MONKTON RIDGE VILLAGE

COMPLETE STREETS

PLANNING & FEASIBILITY STUDY

Town of Monkton, VT

Monkton Ridge Village
COMPLETE STREETS
Planning & Feasibility Study

DRAFT FOR REVIEW
Draft Report: November 2013

***Prepared for**:*
Town of Monkton
280 Monkton Road
Monkton, VT 05473
&
Transportation Advisory Committee
Addison County Regional Planning Commission
14 Seminary Street
Middlebury, VT 05753

Prepared by:
LandWorks
228 Maple Street, Ste. 32
Middlebury, VT 05753

With assistance from:
Resource Systems Group, Inc. (RSG)
180 Battery Street, Ste. 350
Burlington, VT 05401
&
UVM Consulting Archeology Program (UVM CAP)
111 Delehanty Hall
University of Vermont
Burlington, VT 05405

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Table of Contents

Executive Summary 1
1.0 Introduction 3
2.0 Purpose and Need 4
3.0 Project Area/Existing Conditions, Opportunities and Constraints 6
- 3.1 Initial Aerial Photo Analysis 6
- 3.2 Traffic Data 8
- 3.3 Photographs of the Project Area 9
- 3.4 Base map 11
- 3.5 Initial Considerations and Observations Map 12

4.0 Conceptual Alternatives and Proposed Enhancements 13
- 4.1 Overview of Proposed Enhancements 13
- 4.2 Create Gateways to the Village 14
- 4.3 Provide Pedestrian & Bicycle Facilities 15
- 4.4 Address Intersection Geometries 18
- 4.5 Public Transit and Park & Ride 24
- 4.6 Provide Green Space/Address Parking 26
- 4.7 Improve Signage at the Village Approach 26
- 4.8 Access Management at the General Store 27
- 4.9 Additional Traffic Calming Measures 28

5.0 Regional Connectivity 30
6.0 Public Process 32
7.0 Additional Recommendations 36
- 7.1 Street Trees and Vegetation 36
- 7.2 Digital Speed Reader 37

8.0 Right-of-Way (ROW) 39
9.0 Utility Impacts 40
10.0 Natural and Cultural Resources 41
11.0 Phasing 44
12.0 Preliminary Cost Estimates 45
13.0 Appendix
- 13.1. Initial Considerations and Observations Map
- 13.2 Existing Conditions, Issues and Opportunities
- 13.3 Crash Location Map
- 13.4 Conceptual Alternatives
  - a. Gateways
  - b. Road Layout
  - c. Intersections
  - d. Park and Ride
  - e. Town Green / Library
  - f. States Prison Hollow Road Intersection
  - g. Additional Traffic Calming Measure
- 13.5 ARA Assessment (UVM CAP)

Map of Monkton, Beers Atlas 1871

Executive Summary

This report summarizes and presents the key elements of the Monkton Ridge Village Complete Streets Planning and Feasibility Study conducted by LandWorks, Resource Systems Group (RSG), and the University of Vermont Consulting Archeology Program (UVM CAP) in collaboration with the Town of Monkton and the Addison County Regional Planning Commission's Transportation Advisory Committee. The project was funded by a grant awarded through the Vermont Agency of Transportation, Transportation Enhancement Program.

The project was designed to address traffic calming, pedestrian and bicycle mobility, and help plan for a future park-and-ride facility on town-owned property on the west side of Monkton Ridge.

The project was also intended to address roadway geometries, intersection design, and overall traffic safety, including the reduction of traffic speed through the village area, and access management options for key parcels. A key overarching goal for this effort was to consider and propose initiatives and enhancements that would reinforce Monkton Ridge as the central village of the town, and to support and improve economic and cultural vitality as well as the quality of life for the residents of the town center.

This report addresses all of the required elements as set forth in the initial Request for Proposals, and offers a range of design alternatives for the overall streetscape, as well as discrete elements within that streetscape. There are extensive plans and illustrative elements which set forth a range of solutions that the community can consider as it decides how to further improve and enhance Monkton Ridge in response to the present challenges and needs and for the future generations of Monkton residents as well. While there was not a final preferred alternative selected or developed, this document and the accompanying design and engineering recommendations sets forth a number of options which can be selected from at such time that the town takes the next step in village planning and development. In one instance this has occurred insofar as the town did select from these plans a park-and-ride design option to pursue for funding and

implementation. Thus this report, with the community guidance and design and engineering expertise invested in it, provides a blueprint and point of departure for the next phase of this important and timely effort.

In May 2011, Governor Shumlin signed into law Complete Streets legislation saying, "This law will guarantee we're designing roads that work for the future - for older Vermonters, for those who choose to take public transportation, for people who opt to walk to their jobs and errands, and for motorists."

http://governor.vermont.gov/media-complete-streets

1.0 Introduction

This report documents the project process and presents recommendations resulting from the Monkton Ridge Village Complete Streets Planning and Feasibility Study.

The study process included a project kick-off meeting, a community workshop, documentation of existing conditions through field visits and desktop studies, a local concerns meeting, development of draft conceptual alignments, identification of right-of-way issues, utility conflicts and natural and cultural resources, alternatives presentations, development of preliminary cost estimates and a project time line; and, preparation of this report with recommended, preferred improvements.

A Complete Street is defined as ... "a roadway that safely accommodates all travelers, particularly public transit, users, bicyclists, pedestrians (including individuals of all ages and individuals with mobility, sensory, neurological, or hidden disabilities), motorists and freight vehicles, to enable all travelers to use the roadway safely and efficiently."

www.govtrack.us

2.0 Purpose and Need

Purpose and need statements, according to the Vermont Agency of Transportation, provide the foundation for undertaking a project and defining the focus for the work. The "Purpose" portion of the statement defines the goal(s) which the project will attain; and the "Need" portion of the statement, describes the inconsistencies and deficiencies present and why the project goal(s) should be accomplished. The following Purpose and Need statements for the Monkton Ridge Village Complete Streets Planning and Feasibility Study was developed from an analysis of existing conditions, recommendations by local officials, public input and professional expertise:

PURPOSE:

1) Develop pedestrian and bicycle facilities and establish new networks that promote walking and biking within the village that provide opportunities for recreation and that will improve access to town buildings and businesses.

2) Create environments that are more accessible to each other for pedestrians, particularly by developing connections within the Monkton Ridge Village to key destinations such as the Russell Memorial Library, the Town Office, and the Monkton General Store.

3) Develop improvements that expand or enhance connectivity of Monkton Ridge Village to locations along VT Route 116 and surrounding towns.

4) Provide alternatives that will promote traffic calming, reduce vehicular speeds in the village, announce arrival to the village 'gateways', address off-road connections and include recommendations for access management improvements.

5) Create enhancements that can be used to establish Monkton Ridge Village as more of a village environment with improved aesthetic appeal, including an enhanced streetscape and signs that support a variety of user groups.

NEED:

1) Location: Monkton Ridge Village serves as the cultural and municipal center for the entire town and is impacted by a number of constraints and conditions. These include vehicular safety issues within the village itself and around the High Crash Location at the southern gateway, pedestrian and bicycle safety and a lack of infrastructure to support these uses, high traffic volumes stemming from commuters using 116 to travel between Bristol and Hinesburg, access management issues and parking.

2) Town Hall: The Town of Monkton is actively planning for and researching options for a new Town Hall to be constructed on town-owned property on Monkton Road north of the current location. The new town hall would be a resource and a source of pride for the community that would serve to create more of a village feel and a destination within Monkton Ridge.

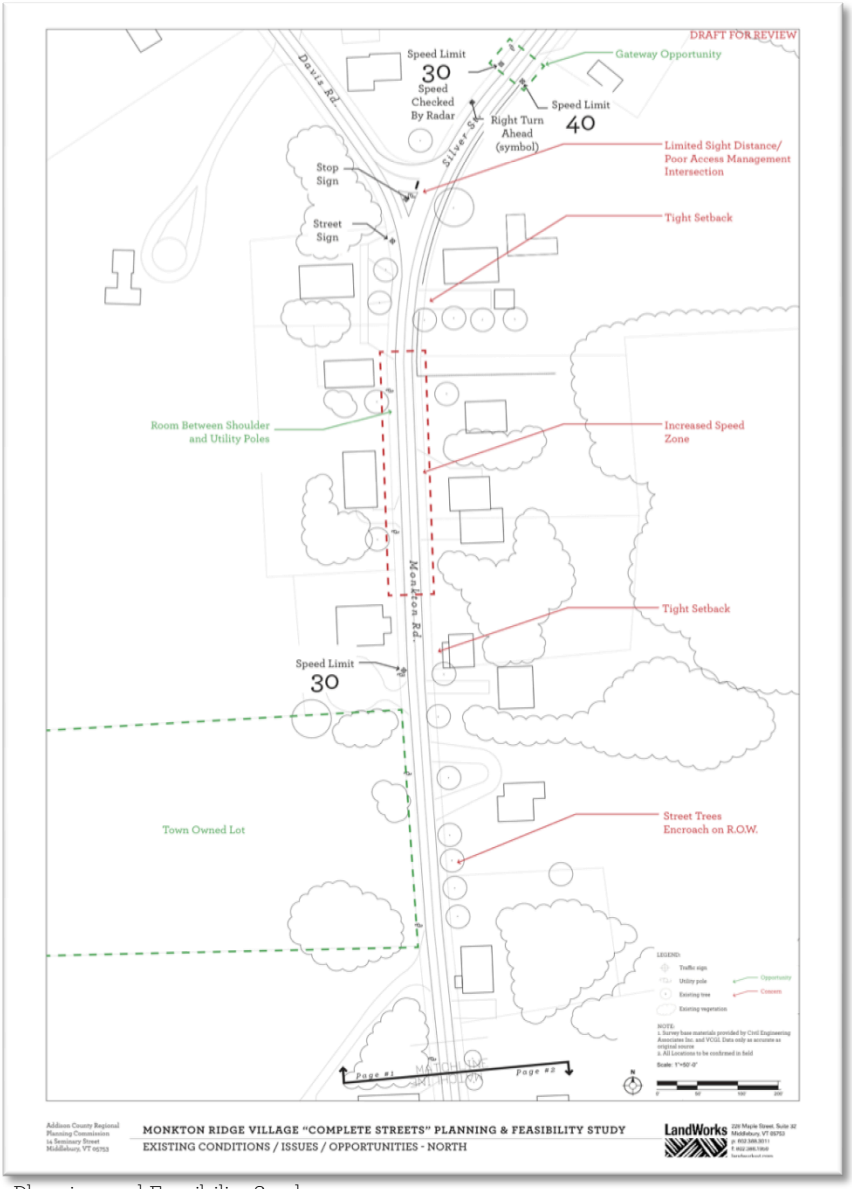
3) Park & Ride: A new park and ride facility is being considered to be built adjacent to the parcel where the new Town Hall would be constructed. This location would attract commuters to the Monkton Ridge Village, would improve connectivity with the surrounding communities, provide options for alternative transportation and, potentially, attract new business to the area.

