

Scoping Study Report

EAST RIVER ROAD SIDEWALK EXTENSION LINCOLN STP BP19(12)

LINCOLN, VERMONT

September 7, 2021



Submitted to:

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1 SUMMARY

The objective of this study is to plan for safe and accessible facilities for bicycles and pedestrians on East River Road (River Road) from the end of the existing sidewalk at approximately 293 East River Road to the Community School. This is a moderately developed area, with mostly residential properties.

The roadway is narrow, at 23 feet wide, with several constraints due to the nearby river. There are no existing sidewalks or dedicated bicycle facilities within the study area. Most of the pedestrian traffic through the study area is children and families walking or biking to and from school. However, the existing conditions are dangerous for these users as they need to travel in either a narrow paved shoulder or off the pavement. A road corridor improvements project is necessary to increase safety and accessibility for all users. The intent of this project is to increase safety for children and families traveling to and from school, as well as other pedestrians and cyclists using the road corridor.

Characteristics of the project area were reviewed including right-of-way, roadway features, traffic data, historic/archeological features, natural resources and other environmental characteristics. There were only minor environmental impacts identified for some of the alternatives in this study. The archeological and historic reviews indicated that two areas along the study area are archeologically sensitive. It is recommended that work remain within the existing right-of-way. Any proposed work outside of the existing right-of-way may require additional investigations for archeological impacts. There are also six structures along the study area that have historic significance. Impacts to these properties should be avoided.

The various public meetings held during this study highlighted the community support for bicycle and pedestrian improvements along River Road. A survey was conducted in lieu of a Local Concerns meeting, which highlighted the support for the project. There was also discussion of a potential shared use path along a parcel donated to the Town. This path was separately evaluated by the Town and may be considered as an alternative to the southern section of the study area. The path would connect to the study area just north of the bridge and extend down to the school.

After the Local Concerns meeting, alternatives were developed with the Steering Committee based on design criteria and local input. The alternatives focused on maintaining separation between pedestrians and vehicles, minimizing permanent easements, and minimizing road crossings. The alternatives were compared on the basis of cost, impacts to environmental and cultural resources, permitting requirements and locally identified critical elements.

The alternatives, including a sidewalk on each side of the road, shared lanes and advisory shoulders, were discussed at an Alternatives Presentation. The preferred alternative was clearly identified in the Alternatives Presentation based on Selectboard support. The

preferred alternative includes a new 5-foot wide sidewalk along the east side of River Road, separated from the road with a 5-foot wide grass edge zone. The sidewalk on the bridge would be immediately adjacent to the travel lane, but raised to provide a barrier. The Selectboard did not select a bicycle facility during the meeting, but instead requested both alternatives be included as add-ons in the preferred alternative cost estimate. Lighting was also requested as an add-on in the cost estimate.

The estimated total project cost for these improvements is \$1,265,000 based on a 2025 construction cost estimate of \$950,000. Phasing is recommended due to the cost and the possibility of the locally evaluated shared use path from the bridge to the school. It is recommended that Phase 1 include a new sidewalk from the end of the existing sidewalk to the north side of the bridge. The new sidewalk should be a minimum of 5-feet wide, although it is recommended that the new sidewalk be installed at 6-feet wide to better accommodate children on bicycles, as the two bicycle facility alternatives evaluated would not be ideal for children and families. Phase 1 will also include a box culvert extension to accommodate the grass edge zone and shoulder over an existing culvert.

