

SUNDERLAND SAFE ROADS
SCOPING STUDY
SUNDERLAND STP BP14(21)
TOWN OF SUNDERLAND, VT
January 29, 2016



Submitted to:
Town of Sunderland
104 Mountain View Road
Sunderland, VT 05250
And
James Sullivan, Director
Bennington County Regional Commission
111 South Street, Suite 203
Bennington, VT 05201

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Section 1: Summary

The objective of this project is to create a safe and accessible route for pedestrians and cyclists to travel along Sunderland Hill Road and Hill Farm Road to key points of interest including the Sunderland Elementary School, the Sunderland Town Office, the commercial district on Route 7A, and residential developments. The study area extends from the Chiserville Bridge, north along Sunderland Hill Road to the intersection of Hill Farm Road, then continues west along Hill Farm Road to Route 7A.

Characteristics of the project area were reviewed including right-of-way width, roadway features, traffic data, historic/archeological features, natural resources and other environmental parameters. There were no environmental impacts identified for any of the alternative routes in the study area.

An Archeological Resource and Historic Preservation Assessment was completed, which indicated that the project area has a moderate potential for intact precontact and historic archeological deposits to be present within the project area. The Archeological Resource and Historic Preservation Assessment recommended that the project be designed to keep ground disturbance close to the existing roadside to limit disturbance to previously undisturbed areas of archeological potential. When the proposed improvements are further defined during final design, the potential for archaeological impacts should be reviewed again. This review may include a Phase 1B archeological investigation.

The project was discussed at a Local Concerns meeting. As a result of this meeting, the following Purpose and Need Statement was developed:

Purpose: To increase safety for school children, pedestrians and cyclists who utilize Sunderland Hill Road for commuting and recreation.

Need: The lack of safe pedestrian and bicycle facilities in this area discourages pedestrian and bicycle activity. In order to encourage activity, improvements to increase safety are a necessity.

After the Local Concerns meeting, alternatives were developed based on design criteria and local input. The alternatives focused on adding a road shoulder to provide space for pedestrians and cyclists, as well as signage and pavement markings to increase driver awareness. The alternatives were compared on the basis of cost, impacts to historic and archeological features, permitting requirements and locally identified critical elements.

The alternatives were discussed at an Alternatives Presentation. The discussions focused on the specifics of each alternative, including space considerations, phasing, and cost. The participants showed support for incremental improvements to widen the road shoulder. Upon completion of the presentation, the preferred alternative was identified as incremental improvements to add a 2-foot wide paved shoulder on both sides of Sunderland Hill Road from the Town Office to the Chiserville Bridge, add a 4-

foot wide paved shoulder on the southbound lane of Sunderland Hill Road from Dunham Road to the Town Office, and add edge line striping, sharrows, pedestrian warning signage and “Share the Road” signage throughout the study area. The discussions focused on these improvements being constructed over several years to minimize the financial impact to the Town, with gravel shoulders being installed first and pavement installation being coordinated with future road resurfacing projects. In a follow-up committee meeting, there were suggestions that the Town Highway Department could construct the gravel shoulders to further reduce the cost of the project.

The estimated total project cost for these improvements is \$985,000 based on a 2016 construction cost estimate of \$695,000. This cost estimate does not include any discounts for local construction.

The phasing plan and funding alternatives were presented at a Public Informational Meeting. The concept of locally constructing the improvements over several years was discussed with comments noting that the Town Highway Department was already busy and this concept would ultimately cost the Town more money than a grant would. There were comments that it may be beneficial to install the edge lines on the road in the near future, since a grant funded project would take several years to design. Following the public meeting, the recommended phasing plan was revised for two phases. The proposed phasing schedule is provided in Section 5 and summarized as follows:

- Phase 1: Install pavement markings on Sunderland Hill Road and Hill Farm Road.
- Phase 2: Install paved shoulders on both sides of Sunderland Hill Road from the Town Office to the Chiselville Bridge. Install a paved shoulder on the southbound side of Sunderland Hill Road from Dunham Road to the Town Office. Install signage.

As the project will be phased, the construction and total project cost estimates were provided by phase. The costs by phase can be found in Section 5 of this report.

Upon local endorsement of this study and public consensus at a Town Meeting, it is recommended that the Town locally budget to install the pavement markings as Phase 1 and apply to the VTrans Bicycle and Pedestrian Program for design and construction funds to implement Phase 2 of the project.

Section 2: Existing Conditions

Project Study Area

The study area for the project was defined by the Sunderland Safe Roads Committee, which includes four residents from the Town of Sunderland, and the Bennington County Regional Commission. As shown in Figure 2-1, the study area extends along Sunderland Hill Road from the Chiselville Bridge to Hill Farm Road and along Hill Farm Road from Sunderland Hill Road to Route 7A. The study area is approximately 3.2 miles in length.

Land Uses

The study area is rural and there is no defined village center or hamlet. As shown in Figure 2-2, the study area is mostly classified as Rural Residential (RR). The RR district is a low density district characterized by larger lot sizes (2 acres minimum). The intent of this district is to maintain and enhance scenic and environmental qualities, encourage the preservation of open space and provide for residential development for the anticipated future population. A small portion of the study area is classified as Rural Commercial (RC). The RC district is located along Route 7A and is intended to provide appropriate locations for limited types of business primarily serving the motoring public.

Existing Transportation Facilities

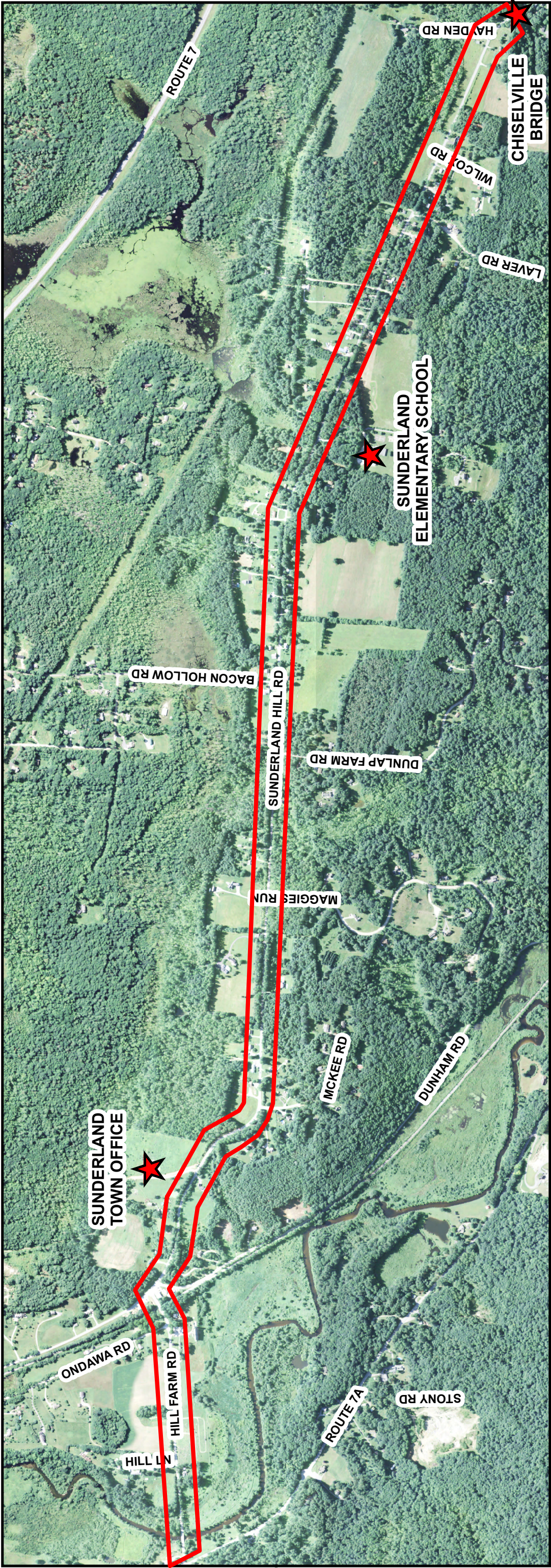
The study area is centered on Sunderland Hill Road and Hill Farm Road. These two roads serve as an important transportation corridor through the Town of Sunderland, with several key destinations. These local roads are often used by people traveling between Manchester and Arlington. Due to the rural nature of these roads, traffic tends to travel at a relatively high rate of speed.

Sunderland Hill Road and Hill Farm Road are local roads with a speed limit of 35 mph. There are several additional local roads that intersect the study area. Sunderland Hill Road is approximately 22 feet wide for the entire length of the project area and has a painted centerline from 1474 Sunderland Hill Road to Hill Farm Road. The portion of Sunderland Hill Road south of 1474 was recently repaved and currently has no pavement markings, although the Town does plan to repaint the center line. Hill Farm Road is approximately 22 feet wide with a painted centerline along the entire length of the road. Neither road has painted edge lines.



