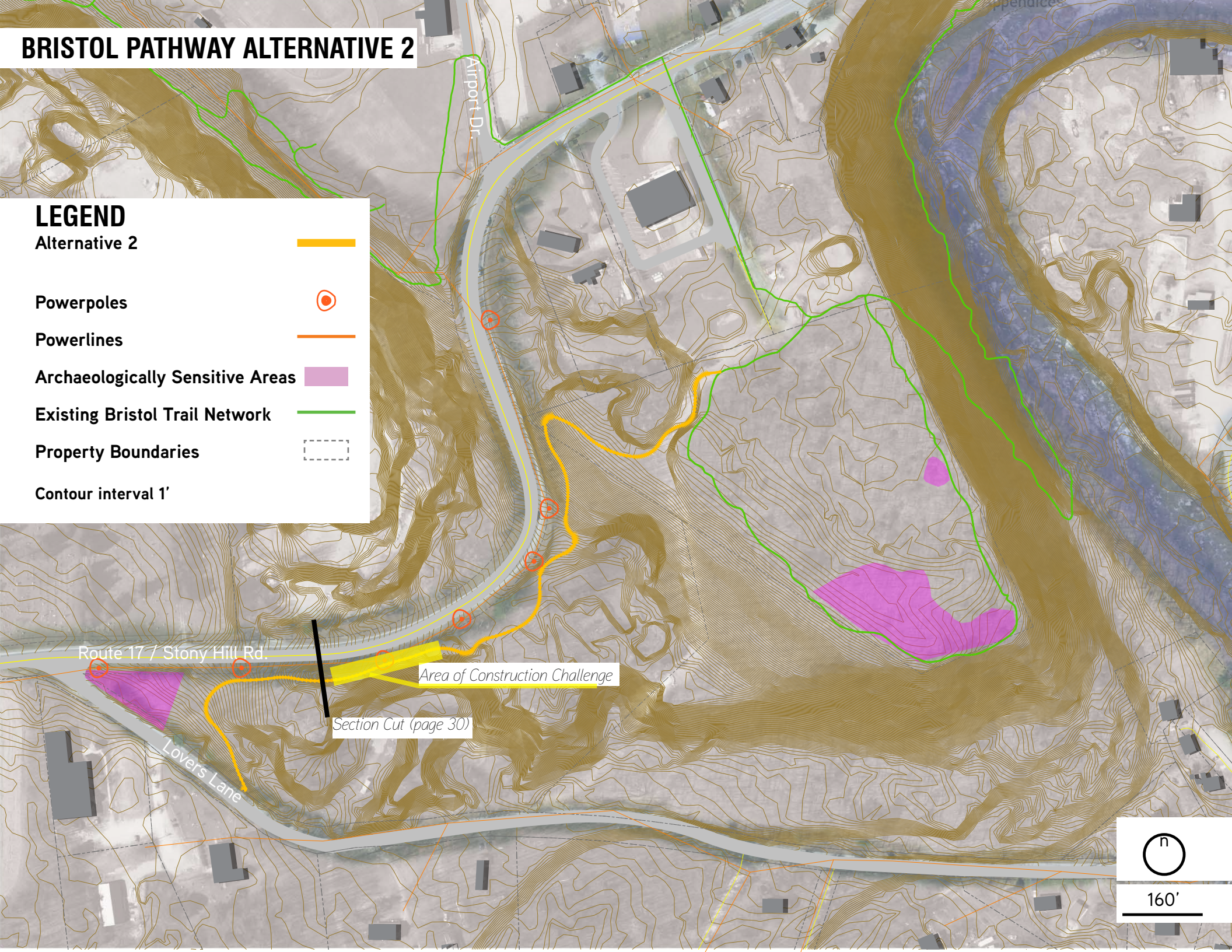


Alternative 2 Concept Corridor

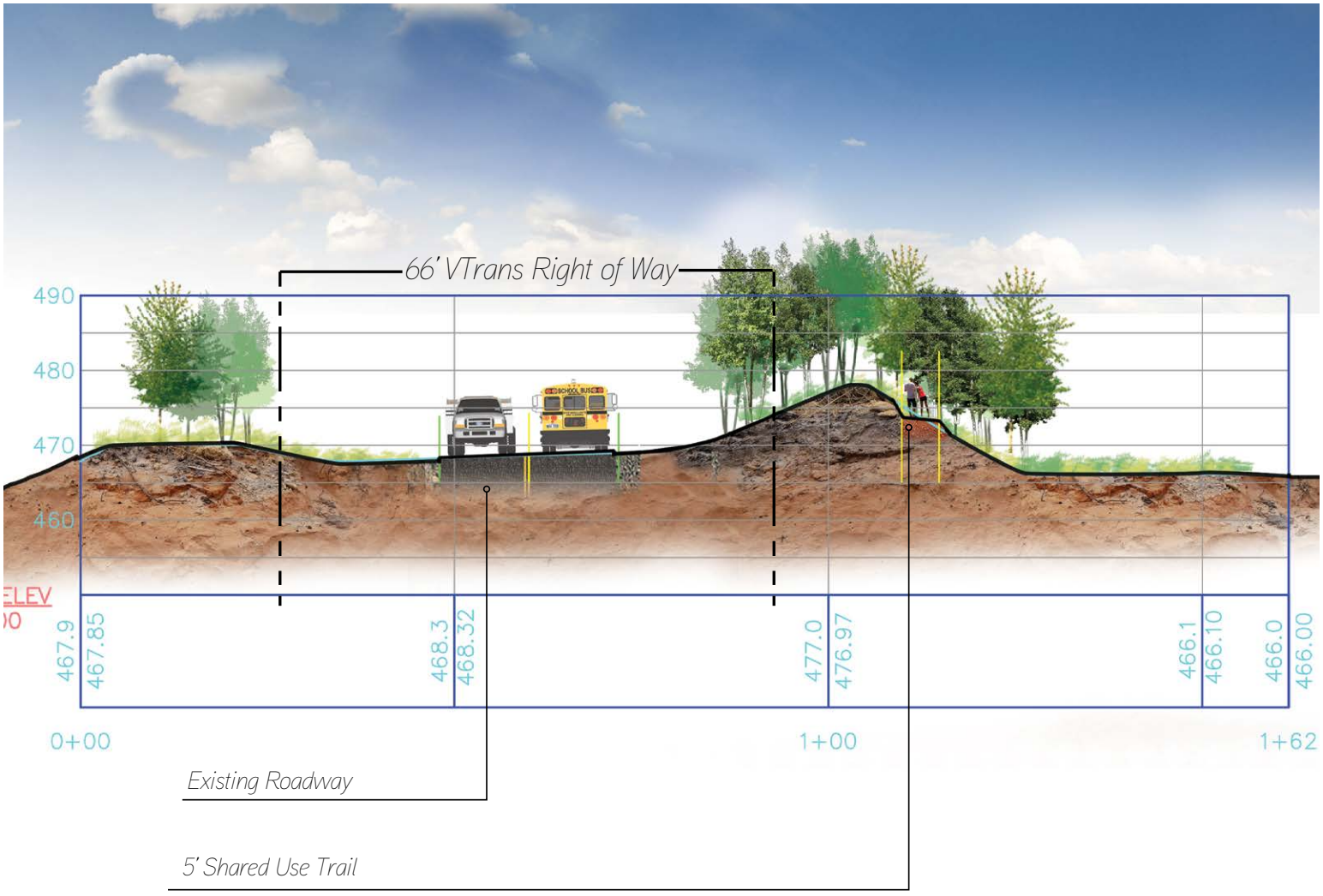


Alternative 2 Potential - Community Trails, Northfield VT

BRISTOL PATHWAY ALTERNATIVE 2



Alternative 2 Typical Section



Alternative 3

Alternative 3 is an 1525' long natural surface trail that provides connection between the Lovers Lane neighborhood and existing Bristol Trail Network hillside trails overlooking the New Haven River. This option would be build as a hand and machine built 3-5' wide natural surface pathway.

Alternative 3 Opportunities

This alternative would be perhaps the least expensive alternative, as its length is the shortest of the three alternatives proposed.

This option introduces the fewest new travelers to the Route 17 corridor, as neither connecting end is anywhere near the state highway.

Alternative 3 Constraints

This alternative is located completely on private land and would require negotiated easements to be constructed. The western edge of this pathway utilizes relatively shallow slopes which could pose a concern to some development plans.

Alternative 3 is also the most restrictive to users, as the eastern end connects to Bristol Trail Network's hiking only trails, and as such, this trail would likely be developed as a foot-traffic only option - bicycles would not be allowed.

There is a small segment of this trail corridor which must traverse very steep and rocky slopes. This area would be more difficult to build as a natural surface trail than other areas within the corridor, and is labeled "Areas of Construction Challenge" on the map on page 32.

Both this trail alignment and Alternative 2 would create half mile links between Lovers Lane and the Airport Dr/Route 17 intersection. The key distinction would be access points towards the western extent of Lovers Lane (Alternative 2) and central Lovers Lane (Alternative 3).

Alternative 3 Cost

This trail alignment is estimated to cost approximately $19.7k through contract with a professional trail builder. Volunteer support of trail building could likely reduce this cost to the Town.