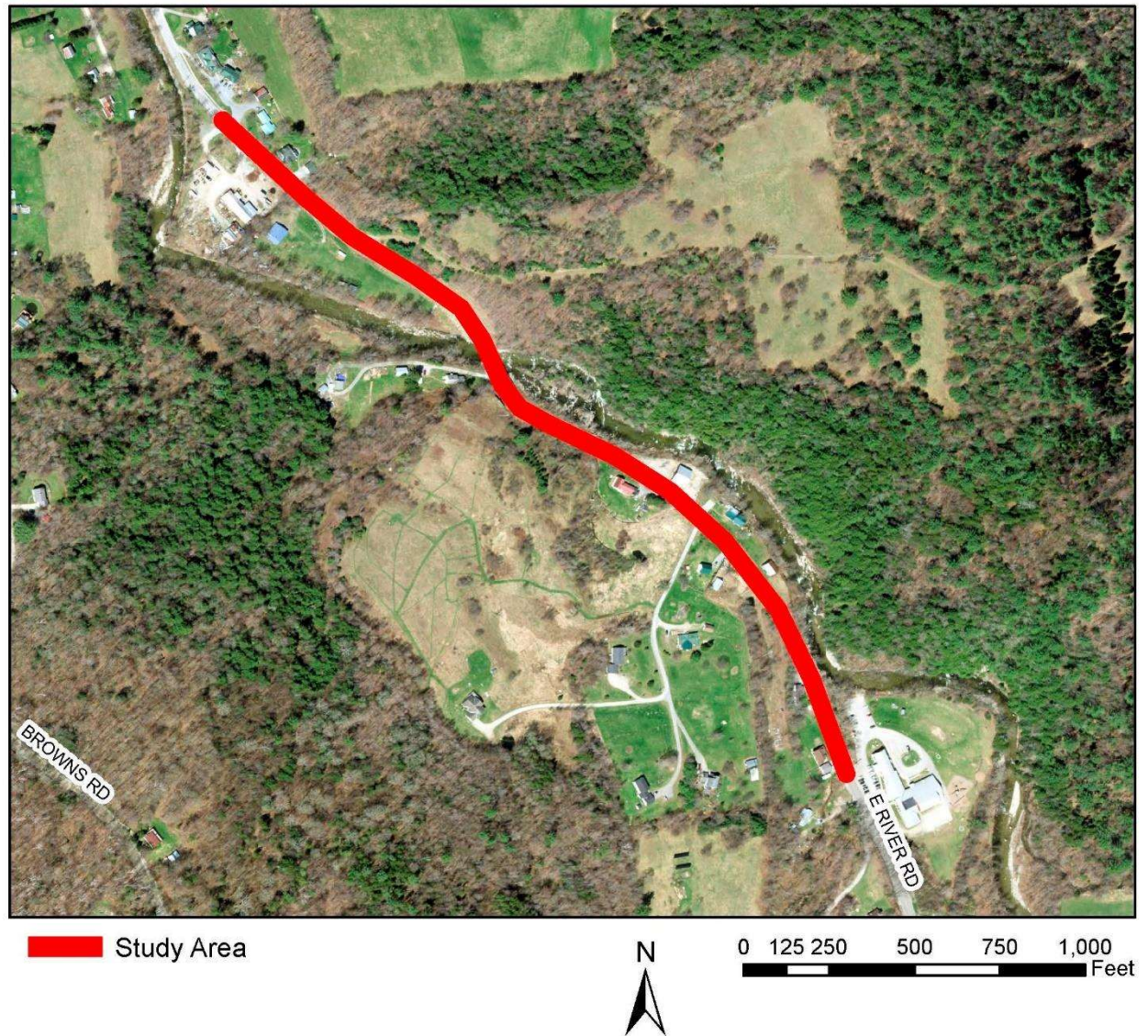
Phase 1 has a total project cost estimate of \$455,000. The Town should apply to the VTrans Bicycle and Pedestrian Program in summer 2022 for design and construction funds to implement Phase 1 after local endorsement of this study and public consensus at a Town Meeting.

2 EXISTING CONDITIONS

2.1 PROJECT STUDY AREA

The study area for the project was defined by the Town and is shown in **Figure 2.1**. The study area extends approximately one half mile along River Road from the end of the existing sidewalk in the Village Center to the Community School.