Photo 2-1: Sunderland Hill Road near Maggie's Run

FIGURE 2-1
PROJECT STUDY AREA

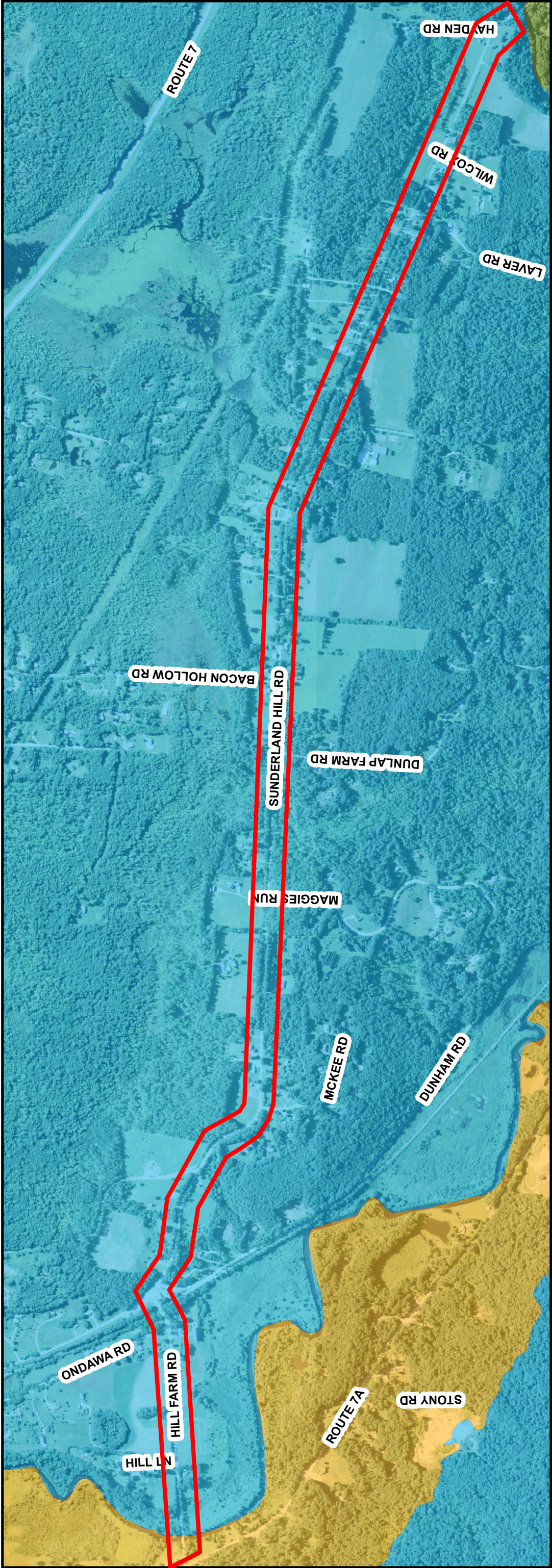


Legend







-  Study Area
-  Key Destination Point



FIGURE 2-2
SUNDERLAND ZONING MAP



Legend

-  Study Area
-  CI - Commercial-Industrial
-  F - Forest
-  RC - Roadside Commercial
-  RR - Rural Residential
-  VR - Village Residential



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According to Vermont Agency of Transportation (VTrans) data, the 2011 Annual Average Daily Traffic was 1,100 for Sunderland Hill Road between the Chiselville Bridge and Hill Farm Road. Data was obtained from VTrans for high crash locations compiled for the 2008-2012 period. There are no high crash locations within the project area.

Sunderland Hill Road appears to have ample available space along most of the roadway for pedestrian and bicycle improvements. The buildings, utility poles, landscaping and trees are set back from the edge of the road in most areas. There is a steep hill from Dunham Road to the Town Office. There are guardrails located on both sides of the road along portions of the hill; however, the guardrails are located approximately 6 feet from the edge of the existing pavement, as shown in Photo 2-2. There are two locations south of the Sunderland Elementary School where ledge or boulder outcrops may conflict with potential improvements.



Photo 2-2: Sunderland Hill Road south of Dunham Road

The challenges to road widening on Hill Farm Road include the bridge over the Battenkill River and an overpass above the railroad tracks. These two structures limit the width available for pedestrian and bicycle improvements. The bridge over the Battenkill River, at approximately 23 feet wide, is only slightly wider than the road. The overpass at the railroad tracks is slightly wider than the bridge; however, there is not enough clear area for a sidewalk or bike lanes. As such, the addition of pedestrian and bicycle facilities would require significant modification or replacement of these structures.



Photo 2-3: Bridge over Battenkill River on Hill Farm Road

The BCRC Transportation Plan identified the Hill Farm Road and Route 7A intersection as a dangerous intersection due to line of sight limitations. However, the study area does not extend onto Route 7A and therefore this study will not address this intersection.

There are no existing pedestrian or bicycle facilities in the project area. However, Sunderland Hill Road and Hill Farm Road are both identified as popular cycling rides on the Vermont State Bike Map. Sunderland Hill Road is identified in the Bennington County Regional Commission's Regional Plan as an example of a preferential road for

cycling. There are also many programs and events that utilize Sunderland Hill Road for bicycle or pedestrian activity, including Tour of the Dragon and the Northshire Marathon. Members of the Sunderland Safe Roads Committee noted that there are several people who utilize Sunderland Hill Road regularly for walking, running and cycling.

Natural and Cultural Resources

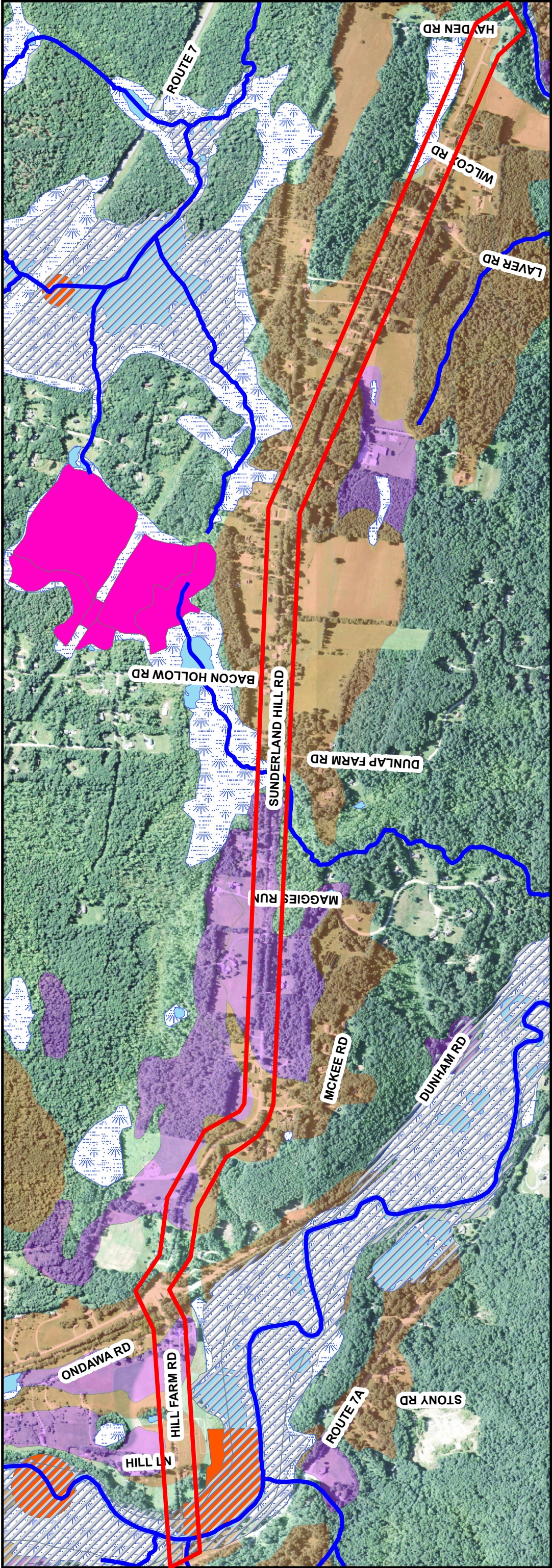
The following Geographical Information System (GIS) data was compiled from the Agency of Natural Resources and the Vermont Center for Geographic Information and is presented in Figure 2-3:

- | | |
|----------------------|---------------------|
| ▪ Wetlands | ▪ Flora/Fauna |
| ▪ Surface Water | ▪ Forest Land |
| ▪ Floodplains | ▪ Agricultural Land |
| ▪ Endangered Species | ▪ Public Land |

There are a few resources near the project area, including two areas of Class 2 wetlands, which are located approximately 25 feet from the road. The only mapped resource within the study area is Prime and Statewide agricultural soil. As bicycle and pedestrian improvements would be located within close proximity to the edge of the road and within the Town right-of-way, the soils impacted would likely be previously disturbed soils. Based on previous discussions with the Vermont Agency of Agriculture, there is typically no impact to the agricultural soils as long as the project is located directly adjacent to an existing road.

An Archeological Resource and Historic Preservation Assessment was completed in July 2015 by Hartgen Archeological Associates, Inc. The report indicates the project area has moderate potential for precontact and historic archeological deposits. The report recommends that ground disturbance be kept close to the existing roadside to limit disturbances to previously undisturbed areas of archeological potential. These previously undisturbed areas of archeological potential are identified on Figures 2-4A, 2-4B and 2-4C in the report. The areas are mostly located along Hill Farm Road and on the northern end of Sunderland Hill Road. There are also a few areas located near the Chiselville Bridge. These areas all appear to be set back from the road. The potential archeological impacts are discussed further in Section 4. The complete report is included as Appendix A.