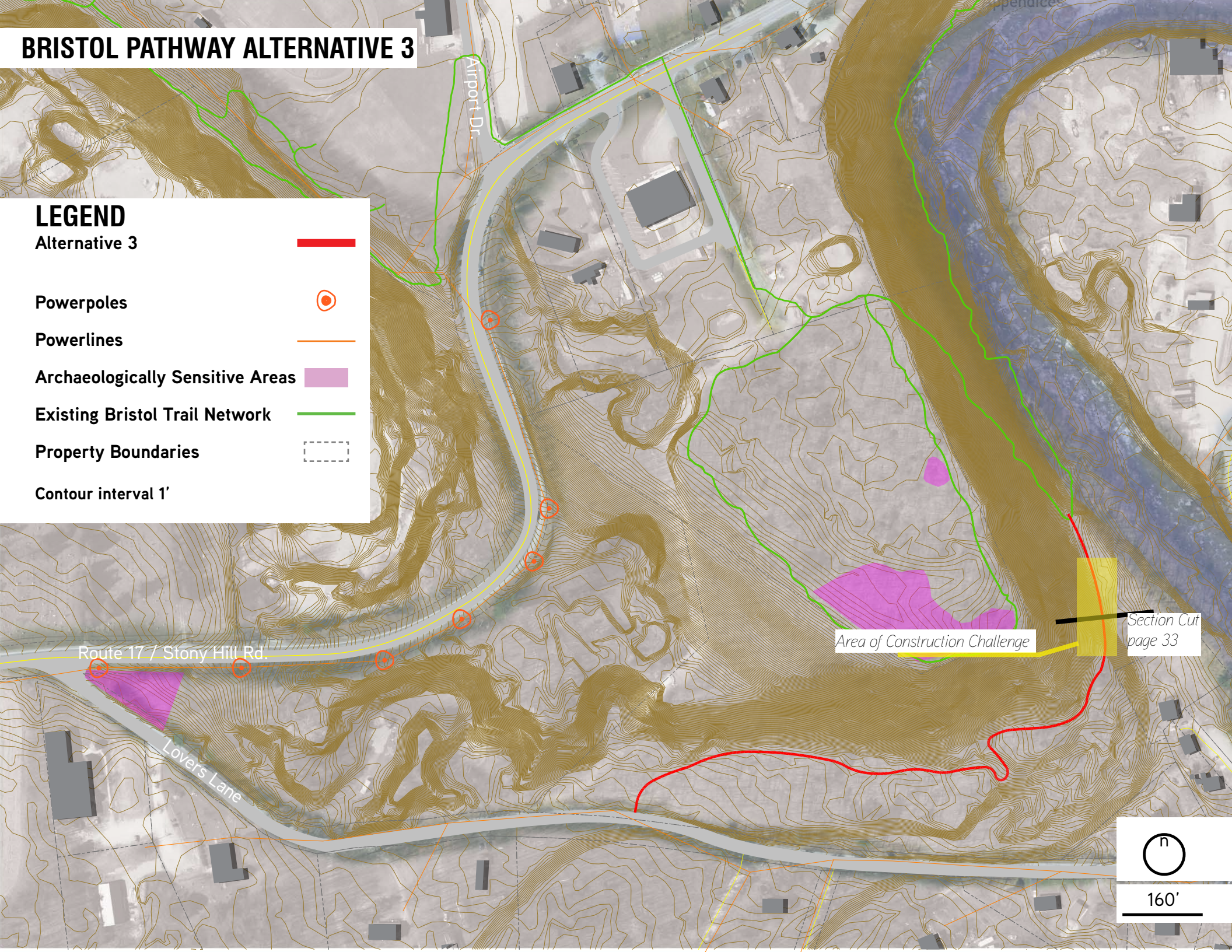


Alternative 3 Potential - Middlesex Trail, Middlesex VT



Alternative 3 Concept Corridor

BRISTOL PATHWAY ALTERNATIVE 3



LEGEND

Alternative 3

Powerpoles

Powerlines

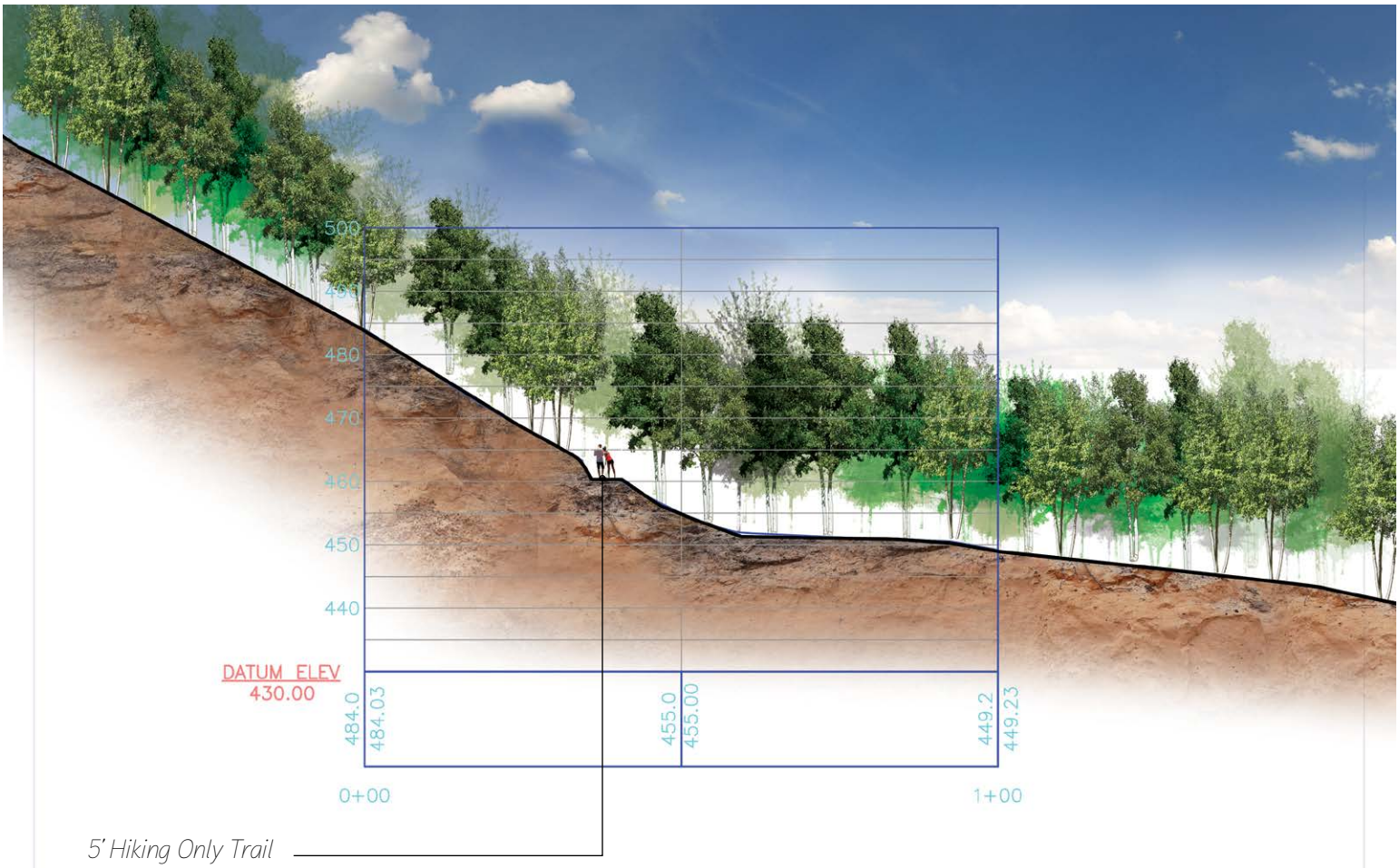
Archaeologically Sensitive Areas

Existing Bristol Trail Network

Property Boundaries

Contour interval 1'

Alternative 3 Typical Section



Alternative Planning Level Cost Comparison Summary

	Amount	Unit	Unit Cost	Cost
Alternative 1: Sidepath along Stony Hill / Route 17				
10' wide paved pathway				
Trail Construction	2230	lf	$342.00	$762,660.00
Retaining Walls	405	lf	$787.00	$318,778.00
Guardrails	2070	lf	$25.00	$51,750.00
Utility Relocation	2	ea	$5,000.00	$10,000.00
Private Easements	2	ea	$5,000.00	$10,000.00
Permitting (Arch. VTrans Access, SWPP)	1	ls	$25,000.00	$25,000.00
Preliminary Engineering (22%)	1	ls	$251,501.00	$251,501.31
Construction Engineering (admin/proj mngmt)	1	ls	$160,046.00	$160,046.00
25% Contingency				$285,797.00
			Total Alternative 1 Cost	$1,840,532.00
Alternative 2: Natural Surface Trail				
3-5' wide natural surface pathway				
Trail Construction - Standard	1414	lf	$6.00	$8,484.00
Trail Construction - Challenging	408	lf	$11.00	$4,488.00
Private Easements	1	ea	$5,000.00	$5,000.00
25% Contingency				$4,493.00
			Total Alternative 2 Cost	$22,465.00
Alternative 3: Natural Surface Trail				
3-5' wide natural surface pathway - foot traffic only				
Trail Construction - Standard	1202	lf	$6.00	$7,212.00
Trail Construction - Challenging	323	lf	$11.00	$3,553.00
Private Easements	1	ea	$5,000.00	$5,000.00
25% Contingency				$3,941.00
			Total Alternative 3 Cost	$19,706.00
sources: Vtrans Cost items / Vtrans Report on Shared-Use Path & Sidewalk Costs / Sinuosity Trails, llc/Randolph Area Trails Ski Association				

Additional detailed conceptual cost estimates for Alternative 1 variants are located in this document's appendices. These estimates adjust the design, but not the alignment to estimate savings if the alternative was built as a 5' concrete sidewalk or a 5' graveled pathway.

For Alternatives 2 and 3, as natural surface trails, these cost estimates represent the level of accuracy available without a direct quote from a trailbuilder.

Alternative Character Summary

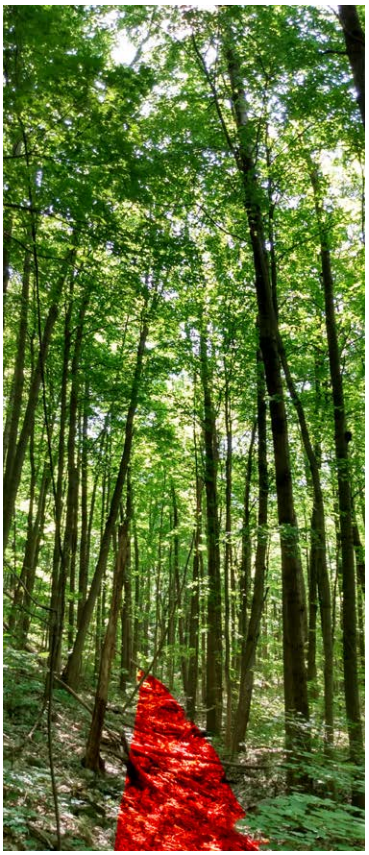
	Alternative 1	Alternative 2	Alternative 3
Length (ft)	*2230*	*1822*	*1525*
Concept Cost Estimate	*$1,840,532..00*	*$22,465.00*	*$19,706.00*
Construction Complexity	*High*	*Medium*	*Low*
Surface Material	*Asphalt/Concrete*	*Natural Surface Trail*	*Natural Surface Trail*
Average Grade	*8.2%*	*6.1%*	*1.8%**
Maximum Grade*	*25%*	*21%*	*21%*
SF of Private Land Impacted	*14330*	*9110*	*7625*
# of Landowners Impacted	*5*	*1*	*1*
Vtrans ROW Impacted	*Yes*	*Unlikely*	*No*