Figure 2.1: Project Study Area



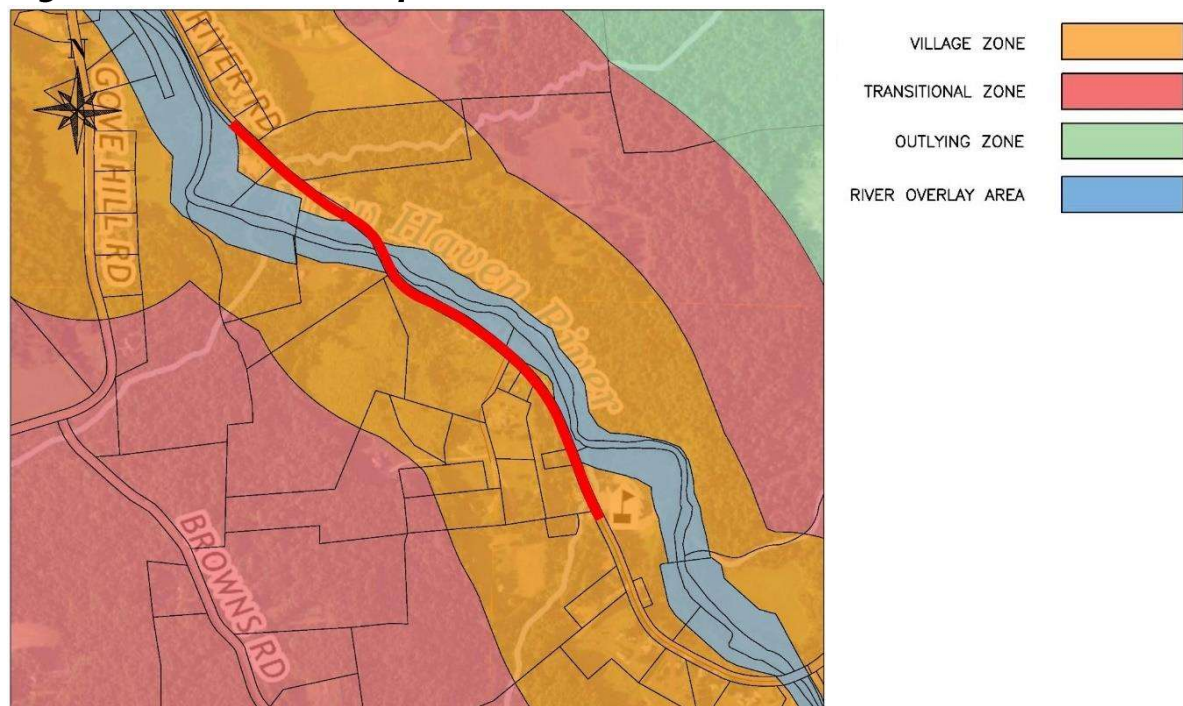
2.2 LAND USES

The study area includes “Village Zone” and “River Overlay Area” zoning uses, as shown in **Figure 2.2**. The study area is contained entirely in the Village Zone and intersects the River Overlay area due to its close proximity to the New Haven River. These zoning districts are characterized as follows:

- Village District: This district aims to maintain a more compact Village central area with appropriate levels of commercial development. Densities are greater than the surrounding districts and may contain various type of housing facilities.
- River Overlay Area: The intent of this overlay is to provide standards for maintaining river habitat and erosion control and to preserve long-term river and stream functions. A 25-foot setback is used from all stream tops of banks and the width varies in the study area as shown in **Figure 2.2**.

The actual land use in the study area is mostly residential with the school at the south end. The Community School serves approximately 120 students from pre-K to sixth grade and includes sports fields and a playground.

Figure 2.2: Land Use Map



2.3 EXISTING TRANSPORTATION FACILITIES

The study area is focused along River Road which is a Class 2 Town highway with a functional classification of Major Collector. The road is generally approximately 23 feet wide, with two 11 foot travel lanes and a narrow shoulder on each side. The road is painted with a center line. The speed limit on River Road is 30 mph.

There is an existing concrete sidewalk that extends south along the east side of River Road from the Village Center to approximately The Old Hotel's northern driveway entrance (at the north end of the study area). The existing sidewalk is separated from the road by a grass edge zone and appears to be approximately 4 feet wide. The surface appears to be in fair to poor condition. There are no existing sidewalk or bicycle facilities within the study area.