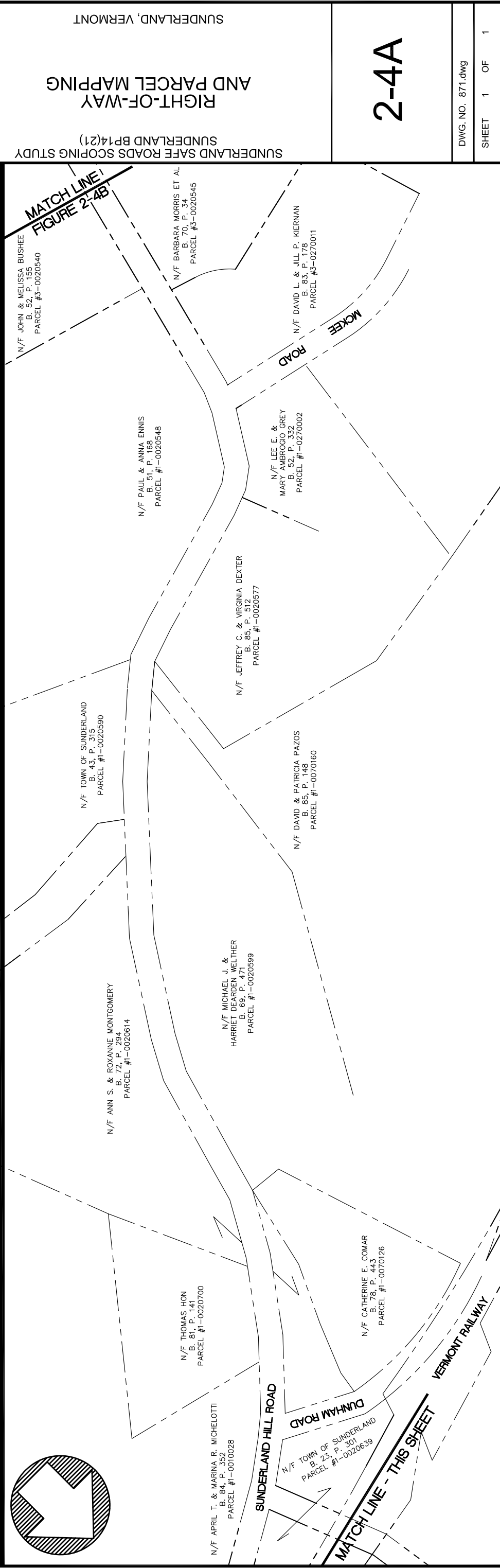
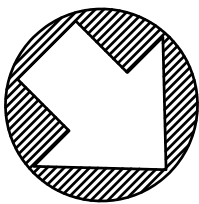
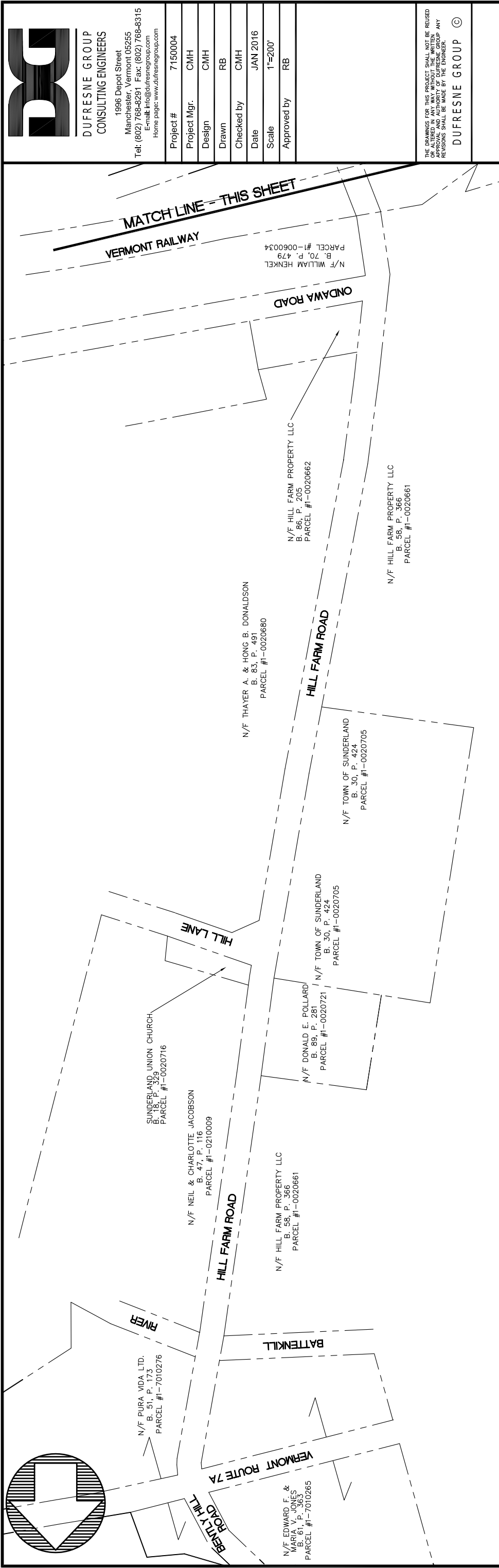
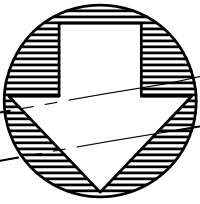
FIGURE 2-3
NATURAL RESOURCES AND ENVIRONMENTAL FEATURES



Legend

- Study Area
- Stream
- Significant Natural Community
- RTE Species
- Waterbody
- Wetland
- Flood Plain
- Prime Ag Soil
- Statewide Ag Soil





SUNDERLAND SAFE ROADS SCOPING STUDY
SUNDERLAND BP14(21)
RIGHT-OF-WAY
AND PARCEL MAPPING
SUNDERLAND, VERMONT

2-4A

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SHEET 1 OF 1

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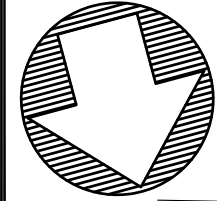
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CONSULTING ENGINEERS

1996 Depot Street
Manchester, Vermont 05255
Tel: (802) 768-8291 Fax: (802) 768-8315
E-mail: info@dufresnegroup.com
Home page: www.dufresnegroup.com

Project #	7150004
Project Mgr.	CMH
Design	CMH
Drawn	RB
Checked by	CMH
Date	JAN 2016
Scale	1"=200'
Approved by	RB

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N/F JANICE GOULD
B. 46, P. 257
PARCEL #3--0020530

N/F PRADEEP & REENA R. KASHYAP
B. 70, P. 288
PARCEL #3--0020494

N/F JEFFREY S. & KELLEY P. LEGGETT
B. 72, P. 297
PARCEL #3--0020478

N/F KIRK T. & HEIDI W. MOORE
B. 70, P. 325
PARCEL #3--0020462

N/F GARY J. & KATHLEEN ZACK
B. 56, P. 377
PARCEL #3--0020452

N/F MICHAEL & DARLENE LYNCH
B. 73, P. 31
PARCEL #3--0300038

N/F JOHN B. COLEY
B. 88, P. 89
PARCEL #3--0020511

N/F MICHAEL & DARLENE LYNCH
B. 73, P. 31
PARCEL #3--0020495

N/F ROBERT P. FALLON,
JOAN J. LEENIG, DEVIN P. FALLON
B. 71, P. 428
PARCEL #3--0300002

N/F RICHARD A., III &
PATRICIA A. SARGENT
B. 75, P. 30
PARCEL #3--0300021

N/F GARY J. & KATHLEEN ZACK
B. 77, P. 115
PARCEL #3--0020449

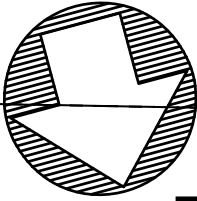
N/F BANK OF AMERICA, N.A.
B. 89, P. 113
PARCEL #3--0020435

N/F MATTHEW R. & HEATHER J. VERNON
B. 87, P. 386
PARCEL #3--0020421

MATCH LINE - THIS SHEET

MATCH LINE - THIS SHEET

FIGURE 2-4A



N/F SUNJIT CHAWLA
B. 88, P. 317
PARCEL #3--0020410

N/F SHIRLEY L. & PHILIP P. LETIECO
B. 64, P. 261
PARCEL #3--0100003

N/F PETER & LILY HAVERBEKE
B. 79, P. 478
PARCEL #3--0020384

BACON HOLLOW ROAD

ROW

N/F THEODORE & BARBARA ZAKRZEWSKI
B. 60, P. 116
PARCEL #3--0020362

N/F RICHARD S. &
MARGARET D. TIMMERMAN
B. 83, P. 166
PARCEL #3--0020352

N/F URI & MARIA P. LAVY
B. 46, P. 54
PARCEL #3--0020340

N/F DEBBIE B. WAIBEL, ET AL
B. 78, P. 219
PARCEL #3--0020334

N/F JENNIFER KING
B. 81, P. 437
PARCEL #3--0020320

N/F PHILLIP T. & VIRGINIA BACON
B. 84, P. 390
PARCEL #3--0020314

MATCH LINE - FIGURE 2-4C

N/F GAIL E. ALBRIGHT, ET AL
B. 75, P. 263
PARCEL #3--0020385

N/F DANIEL J., JR. & TROY R. MULROY
B. 78, P. 133
PARCEL #3--0020357

N/F DANIEL J., JR. & TROY R. MULROY
B. 60, P. 46
PARCEL #3--0020347

N/F MARLYN D. COUTURE TRUST
B. 88, P. 125
PARCEL #3--0020371

N/F URSULA WINTER & EMILY COCA
B. 87, P. 199
PARCEL #3--0020329

N/F MARTIN ARONS
B. 56, P. 334
PARCEL #3--0020317

N/F SALLY B. & JAMES S. AYREY, JR.
B. 70, P. 131
PARCEL #3--0020341

RIGHT-OF-WAY
AND PARCEL MAPPING

SUNDERLAND SAFE ROADS SCOPING STUDY
SUNDERLAND BP14(21)