3.0 Project Area/Existing Conditions, Opportunities and Constraints

3.1 Existing Conditions

LandWorks and RSG have documented existing conditions in the map entitled "Existing Conditions, Issues and Opportunities" and supplemented that with some additional observations developed at the outset of the project including the photographic inventory (selections of which are incorporated into this narrative) and the "Initial Considerations and Observations Map" set forth in this section of the report.

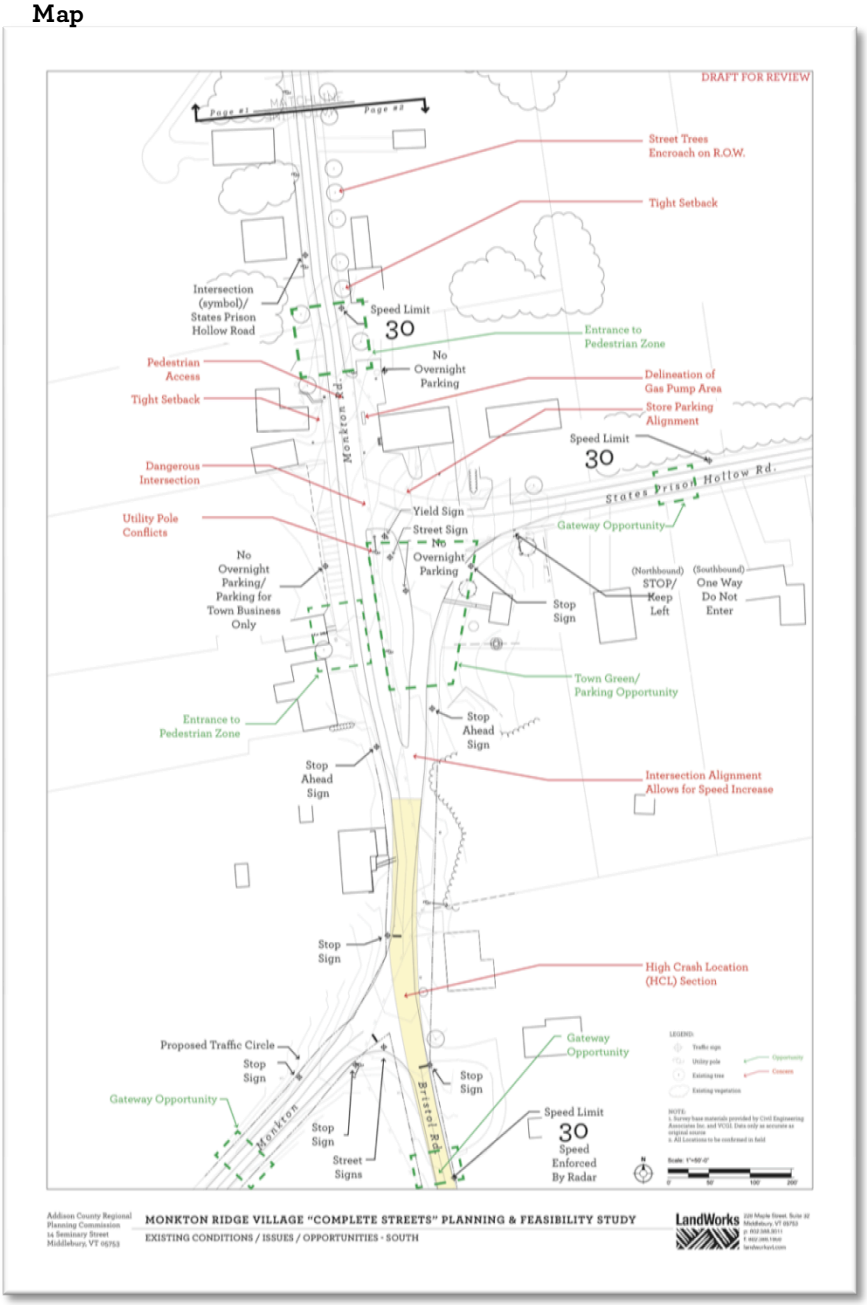
Existing Conditions, Issues and Opportunities, (North)



It is also important to note that this project has reviewed and referenced, as appropriate, earlier and existing studies undertaken for the town, and key takeaways from those efforts include:

- Still the need to slow traffic in Monkton
- Three key intersections
- Curb cuts and access issues
- Reinforce Monkton Ridge as a Village
- Consider connections to Monkton Ridge Central School.

Existing Conditions, Issues and Opportunities, (South) Map



3.2 Traffic Data

The current existing traffic data applies to the roads in the study area:

Monkton Road to intersection with Bristol Road:
2007 Average Daily Traffic: 2,500 vehicles per day
2011 Average Daily Traffic: 1,900 vehicles per day

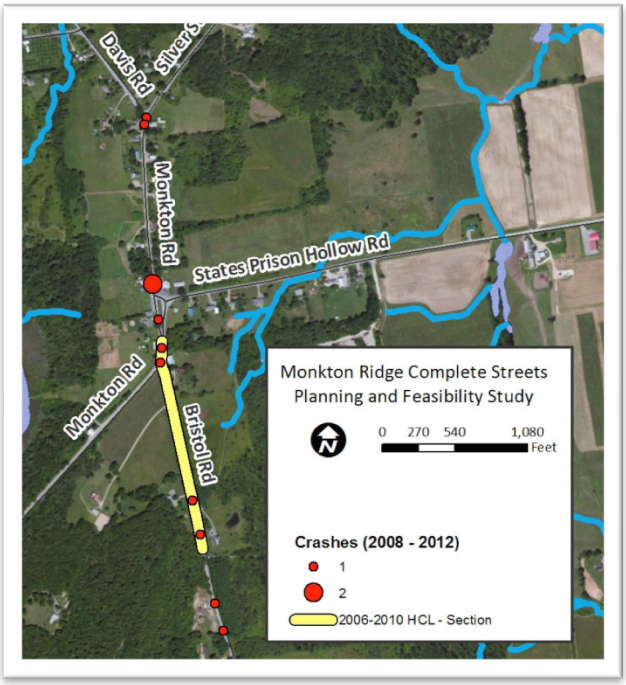
Monkton Road between Bristol/Monkton Road intersection and Silver St.:
2007 Average Daily Traffic: 5,000 vehicles per day
2011 Average Daily Traffic: 4,700 vehicles per day

Silver Street:
2007 Average Daily Traffic: 4,100 vehicles per day
2011 Average Daily Traffic: 3,800 vehicles per day

The 85-percentile speed on Silver Street was 41 mph northbound and 39 mph southbound.

Additionally, a High Crash Location (HCL) has been identified by VTrans along a short portion of Bristol Road south of the Monkton Rd./Bristol Rd. intersection, along with the stretch of Monkton Rd. from that intersection to the general store location just north of the State Prison Hollow Road.

Collectively, these numbers and conditions underline the need for improvements and alterations to the road, intersections and the general store access configurations.



Segment of Crash Location Map. (See Appendix 13.3 for full map)

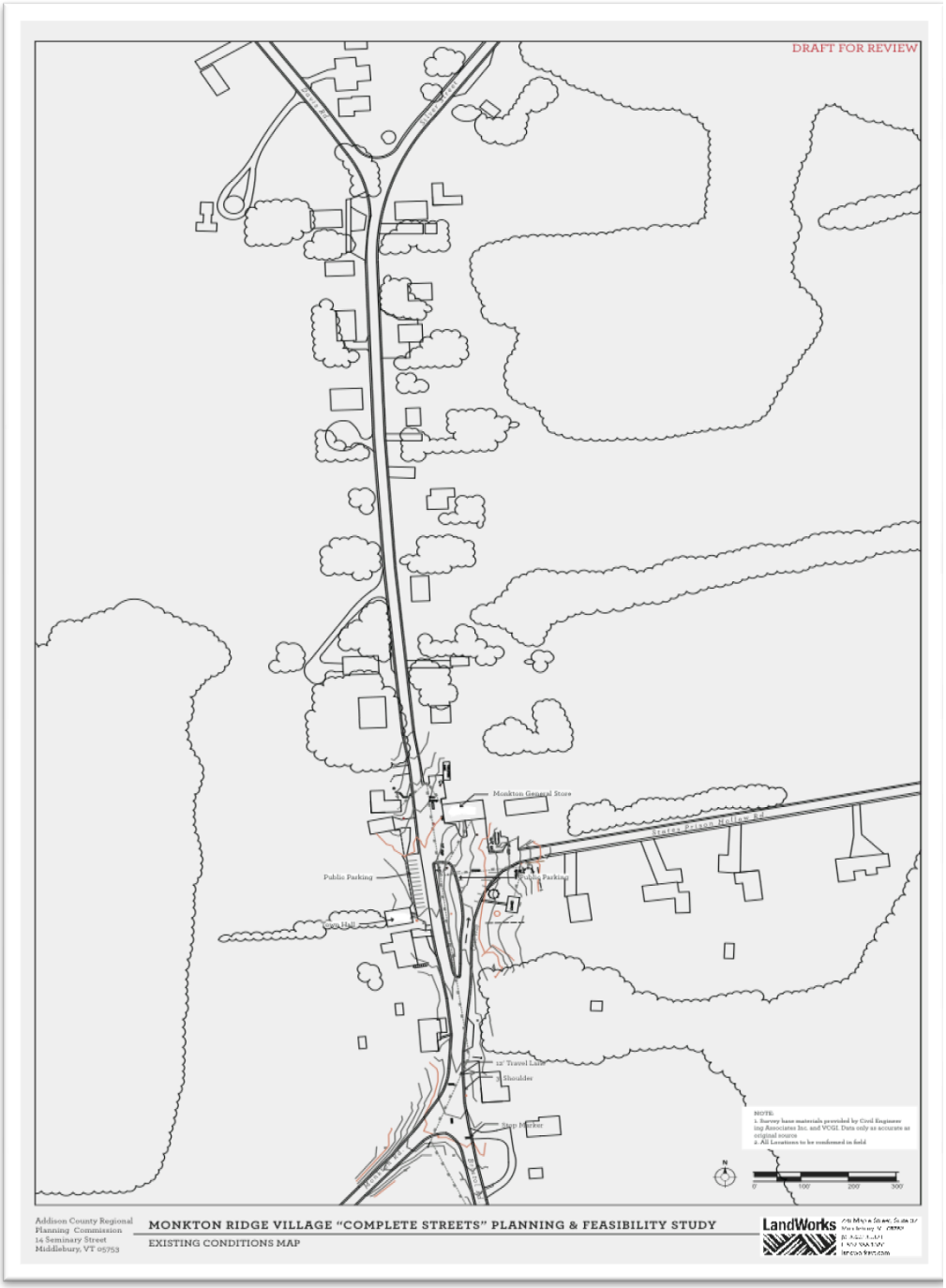
3.3 Photographs of the Project Area

The following two pages of photographs provide documentation of existing conditions as of 2013.