2.4 TRAFFIC DATA

The Annual Average Daily Traffic (AADT) counts, as published by the Vermont Agency of Transportation (VTrans), are shown in **Table 2.1** below. Data was obtained from VTrans for traffic accidents compiled for the 2018-2021 period. There was one traffic accidents recorded in the study area, with no reported injuries.

Table 2.1: Annual Average Daily Traffic Counts

Street Name	Beginning Reference	Ending Reference	2021 AADT
E River Road	Gove Hill Road	South Lincoln Road	1,232

2.5 NATURAL AND CULTURAL RESOURCES

The Vermont Natural Resource Atlas was used to identify natural resources within and adjacent to the study area. These natural resources are presented in **Figure 2.3**. The Atlas does not provide accurate locations for all natural resources; however, it does provide a guide as to what natural resources will require further review during final design. A summary of the natural resources present in the study area is provided below.

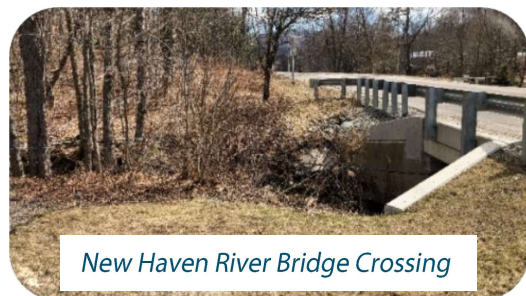
2.5.1. WETLANDS

A preliminary opinion of the presence of wetlands along the study area was performed by Bradley Wheeler of Wheeler Environmental Services. The identified wetland areas were approximately mapped and are shown in **Figure 2.3**. The preliminary classification includes both Class 2 and Class 3 wetlands. Potential wetland and/or buffer impacts from alternatives will be discussed in Section 4.

2.5.2. SURFACE WATERS

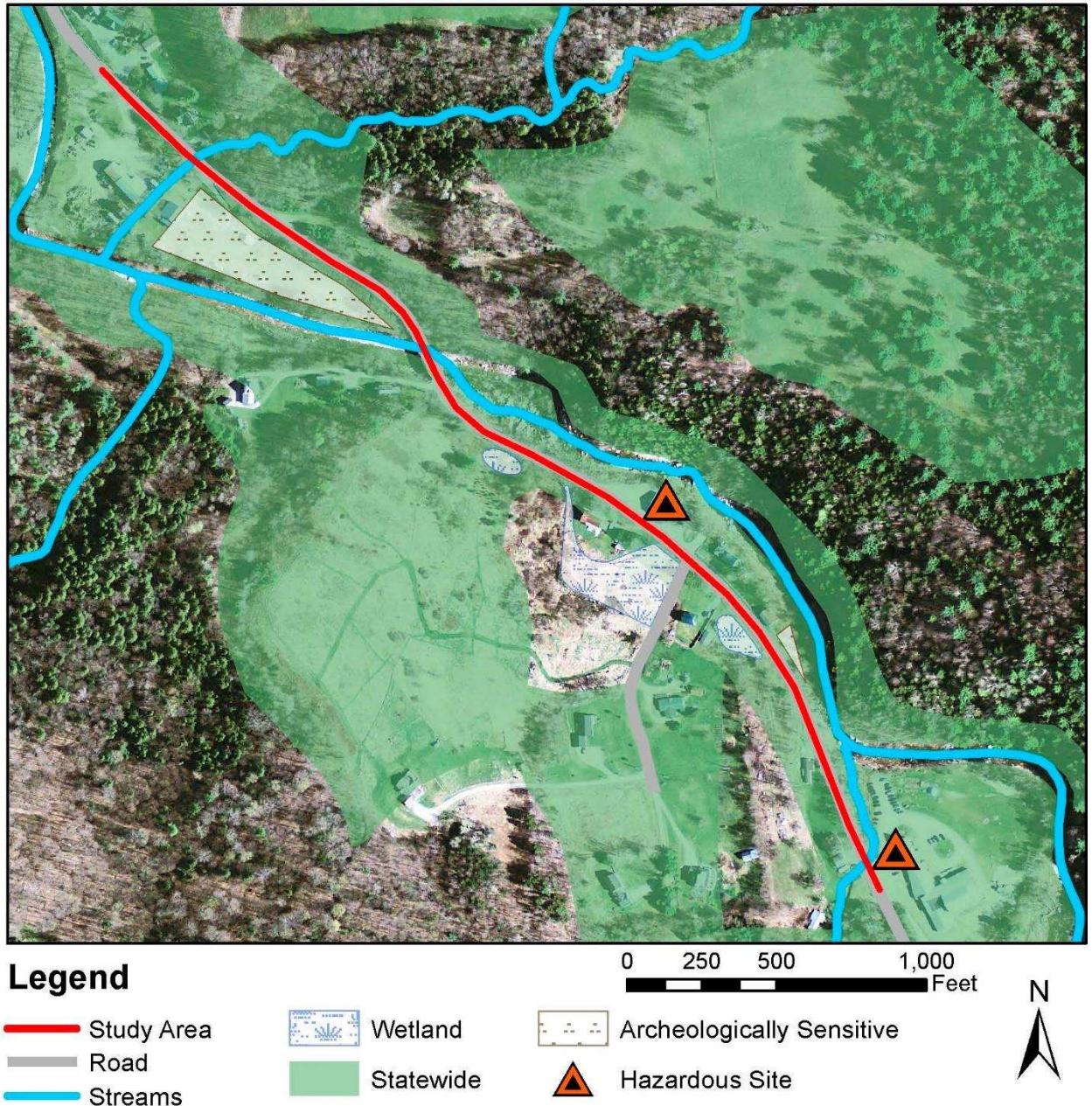
Three streams intersect the project area. The New Haven River runs parallel to River Road for most of the length of project area and has a bridge crossing 0.2 miles south of the existing sidewalk end. The bridge was constructed in 2015 and is in good condition.