SUNDERLAND, VERMONT

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Date JAN 2016

Checked by CMH

Drawn RB

Design CMH

Project Mgr. CMH

Project # 7150004

Home page: www.dufresnegroup.com

E-mail: Info@dufresnegroup.com

Tel: (802) 768-8291 Fax: (802) 768-8315

Manchester, Vermont 05255

1996 Depot Street

CONSULTING ENGINEERS

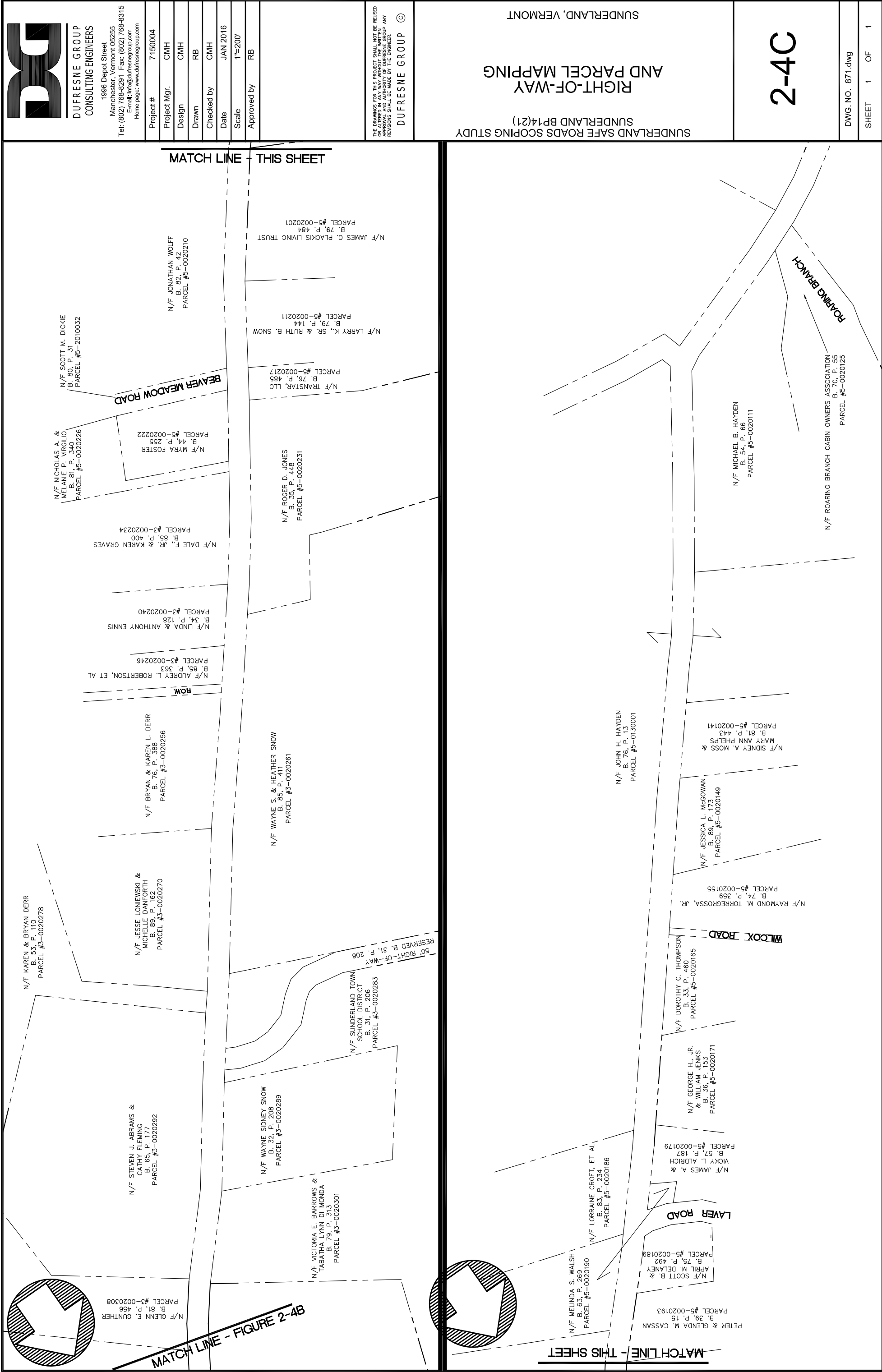
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SHEET 1 OF 1

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2-4B



Right-of-Way

The public road right-of-way (ROW) was determined by a licensed land surveyor reviewing this project to be 49.5 feet, or 3 rods. The property boundaries for the parcels adjacent to the study area were shown previously in Figures 2-4A, 2-4B and 2-4C.

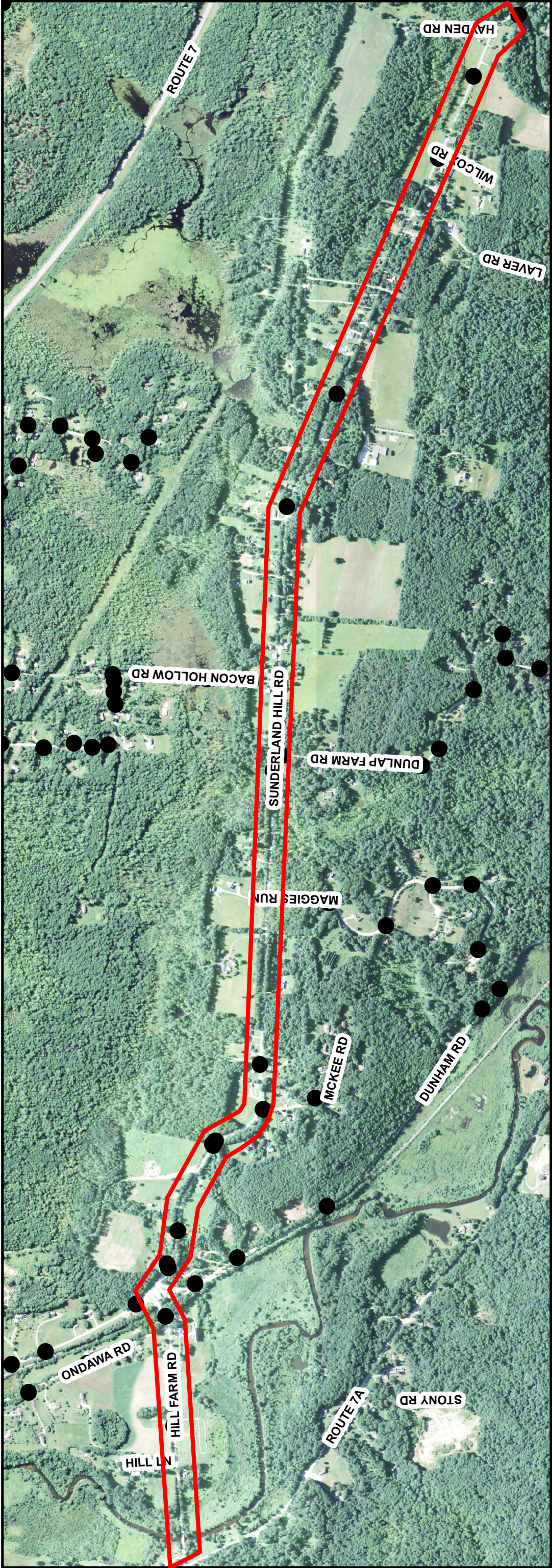
Utilities

There are multiple utilities within the study area including the following:

- Municipal culverts along the project area as shown in Figure 2-5.
- Utility poles with electric, telephone and cable wires throughout the project area as shown in Figure 2-6.

The utility poles within the study area are owned and maintained by Green Mountain Power. The utility poles are typically set back from the road several feet; however, there may be impacts to utility poles located closer to the road. The municipal culverts may be impacted depending on the chosen alternative. The level of impact for each alternative is discussed in Section 4 of this report.

FIGURE 2-5
CULVERT LOCATIONS

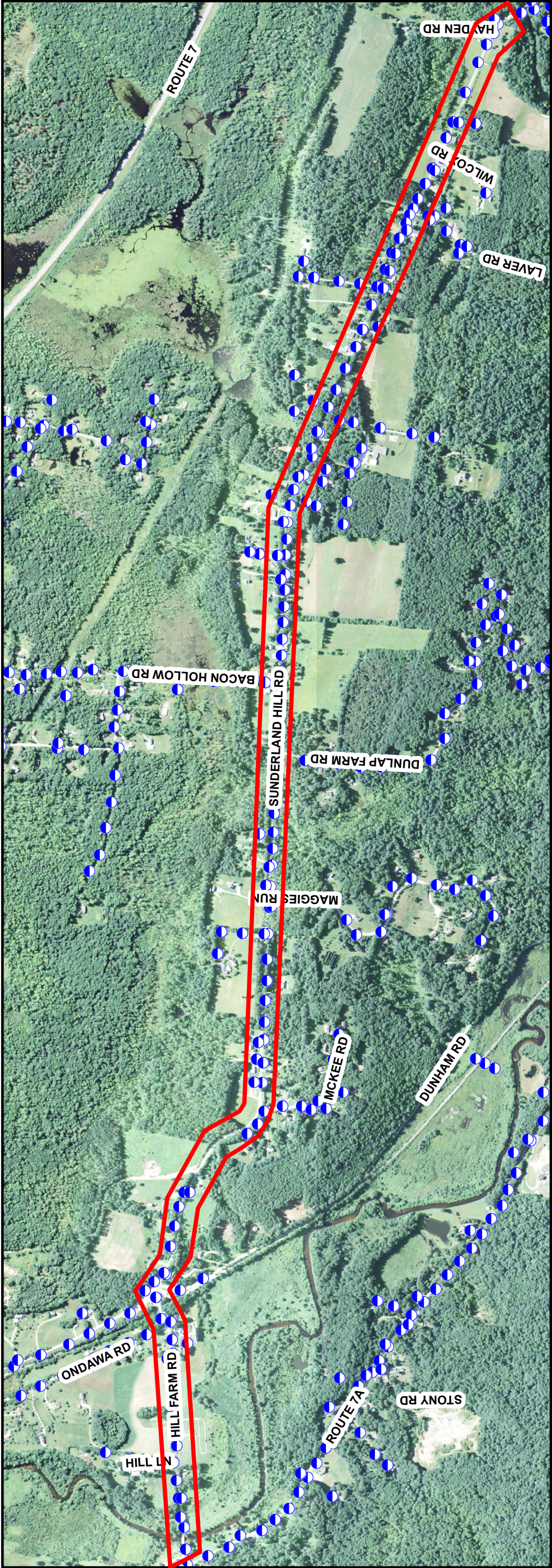


Legend

- Study Area
- Culvert



FIGURE 2-6
UTILITY POLE LOCATIONS



Legend

- Study Area
- Utility Pole



Section 3: Public Involvement

Developing a Purpose and Need Statement requires obtaining input from multiple sources, reviewing the existing characteristics of the area and reviewing local and regional plans to identify the relationship of the planned improvements to these plans.