Alternative 1 Concept Corridor



Alternative 2 Concept Corridor



Alternative 3 Concept Corridor

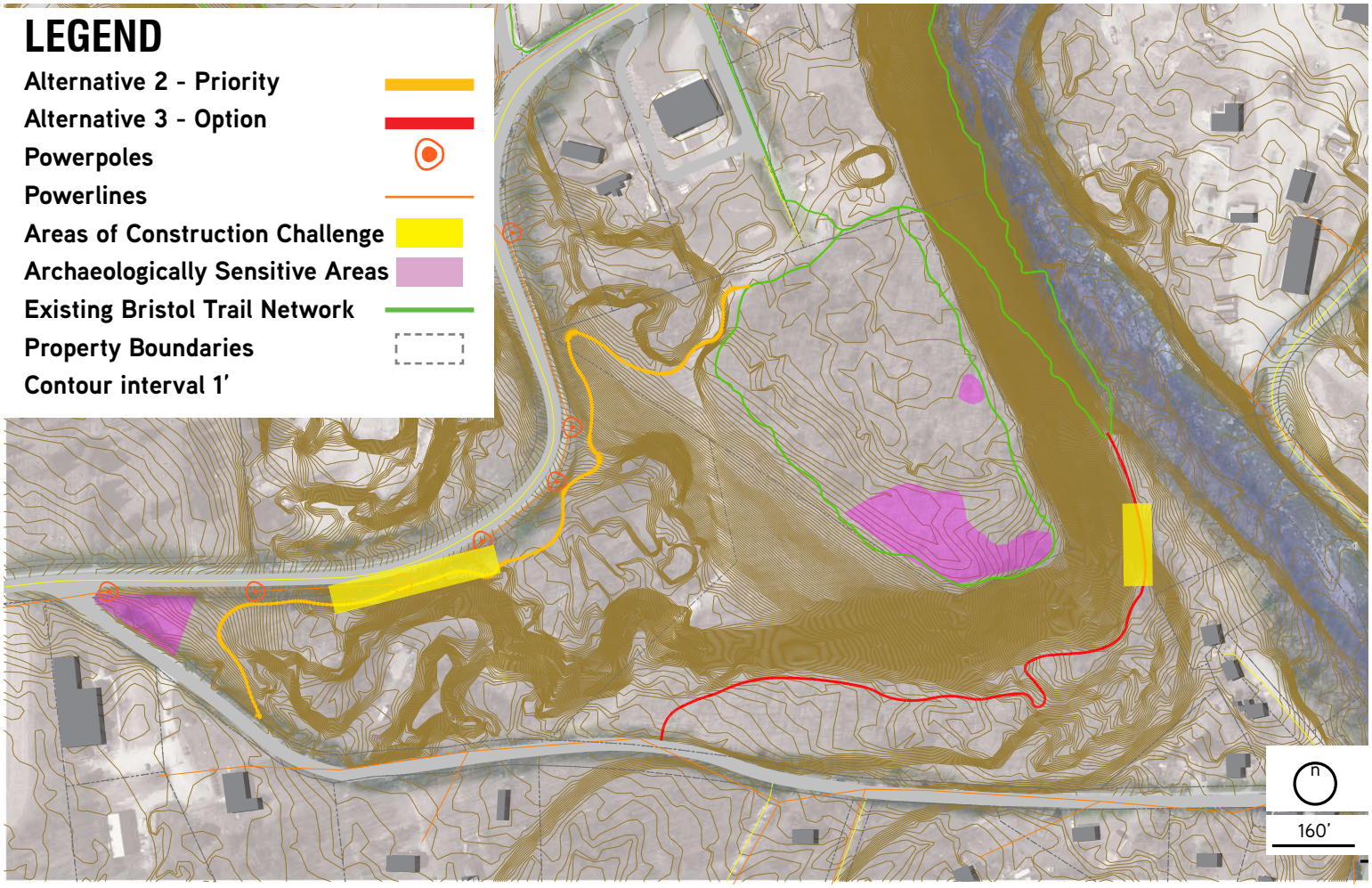
**This relatively low grade is due to the fact that Alternative 3 connects to an existing Bristol Trail Network trail which averages a 13% grade.*

Recommended Alternative : Natural Surface Trails

After collecting feedback via two public meetings, and two related public surveys, the steering committee discussed the multiple alternatives and identified Alternative 2 as the most suitable alternative for the following reasons:

- Strong public support as demonstrated in alternatives survey and online meetings (see Appendix A)
- Directly links Lovers Lane with future development south of Route 17 / Stony Brook Road and Mt. Abe High School
- As natural surface trail, the costs associated with construction are not beyond the capacity of the Town and Bristol Trail Network.
- As proposed, trail provides reasonably accessible grades for biking and hiking, and avoids conflicts with motorized traffic on Route 17.

The steering committee recognized that both natural surface trail options (Alternatives 2 and 3) could be considered phase 1 and phase 2 of future trail expansion within the Bristol Trail Network. By developing both alternatives as part of a comprehensive trail network, current and future residents surrounding the Lovers Lane neighborhood will have multiple alternatives to connect directly to Mt. Abe Union High School, Bristol Downtown, and the broader recreation opportunities of the Bristol Trail Network.



Chapter 5. Implementation

Implementation Guide

This document should ideally act as a springboard for the Town of Bristol, ACRPC, Bristol Trail Network and others to utilize in developing the resources needed to construct the recommended alternative.

This chapter attempts to outline general steps needed to take these lines on maps onto the ground and build new trails.

- Step 0 - Find a champion
- Step 1 - Landowner Engagement
- Step 2 - Easements / License Agreements
- Step 3 - Fundraising
- Step 4 - Trail Marking & Rating
- Step 5 - Construction

Step 0. Find a Champion

Planning projects such as these are often derided for 'sitting on a shelf'. Yet that problem is often one less with the quality or value of the document, and more with the lack of available (human) resources to move a project forward. Town staff, where available can champion a project, as can partner organizations. This project's steering committee represents many potential project champions. The project champion should maintain focus on the ongoing status of trail implementation, and ensure that the effort does not lose momentum once this scoping study has been adopted.

Step 1. Landowner Engagement

As Vermont Trail users and administrators well know, no trail can be built successfully without full support of the landowner on whose land the trail resides.

The Bristol Trail Network has demonstrable experience facilitating trail development, construction and maintenance on private lands throughout the Town of Bristol. Their organization should support efforts by the Town to secure not only written support from landowners for any trails to be developed from this study, but also to secure easements or license agreements for trails that will be available for public use.

Step 2. Easements / License Agreements

A trail built on a handshake has no assurance of lasting through the years and providing ongoing public benefit. Once landowners have conceded a willingness to build a trail, a legally binding document should be developed that sets the parameters for where the trail is to be built, how it may be used, who is responsible for maintenance, and other necessary details. A good model trail easement has been made available by the Pennsylvania Land Trust, and can be downloaded via https://conservationtools.org/library_items/324

Step 3 - Fundraising

The term fundraising should not be seen as solely efforts to raise funds from the general public. Fundraising efforts for trail development and operations can look to non-profits, local governments (at the Town, RPC, or State levels) and business partners to raise funds for trail development.

Unless the overall cost of implementation is very low, no single source of fundraising typically covers an entire trail project. Trail champions should look to leverage any source of funding with another. Once 50% of a natural surface trail project's cost can be sourced locally, through private fundraising or public funding, the final 50% can often be leveraged through a grant. A table of trail-specific grant details can be found on the following page.

To further refine cost estimates found in this document, Bristol Trail Network and the Town of Bristol should investigate which areas of the trail could be built with volunteer engagement vs. professional trail builders. Professional builders come with several advantages, most notably the ability to build a longer-lasting trail with less need of ongoing maintenance. In addition there are several areas marked 'construction challenge' on the map on page 36 - and it is unlikely that these areas would be built well with volunteer labor alone, due to severe side slopes and dense tree growth.

Step 4 - Trail Marking & Rating

Once funding is becoming a reality, its time to ground truth these lines on a map. Working with professional trail builders, the maps developed in this document can serve as a starting point to ground truth the data, as can GPX files of the recommended alternatives, which can be loaded into a GPS device and adjusted or modified as needed. These files can be downloaded here, or by contacting dcrites@dubois-king.com

Ground truthing trail corridors entails identifying a precise on-the ground alignment that will be the most easily constructible corridor, and does not have slope, soil, trees, drainage or other significant construction challenges. An experienced trail builder should be engaged to utilize a clinometer & trail flagging to identify how a trail can be built at a sustainable slope to improve access and minimize ongoing maintenance. Trail slopes should not exceed 1/2 of the hills side slope, or 10% overall slope. More can be found regarding trail construction best practices in the US Forest Service Trail Construction and Maintenance Notebook, 2007 edition.

Step 5 - Construction

Portions of trails built by volunteers will require ongoing coordination and oversight by an organization such as the Bristol Trail Network or Bristol Town Recreation department. Professional trail building, which is assumed in the cost estimates included in this document will require minimal oversight and will likely result in an better finished product, at a higher cost to the Town.

Trail Funding Sources

Once town selectboard and community support for an alternative is in place, securing funding is a clear next step. The following table outlines some of the Vermont and New England specific grants that are available to the Town of Bristol in looking to raise funds to build the selected alternative.

Name	Source	Match Requirement	Max Grant	Next Funding Cycle	Categories	Contact
Land Water Conservation Fund	Federal - Administered by State (FPR)	50/50	$500k	Fall 2020	Acquisition of Land, Development of Rec Facilities, Maintenance of Rec Facilities	Jessica Savage - 802.249.1230 - jessica.savaage@vermont.gov
Recreational Trails Program	Federal - Administered by State (FPR)	80/20	$50k	Fall 2020 - PreApplication	Acquisition of Land for Trails, Development of Rec Trails, Maintenance of Rec Trails	Sherry Smecker Winnie - 802.760.8450 - sherry.winnie@vermont.gov
VOREC	State (FPR)	0 (but bring something.)	-	TBD	Outdoor Recreation that supports economic activity.	Jessica Savage - 802.249.1230 - jessica.savage@vermont.gov
Bicycle & Pedestrian Program	State (VTrans)	80/20	$1M	Fall 2020 - Due Sept. 30	Scoping Studies, Design/Construction Work.	Jon Kaplan - 802.498.4742 - jon.kaplan@vermont.gov
Northern Forest Recreation Grants	Northern Forest Center	50/50	$50k	Spring 2021	Tourism & Recreation Development Grants	Mike Wilson - 207.767.9952 - nwilson@northernforest.org
People for Bikes Community Grants	People for Bikes	None required. 50% Encouraged	$10,000	2021 - COVID Delay	Trails, bike lanes, trailheads and bicycle related amenities	Zoe Kircos zoe@peopleforbikes.org 303.449.4893 x106

Appendices

Appendix A:: Public Engagement Record

This project was initiated in late January of 2020. As initial plans were being drawn up for a robust public engagement project, the COVID 19 pandemic limited traditional engagement processes of gathering public feedback at festivals or town hall meetings.

The steering committee for this project, composed of members from the Addison County Regional Planning Commission (ACRPC), Bristol Town, Bristol Selectboard, Bristol Trail Network, and VTrans decided to engage the public through a dedicated ACRPC website and project materials, online meetings and surveys, promoted locally through social media, physical posters, email chains, and front porch forum posts.

Online Survey

To offer the broader public an opportunity to provide feedback regarding a planned future pathway in Bristol, a survey was developed and offered online. From April 28 to May 29th, the survey was available via http://bit.ly/bristolpathway

In that time, 81 respondents took the time to answer questions regarding this project. A question by question summary of their responses follows.

1. Respondent Location

The overwhelming majority of responses came from Bristol residents (92.5%). Individual results were also seen from nearby towns in VT: Monkton, East Wallingford, and North Ferrisburgh, as well as a single response from Newcastle, Maine.

2. Contact Information

The survey offered respondents an opportunity to leave a contact email to be further notified of updates to this project. 93 percent of respondents chose to leave a contact email, and were notified of project updates through the course of this scoping study.

3. Route Familiarity

Over half of the respondents indicated that they had walked or bicycled between Lovers Lane and Downtown Bristol, but it was not a frequent trip. 16 percent indicated that this was a common trip for them, and 18.5 percent indicated that they have not, but would do so if there were a safer route to make this connection.

4. Route Use

A followup question surveyed what route(s) were most used to connect these destinations. There were numerous individualized responses, but there was a slight preference for connections along South Street to connect to Lovers Lane.

5. Barriers

This question looked towards what barriers kept users from linking Lovers Lane with other destinations in Bristol. 74% cited safety concerns related to traffic, and 24% cited a lack of interest in walking or biking such steep slopes.

6. Four Season Access

83.9 percent of respondents indicated that they would like to see a pathway maintained for access through the winter months. 9.9 percent indicated that it wasn't important to clear a pathway in the winter.