The bridge deck is approximately 29 feet wide from curb to curb, with two 13-foot travel lanes and a 1.5-foot shoulder on each side. The bridge was designed to provide space for pedestrian crossing in the future. The lanes could be adjusted to two 11-foot travel lanes plus a one-foot shoulder on each side, which leaves 5 feet of remaining space on the bridge for a pedestrian sidewalk.



New Haven River Bridge Crossing

Figure 2.3: Natural Resources and Environmental Features



At the southern end of the project area, an unnamed stream crosses River Road through a pipe arch culvert with an approximate span of 6 feet and rise of 4-5 feet. The culvert appears to be concrete-encased and has two headwalls constructed of precast concrete and concrete block and has various indication of past repairs. Both headwalls and the culvert crossing are in fair to poor condition.

The third stream crossing is located approximately 300 feet south of the existing sidewalk end and 700 feet north of the New Haven River bridge crossing. This unnamed stream crosses River Road through a 10-foot-wide, 6-foot-high box, 30-foot-long box culvert, which appears to be in good condition. The data available on the Vermont Culvert

Inventory does not list this as a culvert and instead identifies it as a structure. Therefore, it could be a concrete bridge with no bottom.

Potential stream, bridge and/or culvert impacts from the alternatives will be discussed in Section 4.

1

2.5.3. FLOODPLAINS

There is a floodplain in the study area associated with the New Haven River. The FEMA floodplain mapping is not yet digitized for this area; however, the Flood Insurance Rate Map (FIRM) was obtained from FEMA and is included in **Appendix A**. The mapped floodplain varies in width throughout the study area. Potential floodplain impacts from alternatives will be discussed in Section 4.

2.5.4. STORMWATER

There are no impaired rivers, streams, lakes, or ponds within the study area. There are no issued stormwater permits issued in or around the project area. Stormwater permit requirements will be discussed in Section 4.

2.5.5. RARE, THREATENED AND ENDANGERED SPECIES

There are no rare, threatened, or endangered species located within or adjacent to the study area. The study area does not fall within the known ranges of the federally threatened northern long-eared bat. The study area is within an Emerald Ash Borer infested or high-risk area. The project will need to be reviewed further for impacts related to this species during the final design phase.