A Project Kick-off Meeting was held with the Sunderland Safe Roads Committee and the Sunderland Road Foreman to discuss the project, identify goals and brainstorm possible alternatives. The information obtained at this meeting was used to prepare for the public meetings. One concept alternative discussed at this meeting included incremental improvements along the project area.

Local Concerns Meeting

A Local Concerns Meeting was conducted on April 22, 2015 to discuss the project and obtain input from the public regarding the purpose and need for the project. A copy of the meeting minutes is included as Appendix B.

The meeting was attended by approximately 15 to 20 local residents. The participants and committee discussed the following major topics:

- Safety concerns, including high vehicular speeds and lack of pedestrian facilities;
- Current and future volume of pedestrian and bicycle traffic;
- Future probability of children walking or biking to school;
- Pavement quality and sediment in the road, which potentially impacts cyclists' safety;
- Physical constraints such as utility poles, buildings and driveways; and
- Cost concerns.

There was good support for pedestrian and bicycle improvements, with a few people expressing concern about the details and cost of the improvements. Overall, there was general agreement that there is a lack of pedestrian and bicycle safety in the project area. In addition, current conditions do not allow for children to safely utilize the roads for traveling to and from school. There was full agreement from all participants that cost is a critical factor as the Town cannot afford a high cost project.

It is important to note that there was a discussion regarding a survey that was completed by the Sunderland Safe Roads Committee prior to the start of this study. The survey was distributed at the school and sent home with the students. The survey included questions to parents as to whether their children currently walk/bike to school and if they would allow their children to walk/bike to school if improvements were made to increase safety. There were approximately 8-10 responses to the survey. There are very few children that currently walk or bike to school. However, the responses overwhelmingly indicated that parents would let their children walk or bike to school if the conditions were safer.

Purpose and Need Statement

After the Local Concerns Meeting, the following Purpose and Need Statement was developed based on input from the Sunderland Safe Roads Committee and the public:

Purpose: To increase safety for school children, pedestrians and cyclists who utilize Sunderland Hill Road for commuting and recreation.

Need: The lack of safe pedestrian and bicycle facilities in this area discourages pedestrian and bicycle activity. In order to encourage activity, improvements to increase safety are a necessity.

Alternatives Presentation

An Alternatives Presentation was conducted on September 29, 2015 to present the alternatives, obtain input from the public regarding the proposed alternatives, and select an alternative. A copy of the meeting minutes is included as Appendix C. A summary of the comments received at the Alternatives Presentation is included in Section 4.

Public Informational Meeting

A Public Informational Meeting was held on January 19, 2016 to present the draft report and solicit input from the public. A copy of the meeting minutes is included as Appendix D.

Relationship to Local and Regional Plans

The Sunderland Town Plan and the Bennington County Regional Commission Plan both contain goals, policies and recommendations in support of the proposed improvements. The Sunderland Town Plan contains language in the sections titled “Economic Development” and “Transportation”, as follows:

- *Promoting walking paths, sidewalks where appropriate, and biking trails would bring visitors and provide for healthy recreational opportunities for residents.*
- *Additions and improvements to the transportation system shall be designed to minimize impacts on residential areas and avoid the loss of natural resources, unique sites and wildlife habitat.*

The Bennington County Regional Plan contains the following policies and actions in Section 10.6:

- *It is important to provide and maintain the facilities needed to support safe and convenient walking and bicycling around our communities and throughout the region.*
- *People living in homes scattered throughout the region’s outlying rural areas also can enjoy the benefits of walking. In many cases, the low-traffic and low-speed local roads in these areas serve as acceptable and safe routes for walking. When important pedestrian routes lie along more heavily traveled local roads, additional facilities, such as a widened shoulder or a separated pathway may be more appropriate.*

- *Most bicyclists will preferentially ride on paved secondary roads with light and/or low speed vehicular traffic. Examples of this type of road in our region include West Road in Dorset and River Road/Sunderland Hill Road in Manchester and Sunderland. Such roads are natural bikeways and require little improvement.*

Additionally, Section 10.6 of the Bennington County Regional Plan lists priority pedestrian and bicycle improvements in the region. Item 21 on this list is Sunderland Hill Road described as “*delineation of a safe walking and bicycling lane between Hill Farm Road and the elementary school*”.

Section 4: Evaluation of Alternatives

There are several factors that influence the development of alternatives, including public input, current and future uses, and existing conditions. The critical design elements defined by the review of existing conditions, uses and local input are as follows:

1. Minimize disturbance and scope of construction.
2. Provide alternatives that can be constructed in phases.
3. Identify cost effective solutions.
4. Maintain the rural character of the area.

The development of alternatives was also guided by regulatory standards including the following:

- Vermont Pedestrian and Bicycle Facility Planning and Design Manual
- Americans with Disabilities Act (ADA) Standards for Accessible Design

The typical solution to a lack of pedestrian facilities is a sidewalk. However, in this case due to the rural character of the study area, a sidewalk may not be appropriate on Sunderland Hill Road. The distance between key destination points makes it difficult to propose a sidewalk for even a short distance on Sunderland Hill Road. Therefore, the pedestrian improvement concepts will consider alternatives to a new sidewalk due to the characteristics and critical design elements of this particular project.

In contrast, the bicycle improvements are much simpler, as Sunderland Hill Road and Hill Farm Road are already popular cycling routes. The concepts for bicycle improvements will focus on improving safety in key areas and providing a higher degree of security for beginner cyclists and children.

Alternative 1: “No Build”

The “no build” alternative must be considered for all projects funded by the Federal Highway Administrative Act to comply with the National Environmental Policy Act (NEPA). The “no build” alternative would consist of doing nothing. There would be no construction, no signage installed and no pavement markings installed.

The “no build” alternative would not increase safety for pedestrians and cyclists as there would be no improvement to the existing condition. As the “no build” alternative does not satisfy the Purpose and Need Statement, this alternative is not recommended.

Alternative 2: Bicycle Lanes

This alternative includes bicycle lanes along the full length of the study area with the following features:

- Add 3 feet of pavement width on each side to create a 4-foot wide bicycle lane on both sides of Sunderland Hill Road from Hill Farm Road to the Chiselville Bridge;

- Add 3 feet of pavement width on each side to create a 4-foot wide bicycle lane on both sides of Hill Farm Road from Route 7A to Sunderland Hill Road, with the exception of the bridge and overpass;
- Add pavement markings including edge lines and bicycle lane symbols on Sunderland Hill Road and Hill Farm Road.

The proposed cross section of the road and bicycle lane is shown in Figure 4-1. Vermont State Design Standards allow for 10-12 foot travel lanes on minor arterial roads and the Vermont Pedestrian and Bicycle Facility Planning and Design Manual indicates a bicycle lane shall be a minimum of 4 feet wide. The current travel lane width is 11 feet in each direction, for a total pavement width of 22 feet. The proposed cross section for Alternative 2 would reduce the travel lane width to 10 feet in each direction and add a 4 foot wide bike lane on both sides of the road. This would increase the total pavement width by 6 feet to 28 feet.

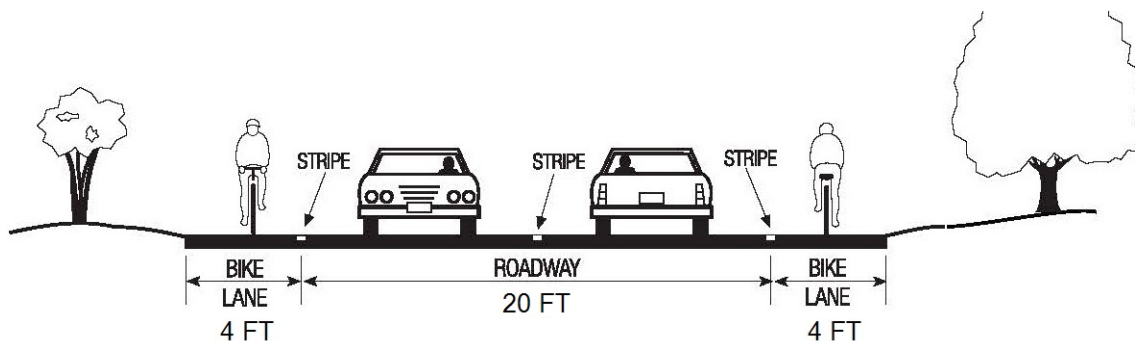


Figure 4-1: Typical Road and Bicycle Lane Cross Section

The pavement edges should be bordered by gravel shoulders (minimum 1 foot wide) to ensure that there is no drop-off from the edge of the pavement. This provides more security for cyclists when they need to ride closer to the edge of the road, for example when there is debris in the bicycle lane or a larger vehicle passing. In addition, the gravel shoulder provides a durable and safe surface for pedestrians outside of the travelled way and bicycle lane, as bicycle lanes should be exclusively for cyclists.

Due to the limited available space at the bridge and the overpass on Hill Farm Road, the bike lanes would terminate on either side of the structures and shared-lane markings, or “sharrows”, would be painted on the road to indicate a shared road space.