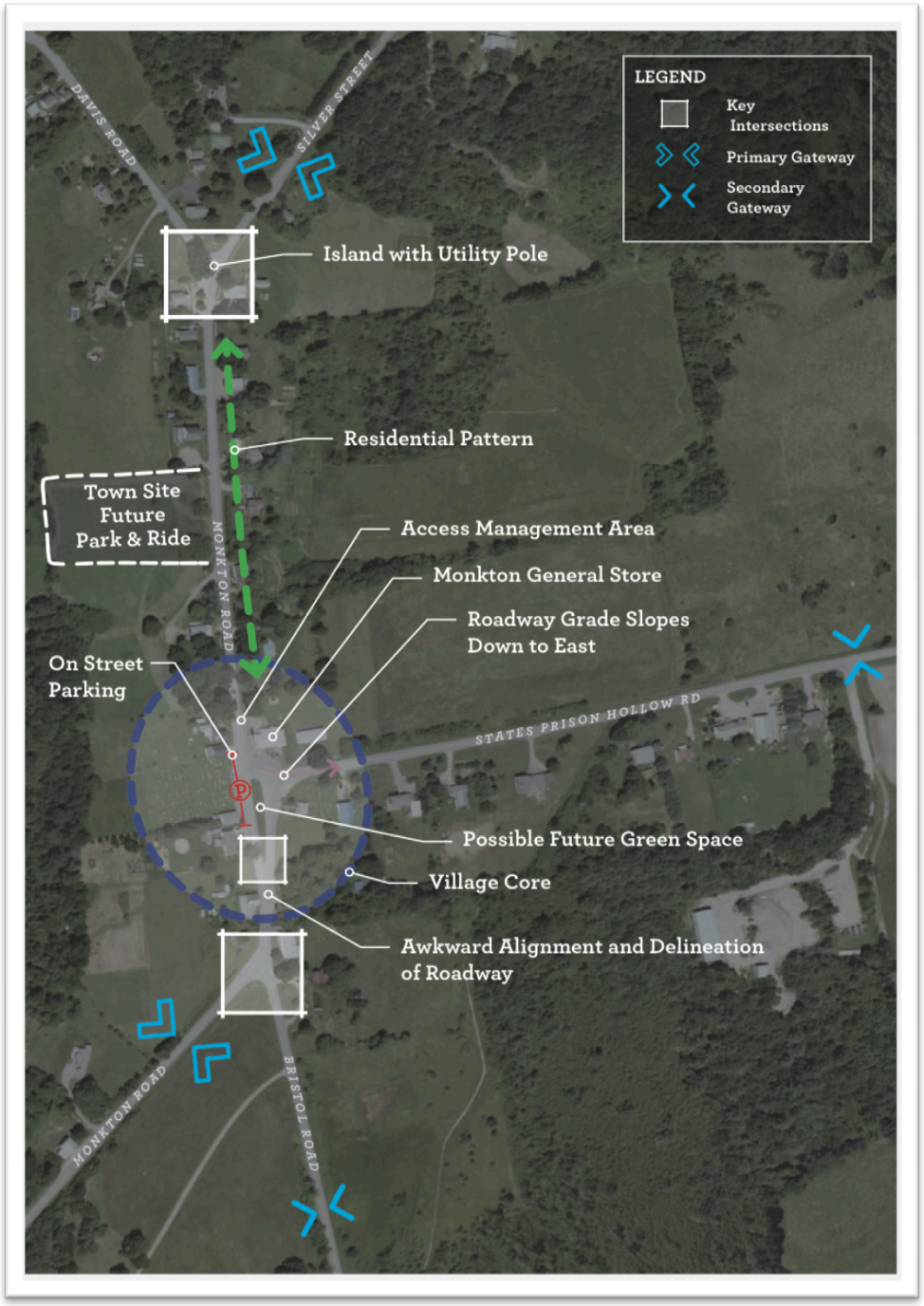
1. Southern approach on Monkton Road from School/Boro area
2. Monkton Road and States Prison Hollow Road Triangle
3. Current parking along route
4. Monkton Road looking north across the street from Monkton General Store
5. Intersection of Monkton Road, Silver Street and Davis Road looking south
6. Gas Pump Area Monkton General Store
7. Intersection of Monkton Road, Silver Street and Davis Road looking north
8. Open space along West side of Monkton Road
9. Monkton General Store viewed from current public parking
10. Intersection of Monkton Road and Bristol Road looking south

11. Southern approach on Monkton Road from School/Boro area
12. Monkton Road and States Prison Hollow Road Triangle
13. Current parking along route
14. Monkton Road looking north across the street from Monkton General Store
15. Intersection of Monkton Road, Silver Street and Davis Road looking south
16. Gas Pump Area Monkton General Store
17. Intersection of Monkton Road, Silver Street and Davis Road looking north
18. Open space along West side of Monkton Road

3.4 Base map


DRAFT FOR REVIEW
Monkton General Store
Public Parking
Public Parking
Shoulder
Addison County Regional Planning Commission
14 Seminary Street
Middlebury, VT 05753
MONKTON RIDGE VILLAGE "COMPLETE STREETS" PLANNING & FEASIBILITY STUDY
EXISTING CONDITIONS MAP
LandWorks

3.5 Initial Considerations and Observations Map



4.0 Conceptual Alternatives and Proposed Enhancements

4.1 Overview of Proposed Enhancements

The recommendations set forth in this planning and feasibility study for the Monkton Ridge Village project area are designed to fulfill the Complete Streets initiative while at the same time addressing the related elements of the Purpose and Need for this study. Natural and physical constraints, available rights-of-way, and potential impacts to surrounding properties were also considered in the development of the alternatives. *The Vermont Pedestrian and Bicycle Facility Planning and Design Manual* and *the AASHTO Design Guide for the Development of Bicycle Facilities and Vermont State Standards* were also reviewed to ensure compliance.

The preferred conceptual plans and cross sections developed as part of this project represent feasible options that can be implemented effectively without altering the notable character of Monkton Ridge. Plans were developed to express two options for each concept.

- Option 1 provides design concepts that reflect the current character and conditions of Monkton Ridge. This option sets forth proposed improvements that are more modest and less costly than Option 2.
- Option 2 provides design concepts that are more extensive and employ a wider range of current traffic calming methods, with the intent to also maintain the rural village character

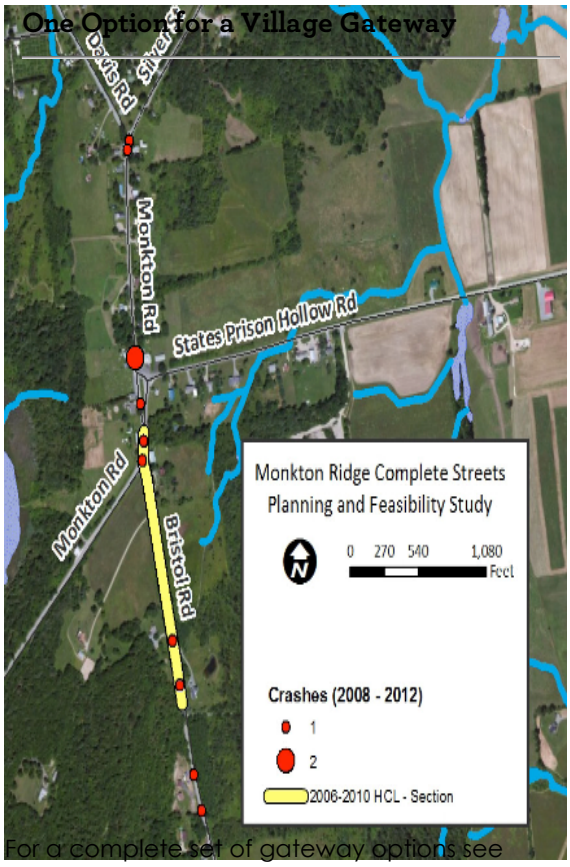
Specific project elements are identified and described in the sections that follow.

4.2 Create Gateways to the Village

One good definition of "gateway" is: "[A]n entrance corridor that heralds the approach of a new landscape and defines the arrival point as a destination. The goal of gateway planning is to arrange this landscape so that it rewards the viewer with a sense of arrival and a positive image of the place." *From Michael Barrett, "Planning Basics for Gateway Design," Zoning News (December 1994)*

Noted Architect Christopher Alexander, in his landmark book *A Pattern Language,* addressed the notion of gateways in this manner:

"Any part of a town - large or small - which is to be identified by its inhabitants as a precinct of some kind, will be reinforced, helped in its distinctness, marked and made more vivid, if the paths which enter it are marked by gateways where they cross the boundary."



For a complete set of gateway options see Appendix 13.4.a

Gateway areas for Monkton Ridge would signal that you are entering a village area and are consistent with the clear directive from the community to help the village look, feel and function more like a village. Three primary gateways were identified as part of the public process:

1). The approach from the west along the Monkton Road.

2) The approach from the south along Bristol Road.

3) The approach from the north along Silver Street.

A secondary gateway would be the approach from State Prison Hollow Road but this gateway is internal to the town, as it does not typically serve commuter or commercial traffic from out of town.

Several components are proposed for the Gateways, including a modified "splitter island" in the center of the roadway, a village entry

sign, posts or fencing, and where, and if appropriate street tree or roadside vegetation plantings.

4.3 Provide Pedestrian and Bicycle Facilities

Addressing pedestrian and vehicular safety go hand and hand. Two road layout options were developed for a portion of Monkton Road starting with just beyond the intersection of Silver Street, Monkton Road and Davis Road in the north spanning to just beyond the intersection of Monkton Road and Bristol Road in the south. This portion of the road was a focus for the project because it was determined through on-site analysis, a review of past planning and traffic reports, as well as from comments from community members during the Local Concern meeting that this area that could benefit from a Complete Streets approach. The Road Layout options below are included in Appendix 13.4.b.:

Road Layout Option 1

1) Option 1: Narrowing (the vehicular travel lanes) slightly and adding shoulder width so as to have 11' travel lanes and 3' shoulders.
2) Option 2 uses the same configuration as Option 1 with the addition of a 5' sidewalk and granite curb along the west side of the road surface.