2.5.6. HAZARDOUS MATERIAL SITES

There are two hazardous waste sites adjacent to the study area. The first is located at 593 River Road (Town Garage) and involves soil contamination identified during the removal of underground fuel storage tanks. This site is listed as “Site Management Activities Completed”. The second is located at the Community School and also involves soil contamination discovered during the removal of underground fuel storage tanks. This site is still open and listed as a low priority, although the notes indicate the site is ready to be moved to “Site Management Activities Completed”. Potential hazardous site impacts from alternatives will be discussed in Section 4.

There are no Urban Soil Background areas in the study area.

2.5.7. AGRICULTURAL LAND

The entire study area contains Statewide agricultural soil. As pedestrian improvements would mostly be located within 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 if the project is located directly adjacent to an existing road.

2.5.8. HISTORIC, ARCHEOLOGICAL AND ARCHITECTURAL RESOURCES

An Archeological Resource Assessment was completed in June 2020 by the University of Vermont Consulting Archaeology Program. The report indicates there are no known archaeological sites within the limits of the study area. The report identified two areas of sensitivity adjacent to the study area, as shown previously in **Figure 2.3**, although these areas likely fall outside the limits of potential disturbance related to the alternatives. If the two identified sensitive areas fall outside the limits of disturbance for the preferred alternative, then no additional investigation is recommended. The complete report is included as **Appendix B**.

A Historic Resources Identification was completed in August 2020 by the University of Vermont Consulting Archaeology Program. The report indicates that there are six structures within the study area that are historically significant. The report recommends that impacts to these six properties be avoided if possible. The complete report is included as **Appendix C**.

2.6 RIGHT-OF-WAY

The public road right-of-way (ROW) was determined by a licensed land surveyor reviewing this project. The right-of-way width is 49.5 feet (3 rods) through the study area. The right-of-way impacts will be further discussed in Section 4.

2.7 UTILITIES

There are multiple utilities within the study area including overhead electric, phone and cable, and underground storm drains and culverts. There are no water or sewer utilities in the study area. The utility poles are owned and maintained by CHA. The storm drains and culverts are owned and maintained by the Town of Lincoln.

Typically, underground utilities will not be impacted by the proposed improvements due to the limited depth of sidewalk facilities. Manholes may require height adjustment if they are located within a proposed sidewalk alignment. Catch basins may require adjustment or relocation if they conflict with a proposed curb or sidewalk. Culverts may require extensions to accommodate a new sidewalk.

Most of the utility poles appear to be set back far enough from the road to allow for the new sidewalk width with minimal pole relocation. Anticipated pole relocations will be further discussed in Section 4.

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 Town to discuss the project, identify goals, and brainstorm possible alternatives. The information obtained at this meeting was used to prepare for the public meetings. The discussions focused on improving pedestrian and bicycle safety along River Road, while minimizing impacts to adjacent properties.