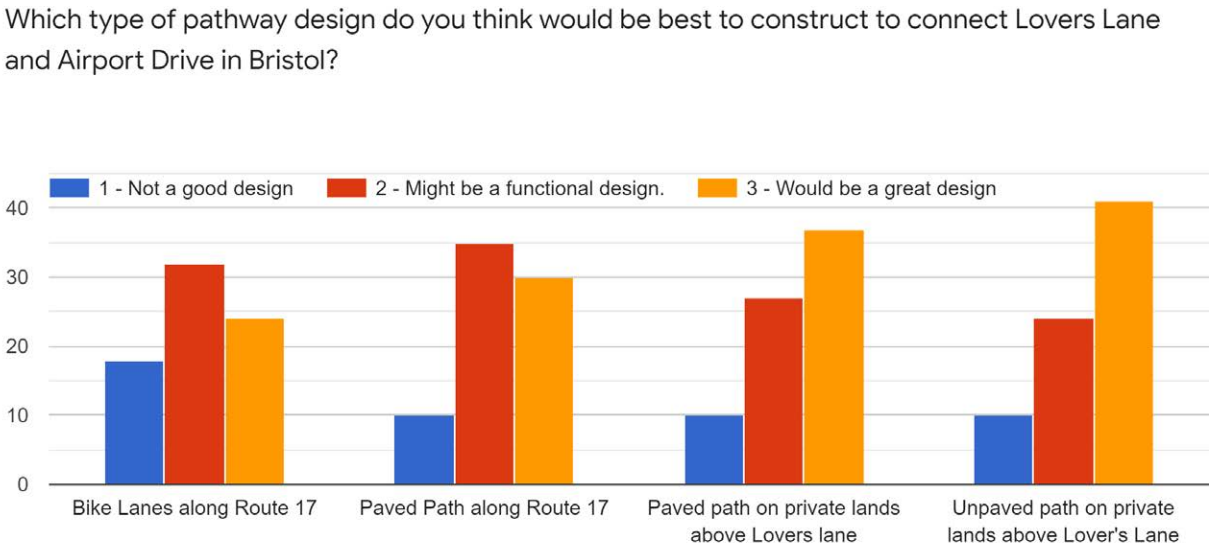
7. Pathway Design

This question utilized the photo seen here to ask respondents their preference on pathway design. There was a slight preference towards pathways away from route 17 and against a bike lane within the VTrans right-of-way.

8. Open-ended Response

The survey ended with an open ended response to solicit additional feedback. The unfiltered results of that question are listed below.

- *There are community members with special needs that benefit from safe passage along there. Students would take it too.*
- *The question I have is what is the cost and impact to taxes. Will it only impact village taxes or the entire Bristol tax base? We already have very high taxes. Does the number of users justify raising taxes?*
- *If the area was made more accessible, I believe we'd have more engagement in Bristol generally. For festivals, the parks, the shops, the Hub, the restaurants and a more vibrant community generally. It's a great idea and a good use of public funds.*
- *Could we make the connector part of the BTN (Bristol Trail Network)?*
- *This is a great initiative! Stoney Hill is currently way too dangerous for foot or bike travel.*
- *It would be great to have a path that allows various kinds of access. A bike lane is great for bikers, but a lot of people also like to walk, or bike w small children where a bike path as shown above might be less utilized*
- *See my note about communicating with folks who do not have cars. Also, I would love to see something to help people who live east out of the village. Walking along 116 is treacherous. I think that helping people connect with the village is a neighborly thing to do and very important, in these times, especially children.*
- *none.*
- *My child goes to BFC and it would be wonderful to have option to walk her to school.*
- *I would be much more likely to buy a property in a town with good bicycle access.*
- *It would help people from "down the hill" access school/ downtown and feel less isolated. Encourage more biking/ walking/healthy activity. Could extend toward creating more trails in the Bristol Trail Network. More connection with nature if in the woods.*
- *I love any plans that encourage walking and biking in a safe environment!*
- *I'm not sure that this path would dramatically increase the number of people walking between these places but if its built I'll use it.*



Local Concerns Meeting

A local concerns meeting was held on May 13th, 2020 to gather public input regarding the future development of a pathway to connect Lovers Lane and Bristol Downtown. The meeting was held online from 7pm to 8pm and was open to the public. The meeting was held as an online video conference.

Fifteen community members attended the meeting. The meeting consisted of a 20 minute presentation outlining salient points in the existing conditions chapter of this document, and a round-robin opportunity for each attendee to voice concerns and ideas regarding the project.

Meeting attendees noted relevance of regional bicycling routes in the area, such as the triangle loop, and expressed interest in further promotion of the online survey. Meeting notes from the evening are included on page 44.

Alternatives Survey

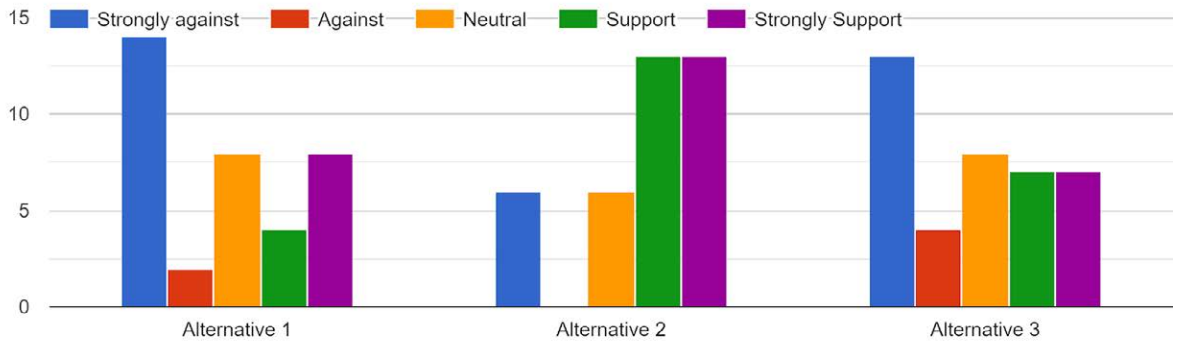
The alternatives survey was developed as an alternative to the live and in person meeting in that it attempted to provide maps, images, and illustrations that explain the three proposed alternative in similar detail to the public meeting presentation. This survey was available online from July 14th to August 15th 2020. A total of 40 individual responses were recorded.

At the end of the survey, respondents were asked to rank each alternative on a 1-5 scale, with 1 equating to a 'strongly against' rating, and 5 equating to a 'strongly support' rating. The results of this survey question are illustrated in the chart below.

In addition to this one survey question, there was an opportunity for respondents to leave remarks and comments. Their comments are included as follows:

- *Seems to me the shortest/cheapest route is the best choice - all three have potential issues...*
- *Thank you for such a clear description of everything. Well done!*
- *Is it possible to make a cost estimate for Alternative 2 constructed with an ADA standard paved path?*
- *Thank you for making this so clear!*
- *1 has many advantages, especially usability. When I was running, going up or down Stony Hill seemed like a sidewalk/path would be great for those using that route. It is almost there today along the shoulder. Seems like there could be a hybrid between 1 and 2. 1 should be down sized to a 4', maybe 5' max path. 1 could take advantages of the meandering path of 2 to avoid poles and costs? I*

Alternative Choice - please mark each alternative based on your support for its development in Bristol.



guess there is a reason for retaining instead of sloping? It's always great to have a paved surface, but a stone/ gravel path on a modified 4' option 1 could be lucrative. I support 1, but not at the cost proposed. I know $1M doesn't buy much and option 1 as presented clearly shows that. Need to sharpen the pencil on option 1 to make it feasible. - Kevin Hanson

- *Pluses on Alt # 1 -- most accessible for ADA, as well as strollers, children's bikes, rollerblades, etc., good placement for cyclists, potential for year-round usage, visibility from 17 is an opportunity to market the Trail Network, archaeological area might be worthy of some historical signage? (I had no idea and would be really interested to know more about why that bit of land is of interest!) Has the highest potential for the most usage and most options for use types.*

- *Pluses on Alt # 2 -- cost is the big plus here since the route is so close to the first one, and avoiding the archaeological complication. Between the two, I might rather go with the bells & whistles offered by the more comprehensive version, but would be perfectly happy with this.*

- *Pluses on Alt # 3 -- cost obviously. A bit less obviously would be the entrance site closer to the middle of Lover's Lane so that folks who live in the neighborhoods wouldn't have to walk all the way to the junction with 17 first. Hard to know if that balances out the disadvantages of it not being able to accommodate wheeled travel.*

- *1) Cost prohibitive, and for other than walking bicycles could access downtown via South St. 2) Best choice could possibly walk bike to rideable areas? From existing BTN connection you could proceed to school, downtown, or follow rugged BTN down to river for an extended hike? 3) Too rugged a landscape for a higher number of users.*

- *I like the idea of connecting Mt. Abe to Lover's Lane for the sake of student foot traffic. The first option is appealing but the cost is entirely too great, unless we want to defund the police force to a certain degree and channel those funds into this project, or there is some significant grant money available somewhere. I also feel like this can be a dangerous route for pedestrians and bikers and I'm not sure the paved path would necessarily be any safer, particularly if the foot/bike traffic becomes greater. The idea of having something kept clear of snow in the winter is also nice but again, not given the expense. The second options talks about the grade of the trail but the other two options don't mention this, I wonder about that information. Option 3 mentions "shallow slopes which could pose a concern to some development plans", I'd like to understand what this means. I walk a loop that takes me down/up both Stoney Hill and Mill Hill and I have wondered about side walks for both those routes. Are there any conversations about a sidewalk on Mill Hill, down to Hewitt Road. I actually see more foot traffic there than on Stoney Hill. Thanks for asking! Sorry I missed the meeting, I was out of town.*

- *It would be great to know what offsets in public funding are available for option 1. Then we know what it's true cost would be. Option 3 seems as though it's less bang for the buck when only saving a little money over version 2. Overall I support this effort.*

- *I like the idea of connecting to the trail network as it will be used more widely, but the only downside is accessibility. Perhaps that could be considered as a stage 2 of the project?*

- *Alt 1 is much too expensive based on the number of people that it might serve. Also, paralleling Rte 17/116 is dangerous. The same danger applies to a portion of Alt 2 but at least Alt 2 addresses the connection between Lover's Lane and Airport Drive and is a lot less expensive. Alt 3 appears to be a "bridge to nowhere" insofar as connecting LL and AD. How about a link between the Firehouse Lane and Lover's Lane? Is the slope too steep?*

- *It needs run parallel with Stoney Hill Rd to connect to Airport Drive and support both foot, wheelchair, bicycle traffic. Could simply widening Stoney Hill RD/RT 116 with an added paved bicycle lane mark Marked with*

green paint be an option? State money since it's a State Highway? Safe routes to School grant funds as well as it's a needed safe route to Mt. Abraham Middle/High.

- *Love #2 b/c it is relatively inexpensive and would be open to bikes as well as foot traffic. #1 would be ideal b/c access to all, but the cost appears prohibitive. While access for those with disabilities is always preferable. However, with limited community resources, the question "Is this access the best way to spend $120,000 for add'l access for those with disabilities"? I don't know, but it might not be.*

- *I think alternative #1 is WAY too costly (our taxes are already stretched to the limit) and could potentially be dangerous right next to the road. Having said that if it were MUCH cheaper this would be my choice as it seems the simplest. Alternative 2 and 3 are beautiful but I have reservations about trash being deposited in the woods as people tend to do. Perhaps there could be trash cans at the entrance and exit? I appreciate the work done to support this, our town would definitely benefit from these 2 designs.*

- *It seems the city is spending a vast amount of time and money for the benefit of 1 developers / landlords bottom line. They knew it was a rural area, without sidewalks, when they built the development*

Alternatives Meeting

An alternatives meeting was held on July 30th, 2020 via the zoom online platform. In conjunction with this meeting, an alternatives briefing survey was developed to inform those who did not have the ability to attend the live event, and record their vote for a preferred alternative.

Outside of steering committee members from ACRPC, Town of Bristol, Bristol Trail Network, and the consultant group, only three members of the general public were in attendance. Those in attendance noted a desire to minimize trail slopes to increase accessibility. The steering committee noted the low attendance and resolved to further promote the survey in order to build a better understanding of public interest and preference of the alternatives.