Both of these options can be accomplished within the 28' of the ROW (as currently used) and within the existing 50' ROW available along Monkton Ridge. While 4' minimum shoulder widths are required for a designated bicycle lane, it is accepted that 3' wide shoulders are sufficient for local bicycle use.

Option 1: Lane and Shoulder Realignment

This upgrade includes the reestablishment of a consistent 28' width paved road surface throughout the designated portion of Monkton Road. Maintaining a consistent road width and distinct edge is desirable and does not alter village character. By using the width of the current paved surface (12' lane; 2' shoulders - total surface width of 28') and reallocating the amount of space in each lane, vehicular speed can be potentially reduced through the village. The second feature proposed is to reduce the travel lane from the current 12' lane width down to the minimum suggested for this type of road, which is 11'. Constricting the travel lane down 1' beginning at the gateways will encourage vehicles to slow down and respect the appropriate speed for the village. The combination of these two simple changes allows for the implementation of the final design feature: a full 3' paved shoulder on each side of the road. A consistent, uninterrupted 3' shoulder provides a reasonable travel route for bicycles and can accommodate pedestrians.

Thus, expanding the shoulder surface width to 3' encourages alternative modes of transportation to be used through the study area. These proposed changes will be consistent with village character.

Road Layout Option 2

Options for Roadway Redesign

Top: Lane and Shoulder Realignment
Bottom: 5' Sidewalk

Option 2: 5' Sidewalk

This upgrade includes all of the components of Option 1 and adds a 5' sidewalk on the west side of Monkton Road. A sidewalk extending approximately 1,075' from the Monkton Friends Methodist Church to the current Town Hall would add to the village aesthetic and provide for and promote safe and efficient pedestrian movement. Located in between the utility poles and road surface within the existing right-of-way, this alignment of the sidewalk will minimize intrusion onto adjacent residential properties and their front yards. This design highlights the village core as a pedestrian area and allows for designated crossing areas that provide appropriate connectivity from one side of the street to the next.

4.4 Address Intersection Geometries

A critical component of traffic safety is the effect that the functional attributes of any intersection have on turning movements and motorist behaviors. RSG, in association with LandWorks has analyzed and proposed design alternatives for 3 intersections:

- Monkton Road / Bristol Road Intersection
- Monkton Road / States Prison Hollow Road Intersection
- Monkton Road / Silver Street / Davis Road Intersection

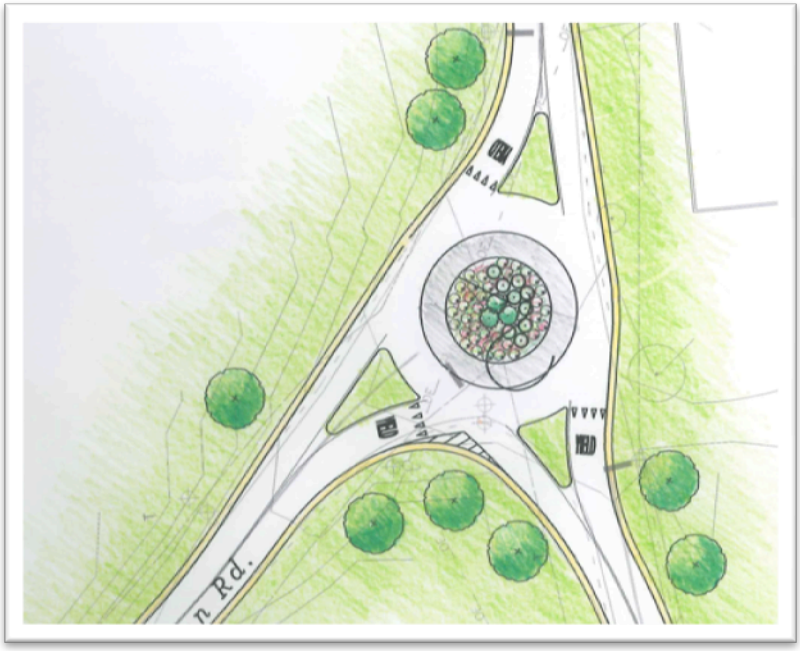
Monkton Road / Bristol Road Intersection

The Monkton/Bristol Road intersection is currently a "three-legged" skewed "T" intersection. The north–south axis of the intersection consists of Monkton Road and Bristol Road. The southwestern "leg" of the intersection is Monkton Road, approaching the intersection at approximately a 55-degree angle. In 2007, the intersection was converted to an all way stop control with stop signs at each approach.

Past intersection controls stopped only the northeast bound vehicles along Monkton Road allowing for uncontrolled, higher speed southbound right turns and through movements. This operating characteristic required a large paved area on the northwest quadrant of the intersection. Additionally, the skewed intersection geometry leads to an acute northeast to southbound right turn vehicle movement, also requiring substantial pavement for trailer off-tracking.

The resulting intersection consists of large expanses of pavement, poor approach angles, long distances through the

Proposed Roundabout



Rendering of proposed intersection upgrade at Monkton Road/Bristol Road. See appendix 13.4.c for complete set of intersection plans.

intersection, and considerable crossing distances for bicyclists and pedestrians. While the topography is generally flat, the skewed northeast-bound Monkton Road intersection approach reduces the sight distance. The long distance between stop bars, approximately 110-feet between the southbound Monkton Road and northbound Bristol Road approaches, increases the exposure of vehicles, bicycles and pedestrians within the intersection. Two alternatives have been developed to address these issues.

Realigned "T" Intersection

This alternative realigns the northeast-bound Monkton Road approach to the intersection. Prior to the intersection, a horizontal curve directs vehicles to approach the Bristol Road intersection at a 90-degree angle directly across from a private drive. This alternative realizes the following improvements:

- Intersection crossing distances across the northeast-bound approach of Monkton Road are reduced from 110-feet to 45-feet.
- Intersection skew is removed.
- Intersection spacing between the Monkton Road / States Prison Hollow Road intersection is increased from 650-feet to 775-feet.
- Intersection is aligned with private drive, reducing headlight glare into residence and reducing the number of conflict points.

Intersection Option

Monkton Road / Bristol Road "T".See Appendix 13.4.c for complete set of options.

The improvements require significant right-of-way (ROW) to the southwest of the existing intersection. The improvements may potentially impact a utility pole, existing pole anchoring, and an underground communication conduit.

Roundabout

This alternative proposes removing the stop intersection control and constructing a roundabout at the intersection. This alternative includes:

- Removes the effects of the skewed intersection.
- Reduces intersection conflict points for vehicles.
- Reduces pedestrian crossing distance to one lane at a time, approximately 16-feet.
- Provides a gateway enhancement opportunity.

This alternative has several issues associated with it, including:

- The northern driveway access to the property east of the intersection may need to be removed.
- Curbing will likely be required on the central and splitter islands, and potentially on the approaches. The new curbing may necessitate expanded closed drainage systems.
- Sidewalks and bike lanes are not provided and may be needed through the intersection.
- Impacts to a utility pole, anchoring, and underground conduits are likely.
- ROW impacts can be expected on all approaches to the intersection.

Monkton Road / States Prison Hollow Road Intersection

The Monkton Road/States Prison Hollow Road intersection is a three-legged "T" intersection consisting of Monkton Road on the north-south axis and a westbound approach from States Prison Hollow Road. The States Prison Hollow Road intersection is stop controlled and the Monkton Road intersection is uncontrolled on both approaches. The intersection curves to the north as States Prison Hollow Road approaches Monkton Road. The topography drops off to the east at an approximately 7% grade along States Prison Hollow Road.

The southeast quadrant of the intersection consists of a one-way northbound parking area for the Town Library. The parking area intersection consists of a large, nearly 200-foot opening on the south side of States Prison Hollow Road. To discourage cut-through traffic, the parking area is signed for one-way traffic and includes a type-III barricade to narrow the paved area. Several parking spaces are striped in front of the Town Library and along the one-way access road.

On the north side of the intersection is the Monkton General Store. The parking area for the Monkton General Store is accessed by a continuous, nearly 300-foot curb cut along the northeast quadrant of the intersection. Within this curb cut is a gas pump offset approximately 14-feet from the Monkton Road edge of travel way.

On the west side of the intersection is the Monkton Town Hall, several residences, and a cemetery. There are 13 perpendicular parking spaces in front of the Town Hall extending north to the Monkton

Road/States Prison Hollow Road intersection. Based on the surrounding land use, available parking spaces, and potential for a park and ride, considerable pedestrian traffic can be anticipated in this area.

One set of improvements was developed to address these issues. The horizontal curve as States Prison Hollow Road approaches Monkton Road was removed, reducing the skew of the intersection and pulling the roadway south away from the Monkton General Store. The space made available from this shift may allow for a redevelopment of the driveway access points to the Monkton General Store, particularly adjacent to the intersection. This realignment of the States Prison Hollow Road approach may require the relocation of a utility pole south of the existing intersection, and any modifications to the Monkton General Store parking area will require close coordination and potentially easements from the owners of the store.

Ideally, the radii of both sides of the State Prison Hollow Road intersection with Monkton Road need to be sufficient to accommodate the town fire trucks and this will affect both the parking area to the south and the area available for parking at the General Store.

Additionally, and if feasible, the vertical alignment of State Prison Hollow Road should be leveled at the intersection to address traction issues when the road is icy in winter. Currently there is a Yield sign is in this location to acknowledge the difficulty that trucks have at this intersection when approaching from the east.

Revised access points are also proposed for the parking areas at the Town Hall and Library. The intention of these revised access points is to delineate specific locations. These access management enhancements will likely require curbing and associated drainage infrastructure to define the drive entrances.

The next steps for addressing improvements at this intersection would be:

1) Review with all affected property owners;
2) Conduct more detailed grading, drainage and alignment engineering;

3) Develop cost estimates for a final refined and preferred version; and
4) Identify funding and implementation methods.