3.1 LOCAL CONCERNS MEETING

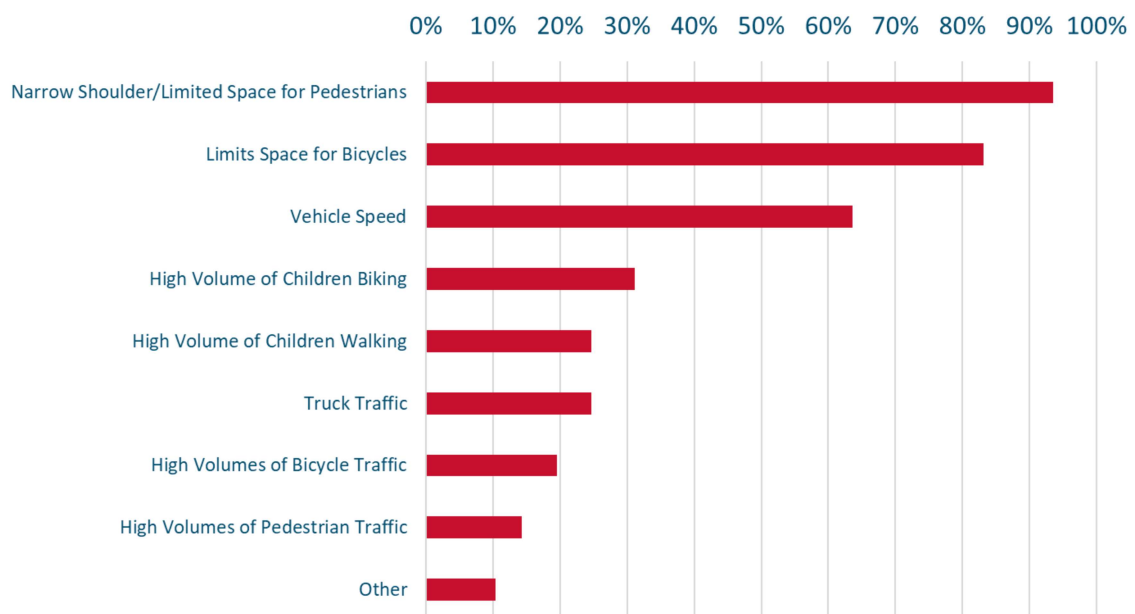
A Local Concerns Meeting is typically conducted to allow the community and adjacent property owners to provide input regarding the purpose and need for the project. Due to the COVID-19 pandemic, a public survey was conducted in lieu of a public meeting. The survey included seven questions and received 77 responses. The survey questions and results are summarized below.

1. What concerns do you have regarding safety along River Road?

This question provided a list of options with directions to check all that apply.

The results are summarized in **Figure 3.1**. The “other” responses included lack of education (i.e. safe pedestrian and bicycle use and visibility), recommendations on sidewalk extensions in other areas, and concerns regarding cost.

Figure 3.1: Public Survey Question #1 Responses



2. *If you are a parent, do your children walk to school along this route currently?*
The results of this question are summarized in **Figure 3.2**.

3. *Do you feel that pedestrian improvements are needed along River Road to the school?*

88% of respondents answered yes, 9% answered no and 3% answered not sure.

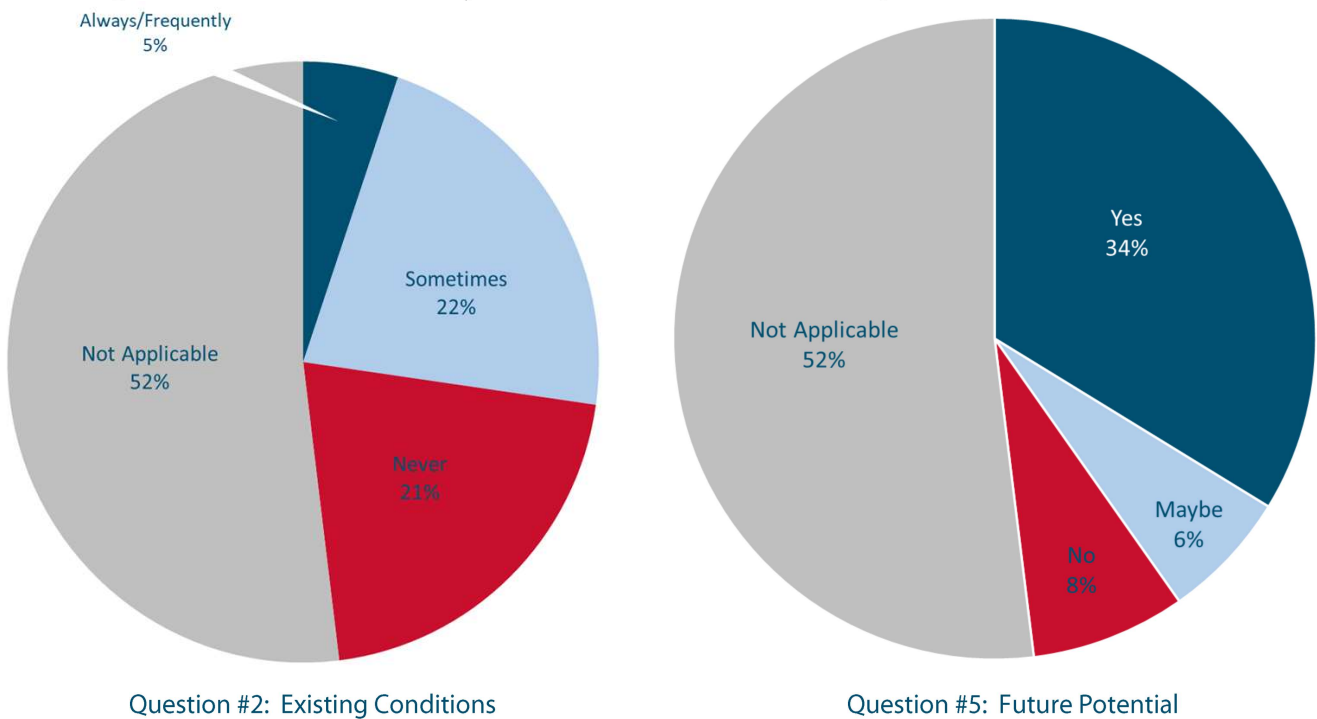
4. *Do you feel that bicycle improvements are needed along River Road to the school?*