The meeting revealed general discomfort on the part of the Town and ACRPC with the high cost and complexity of alternative 1 - a paved pathway along State Route 17. The notes from this meeting are included on page 45

Local Concerns Meeting Minutes
Wednesday, May 13, 2020

In Attendance
- Valerie
- Alex Mihavics
- Meridith Mcfarland
- Sally Burrell
- Nancy Luke
- Ian Albinson
- Porter
- Mike Winslow
- Lee
- Allen
- Katie's iPad (works for ACRPC, on Bristol Planning Commission)
- Kevin Harper
- iPhone Mark
- Dayton Crites
- Julia Ursaki

Presentation Q&A & Comments
- Kevin Harper - partner in the Stony Hill property. Would like to see something happen. Would like to be updated with any plans developed. Notes that site plans are just beginning - project work will likely start next week

- Alex M - no questions at this time

- Allen - no q

- Ian Albinson - seeing the slope map gives concerns about cost of potential pathway

- Katie's iPad - Triangle Loop Project - Vergennes, Bristol, and Middlebury (?) - decided that coming up Stony HIll was not the way to go. But as a local, we know people walk here and so there should be accommodations

- Meridith - 60 responses from survey - what's the general temperature from the survey?

- Dayton: generally, enthusiasm. Not much of a "why are we doing this" response; some more enthusiasm for preliminary option that is separated from the road.

- Meridith also will share survey again on Facebook page

- Mike Winslow - will share contact for triangle loop. Can we hear project schedule again?

- Nancy - likes all of the work that has been happening with Bristol trails. Likes this project and idea, wants to make the town more livable and enticing - good thing for everyone.

- Porter - how much longer will the survey be open? How can we pull in additional people who we haven't heard from yet?

- Dayton: plan was to keep survey up for additional two weeks after this meeting.

- How do we reach a broader community?

- Katie: something in the paper usually gets a reaction

- Valerie: what potential alignments is the D&K team coming up with? To visualize what is possible.

- Porter asks - when will we see those?

- Dayton pulls up project schedule - alternatives development in May 2020; preferred selected in Aug/Sept.

- Porter also asks if each alternative will have a cost associated?

- Dayton : Yes, concept level
- Sally Burrell - public will want to know who will be able to use this path? Is it going to be for kids riding their bikes, something for just mountain bikes, just road bikes? Who has access? Good for strollers?
- Re: triangle loop project (not this project) - Notes that Plank Road is very rocky and dusty and no bikes would want to ride there
- Mike Winslow - important to remember that this is a planning study to lay out next steps.
- Porter - bikability & trail network perspective. Trail segment along South Street has many constraints and barriers to bicycles. So this connection is really important to the overall network, can connect to high school section
- Kevin Harper - were you thinking bike hill along the flats on Stony Hill property?
- Valerie - saw one comment on social media that now is not the right time to be doing this. Her perspective: this is a planning study. This gives us the knowledge and foundation to make decisions going forward; but a lot needs to happen before something could actually happen (i.e. securing funding, final designs, etc). It will take some time to realize the outcome of this study.
- Sally - question about crossing over spot.. Where will people cross to get from our path to the Village?
- Dayton - potential at fire department
- Porter asks Valerie if there is already funding for a crosswalk at Fire House Drive? Valerie says there is no officially designed/approved crosswalk that she knows of. TBD.
-

Alternatives Public Meeting

July 30, 2020 at 7pm
Online - Zoom

Attendees:

- Dayton Crites - D&K
- Julia Ursaki - D&K
- Valerie - Town of Bristol
- Gerry Slanger and Janet - member of Bristol trail network
- Mike Winslow - ACRPC
- Ted Lylis - resident interest in what's going on - former selectboard member
- Ian Albinson - Bristol Selectboard/Bristol CORE
- Porter Knight - Bristol Trail Network

Comments and Questions

Gerry - Bike leader, hike leader. Only "hardcore" people are going to go up Stony Hill - the road is too steep. Worries about maintenance too (snow plow will just push snow there anyway)
Alternative 2 - good option, but really steep
Alternative 3 - not for bikes. Only for walking and snowshoeing
Bottom line, this is a really steep climb. Steps and rails can make the trails much safer and friendlier.

Porter -
One of the most valuable things about this study is "putting to bed" a sidewalk/path along Stony Hill. Hard to explain costs, complexities of why this is so hard to build, why it's something nobody's going to spend money on. Town hardly has capacity to plow sidewalks in Village area!
Alt 2 and 3 - from a trail standpoint, she would like to do both of them. If well marked, both are trails that volunteers can easily create (if landowners approve). Can do some fundraising to help with more complex areas (as have done in the past).
At best, this will be a challenging trail, 3 seasons. Kids may use to get to school, some may use to go up and

down. Steep terrain.

Mike
Let's get an increased participation on the survey. Can folks reach out to their networks and encourage others to post?
Add grade for "total trip" of alternative 3, from Lover's Lane all the way into Town (including climb)

Valerie
Appreciates Porter's comments about the trails. Both alts 2 & 3 can be built
Once they're there, Woodland apartments community will appreciate. Thinks they will be used
Communications w/ Stan Livingston and this study's product (the report) will be very useful in partnership moving forward.

Ted Lylis
Likes this presentation and alternatives; thinks the presentation should be made more public so people can make informed decisions with survey

Mike says presentation is on ACRPC website (double check to make sure)

Ian
Looking at Alt 2 & 3 - would be nice to provide a loop. For people who park in Bristol and want to "experience" the Bristol trail network, could we connect Alt 2 and 3 so it's a loop?

Next steps:
Leave survey available for longer to get more participation (close Friday, August 14).
September 14 is the presentation to the Selectboard
End of September is the hard deadline for the report - will include funding opportunities!

Appendix B: Archaeological Resource Assessment

HARTGEN
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ARCHEOLOGICAL RESOURCE ASSESSMENT

Bristol Path Scoping Study Project

Route 116/17
Town of Bristol
Addison County, Vermont

HAA # 5496-11

Submitted to:
DuBois & King, Inc.
28 North Main Street
Randolph, Vermont 05060

Prepared by:
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April 2020

MANAGEMENT SUMMARY

SHPO Project Review Number:
Involved State and Federal Agencies: *Vermont Agency of Transportation (VTrans)*
Phase of Survey: *Archeological Resource Assessment (ARA)*

LOCATION INFORMATION

Municipality: *Town of Bristol*
County: *Addison County, Vermont*

SURVEY AREA

Length: *534 meters (1,752 ft)*
Width: *360 meters (1,181 ft)*
Area: *23.9 acres (9.69 ha)*

RESULTS OF RESEARCH

Archeological sites within one mile: *6*
Surveys in or adjacent: *2*
NR/NRE sites in or adjacent: *one, VT-AD-1725 Middle Archaic site within APE*
Precontact Sensitivity: *High*
Historic Sensitivity: *Low*

RECOMMENDATIONS

The archeological investigations conducted by NEARC (Beale, et al. 2019) provide a good assessment of the archeology of the landform south of the fire station. As long as Loci 1 and 2 (ASA 1 and 2) are avoided by ground disturbing activities, no further archeological review is recommended on that landform.

The intersection of Route 116/17 and Lover's Lane is considered to have archeological potential. If the project will entail disturbance to that location, Phase IB archeological testing is recommended in areas to be disturbed. If that area can be avoided, no further archeological review is recommended.

Report Authors: *Thomas R. Jamison, PhD, RPA #16566*
Date of Report: *April 2020*

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ARCHEOLOGICAL RESOURCE ASSESSMENT

1 Introduction

Hartgen Archeological Associates, Inc. (Hartgen) conducted an Archeological Resource Assessment for the proposed Bristol Path Scoping Study Project (Project) located in the Town of Bristol, Addison County, Vermont (Map 1). The Project requires approvals by the Vermont Agency of Transportation (VTrans). This investigation was conducted to comply with Section 106 of the National Historic Preservation Act of 1966, as amended, and will be reviewed by the VTrans archeology officer. This investigation adheres to the Vermont State Historic Preservation Office's (SHPO) *Guidelines for Conducting Archeology in Vermont* (2017).

2 Project Information

A site visit was conducted by Thomas R. Jamison on March 16, 2020 to observe and photograph existing conditions within the Project Area. The information gathered during the site visit is included in the relevant sections of the report.

2.1 Project Location

The project is located along the south side of Route 116/17 at the west end of the Village of Bristol and extends between Lovers Lane on the west and Airport Road on the east.

2.2 Description of the Project

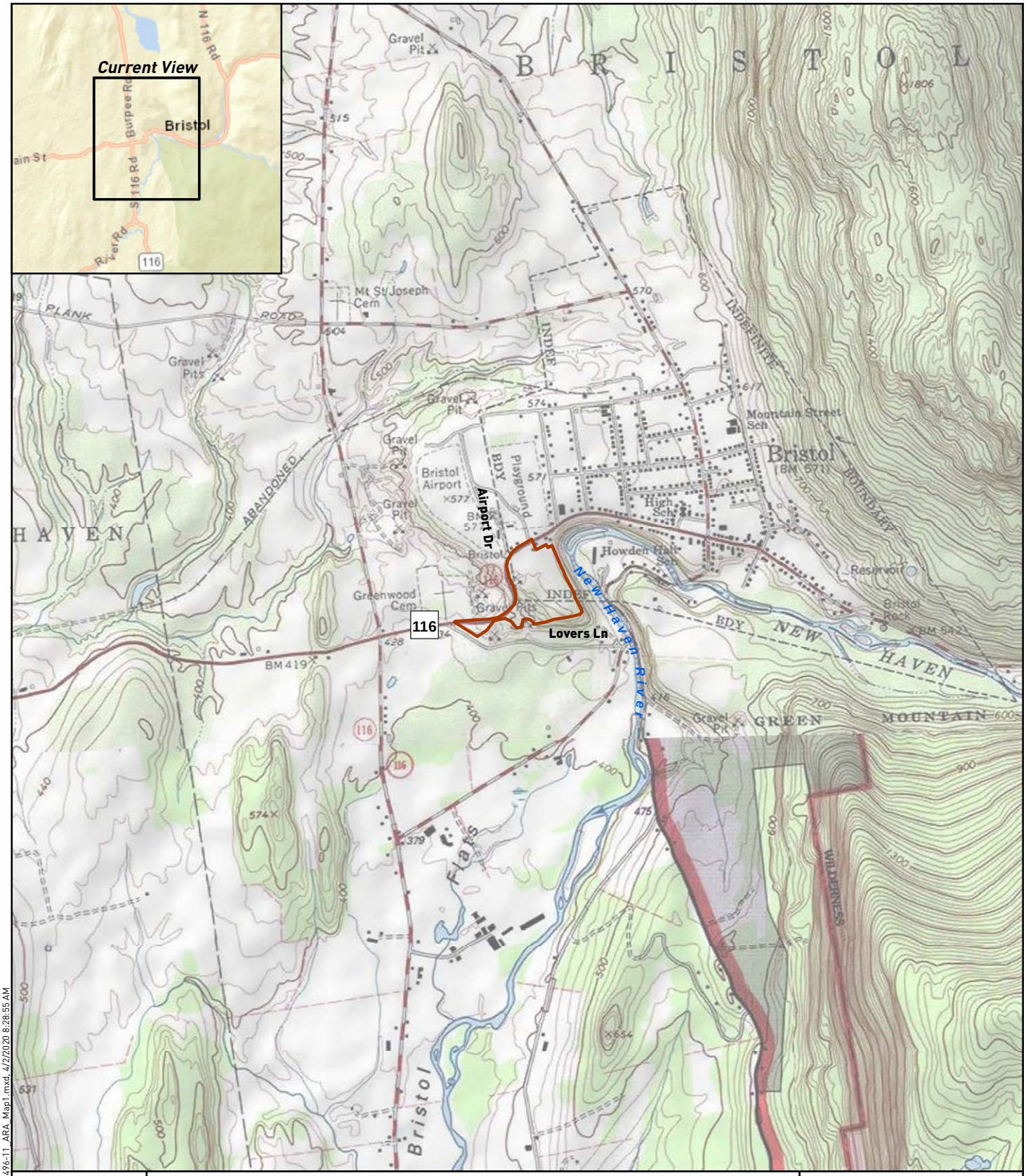
The intent of the project is to develop a sidewalk or multi-use path connecting newly developed residential areas along Lovers Lane and Airport Road that provides access to Mount Abe High School.