Monkton Road / Silver Street / Davis Road Intersection

The Monkton Road/Silver Street/Davis Road intersection is located on the northern edge of the Monkton Ridge settlement. The southern Monkton Road and northeastern Silver Street approach act as the primary through route with Davis Road intersecting in a horizontal curve from the northwest, thereby forming a 'Y' intersection. Davis Road splits into two segments near the approach to the intersection, with one segment heading towards Silver Street to the north and the other directed toward Monkton Road and points south. Both segments are stop controlled at the intersection, while the Silver Street and Monkton Road approaches are both uncontrolled.

Due to an approximately 4% down-gradient vertical curve north of the intersection along Silver Street, sight distance from the Davis Road approach is limited to the north. Vehicle speeds tend to be increasing as travelers head north exiting the Monkton Ridge settlement, and travelers from the north are entering the reduced speed zone of 35 mph in the Ridge from 40 mph along Silver Street.

The alignment of Davis Road with Monkton Road leads to an acute intersection angle of 35-degrees. This angle requires that a vehicle traveling along Davis Road heading southbound to Monkton Road must look hard left over their shoulder to view southbound traffic from Silver Street; this action results in less opportunity for visibility to pedestrians walking north, crossing Davis Road along Monkton Road. Additionally, the area where Davis Road splits is uncontrolled resulting in potential conflict areas from crossing traffic.
Similar to the Monkton Road / Bristol Road intersection, two alternatives have been developed to address these issues, including a realigned "T" intersection and a roundabout.

Realigned "T" Intersection

The realigned "T" intersection alternative eliminates the southbound Davis Road approach to Monkton Road and redefines the curve approaching the intersection, effectively consolidating the two approaches from Davis Road into one. This one intersection is designed to be perpendicular to the existing Monkton Road / Silver

Street curve, removing the 35-degree acute angle approach. As one intersection (as opposed to three in the existing condition), the number of vehicle / pedestrian / bicycle conflict points and areas has been considerably decreased.

This alternative will likely impact the utility pole in the existing central island, adjacent pole anchoring, and underground communication conduits. If warranted based on traffic volume or neighborhood characteristics, this realigned intersection may be converted to all-way stop control. However, a change in the control devices is not recommended solely for traffic calming purposes.

Roundabout

This alternative proposes constructing a roundabout at the intersection. The roundabout would eliminate the skewed Davis Road to Monkton Road approach. The yield control into the roundabout would assign right-of-way for all vehicles entering the intersection, improving the ability of vehicles to enter the intersection from Davis Road. The limited sight distance along southbound Silver Street would require advance warning signs to notify motorists of the upcoming intersection prior to the Ridge. These warning signs should be coordinated with any neighborhood gateway enhancements.

As a the existing Monkton Road and Silver Street approaches are uncontrolled, the application of a roundabout would introduce new control devices to the intersection and impart additional delay to motorists along the corridor. This delay would likely reduce vehicle speeds into the Ridge neighborhood. Additionally, the new control devices will likely introduce speed changes at the approach to the roundabout, which may increase the likelihood of rear-end type collisions at this location.

The roundabout alternative will likely require curbing along the splitter islands and may require drainage infrastructure. Similar to the realigned "T" alternative, a utility pole, anchors, and underground conduit will likely be impacted.

Roundabout Option

Silver Street, Davis Street, Monkton Road intersection.

4.5 Encourage Public Transit and Reduce Overall Traffic through a Park and Ride Facility

The public workshop yielded distinct support for exploring a permanent location for a Park & Ride facility in Monkton as well as a desire to see a public transit commuter route established - perhaps serving traffic and commuters from both Bristol and Vergennes on a route following Silver Street to points north that would connect with other routes and busses in Chittenden County and beyond (i.e. Waterbury/Montpelier). Based on conversations with Jim Moulton, Executive Director of Addison County Transit Resources (ACTR), a possible route through Monkton has been discussed and will be subject to further study and analysis as part of ACTR's strategic planning to be conducted in 2014.

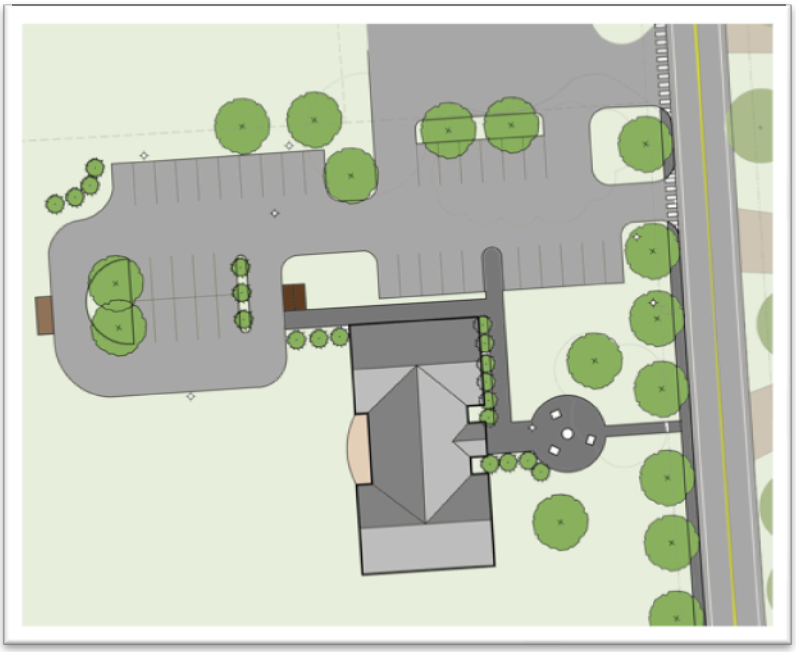
A Park & Ride facility would be desirable with or without a transit connection as it would allow for and support car-pooling/ride sharing, a trend that is gaining momentum in the Champlain Valley and Central Vermont.

Two Park & Ride sites were identified (along with a de facto location that now exists at the Town Library site): the town owned land on Silver Street and the Monkton Elementary School. An analysis of the Monkton School site yielded several issues, which indicated this site, was not as viable as a Monkton Ridge location. These included but were not limited to: 1) the location at the school would not capture and be convenient to the commuting public south, north and east of Monkton Ridge; 2) there could be safety and security issues associated with such a facility at an elementary school site; and 3) the site would not be as centrally located if and when public transit is established in Monkton.

The primary site explored for a future Park & Ride is the town owned property on the west side of Silver Street in Monkton Ridge Village. Space is adequate and the location would well serve the commuting public. Several options have been developed for this site, including Option 1 which would be a facility developed without the integration of a future town office/library complex. This option would accommodate 20 parking spaces with room for expansion as well as turning radii for a full size transit bus. Option 2 anticipates a future

town office complex and connects to the primary parking area for the complex, based on a 2012 design developed by NBF Architects and Naylor & Breen Builders. Option 2 also has an area to accommodate a shelter and a full size bus turnaround. A variation on this option would be to build the parking area for the future town offices and utilize that initially as a Park & Ride, with its own entrance from Silver Street. When the town's offices are built, a new facility for Park & Ride would then be developed as envisioned in Option 2.

Town Green/Library Option 2



Lastly, as part of this study, LandWorks and RSG developed an option for a smaller Park & Ride apart from the location of the proposed Town Hall. This option is for a smaller facility at the current Russell Memorial Library site and is proposed in conjunction with a new Town Green (see Section 4.7). This design, as set forth in Option 2 "Town Green/Library" would incorporate a larger green space and improved geometries for the vehicular access and egress to the site. A bus shelter, if and when public transit becomes available, is also shown in this option.

For the Park & Ride Project it is anticipated that the following elements will be included/addressed in the site development and construction process:

- Gravel surface with suitable sub-base and/or fabric for lot establishment and stabilization. A surface finish of gravel fines is proposed, with asphalt as an alternate.
- Perimeter drainage swales to ensure positive drainage and to avoid ponding on or saturation of parking surface.
- Curb stops, if budget supports the cost, to delineate spaces, with space markings, if the asphalt alternate is selected.

- Lot identification sign and sign(s) to denote accessible parking areas.
- LED Cut-off area light to illuminate lot entry from Silver Street.
- Landscaping to provide shade and screening as necessary.

Design and engineering will be straightforward and will/may include:

- Layout and cross setional design for the lot; including any necessary drainage;
- Lighting specification/connection;
- Landscaping locations and specifications; and
- Addressing any permit requirements as necessary.

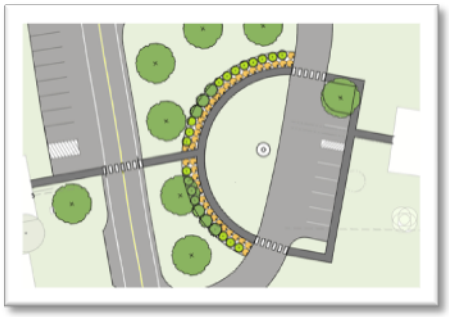
4.6 Provide Green Space to Enhance the Village Environment and Address Parking

There are two proposed options for a reorganization of the paved area immediately in front of the Town Library will provide a number of desirable benefits including:

1. Creating more of a village character on the Ridge by adding green space that can support some modest town and resident uses for outdoor activities and events;
2. Reducing traffic and turning movements that currently exist in and out of this area, which is mostly paved; and
3. Incorporating street trees and lighting to aid in traffic calming along Monkton Road.

Additional enhancement plans can be found in the plan set for this study in Appendix 13.4.e.

Town Green/Library Option 1



Design concept for an enhanced green area in front of the library.

4.7 Improve Signage at the Village Approach areas and along Monkton Ridge

Signing is revisited within the parameters of the Manual on Uniform Traffic Control Devices (MUTCD) to provide sufficient information and guidance where necessary, and to eliminate unnecessary signage. There is not currently a proliferation of signage along Monkton Road, Bristol Road and Silver Street, but some additional signage may facilitate traffic calming and speed reduction in the village.

For example, a "Share the Road" sign (for bicycles and vehicles) may be desirable even before wider shoulder areas are delineated. Pedestrian symbol signs may also be desirable to add either before or at the identified gateway areas or just beyond the Monkton/Bristol intersections on the northbound side, and the just before or beyond the Davis Road intersection.

Signage decisions will need to be made in coordination with any improvements to the road surface and intersections. These two must work together and be part of a larger traffic calming system that all works in tandem.

4.8 Access Management at the General Store

The Monkton General Store is an important and valued business on the Ridge. Access and parking at this site is challenging due to its limited space.,location of the gas pumps and proximity to the road. As a result, the means to improve access safety and parking options are limited and also dependent on the re- alignment of State Prison Hollow Road. It would be desirable to provide for a very small island at the corner so as to eliminate the continuous curb cut at this location, but again, this would have to happen in concert with redefining the travel and turning area for the right-hand turn off of State Prison Hollow Road. In addition, better delineation of parking areas around the store would also potentially improve the circulation and efficient use of the General Store site.