This alternative would significantly increase the width of the road. The additional 8 feet minimum needed for the bike lanes and gravel shoulders would require relocating drainage swales, driveway culverts, mailboxes and signs, as well as extending culverts crossing the road. Some of the utility poles will also require relocation, which would need to be coordinated with Green Mountain Power and FairPoint. In some areas permanent easements may be required.

In August 2014, VTTrans published a report titled “Report on Shared-Use Path and Sidewalk Unit Costs”. This report included typical 2014 construction costs for bicycle lanes, which range from \$5,360 to \$536,680 per mile, with an average bid price of

\$300,000 per mile. The huge variation in costs for bicycle lane construction on already existing roadways is mostly due to whether or not road widening is necessary as the conditions encountered, such as ledge, relocation of drainage swales, and easements, will be different in every situation. The most cost effective way to add a bicycle lane to an existing road is to include it as an element of a road resurfacing or road reconstruction project.

Since the southern half of Sunderland Hill Road was resurfaced in 2015, it will likely be 10-15 years before the road is resurfaced again. If there are plans to resurface Hill Farm Road or northern portion of Sunderland Hill Road in the next few years, this would provide an opportunity to add bicycle lanes on those portions of road.

Adjusting the 2014 average bid price of \$300,000 per mile for inflation, the 2016 construction cost would be \$315,000 per mile. Therefore, the 2016 construction cost for Alternative 2 would be approximately \$1,010,000. If the project is not constructed in 2016, the construction cost will need to be readjusted for inflation. A detailed cost estimate is not provided for this alternative as it was not chosen as the preferred alternative.

Alternative 3: Wide Shoulders

This alternative includes wide shoulders along the Sunderland Hill Road with the following features:

- Add 2 feet of pavement on both sides of Sunderland Hill Road from the Town Office to the Chiselville Bridge to create 3-foot wide paved shoulders;
- Add a 4-foot wide paved shoulder on the southbound side of Sunderland Hill Road from Dunham Road to the Town Office;
- Add edge lines along the entire length of Sunderland Hill Road and Hill Farm Road; and
- Add “Share the Road” signage on Sunderland Hill Road and Hill Farm Road.

This alternative was presented as an incremental improvement concept. The work could be phased over several years to reduce the financial impact to the Town.

The key destination points on Sunderland Hill Road are the Town Office, the Sunderland Elementary School, the Chiselville Bridge and residential developments located on McKee Road, Maggie’s Run, Dunlap Farm Road, and Bacon Hollow Road. All of these points are located between the Town Office and the Chiselville Bridge. As such, the wide shoulders on both sides of the road are proposed to begin at the Town Office and extend south to the bridge.

The proposed cross section of the road and wide shoulder is shown in Figure 4-2. As previously noted, the Vermont State Design Standards allow for 10-12 foot travel lanes on minor arterial roads. The Vermont Pedestrian and Bicycle Facility Planning and Design Manual indicates that paved shoulders should be at least 3 feet wide to

accommodate bicycles and pedestrians. The proposed cross section for Alternative 3 on Sunderland Hill Road from the Town Office to the Chiselville Bridge would reduce the travel lane width to 10 feet in each direction and add 2 feet of width to create a 3-foot wide shoulder on both sides of the road.

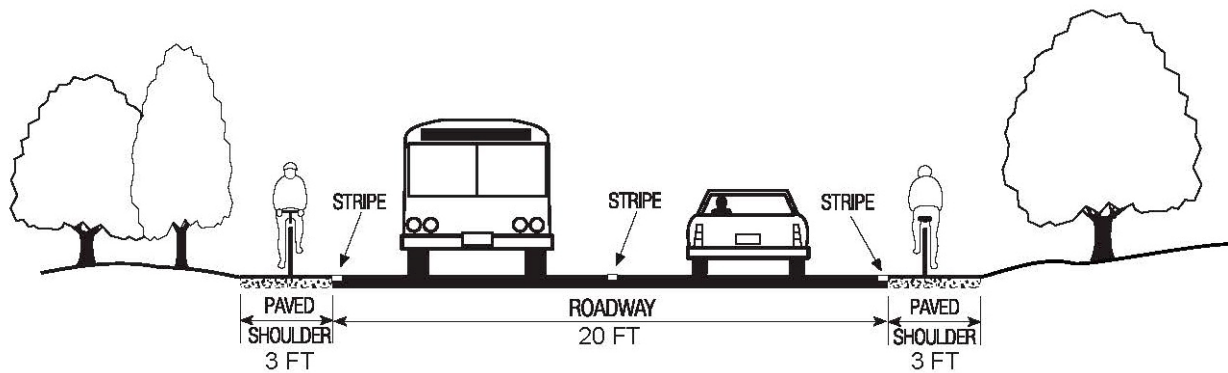


Figure 4-2: Typical Road and Wide Shoulder Cross Section

The additional width would be created by adding 15-inches of gravel or reclaimed asphalt pavement (RAP) over a geotextile fabric for roadbed separation. The additional 2 feet on each side would then be paved. The paving could be completed immediately following the installation of the gravel or it could be completed several years later, possibly as part of a future road resurfacing project.

The edge line would be painted 1 foot from the edge of the pavement to create the 10 foot wide travel lanes on both Sunderland Hill Road and Hill Farm Road. The edge line placement provides 3 feet of space for pedestrians and cyclists along Sunderland Hill Road.

There is a steep hill with curves located on Sunderland Hill Road between Dunham Road and the Town Office. The proposed paved shoulder would be located on the southbound (uphill) side of the road as shown in Figure 4-3. When riding uphill, cyclists tend to travel slowly and weave, which can be dangerous when cyclists are sharing the travel lane with vehicles. The paved shoulder would provide space for cyclists and pedestrians to travel slowly up the hill, while staying out of the travel lane. The paved shoulder would not be marked as a bicycle lane so that pedestrians could also utilize the space. The paved shoulder should be matched on the outside edge with a narrow gravel shoulder to prevent a drop-off along the edge of the pavement.

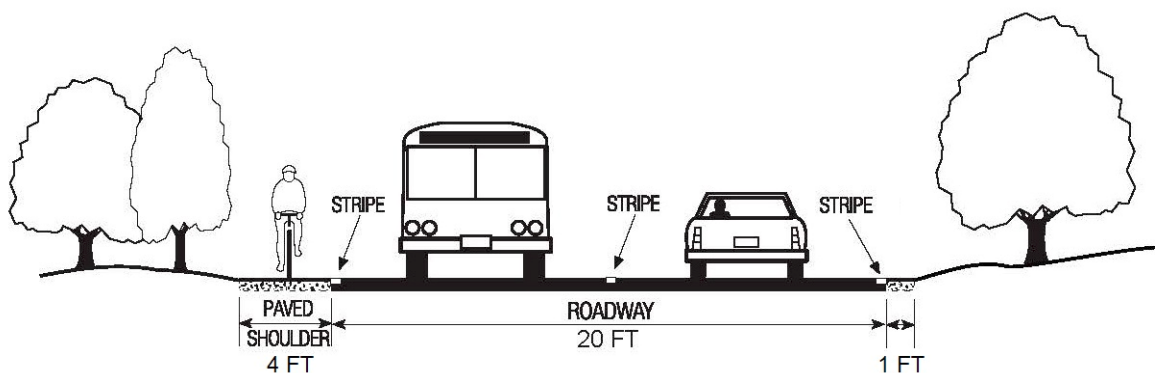


Figure 4-3: Typical Road and Single Paved Shoulder Cross Section

“Share the Road” signage (W11-15) is proposed at each end of the study area on Sunderland Hill Road and Hill Farm Road. The goal of this signage is to make drivers aware that this area is utilized by pedestrians and cyclists. Sunderland Hill Road already has pedestrian warning signs placed in both directions approaching the Sunderland Elementary School.

This alternative would increase the width of the road by 4 feet in the areas noted above. The additional width needed for the wide shoulders may require relocating or modifying driveway culverts and relocating mailboxes and signs. It may also be necessary to extend culverts crossing the road to accommodate the additional width. It is anticipated that most of the existing drainage swales will not be significantly impacted. Some of the utility poles may require relocation, which would need to be coordinated with Green Mountain Power. Permanent easements are not anticipated.

Based on the detailed cost estimate presented later in this section, the estimated 2016 construction cost for Alternative 3 is \$695,000. If the project is not constructed in 2016, the construction cost and total project cost will need to be readjusted for inflation. A detailed cost estimate is provided later in this section.

Permitting Requirements

These types of projects do not typically require significant permitting. The permitting requirements for Alternatives 2 and 3 are shown in Table 4-1. Both projects would require two permits from the Stormwater Program as follows:

- Construction General Permit – required for any project that disturbs more than 1 acre of land, which would occur in both projects.
- Stormwater Discharge Permit – required for any project that adds a minimum of 1 acre of impervious area. Alternative 2 would increase the impervious area by approximately 2.3 acres and the full build-out of Alternative 3 would increase the impervious area by approximately 1.3 acres.

Alternative 2 would also likely require a Stream Alteration Permit and Wetland Permit for the extension of a culvert across Sunderland Hill Road, just north of Dunlap Farm Road.

**TABLE 4-1
PERMITTING REQUIREMENTS
SUNDERLAND SAFE ROADS SCOPING STUDY
SUNDERLAND, VERMONT
JANUARY 29, 2016**

Permit or Approval	Alternative 2 Bike Lanes	Alternative 3 Wide Shoulders
Act 250	No	No
Construction General Permit	Yes	Yes
Fish and Wildlife Division	No	No
Stream Alteration	Yes	No
Stormwater Discharge Permit	Yes	Yes
19 VSA 1111 Access Permit	No	No
Wetland Permit	Yes	No

If Federal funding is utilized, an environmental analysis will be required in accordance with the National Environmental Policy Act (NEPA). It is likely that the project would qualify for a Categorical Exclusion as it is not anticipated to have a significant effect upon natural and cultural resources, nor a significant environmental impact.