2.3 Description of the Area of Potential Effects (APE)

The area of potential effects (APE) includes all portions of the property that will be directly or indirectly altered by the proposed undertaking. The APE encompasses approximately 23.9 acres (9.69 ha). The APE extends south of the Bristol Fire Station across the high terrace overlooking the New Haven River and west along Route 116/17 to the intersection with Lover's Lane (Map 2).

3 Environmental Background

The environment of an area is significant for determining the sensitivity of the Project Area for archeological resources. Precontact and historic groups often favored level, well-drained areas near wetlands and waterways. Therefore, topography, proximity to wetlands, and soils are examined to determine if there are landforms in the Project Area that are more likely to contain archeological resources. In addition, bedrock formations may contain chert or other resources that may have been quarried by precontact groups. Soil conditions can provide a clue to past climatic conditions, as well as changes in local hydrology.



1,000 0 1,000 2,000 Feet

300 0 300 600 Meters

Note: Contour interval is 20 feet.

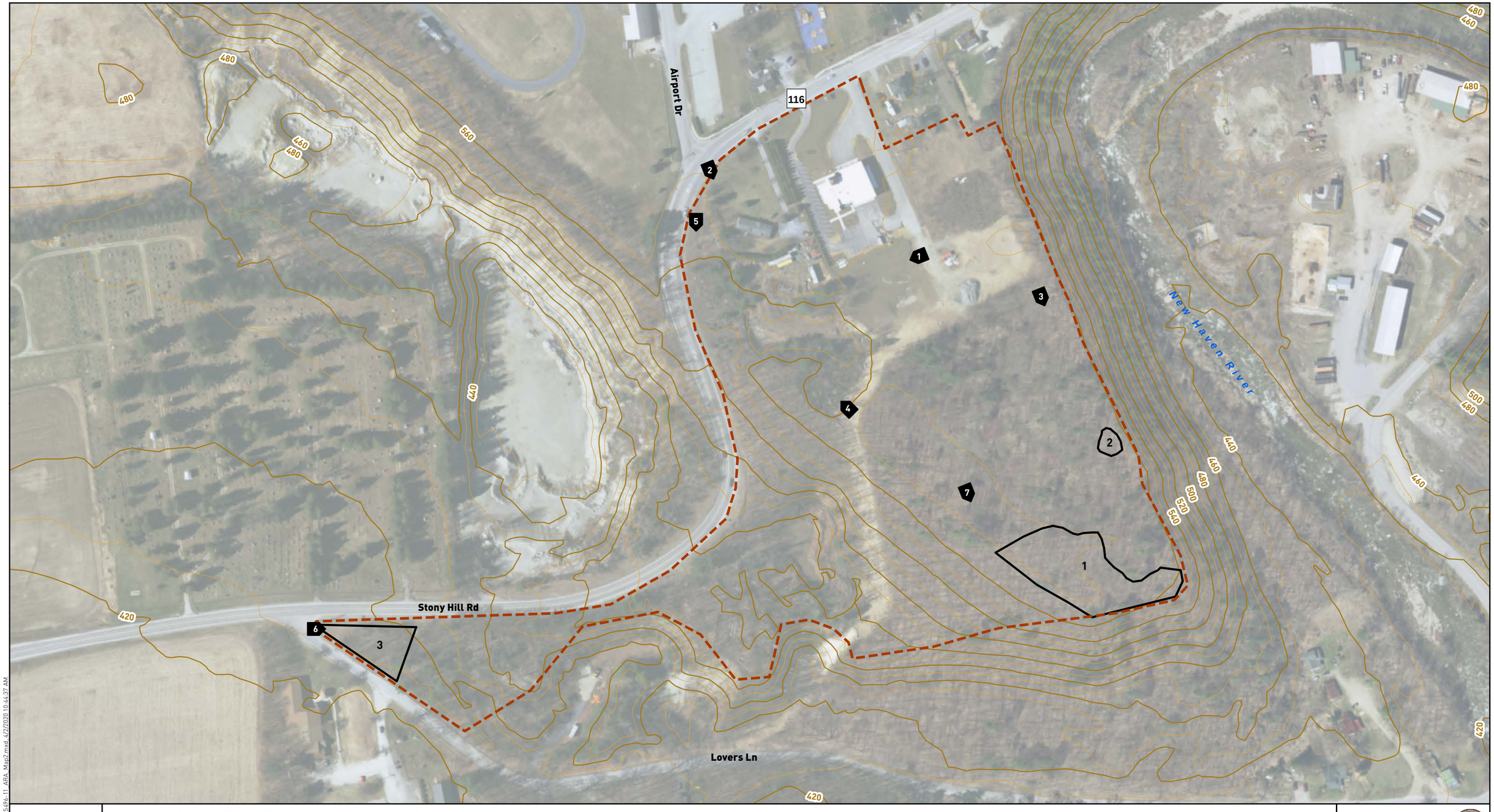
Project Location

GIS Services Accessed 4/2/2020: Environmental Systems Research Institute, Inc., World Street Map; USGS The National Map

HARTGEN archeological associates inc

Map 1

E:\5496\GIS\Documents\HAA_5496-11_ARA_Map1.mxd, 4/2/2020 8:28:55 AM



N

100 0 100 200 Feet

30 0 30 60 Meters

Note: Contour interval is 10 feet.

Legend

- Photo Angle
- Archaeologically Sensitive Area (ASA)
- Area of Potential Effects (APE)

Project Map

Vermont Open Geodata Portal Contours and
Environmental Systems Research Institute, Inc.,
World Imagery Accessed 4/2/2020

HARTGEN archeological associates inc

Map 2

E:\5496\GIS\Documents\HAA 5496-11 ARA Map2.mxd 4/2/2020 10:44:37 AM

3.1 Present Land Use and Current Conditions

Currently, most of the APE is wooded. However, the northern section along Route 116/17 is generally open surrounding the Bristol Fire Station and two residential parcels (Photos 1 and 2). The wooded area directly south of the fire station has seen somewhat appear to be some small exploratory gravel pits (Photo 3). There are also some community trails through that area. To the west, the wooded area is primarily disturbed with abandoned gravel pits (Photo 4) or covered with large cobbles/boulders discarded from gravel operations (Photo 5). One small grassy area is located at the intersection of Route 116/17 and Lover's Lane (Photo 6).



Photo 1. Area behind the Bristol Fire Station. Note undulating topography related to recent storm drainage work. View to the southwest.



Photo 2. Lawn of the Nelson parcel at 81 West Street. Note level topography and USGS survey marker in the foreground. View to the south/southeast.



Photo 3. Wooded area south of the fire station. Note archeological survey stake in the foreground and level terrain. View to the south/southeast.



Photo 4. Abandoned gravel pit south of the Nelson parcel. Note large boulders in the bottom of the pit. View to the northwest.



Photo 5. Boulders and cobbles, presumably rejected from adjacent gravel pits, alongside Route 116/17. View to the south/southeast.



Photo 6. Area at intersection of Route 116/17 (left) and Lover's Lane (right). View to the east.

3.2 Soils

Soil surveys provide a general characterization of the types and depths of soils that are found in an area. This information is an important factor in determining the appropriate methodology if and when a field study is recommended. The soil type also informs the degree of artifact visibility and likely recovery rates. For example, artifacts are more visible and more easily recovered in sand than in stiff glacial clay, which will not pass through a screen easily.

The soils of the APE entirely developed on glaciofluvial sediments deposited by glacial outwash processes (USDA 2020). These soils, where level, would have been attractive locations for precontact occupation overlooking the New Haven River. The landform is identified as a kame terrace (Calkin 1965).

Table 1. Soils in Project Area

Symbol	Name	Textures	Slope	Drainage	Landform
AdB	Adams	Loamy fine sand	0-8%	Somewhat excessively drained	Glaciofluvial terrace
CtA	Colton	Gravelly sandy loam	0-3%	Excessively well drained	Glaciofluvial terrace
CtD	Colton	Gravelly sandy loam	15-25%	Excessively well drained	Glaciofluvial terrace
CtE	Colton	Gravelly sandy loam	25-60%	Excessively well drained	Glaciofluvial terrace
Gp	Gravel Pits	Gravel	Varied	Excessively well drained	Glaciofluvial sediments (disturbed)

3.3 Bedrock Geology

The bedrock in the Project Area rests on the Dunham dolostone, "buff- and pink-mottled and massive, or light-gray, pinkish-gray-weathering, and massive to poorly bedded dolostone. Contains distinctive small pebbles and grains of well-rounded quartz" (Ratcliffe 2011). However, the APE is surrounded on the east and the west by Cheshire quartzite a "light-gray- to tannish-gray-weathering, massive to poorly bedded vitreous quartzite". The Dunham dolostone was not typically used by Native American groups for stone tool manufacture. However, it could have been utilized on an expedient basis. The Cheshire quartzite, in contrast, was heavily utilized throughout the precontact era with a number of quarry sites known in the Bristol area.

3.4 Physiography and Hydrology

The Project Area is has a varied topography. The north end behind and adjacent to the Bristol fire station is quite level, similar to the landform occupied by much of the village of Bristol. This level landform extends in a triangular area directly south of the fire station as a terrace overlooking the New Haven River. This landform has very steeply sloped margins on the east and south with slightly less slope along the western side. The APE west of this landform has been heavily modified by sand and gravel mining between Stoney Hill Road and Lovers Lane.

The APE is composed of coarse sand and gravel sediments. It is highly porous and there is no visible surface water in the immediate area. The only water located nearby is the New Haven River that flows along the east side of the APE and is set slightly to the south of the southern boundary.

4 Documentary Research

Hartgen conducted research at the Vermont Division for Historic Preservation (VDHP) to identify previously reported archeological sites, State and National Register (NR) properties, properties determined eligible for the NR (NRE), and previous cultural resource surveys.

4.1 Archeological Sites

The archeological site files at VDHP contained four sites within one mile (1.6 km) of the Project Area (Table 2). Previously reported archeological sites provide an overview of both the types of sites that may be present in the APE and the relationship of sites throughout the surrounding region. The presence of few reported sites, however, may result from a lack of previous systematic survey and does not necessarily indicate a decreased archeological sensitivity within the APE.

These sites, two precontact and two historic industrial, characterize much of the history of Bristol. The area is known for many precontact sites, often associated with the exploitation of the Cheshire quartzite outcropping in the massive escarpment that dominates the local landscape east of the village. The two industrial sites represent the exploitation of limestone and iron deposits found in the area during the early 19th century (Rolando 2007).