A redesign option for this area is included as part of the plan set for this study.

4.9 Additional Traffic Calming Measures

A number of additional traffic calming initiatives can be considered for Monkton Ridge. Splitter islands are an example of an in-the-road measure to reduce travel speeds as a vehicle approaches a more settled area where speed limits are reduced. LED speed readers also influence motorist behavior by alerting the driver to the vehicle speeds that are over the posted limit. Mid-block calming features can also range from simple plantings in or at the edge of the Right-of-Way to cut-off street lighting fixtures. Removable "Pedestrian Crossing" signs and textured or raised "speed tables" are other options. These type of design elements are all aimed at reminding drivers through visual and physical cues that they are traveling through a village. These elements encourage slower speeds and raise awareness that pedestrians or bicycles may be present.

Lighting provides night-time illumination in a densely settled residential area which in turn requires attention to road conditions and translates into safer driving. Two areas of street lighting are proposed along Monkton Ridge to achieve this effect.

Speed tables were also considered but have not gained much in the way of local support insofar as they can be an annoyance to local residents. Plowing also becomes a concern. For additional information on LED speed readers see section 7.2 LED speed reader.

Below are the alternative midblock calming designs.

Planting and Lighting

A combination of street tree and shrub plantings along with appropriate lighting can be useful tools in calming traffic at mid-block locations. Street plantings narrow the perceived travel corridor, slowing speeds.

In Monkton Ridge Village a mixture of street trees and shrub plantings are proposed depending on the existing roadside vegetation. Street lights reinforce the feel of a village setting

Options for Mid-Block Calming

Top,Option 1: At-Grade Median

Middle, Option 2: Planting and lighting

Bottom, Option 3: Raised Speed Table.

during the day and allow the design to function at night as well. Limiting the street lighting to a few mid-street locations will not undermine the rural setting.

At-Grade Median

The "At-Grade Median" is designed as a traffic calming measure to slow vehicles at mid-block locations. The movement required by the median alerts drivers and encourages them to slow down and navigate what is ahead. When combined with a removable pedestrian sign for the summer months, roadside plantings and street lighting, the "At-Grade Median" is a minimally obtrusive functional option for slowing traffic in a mid block situation. Because the median is not raised from the road surface there are no impediments for plowing and winter maintenance. This option works well both with or without a sidewalk.

Raised Speed Table

The "Raised Speed Table" is designed as a traffic calming measure to slow vehicles at mid-block locations. They are effective in calming traffic on streets where the speed limit needs to be maintained rather than slowing cars more significantly. A change in pavement color and texture along with a slight rise in the road surface promote speed awareness while still maintaining the alignment of the road surface. The elevated platform design of the speed tables ensures that speeding cars will slow down while safe drivers can continue driving at typical village speed limits. Used in tandem with a removable pedestrian sign for the summer months and lighting and street trees this option provides the highest level of traffic calming.

5.0 Regional Connectivity

Monkton Ridge Village can be seen as an important link in the overall connectivity of the region. Silver Street and Bristol Road serve as distinctive routes for commuters, travelers, bicyclists and pedestrians moving through the area. Due to the convergence of multiple roads (Monkton Road, States Prison Hollow Road, Bristol Road, Davis Road and Silver Street) the village area can play a greater role in strengthening connectivity with surrounding communities and provide options for safe, enjoyable and functional bicycle and pedestrian networks.

Bicycling is also a regional activity. The proposed traffic calming improvements and increased shoulder width within the village create a safer experience for cyclists passing through the village. The proposed Park and Ride can reduce overall commuter traffic and provides a point of departure for cyclists wishing to visit destinations in the area or to explore the beautiful country roads nearby, while also expanding the diversity of routes or loops cyclists might explore in the surrounding area. Other public parking locations near Monkton Ridge Village include the Park and Ride at the intersection of Route 17 and 116; and public parking areas in Bristol and Hinesburg villages. Collectively these designated public parking areas support a potential network of cycling routes in the surrounding area. These improvements also serve to unite Monkton Ridge's Village center and its destinations, including the Monkton General Store, the Town Office, the Russell Memorial Library, and the nearby Monkton Central School, as well as area attractions that include country inns, orchards and agrarian uses with farm stands.

Traveling south, other attractions include the Appalachian Gap bike route that begins at the intersection of Route 17 and 116; Bristol's highly acclaimed Bartlett Falls at the New Haven River; Lincoln's proposed bicycle route along the New Haven River; and the shopping, historic town center of Bristol village. Traveling north attractions include dining and shopping amenities in Hinesburg center and South Burlington, which serves as a gateway to the endless attractions found in the Burlington area. In addition, the proposed park and ride will serve commuters within the town of Monkton and surrounding areas

traveling to larger town centers such as Burlington, South Burlington, Vergennes, and Middlebury. Whether commuters carpool or take advantage of the newly proposed ACTR bus route for Route 116 between Bristol and Burlington with stops in Starksboro and Hinesburg, ease of travel between village and town centers along this route will be improved for visitors and residents. These expanded transportation options will provide a greater sense of regional connectivity between town centers along the corridor.

6.0 Public Process

6.1 Preliminary Public Outreach

A start-up meeting was held on June 3, 2013 to restate and discuss the project purpose and desired outcomes, project history and background, project timeline, and to form a plan for an effective and inclusive Local Concerns meeting. Shortly after the start-up meeting, the consultant and the Addison County Regional Planning Commission issued a press release promoting the meeting. The press release highlighted the importance of community participation in planning Complete Streets and emphasized the significance of this project relative to recent state legislation. Additionally, the press release outlined the following topics for discussion and the general purpose of the meeting:

- to identify and discuss pedestrian, bicycle and vehicular issues within Monkton Ridge Village;
- to start a planning process for access and egress issues related to the anticipated park-and-ride facility;
- to review a range of improvements and enhancements to the village streetscape;
- to begin the process of creating a community vision and Complete Streets implementation strategy; and
- to identify short term, affordable projects that will improve the village environment and address traffic safety concerns.

6.2 Local Concerns Meeting

On June 27th, 2013 the ACRPC Transportation Advisory Committee held the Local Concerns Meeting to gather public input from the residents of Monkton. The meeting took place at the Monkton Central School on Monkton Road. Approximately 25 residents attended the meeting which was lead by LandWorks with input from Resource Systems Group (RSG). The evening's agenda included the presentation of a draft Project Purpose & Needs Statement, an overview of the project,

Poster advertising Local Concerns Meeting

a presentation of the study process and preliminary findings followed by a 30- minute group workshop session. The groups were given the following tasks/questions to guide their discussion:

1. Using the individual maps on the back of this agenda to define the study area, please note where people walk and where they are going. Where do people bike in Monkton Ridge Village? Where is there parking?

2. Do you agree or disagree with Project Purpose & Needs Statement? Please provide any additions or revisions.

3. Would a permanent park and ride location be useful to Monkton residents? If so, where is the best location? Consider things such as vehicle access and egress, a potential bus stop location, and connections to other areas of the village.

4. Are there other issues and/or improvements that would enhance Monkton Ridge and make it feel more like village and the road a "Complete Street"? What could be done to make it safer and "calm" traffic?

Following the workshop, a representative from each group presented an overview of their thoughts, ideas and concerns. The key takeaways from the group discussions are summarized below.

The Village

"Monkton Ridge doesn't seem like a village to outsiders". This comment from one participant was reflected in the overall feedback from the groups who provided a broad range of proposed improvements. These include creating a Town Green near the Library, enhancing the village streetscape to promote a sense of place, adding street trees, improving the area in front of the General Store (primarily by redefining the store parking and State Prison Hollow Road alignment), establishing destinations within Monkton Ridge by promoting small business, and by adding visual cues at the gateways that would concurrently identify arrival to the Ridge and serve as a traffic calming tool. Developing a Park & Ride in concert with a new ACTR bus stop was also favored by the workshop participants and

will, as one participant mentioned, help to establish "a reason for being there". A key takeaway from the village topic is the need to develop an alternative plan for parking within the village and to provide greenspace at the Library.

Traffic & Safety

A primary area of concern for the Monkton Ridge area is the volume and speed of vehicular traffic and its implications on safety in the area. Efforts to calm through traffic were highly supported by workshop participants who mentioned solutions such as neckdowns, bumpouts, blinking lights at crosswalks, lowering the speed limit to 25 MPH, speed radar reduction signs, splitter islands and speed tables. It was also highly recommended that traffic calming solutions begin outside of the village area, specifically in the Boro/School area. Many participants also noted the dangerous intersection at the junction of Davis and Silver Street stating that sight lines create a blind corner there. It was also noted that there is a real need to review traffic all the way to the Brennan House. Another location where traffic and safety issues exist is at the Monkton Road/States Prison Road intersection. In this location "the grade is important as well in alignment going to road". Finally, one participant noted the importance of "avoiding improvements that cause larger problems - to keep traffic moving but slowed down."

Pedestrian and bicyclist networks

The workshop groups identified multiple areas in Monkton Ridge in need of improved pedestrian networks. For the most part, this was envisioned as areas of new sidewalk with corresponding crosswalks. More than one participant noted the importance of good planning to ensure that the "sidewalk goes somewhere" and has a "logical termini". A sidewalk on the west side of Silver Street from Town Hall to the Davis Street intersection is an important area of concern for pedestrians. Participants noted that a crosswalk between Town Hall and the Monkton General Store would be a good location to connect the two

Word Cloud generated by feedback from the Local Concerns Meeting.

areas.

Alternatively, the groups indicated a desire to explore wider shoulders (no sidewalks) in the village area. It was noted that many people use the roads in Monkton Ridge for running and exercise. This alternative may also appeal to bicyclists, whom participants indicated use the road for recreation and commuting.

There is also a strong desire to emphasize Safe Routes to School as part of this planning project and to ensure that alternatives bear in mind appropriate connectivity to future bicycle or pedestrian routes to the Monkton Central School (approximately 1 mile away). A school-town walkway was mentioned, and again, participants proposed to increase the width of the roadway to provide on-street facilities. It was further noted that the utility company has cleared an area on the south side of Monkton Ridge Village and participants mentioned the possibility of a gravel path or trail along or near the cleared route.