Evaluation Matrix

An evaluation matrix was prepared to compare the three alternatives and is presented in Table 4-2. The evaluation matrix includes factors such as critical design elements, purpose and need, cost, permitting, utility impacts and right-of-way impacts.

**TABLE 4-2
EVALUATION MATRIX
SUNDERLAND SAFE ROADS SCOPING STUDY
SUNDERLAND, VERMONT
JANUARY 29, 2016**

Characteristic	Alternative 1 No Build	Alternative 2 Bike Lanes	Alternative 3 Wide Shoulders
Meet Purpose and Need	No	Yes	Yes
Amount of Disturbance	None	Significant	Moderate
Phased Construction	N/A	Yes	Yes
Maintain Rural Character	Yes	Somewhat	Yes
Construction Cost	\$0	\$1,010,000	\$695,000
Utility Relocation or Modification	None	Significant	Moderate
Permanent Easements ¹	None	Likely	No
Permitting	None	4 permits	2 permits

Notes:

1. Right-of-way determinations assume that the right-of-way is centered on the road. In all cases, the bicycle and pedestrian facilities would be located within the right-of-way. Any impacts noted in the table would be for incidental construction such as drainage swale/culvert relocations and utility pole relocations.

Alternatives Presentation

The alternatives described in this section were discussed at the Alternatives Presentation Meeting. The local concerns from the previous meeting were reviewed and each alternative was briefly described. The participants quickly eliminated Alternative 2 due to the larger scope of the project and significantly higher cost. The participants discussed statistics related to safety, volume of pedestrians and bicycles, accident history, and future number of children walking or biking to school.

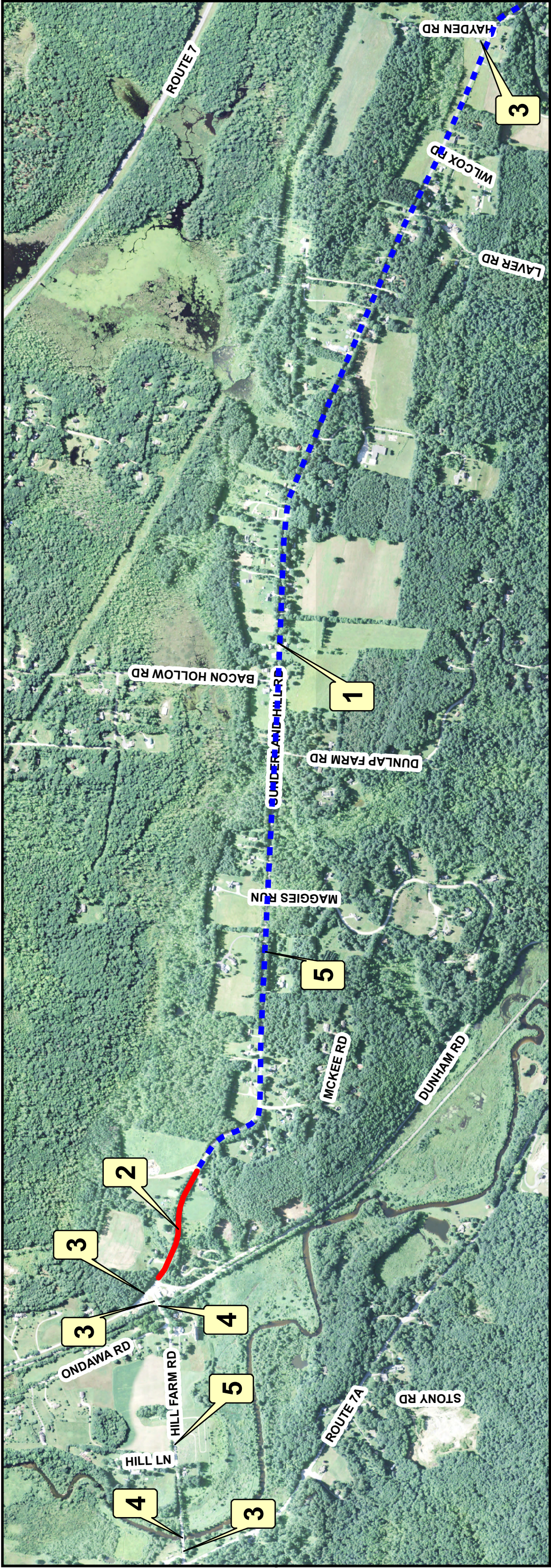
Alternative 3 was further discussed in regard to paving schedule, required depth of gravel subbase and phasing. The depth of the gravel was identified as an important component of the alternative. A follow-up meeting was held with the Town's Highway Foreman, Marc Johnston, to discuss gravel shoulder cross section details. It was decided that the gravel depth would match the Town's road standard requirement of 15 inches; however, road stabilization fabric would also be installed under the gravel. The fabric was requested by the Town based on the possible lack of road subbase along the edges of the existing road.

After the additional discussion on Alternative 3, there was general support for the alternative as a method to improve pedestrian and bicycle safety. There was some concern from participants on how the project would proceed and if a Town Meeting vote would be required. Selectboard member, Mark Hyde, assured the participants that there would be a Town Meeting vote if the project proceeded.

Preferred Alternative

Based on input from the Alternatives Presentation, Alternative 3 – Wide Shoulders was clearly the alternative preferred by all participants at the meeting. Selectboard member Mark Hyde was present at the Alternatives Presentation and indicated that the Selectboard had been updated on the project and will endorse the alternative chosen by the committee. The Sunderland Safe Roads Committee endorsed Alternative 3. The components included in Alternative 3 are shown in Figure 4-4. Photographic simulations of the wide shoulders are shown in Figures 4-5 through 4-8.

FIGURE 4-4
PREFERRED ALTERNATIVE COMPONENTS



PREFERRED ALTERNATIVE COMPONENTS:

1. INSTALL 2' WIDE SHOULDERS ALONG 12,770 LF OF SUNDERLAND HILL ROAD (BOTH SIDES), FROM TOWN OFFICE TO CHISELVILLE BRIDGE.
2. INSTALL 3' WIDE SHOULDER ALONG 1,220 LF OF SUNDERLAND HILL ROAD (SOUTHBOUND SIDE), FROM DUNHAM ROAD TO TOWN OFFICE.
3. INSTALL "SHARE THE ROAD" SIGNAGE.
4. INSTALL "SHARROWS".
5. INSTALL 4" WHITE EDGE LINES ALONG ENTIRE STUDY AREA.

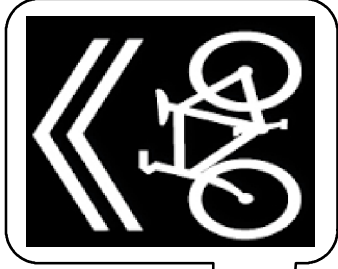




Figure 4-5: Photo Simulation - Paved Shoulders on
Sunderland Hill Road (looking south from Bear Ridge Road)



Figure 4-6: Photo Simulation - Paved Shoulders on
Sunderland Hill Road (looking north from Maggies Run)



Figure 4-7: Photo Simulation - Paved Shoulders on
Sunderland Hill Road (looking south from Mountain View)



Figure 4-8: Photo Simulation - Paved Shoulder on
Sunderland Hill Road (looking north towards Dunham Road)

Alternative 3 was chosen as the preferred alternative for multiple reasons, which are summarized as follows:

1. The wide shoulders minimize disturbance and meet the desire for a smaller scope project.
2. The wide shoulders improve safety by increasing space for pedestrians and bicycles.
3. The public input stressed that the project must be conscientious of cost.

In addition, the wider shoulders will improve safety for children walking or biking to school; however, there would still be a lack of a physical separation between vehicle and pedestrian/bicycle traffic. If the number of children walking or biking to school increases after the wide shoulders are installed, it may be beneficial to consider additional safety measures in specific areas, such as a reduced speed limit during specified hours or a crossing guard.

Design Considerations for the Preferred Alternative

The preferred alternative is summarized above; however, there are some additional design considerations that will need to be evaluated during final design. These design considerations include utility pole relocations, culvert modifications, drainage swale modifications, and ledge rock removal.

Utility Pole Relocations:

In most areas, the utility poles are located several feet off the road and will not require relocation to construct the wide shoulders. However, there are approximately 10 poles that are closer to the existing edge of pavement that will require further evaluation during the design phase. The locations that require further evaluation are as follows:

- Intersection of Hayden Road – two poles
- Between Wilcox Road and Laver Road – 5 poles
- 1315 Sunderland Hill Road – one pole
- Intersection of Dunlap Farm Road – two poles

Culvert and Drainage Swale Modifications:

There are two drainage swales at the southern end of the project on the west side of Sunderland Hill Road that will likely need to be modified or relocated to accommodate the wide shoulder. The first swale is located between house 797 and Laver Road. The second swale is located between houses 887 and 969. These swales both convey water down the hill in a southerly direction. The swales are located close to the road and would need to be reshaped or moved further from the road to accommodate the new shoulder. There are five driveway culverts associated with these swales that would likely require modification or relocation.

In some cases, it may be possible to extend the culverts with bends and short lengths of pipe. In other cases, it may be necessary to remove and reset the culvert further away from the road. The driveway culverts should be reviewed during the design phase to determine how each one should be modified or relocated.

The remainder of the area to receive a new shoulder appears to have sufficient space to accommodate the new shoulder. As the driveway culverts are typically in alignment with the drainage swales, the culverts should be outside of the area impacted by the new shoulders. The culverts crossing Sunderland Hill Road all appear to daylight outside of the area impacted by the new shoulders and therefore should not require any modification.