Within the APE, site VT-AD-1725 was identified during Phase I survey in 2017 and evaluated during Phase II investigations in 2018 (Beale, et al. 2019). Three loci of occupation were identified with a Middle Archaic Neville projectile point found in one location. VT-AD-1726 was identified on a smaller and lower elevation landform adjacent to the New Haven River. A small amount of quartzite debitage was encountered, but has not been subjected to Phase II investigation as yet.

Table 2. Vermont Archeological Inventory (VAI) sites within one mile (1.6 km) of the Project Area

VAI Site No.	Site Identifier	Description	Proximity to Project Area
VT-AD-0409	Bedell Lime Kiln	c. 1850-1890 lime kiln	0.61 mi/0.98 km to E
VT-AD-1363	Lathrop Gravel Pit	Unknown precontact, quartz, quartzite and chert debitage, biface and scraper from local chert	0.73 mi/1.17 km to SE
VT-AD-1364	Lathrop Gravel Pit	Unknown precontact, chert and quartzite debitage, FCR	0.46 mi/0.74 km to SE
VT-AD-1672	Bristol Forge	Late 18th to late 19th century, iron forge	0.51 mi/0.83 km to E
VT-AD-1725	Area A	Middle Archaic, Neville chert projectile point, quartzite biface fragments, scraper, chopper, quartzite and quartz debitage, FCR	Within APE
VT-AD-1726	Area B	Unknown precontact, quartzite debitage	86 m/280 ft to S

4.2 Historic Properties

An examination of the files at VDHP identified no NR properties, no NRE properties and no properties previously determined to be ineligible within or adjacent to the APE.

4.3 Previous Surveys

On file at VDHP is one previous survey within the immediate vicinity of the Project. This survey took place in 2017 and 2018 and encountered two precontact sites, VT-AD-1725 and VT-AD-1726. VT-AD-1725 is located within the project APE in three recorded loci on the high terrace overlooking the New Haven River (Beale, et al. 2019). One Neville Middle Archaic projectile point was found, along with biface fragments, debitage and one FCR. Loci 1 and 2 were determined to be eligible for listing on the National Register, while Locus 3 was determined unlikely to be eligible. Site VT-AD-1726 is located outside of the current APE to the south along Lover's Lane. It has not been evaluated in Phase II investigations.

The next closest project conducted in the area is the Lathrop Gravel Pit project (Table 3). In that case, located 0.2 miles (0.32 km) to the east of the APE, two precontact sites were identified during testing overlooking the New Haven River (VT-AD-1363 and VT-AD-1364). Artifacts recovered at these sites consisted of chert and quartzite debitage and a few tool fragments and fire cracked rock (Mandel and Crock 2004).

Table 3. Relevant previous surveys within or adjacent to the Project

Year	Investigator	Methodology	Results	Notes
2004	Mandel and Crock	Phase I shovel testing	Two precontact sites (VT-AD-1363 and VT-AD-1364)	Lithic debitage and tool fragments and FCR
2019	Beale et al.	Phase I shovel testing and Phase II shovel testing and unit excavation	Two precontact sites (VT-AD-1725 and VT-AD-1726)	Lithic debitage, tool fragments and FCR along with one chert Neville projectile point

5 Historical Map Review

Neither the 1857 Walling nor the 1871 Beers maps of Bristol (Map 3) depict any structures in the project vicinity (Beers 1871; Walling 1857). The 1889 Norris birds-eye view lithograph of the village of Bristol does not include the project area (Norris 1889). One of the houses adjacent to the northeast corner of the APE (Map 3) is shown on the 1903 to 1920 USGS quadrangles (USGS 1903, 1905, 1920). None of the Sanborn maps of the village depict the project APE, although both of the houses adjacent to the northeast corner of the APE are shown on the 1920, 1927 and 1935 Sanborn maps (Sanborn 1920, 1927, 1927/1935).

None of the USGS quadrangles depict any structures within the APE. The only activity is represented by symbols indicating gravel mining (Map 3) in or adjacent to the western parts of the APE (USGS 1963).

6 Archeological Discussion

6.1 Precontact Archeological Sensitivity Assessment

Completion of the VDHP Environmental Predictive Model provides a measure of the precontact archeological sensitivity of the project area (Appendix 1). The Project Area is sensitive for proximity to the New Haven River in an area with rapids, being on a high glacial outwash terrace and along the travel corridor of the river. Points were also added for the Project Area having a precontact site (VT-AD-1725) within its boundaries and the landform being a potential source of lithic material. The score was reduced due to disturbance and slope. The Project Area has a score of 44. A score of 32 and above is considered to indicate precontact sensitivity.

6.2 Historic Archeological Sensitivity Assessment

The historic sensitivity of an area is based primarily on proximity to previously documented historic archeological sites, map-documented structures, or other documented historical activities (e.g. battlefields).

None of the historic maps show any structures within the project APE. The only historic activity indicated is related to gravel mining, a process that destroys the landscape to a large degree. Therefore, the historic archeological sensitivity is low.

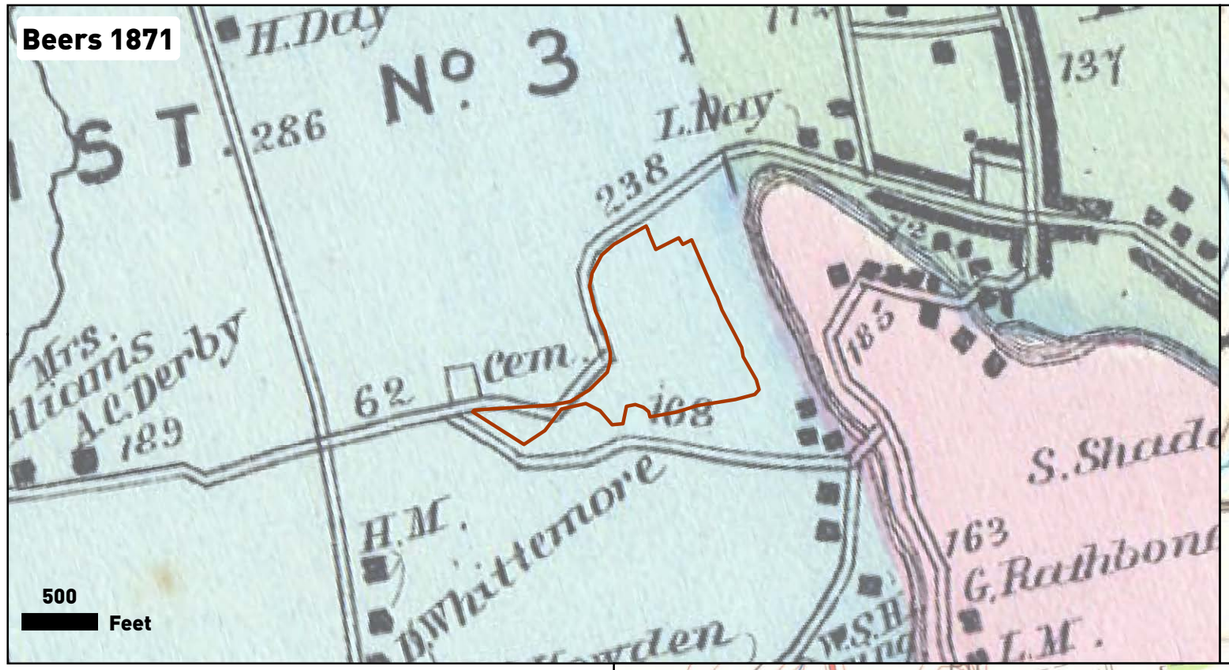
6.3 Archeological Potential

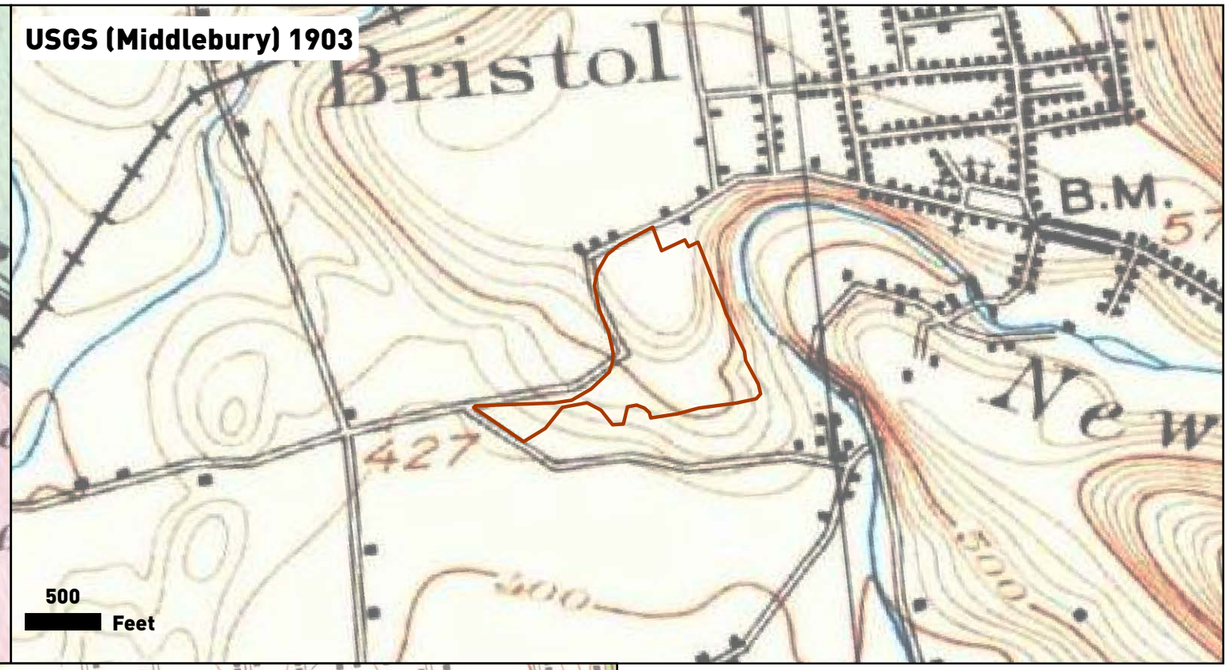
Archeological potential is the likelihood of locating intact archeological remains within an area. The consideration of archeological potential takes into account subsequent uses of an area and the impact those uses would likely have on archeological remains.