Poster announcing Alternatives Presentation

6.3 Alternatives Presentations

The final public meeting for the project was held on September 9, 2013 as part of a regularly scheduled Selectboard Meeting. The purpose of the meeting was to present the Alternatives to the residents of Monkton. Feedback from meeting participants included concerns about any proposal for widening of existing ROWs (due to the historic settlement pattern of residences being located in close proximity to the road), concerns that a 3-way stop intersection has not worked well when previously implemented and a corresponding interest in using traffic circles where appropriate, and, lastly, that the Monkton Road/State's Prison Hollow Road intersection is high priority for improvements.

A follow-up Alternatives presentation was provided to the Addison County Regional Planning Commission and members of the Transportation Advisory Committee on September 11, 2013.

7.0 Additional Recommendations

7.1 Street Trees and Vegetation

The Village of Monkton Ridge has well-developed, mature vegetated cover throughout most of the Bristol Road/Silver Street corridor, which complements the agrarian character of this area. Existing mature trees along the edge or near to the Right of Way should be maintained wherever possible. There are several locations where replacement plantings (for mature, older trees) or new plantings should be encouraged. The Town should encourage residents to plant front yard trees when embarking on any upgrades to their property. The Town may be able to do this by providing help with the planting of such trees and possibly bulk purchasing of trees. The Urban and Community Forestry Program of Vermont Department of Forests, Parks, and Recreation, Division of Forestry can provide support and guidance to this end.[1] Among their many useful resources is the Vermont Tree Selection Guide which is available online.[2]

Given the constraints on town and personal budgets, it is often difficult to support expenditures for planting trees. However, it has been shown that the initial investment and long term maintenance costs are repaid in multiple ways with the contribution that mature trees make toward creating an inviting, livable and economically vital community. A long-term view of the cost and benefit of this approach is needed in promoting this important initiative. The benefits of trees, which are listed below, are more fully explained in the Landscape Guide for Vermont Roadways and Transportation Facilities, June 2002 available from the Vermont Agency of Transportation.[3]

Vehicular Transportation Benefits

- Safety - street trees used in combination with signage and a proper road surface have been shown to slow traffic by narrowing the appearance of the roadway and defining the village setting. Slower traffic has been shown to result in fewer and less severe accidents.

[1] http://www.vtfpr.org/urban/for_urbcomm.cfm
[2] http://www.vtfpr.org/urban/documents/VTTree%20Guide.pdf
[3] http://www.aot.state.vt.us/progdev/documents/design/vtrans%5flandscape%5fguide.pdf

- Wayfinding - Roadside trees or groups of trees can serve as landmarks along the roadway, and even alert drivers to upcoming turns and crosswalks.
- Multi-modal - Pedestrians benefit from the summer shade and cooling of street trees. Street trees encourage pedestrian use by greatly improving their comfort.

Community Benefits

- Economic - Despite the difficulty of placing value on such intangible factors, research has determined that communities do better economically when they protect their existing trees and continue to plant new ones.
- Aesthetic and Quality of Life - Defining community character, defining the entrance or gateway to a village, screening, framing views, noise attenuation.

Ecological Benefits

- Air Quality
- Water Resources
- Cooling and Energy Savings
- Wildlife

Selection

Street tree selection should consider the site or location where the tree is to be installed, the soil type, growing conditions, overhead power lines, and set-back.

Where to Plant

Ideally, street trees are planted in or at the edge of the greenbelt that makes up the distance from the edge of the pavement to the ROW. This location provides a few benefits for the pedestrian such as horizontal and vertical separation from the roadway and a sheltering canopy.

7.2 Digital Speed Reader

LED speed readers influence motorist behavior by alerting the driver to their vehicle speed if it is over the posted limit. Daryl Benoit of the Addison County Regional Planning Commission has conducted a study on the efficacy of such speed readers and found that placement

for such signage is critical for them to have an effect.[4]

The best locations for such an LED speed reader would be on the southbound approach to the Ridge on Silver Street just before the Davis Road intersection. A location along the Ridge, perhaps just past the General Store, would be an appropriate location to slow northbound travelers.

[4] Effectiveness of Radar Speed Feedback Signs & Other Traffic Calming Techniques, A Test Case in Shelburne, Vermont 2006-2012. Sep 2013. Addison County Regional Planning Commission

8.0 Right-of-Way (ROW)

The municipal Right-of-Way (ROW) were reviewed through available Town records and existing mapping to provide a basic understanding of the limits. Boundary surveys were not completed, but the ROW shown on these drawings is from regional GIS data and other mapping adequate for the purposes of planning; however, it will be necessary to confirm ROW limits during future design and construction phases to accurately locate preferred options relative to the ROW and existing features.

None of the proposed alternatives anticipate the need for permanent ROW changes; however, nearly all improvements will require temporary construction easements in order to be able to fully construct the improvement.

9.0 Utility Impacts

The utilities in the project area that could be affected by this project include:

Drainage Facilities
There is one catch basin located at the southeast corner of the intersection of States Prison Hollow Road and Monkton Road.

Water/Sewer
The Town of Monkton does not have a municipal wastewater treatment system. Private water wells are located throughout the project area, but none were of consequence for the proposed improvements.

Electric/Telephone
Overhead power and communication lines alternate along the streets throughout the project area. The preferred alternatives proposed in this report may impact pole locations at the States Prison Hollow Road/ Monkton Road and Davis Road/Silver Street intersection. Relocation options will need to be addressed in a subsequent phase of work.

10.0 Natural and Cultural Resources

The conceptual alternatives were reviewed for potential impacts to natural and cultural resources. Potential impacts were assessed through on-site observations, resource agency reviews, and review of resource mapping. There will be no impacts to surrounding natural and cultural resources. This is a preliminary assessment and it may be necessary to re-evaluate potential impacts too natural and cultural resources after a construction-ready design is completed.

Wetlands

National Wetland Inventory (NWI) data in GIS format was obtained from the Vermont Center for Geographic Information (VCGI) to determine the possible location of wetlands in the study area. The Vermont Water Resource Board has adopted a particular set of these maps, available in digital format from VCGI, as the Vermont Significant Wetlands Inventory maps (VSWI).

Wetlands are classified into three categories by the Vermont Wetland Rules. The first two classes (Class I and Class II) are considered "significant" and are protected by the Vermont Wetland Rules. All uses which are not allowed in Class I and II wetlands require review by the Vermont Agency of Natural Resources Wetlands Office through a Conditional Use Determination. Class III wetlands are either considered not significant for producing any wetland functions or have not been mapped on the NWI maps. Class III wetlands are not protected under the Vermont Wetland Rule, but may be protected by other federal, state or local regulation.

The NWI data source obtained from VCGI identifies Class I and Class II wetlands that are regulated. According to this GIS data, there are no wetlands of any class that will be affected by the proposed upgrades.

Significant Habitat

According to the most recent Monkton Town Plan Update (2013-2018) there are no Important Resource Areas or Wildlife Habitat in Monkton Ridge. Just outside the study area to the north on Silver Street and Davis Road there are Critical Wildlife Transit Corridors. The proposed improvements do not impact the identified Important

Resources Areas of Wildlife Habitat within Monkton Ridge.

Flood Hazards

This project is not located in a 100-year flood zone. The improvements considered in this study typically do not inhibit water flow and do not have a significant impact on flood capacity.

Surface Waters

There are no surface waters within the study area. Monkton Pond is located near the Monkton Ridge Village and impacts to this resource may need to be reviewed at later phases of the project. Also, the Monkton Town Plan Update (2013-2018) includes information on underground fuel storage tanks in Monkton Ridge that have impacted groundwater quality stating, "these tanks have been removed, but ground water is still polluted. The State currently provides water to these homes, businesses and the Town Hall. In the future the town might consider the feasibility of providing drinking water to affected homes through community water system: some grants are available for these activities. "

Hazardous Wastes

According to the Vermont Active Hazardous Sites List offered by the Vermont Department of Conservation and Waste Management Division (DECWMD), as well as the EnvironHazmat_HAZSITES GIS layer, which is produced by the Vermont Center for Geographic Information and originated by the DECWMD, there are no Hazardous Sites Lists within the study area.

Archaeologic and Historic Resources

An archeological and historic resource assessment was completed by The University of Vermont Consulting Archaeology Program (UVM CAP) to evaluate potential cultural impacts by this project. The study sought to identify any previously recorded National Register (NR) eligible archeological resources in the direct vicinity of the study corridor and assessed the archeological sensitivity of all areas falling within the project. A field inspection and background research conducted by UVM CAP concludes that the area of the proposed New Town Hall and associated parking, along the western side of Silver Street in Monkton Ridge is archaeologically sensitive for precontact Native American sites, as well as a historic Euroamerican farmstead

site. Remaining project elements will not impact archaeologically sensitive areas. As a result, it is recommended that a Phase I site identification survey be conducted in the portion of the sensitive area that will be disturbed by the proposed project as part of the Section 106 permitting process, unless that sensitive area can be avoided.

The full UVM CAP report can be found in Appendix 13.5.

Public Land

The GIS data layer CONSPUB obtained from VCGI identifies publicly owned lands or protected lands. Public lands are likely to be maintained with a minimal degree of land development, and may allow multiple uses such as logging and recreation access. Public lands within the study area include:

1. The existing Town Office and Town Office lands;
2. The Russell Memorial Library and lands;
3. The proposed future Town Office and Park & Ride site adjacent to the Monkton Friends Methodist Church; and
4. Just east of the study area on States Prison Hollow Road is the Town Garage and recycling center.

Conclusion

Natural and cultural resources are minimal or non-existent in the project area and the project is permitable from a local, State and Federal perspective.

11.0 Phasing

No phasing determined at this point.

12.0 Preliminary Cost Estimates

The preliminary cost estimate for the conceptual designs is presented on the following pages. It is important to note that none of these specific improvements have been engineered, so the costs for the schematic designs are based only on current quotes from respective retail companies, engineering firms, VT Agency of Transportation and a comparison with similar projects. When fully engineered and implemented they may vary considerably from this initial estimate. Moreover, at this point in the design development, there is no need for right-of-way or property acquisition. If, during the development of construction documents, this should become necessary, it is entirely possible that the final, built costs of the project could be as much as twice the current estimates. However, the preliminary estimates will provide the town with reasonable figures to use for planning purposes, including budgeting for infrastructure replacement costs and maintenance. Although regional and state funding may be used for the development of the project, maintenance of the facilities including winter snow and ice remains the responsibility of the town. A good rule of thumb, according to the VTrans Bicycle & Pedestrian Manual, is that 3-5% of infrastructure replacement costs should be spent on annual maintenance (e.g. if you spend $100,000 to construct the enhancements, then $5,000 should be budgeted for maintenance each year).