Ledge Rock Removal:

There are two areas of ledge or boulders along the wooded area north of Laver Road. These ledge outcrops or boulders would need to be removed further into the tree line in order to accommodate the new shoulder. This was discussed with the Sunderland Road Foreman, Marc Johnston, who indicated that the Highway Department was already planning to remove these two areas of ledge/boulders.

Total Project Cost Estimate

The preliminary cost estimate presented in Table 4-3 has been prepared for the preferred alternative as described previously in this section. As shown, the preliminary construction cost estimate for Alternative 3 is \$695,000 in 2016 dollars, which includes a 25% contingency.

**TABLE 4-3:
PRELIMINARY CONSTRUCTION COST ESTIMATE
SUNDERLAND SAFE ROADS SCOPING STUDY
SUNDERLAND, VERMONT
JANUARY 29, 2016**

Item Description	Quantity	Unit	Unit Price	Total Price
Clearing and Grubbing	1	LS	\$ 15,000.00	\$ 15,000.00
Common Excavation	2,580	CY	\$ 20.00	\$ 51,600.00
Channel Excavation	220	CY	\$ 20.00	\$ 4,400.00
Gravel Subbase	170	CY	\$ 30.00	\$ 5,100.00
Gravel Shoulder	2,420	CY	\$ 65.00	\$ 157,300.00
Bituminous Concrete Pavement	1,365	TON	\$ 100.00	\$ 136,500.00
Culvert Modifications	5	EA	\$ 1,000.00	\$ 5,000.00
Geotextile for Roadbed Separator	6,300	SY	\$ 2.00	\$ 12,600.00
Durable 4-inch White Line	33,500	LF	\$ 2.00	\$ 67,000.00
Durable Symbols	4	EA	\$ 95.00	\$ 380.00
Signs	4	EA	\$ 75.00	\$ 300.00
Sign Post (12 ft high)	4	EA	\$ 100.00	\$ 400.00
Remove and Reset Sign	40	EA	\$ 125.00	\$ 5,000.00
Relocate Mailbox (single support)	45	EA	\$ 160.00	\$ 7,200.00
Flaggers	200	MHRS	\$ 30.00	\$ 6,000.00
Traffic Control	1	LS	\$ 10,000.00	\$ 10,000.00
Mob/Demob	1	LS	\$ 72,000.00	\$ 72,000.00
SubTotal Construction Cost				\$ 556,000.00
Contingencies (25%)				\$ 139,000.00
Total Construction Cost				\$ 695,000.00

Notes:

1. Construction costs are preliminary and are not based on detailed plans and specifications. Actual cost may vary substantially from these estimates. Contingencies are based on approximately 25% of the construction cost at the preliminary planning stage.
2. The Engineering News Record Construction Cost Index was 10,133 when the cost estimate was completed in January 2016.
3. Restoration of growth and erosion prevention/sediment control are included in the Mobilization/Demobilization item.
4. The required ledge rock removal is not included in this cost estimate as the Town is already planning to remove the ledge.

Table 4-4 presents the total project costs for the preferred alternative. The total project cost for Alternative 3 is estimated at \$985,000 based on a construction cost of \$695,000 in 2016.

**TABLE 4-4:
PRELIMINARY TOTAL PROJECT COST
SUNDERLAND SAFE ROADS SCOPING STUDY
SUNDERLAND, VERMONT
JANUARY 29, 2016**

DESCRIPTION	TOTAL COST
Construction Cost (2016) with 25% Contingency	\$695,000
Engineering:	
Design Phase Engineering	\$100,000
Construction Phase Engineering	\$100,000
Local Project Management	\$70,000
Legal, Administrative and Fiscal	\$20,000
Total Project Cost	\$985,000

Notes:

1. Construction costs are shown in Table 4-3. The construction cost includes 25% contingency.
2. Engineering costs are estimated at 15% of the construction cost for both the design and construction phases.
3. Local Project Management costs are estimated at 10% of the construction cost.
4. Legal, administrative and fiscal costs are estimated at 3% of the construction cost.

Section 5: Fiscal Implementation

As presented in Section 4, the proposed project consists of incremental and spot improvements including a wide paved shoulder along both sides of Sunderland Hill Road from the Town Office to the Chiselsville Bridge, a wide paved shoulder along the southbound side of Sunderland Hill Road from Dunham Road to the Town Office, and signage and pavement markings throughout the study area. The estimated total project cost for these improvements is \$985,000 based on a 2016 construction cost estimate of \$695,000. The construction costs should be inflated by 3-4% per year to estimate construction costs in the future, with non-construction costs increased accordingly.

Funding Alternatives

The Town of Sunderland does not have the funds to finance the entire improvement project locally as a single project. The options for funding include grants, long-term debt or phasing. The VTrans Bicycle and Pedestrian Program, administered by the VTrans Local Projects section provided funding for this report and is the most likely funding source for design and construction if the Town chooses to pursue grant funding.

The proposed project is an eligible project under the Bicycle and Pedestrian Program. The funding shares are 90% Federal/State and 10% local. However, if a project funded under this program does not proceed to construction, any funds provided for the preliminary and design phases are subject to being paid back by the municipality. Grant applications are accepted annually and are generally due by the last week of July.

The Transportation Alternatives Program, also administered by the Local Projects section, is an option for funding design. As the maximum Federal award under the Transportation Alternatives Program is limited to \$300,000, this is not an option for funding the construction phase for the entire route. The Transportation Alternatives Program has an award range of \$20,000 to \$300,000 and the local match is 20%. A minimum of 50% of the local match must be a cash expenditure, with the remainder of the local match as “in-kind” services; however, an in-kind match is not required and the entire local match may be a cash expenditure.

Phasing Plan

Throughout the project, the committee placed an emphasis on incremental improvements and the desire to phase the improvements over several years. Additionally, there was discussion on locally constructing the improvements. However, during the final public meeting, there were the following concerns regarding locally constructed incremental improvements:

- Availability of the Town’s Highway Department to construct the improvements;
- The cost of local construction versus the cost of a local match; and
- Inconsistent wide shoulders during phased construction (where one phase ended and the next has not yet begun).

Based on the discussion during and after the final public meeting, the implementation plan has shifted from locally constructed incremental improvements over several years to a full scope grant funded project. Since a grant funded project will need to go through the VTrans Local Projects development process, it will be several years before construction commences. Due to the long project development schedule, there was some discussion on installing pavement markings in the near future. A proposed phasing plan is presented in Table 5-1.

TABLE 5-1:
PHASING PLAN
SUNDERLAND SAFE ROADS SCOPING STUDY
SUNDERLAND, VERMONT
JANUARY 29, 2016

Phase	Description	Date
Phase 1	Pavement markings throughout the study area	2016
Phase 2A	Design of improvements	2017-2020
Phase 2B	Construction of improvements	2020

The construction cost estimates and total project costs are presented for each phase of the project in Table 5-2. Phase 1 would not require any engineering, local project management or legal, administrative and fiscal costs.

TABLE 5-2:
TOTAL PROJECT COST BY PHASE
SUNDERLAND SAFE ROADS SCOPING STUDY
SUNDERLAND, VERMONT
JANUARY 29, 2016

DESCRIPTION	PHASE 1 COST ESTIMATE	PHASE 2 COST ESTIMATE
Construction Cost (2016) with 25% Contingency	\$85,000	\$610,000
Engineering:		
Design Phase Engineering	\$0	\$100,000
Construction Phase Engineering	\$0	\$100,000
Local Project Management	\$0	\$70,000
Legal, Administrative and Fiscal	\$0	\$20,000
Total Project Cost	\$85,000	\$900,000

Notes:

1. Construction costs are shown in Table 4-3. The construction cost includes 25% contingency.
2. Construction costs for Phase 1 include the pavement markings throughout the entire study area (edge lines and sharrows).
3. Construction costs for Phase 2 include the wide shoulders.
4. The legal, administrative and fiscal costs should be confirmed by the Town prior to budgeting for this work.

The construction cost estimate for Phase 1 includes approximately \$85,000 for pavement markings (with a 25% contingency). It is likely that the Town will receive a much lower price for pavement markings when combined with the annual line striping

work. The edge lines are included in the construction cost estimate at a price of \$2 per linear foot. According to the Town, the local cost to install a centerline is approximately 9 cents per linear foot. Based on this local pricing, the cost to install edge lines and sharrows would be approximately \$3,400.

Phase 2 includes the remainder of the preferred alternative components. These improvements can be constructed as a single project or phased over 2 or more projects, regardless of the funding source. If the Town chooses to apply for a grant to fund the Phase 2 improvements, it should be taken into consideration that final design could take 3 to 5 years through the VTrans project development schedule. Considering this schedule, it may be beneficial to apply for a grant for the entire project scope. The majority of the costs will come due in the construction phase, which gives the Town a few years to budget for the full amount of the local share. Based on funding under the Bicycle and Pedestrian Program, the local share of the total project cost would be \$90,000, if the Phase 2 improvements were constructed as a single project.

Project Schedule

The proposed project schedule is based on several criteria including the following factors:

- The need for the improvements as defined by local officials.
- The cost of the project to property owners and local approval of the project.
- The priority of improvements as defined by local officials.
- The phasing plan presented in Table 5-1.

Based on these factors, the project schedule shown in Table 5-3 is achievable.

TABLE 5-3:
PROJECT SCHEDULE
SUNDERLAND SAFE ROADS SCOPING STUDY
SUNDERLAND, VERMONT
JANUARY 29, 2016

Project Task	Date
Receive Approval of Scoping Study	February 2016
Town Meeting Approval of Phase 1 Funding	March 2016
Town Meeting Approval of Phase 2 Grant Application	March 2016
Construction of Phase 1	Summer 2016
Submit Phase 2 Grant Application	July 2016
Receive Notice of Grant Award	September 2016
Grant Agreement Executed	December 2016
Procurement for Design Services	January 2017
Design of Phase 2	2017-2020
Construction of Phase 2	2020