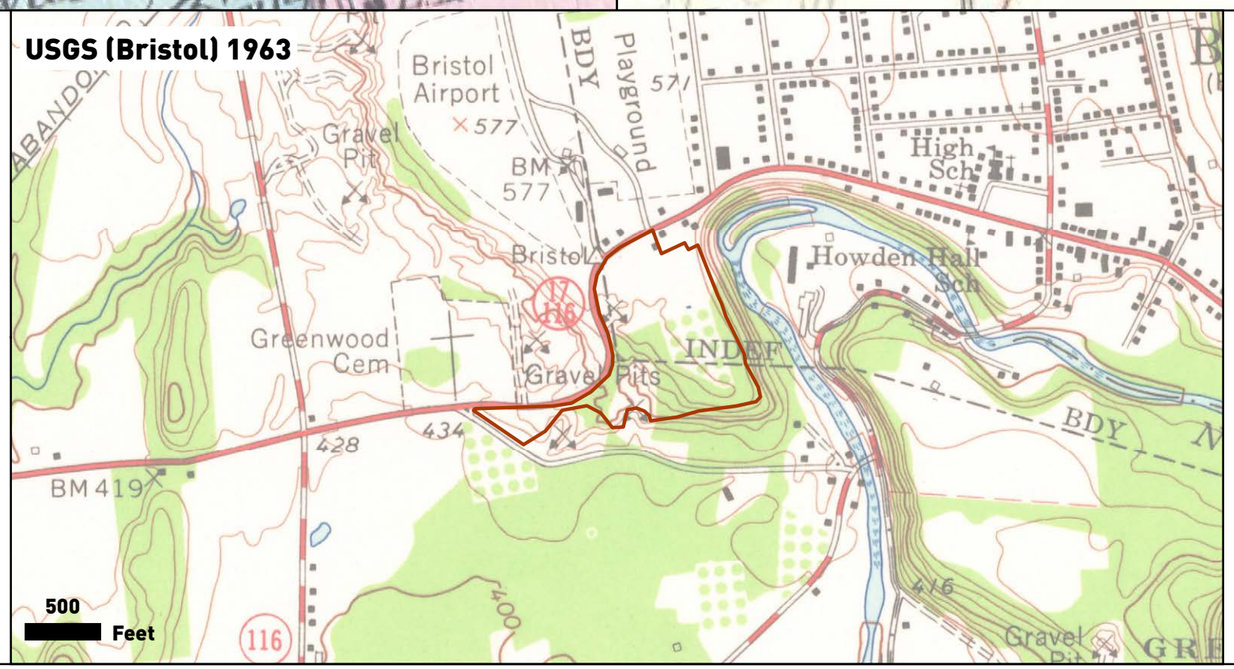
Large sections of the APE have been heavily disturbed by sand and gravel mining and/or development. The areas of archeological potential are restricted to the terrace south of the fire station and the Nelson parcel directly west of the fire station.

The area south of the fire station has recently been the subject of Phase I and II archeological investigations that identified three loci of precontact archeological deposits (Beale, et al. 2019). Two of those loci (Loci 1 and

2) are located at the southern end of this landform and are likely eligible for listing on the National Register of Historic Places. They are depicted as Archeological Sensitivity Areas (ASA) 1 and 2. The third locus (Locus 3) is located at the northern end of the landform and is considered of limited archeological significance and unlikely to be eligible. The testing was conducted along the edges of the landform, an area of greatest archeological potential. The interior of the landform has been disturbed in spots by exploratory gravel mining and has less archeological potential due to that disturbance and being located further from the edges of the landform (Photo 7).







Legend

Area of Potential Effects (APE)

HARTGEN archeological associates inc

Historical Maps 1871-1963

Map 3

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Photo 7. Interior of landform of site VT-AD-1725. Note undulating topography related to exploratory gravel mining. View to the south/southeast.

The Nelson parcel appears artificially level, probably from grading when the current house was constructed between 1993 and 2003. That parcel has probably been highly disturbed.

At the western end of the APE, a small area at the intersection of Route 116/17 and Lover's Lane is fairly level and undisturbed. It is labeled ASA 3 on Map 2. This location may retain precontact or historic archeological deposits.

6.4 Archeological Recommendations

The archeological investigations conducted by NEARC (Beale, et al. 2019) provide a good assessment of the archeology of the landform south of the fire station. As long as Loci 1 and 2 (ASA 1 and 2) are avoided by ground disturbing activities, no further archeological review is recommended on that landform.

The intersection of Route 116/17 and Lover's Lane is considered to have archeological potential. If the project will entail disturbance to that location, Phase IB archeological testing is recommended in areas to be disturbed. If that area can be avoided, no further archeological review is recommended.

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Appendix 1: VDHP Environmental Predictive Model

VERMONT DIVISION FOR HISTORIC PRESERVATION

Environmental Predictive Model for Locating Pre-contact Archaeological Sites

Project Name Bristol Path Scoping Study **County** Addison **Town** Bristol
DHP No. **Map No.** **Staff Init.** T. Jamison **Date** 2/28/2020

Additional Information

Environmental Variable	Proximity	Value	Assigned Score
A. RIVERS and STREAMS (EXISTING or RELICT):			
1) Distance to River or Permanent Stream (measured from top of bank)	0- 90 m 90- 180 m	12 6	12
2) Distance to Intermittent Stream	0- 90 m 90-180 m	8 4	
3) Confluence of River/River or River/Stream	0-90 m 90 –180 m	12 6	
4) Confluence of Intermittent Streams	0 – 90 m 90 – 180 m	8 4	
5) Falls or Rapids	0 – 90 m 90 – 180 m	8 4	8
6) Head of Draw	0 – 90 m 90 – 180 m	8 4	
7) Major Floodplain/Alluvial Terrace		32	
8) Knoll or swamp island		32	
9) Stable Riverine Island		32	
B. LAKES and PONDS (EXISTING or RELICT):			
10) Distance to Pond or Lake	0- 90 m 90 -180 m	12 6	
11) Confluence of River or Stream	0-90 m 90 –180 m	12 6	
12) Lake Cove/Peninsula/Head of Bay		12	
C. WETLANDS:			
13) Distance to Wetland (wetland > one acre in size)	0- 90 m 90 -180 m	12 6	
14) Knoll or swamp island		32	
D. VALLEY EDGE and GLACIAL LAND FORMS:			
15) High elevated landform such as Knoll Top/Ridge Crest/ Promontory		12	
16) Valley edge features such as Kame/Outwash Terrace**		12	12

17) Marine/Lake Delta Complex**		12	
18) Champlain Sea or Glacial Lake Shore Line**		32	
E. OTHER ENVIRONMENTAL FACTORS:			
19) Caves /Rockshelters		32	
20) ☑ Natural Travel Corridor ☐ Sole or important access to another drainage ☐ Drainage divide		12	12
21) Existing or Relict Spring	0 – 90 m 90 – 180 m	8 4	
22) Potential or Apparent Prehistoric Quarry for stone procurement	0 – 180 m	32	32
23)) Special Environmental or Natural Area, such as Milton acquifer, mountain top, etc. (these may be historic or prehistoric sacred or traditional site locations and prehistoric site types as well)		32	
F. OTHER HIGH SENSITIVITY FACTORS:			
24) High Likelihood of Burials		32	
25) High Recorded Site Density		32	32
26) High likelihood of containing significant site based on recorded or archival data or oral tradition		32	
G. NEGATIVE FACTORS:			
27) Excessive Slope (>15%) or Steep Erosional Slope (>20)		- 32	-32
28) Previously disturbed land as evaluated by a qualified archeological professional or engineer based on coring, earlier as-built plans, or obvious surface evidence (such as a gravel pit)		- 32	-32

**** refer to 1970 Surficial Geological Map of Vermont**

Total Score: 44

Other Comments :

Precontact site VT-AD-1725 is located within the project APE and thought to be eligible for listing on the National Register.

0- 31 = Archeologically Non- Sensitive
32+ = Archeologically Sensitive

Appendix C: Alternative 1 Planning Level Cost Estimates

Alternative 1 ::
Asphalt (Bituminous Concrete) 10' Pathway

VTrans Unit Price Costs (2020 report)	**Total cost/ft**
Shared use path options	
10 foot wide bituminous concrete path	$ 342.00
10 foot wide aggregate surface path	$ 301.00
Sidewalk options	
5 foot Concrete Walk w/ No Curb	$ 184.00
5 foot Aggregate walk w/ No Curb	$ 68.00

Path length

2230 ft

Path construction cost	**Path Construction Cost**
10 foot wide bituminous concrete path	**$ 762,660.00**

Retaining Wall Construction Cost

$ 1,900.00 per SY via Hartford, VT (retaining wall of similar size/grade situation)

Start Sta	End Sta	Length	Height	SY	**Retaining Wall Construction Cost**
200	350	150	2	33.33	$ 63,333.33
560	625	65	4	28.89	$ 54,888.89
1260	1450	190	5	105.6	$ 200,555.56
					$ 318,777.78

Other items construction costs	$/QTY	QTY	
Moving utility poles	$ 5,000.00	2	$ 10,000.00
Guardrail to separate from road	$ 25.00	2070	$ 51,750.00

Total Construction Cost	
10 foot wide bituminous concrete path	**$ 1,143,187.78**

Non Construction Costs (incl PE and CE)				
Permitting		$ 25,000.00	1	$ 25,000.00
Easements		$ 5,000.00	2	$ 10,000.00
PE	22%			$ 251,501.31
CE	14%			$ 160,046.29

PE = preliminary engineering (design)

CE = construction engineering (admin, local proj mgmt)

Contingency	25%	$ 285,796.94
10' shared use path		**Total Cost**
10 foot wide bituminous concrete path		**$ 1,840,532.32**

Alternative 1b ::
Concrete Sidewalk - 5' Width

VTrans Unit Price Costs (2020 report)	**Total cost/ft**
5 foot Concrete Walk w/ No Curb	$ 184.00

Path length

2230 ft

Path construction cost	**Path Construction Cost**
5 foot Concrete Walk w/ No Curb	$ 410,320.00

Retaining Wall Construction Cost

$ 1,900.00 per SY via Hartford, VT (retaining wall of similar size/grade situation)

Start Sta	End Sta	Length	Height	SY	**Retaining Wall Construction Cost**
200	350	150	2	33.33	$ 63,333.33
560	625	65	2	14.44	$ 27,444.44
1260	1450	190	2	42.22	$ 80,222.22
				Total	$ 171,000.00

Other items construction costs	$/QTY	QTY	
Moving utility poles	$ 5,000.00	1	$ 5,000.00
Guardrail to separate from road	$ 25.00	2070	$ 51,750.00

Total Construction Cost

5 foot Concrete Walk w/ No Curb	$ 638,070.00

Non Construction Costs (incl PE and CE)

Permitting		$ 25,000.00	1	$ 25,000.00
Easements		$ 5,000.00	2	$ 10,000.00
PE	22% of construction cost			$ 140,375.40
CE	14% of construction cost			$ 89,329.80

PE = preliminary engineering (design)

CE = construction engineering (admin, local proj mgmt)

Contingency	25%	$ 159,517.50
5 foot Concrete Walk w/ No Curb		$ 1,062,292.70

Alternative 1c ::
Aggregate Sidewalk - 5' Width

VTrans Unit Price Costs (2020 report)	**Total cost/ft**
5 foot Aggregate walk w/ No Curb	$ 68.00

Path length

2230 ft

Path construction cost	**Path Construction Cost**
5 foot Aggregate walk w/ No Curb	$ 151,640.00

Retaining Wall Construction Cost

$ 1,900.00 per SY via Hartford, VT (retaining wall of similar size/grade situation)

Retaining Wall Locations and Heights

Start Sta	End Sta	Length	Height	SY	**Retaining Wall Construction Cost**
200	350	150	2	33.33	$ 63,333.33
560	625	65	2	14.44	$ 27,444.44
1260	1450	190	2	42.22	$ 80,222.22
				Total	$ 171,000.00

Other items construction costs	$/QTY	QTY	
Moving utility poles	$ 5,000.00	1	$ 5,000.00
Guardrail to separate from road	$ 25.00	2070	$ 51,750.00

Total Construction Cost	
5 foot Aggregate walk w/ No Curb	$ 379,390.00

Non Construction Costs (incl PE and CE)				
Permitting		$ 25,000.00	1	$ 25,000.00
Easements		$ 5,000.00	2	$ 10,000.00
PE	22%			$ 83,465.80
CE	14%			$ 53,114.60

PE = preliminary engineering (design)

CE = construction engineering (admin, local proj mgmt)

Contingency	25%	$ 94,847.50
5 foot Aggregate walk w/ No Curb		$ 646,000.00