Estimate of Probable Costs: Monkton Complete Streets			
ITEM	**SIZE / QUANTITY**	**UNIT PRICE (installed)**	**TOTAL PRICE**
ROAD LAYOUT			
(Option 1 "Lane/Shoulder Realignment")			
11' Travel Lanes-striping	2,000	$0.25 lf	$500
		Subtotal Option 1	$500
(Option 2 "5' Sidewalk")			
11' Travel Lanes-striping	2,000	$0.25 lf	$500
5' Sidewalk	1,075	$8.00 ft	$8,600
		Subtotal Option 2	$9,100
MID-BLOCK TRAFFIC CALMING			
(Option 1 "Planting/Lighting")			
Street Tree Planting-Deciduous spp. (2-2 1/2" cal.)	3	$500.00 ea	$1,500
Roadside Shrub Plantings-spp.	7	$50.00 ea	$350
LED Street Lighting	2	$1,200.00 ea	$2,400
		Subtotal Option 1	$4,250
(Option 2 "At-Grade Median")			
Median	1		
Option A: Imprint Paving	18	$7.00 sq ft	$126
Option B: Granite Curbing	29	$36.00 lf	$1,044
& Cobblestones	18	$15.00 sq ft	$270
Removable Pedestrian Warning Sign	1	$100.00 ea	$100
LED Street Lighting	2	$1,200.00 ea	$2,400
Street Tree Planting-Deciduous spp.	3	$500.00 ea	$1,500
Roadside Shrub Plantings-spp.	7	$50.00 ea	$350
		Subtotal Option 2A	$4,476
		Subtotal Option 2B	$5,394
(Option 3 "Raised Speed Table")			
Raised Speed Table, Painted, with Imprint Paving	1	$3,000.00 ea	$3,000
Removable Pedestrian Warning Sign	1	$100.00 ea	$100
LED Street Lighting	2	$1,200.00 ea	$2,400
Street Tree Planting-deciduous spp. (2-2 1/2" cal.)	3	$500.00 ea	$1,500
Roadside Shrub Plantings-spp.	7	$50.00 ea	$350
		Subtotal Option 3	$7,350
GATEWAYS [includes installations at north & south]			
(Option 1 "Road Alignment with Amenities")			
Travel Lane Restriping (neck-down and shoulder expansion)	252	$0.25 lf	$63.00
LED Street Lighting	4	$1,200.00 ea	$4,800
"Monkton Ridge" Welcome Sign	2	$2,500.00 ea	$5,000
Gateway Fencing-post & rail	96	$18.00 lf	$1,728
Gateway Planting Vegetation (deciduous trees & shrubs spp.)	Approx. Allowance		$1,850
		Subtotal Option 1	$13,441
(Option 2 "Splitter Island")			
Travel Lane Restriping (neck-down and shoulder expansion)	252	$0.25 lf	$63
LED Street Lighting	4	$1,200.00 ea	$4,800
"Monkton Ridge" Welcome Sign	2	$2,500.00 ea	$5,000
Gateway Fencing-post & rail	96	$18.00 lf	$1,728

Gateway Vegetation (deciduous trees & shrubs spp.)	Approx. Allowance		$1,850
Splitter Island (with imprint paving)	22	$7.00 sf	$154
		Subtotal Option 2	$13,595
SPHR / LIBRARY / GREEN			
(Option 1)			
Pavement (includes subsurface gravel & fabric)	8946	$3.25 sf	$29,075
Parking Lines (Paint)	130	$0.25 lf	$33
Crosswalk (Paint; includes 3 crosswalks)	95	$0.75 lf	$71
5' Sidewalk	505	$8.00 ft	$4,040
LED Street Lighting	4	$1,200.00 ea	$4,800
Shrubs	63	$50.00 ea	$3,150
Deciduous Trees spp. (2-2 1/2" cal.)	10	$500.00 ea	$5,000
Public Art/Sculpture	Approx. Allowance		$2,500
		Subtotal Option 1	$48,668
(Option 2)			
Pavement (includes subsurface gravel & fabric)	10678	$3.25 sq ft	$34,704
Parking Lines (Paint)	150	$0.25 lf	$38
Crosswalk (Paint; includes 4 crosswalks)	150	$0.75 lf	$113
5' Sidewalk	718	$8.00 ft	$5,744
LED Street Lighting	4	$1,200.00 ea	
Benches	7	$500.00 ea	$3,500
Deciduous Trees spp. (2-2 1/2" cal.)	10	$500.00 ea	$5,000
		Subtotal Option 2	$49,098

Low Subtotal	$66,859
High Subtotal	$79,143
10% Contingency*	$7,914
10% Engineering/Planning/Design*	$7,914
TOTAL	**$94,971**

**Based on High Subtotal*

Monkton "Complete Streets"

Estimate of Probable Costs: Landscape **Date: 11/5/13**

DRAFT

Monkton Complete Streets: Park & Ride Cost Breakdown

ITEM	SIZE / QUANTITY		UNIT PRICE (installed)		TOTAL PRICE
SITE DEVELOPMENT / CONSTRUCTION					
Gravel Paving: Includes					
12" #2 crushed stone		460		cu. yds	
Filler fabric/geotextile		12,434		sq. ft.	
4" Gravel fines finish		154		cu yds	
Total			$2.00	sq.ft.	$24,868
Curb stops		20	$55.00	ea.	$1,100
Earthwork: Swales (including grading and re-seeding)			Allowance		$3,000
LED cut-off lights (installed with concrete footer and electrical)		4	$1,200.00	ea	$4,800
Landscaping:					
Shrubs		10	$50.00	ea.	$500
Deciduous trees		5	$500.00	ea.	$2,500
				Subtotal	$36,768
Alternate for asphalt parking surface					
Bituminous top coat (includes above grtavel and fabric)		12,434	$1.25	sq.ft.	$15,543
Pavement markings		356	$0.25	lf	$89
				Subtotal	$48,300
DESIGN & ENGINEERING					
Layout, cross-sectioning, drainage			Allowance		$2,500
Lighting specs/connection			Allowance		$500
Landscaping locations/specs			Allowance		$500
Permit requirements/construction oversight			Allowance		$2,000
				Subtotal	$5,500
				Construction Subtotal	$42,268
				5% Contingency	$2,113
TOTAL FOR GRAVEL SURFACE LOT					**$44,381**
TOTAL FOR ASPHALT SURFACE LOT					$56,489.48

Date: 8/26/13

1. This cost estimate is subject to review and refinement; with design approval, final details for the specific elements and specific product selections will provide the basis for a more accurate, final cost projection.
2. Cost estimate based on current materials cost and are subject to change

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Monkton Ridge Complete Streets
Intersection Improvement Alternatives
9/4/2013

				Monkton Road / Bristol Road				Monkton Road / SPHR		Monkton Road / Silver Street			
				"T" Realignment		Roundabout		Realignment		T" Realignment		Roundabout	
Item	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Cost**	**Quantity**	**Cost**	**Quantity**	**Cost**	**Quantity**	**Cost**	**Quantity**	**Cost**
201.10	CLEARING AND GRUBBING	LS	VAR	1	$ 20,000.00	1	$ 5,000.00	1	$ 2,000.00	1	$ 5,000.00	1	$ 8,000.00
203.15	COMMON EXCAVATION	CY	$15.00	1790	$ 26,850.00	1310	$ 19,650.00	1020	$ 15,300.00	1130	$ 16,950.00	1140	$ 17,100.00
203.30	EARTH BORROW	CY	$10.00	620	$ 6,200.00	240	$ 2,400.00	320	$ 3,200.00	190	$ 1,900.00	130	$ 1,300.00
301.35	SUBBASE OF DENSE GRADED CRUSHED STONE	CY	$35.00	700	$ 24,500.00	710	$ 24,850.00	450	$ 15,750.00	600	$ 21,000.00	670	$ 23,450.00
406.25	BITUMINOUS CONCRETE PAVEMENT	TON	$150.00	700	$ 105,000.00	690	$ 103,500.00	430	$ 64,500.00	600	$ 90,000.00	660	$ 99,000.00
616.21	VERTICAL GRANITE CURB	LF	$30.00	0	$ -	450	$ 13,500.00	610	$ 18,300.00	0	$ -	390	$ 11,700.00
635.11	MOBILIZATION / DEMOBILIZATION	LS	8%	1	$ 17,100.00	1	$ 29,600.00	1	$ 12,400.00	1	$ 12,800.00	1	$ 24,900.00
641.10	TRAFFIC CONTROL	LS	VAR	1	$ 10,000.00	1	$ 40,000.00	1	$ 15,000.00	1	$ 15,000.00	1	$ 40,000.00
N/A	STRIPING	LS	VAR	1	$ 5,000.00	1	$ 12,000.00	1	$ 5,000.00	1	$ 3,000.00	1	$ 12,000.00
N/A	DRAINAGE	LS	VAR	1	$ 8,000.00	1	$ 15,000.00	1	$ 12,000.00	1	$ 5,000.00	1	$ 15,000.00
N/A	SIGNS	LS	VAR	1	$ 3,000.00	1	$ 8,000.00	1	$ 3,000.00	1	$ 2,000.00	1	$ 8,000.00
N/A	ROUNDABOUT INCIDENTALS	LS	VAR	0	$ -	1	$ 150,000.00	0	$ -	0	$ -	1	$ 100,000.00
N/A	UTILITY RELOCATION	LS	VAR	1	$ 15,000.00	1	$ 15,000.00	1	$ 15,000.00	1	$ 15,000.00	1	$ 15,000.00
			Subtotal Construction		$ 240,650.00		$ 438,500.00		$ 181,450.00		$ 187,650.00		$ 375,450.00
			Contingency	20%	$ 48,130.00		$ 87,700.00		$ 36,290.00		$ 37,530.00		$ 75,090.00
			Construction Total		**$ 288,780.00**		**$ 526,200.00**		**$ 217,740.00**		**$ 225,180.00**		**$ 450,540.00**
			Town Administration	10%	$ 28,880.00		$ 52,620.00		$ 21,780.00		$ 22,520.00		$ 45,060.00
			Engineering / Design	15%	$ 43,320.00		$ 78,930.00		$ 32,670.00		$ 33,780.00		$ 67,590.00
			ROW Fees	VAR	$ 50,000.00		$ 20,000.00		$ 15,000.00		$ 15,000.00		$ 20,000.00
			Construction Admin	12%	$ 34,660.00		$ 63,150.00		$ 26,130.00		$ 27,030.00		$ 54,070.00
			Grand Total		**$ 445,640.00**		**$ 740,900.00**		**$ 313,320.00**		**$ 323,510.00**		**$ 637,260.00**

13.0 Appendix