86% of respondents answered yes, 9% answered no and 5% answered not sure.

5. *If you are a parent and your child does not currently walk or bike to school, would you start walking or biking to school if there was a safe pedestrian facility?*

The results of this question are summarized in **Figure 3.3**. As shown, the number of parents who would allow their children to walk or bike to school significantly increases if a safe facility were to be constructed.

Figure 3.2: Public Survey Questions #2 and #5 Responses



6. *Are there any specific features you would like to see in a pedestrian/bicycle facility? For example, lighting, drainage improvements, streetscaping, landscaping, etc.*

One of the more common responses to this question was to provide separation from vehicle traffic for both bicycles and pedestrians. Other responses included traffic calming strategies, lighting, repair roadway pavement, and proper drainage. Ultimately, the responses focused on safety as the main priority with aesthetics and features being secondary.

7. *Provide any additional comments, concerns or questions you have.*

The responses here mostly echoed the responses to previous questions, with most respondents indicating support for some type of pedestrian/bicycle facility. There were also suggestions for a shared-use path, away from the road, providing connectivity to additional locations.

3.2 PURPOSE AND NEED

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

Purpose: To provide safe and accessible facilities to accommodate existing, and encourage new, pedestrian and bicycle traffic flow between the Village Center and the Community School, including a large volume of school-aged children.

Need: The existing conditions are dangerous for both pedestrians and bicycles as there are no dedicated pedestrian or bicycle facilities on a rural road with minimal shoulders and truck traffic. The conditions become even more dangerous when considering that a high percentage of the non-vehicle users are school-aged children.

This project is necessary to improve and expand bicycle and pedestrian facilities to increase safety and accessibility for all users and provide connectivity to and from the Community School.

3.3 ALTERNATIVES PRESENTATION

An Alternatives Presentation was conducted on December 1, 2020 to present the alternatives, obtain input from the public regarding the proposed alternatives, and select an alternative.

There was discussion regarding an alternative cross-country route along the New Haven River, through a recently donated parcel of land. This route would keep children away from the Road from the bridge south to the School; however, it would require a bridge at the school to cross the River and there were concerns regarding slopes. There was also discussion regarding the isolated nature of this alternative and that it may not be safe for children to walk/bike alone.

Within the scope of this study, the discussions focused on utility pole relocations, providing a grass edge zone between the road and sidewalk, and maintenance requirements.

The Selectboard did not endorse a preferred alternative during this meeting and asked for advisory bike lanes to be considered in the alternatives. In regard to the new alignment on the donated parcel, the Town provided direction to Dufresne Group to

focus on the original scope of the study considering all of the field work and investigations had already been completed. The Town would perform an evaluation of this cross-country path locally.

A second Alternatives Presentation was conducted on May 2, 2021. The Town also heard a presentation from a local resident regarding the potential path alignment on the donated land. The Selectboard decided to proceed with both studies separately. There was discussion on funding opportunities and the schedule for the various grant programs. The Selectboard unanimously voted to endorse an alternative that includes a new sidewalk along the east side of River Road. The board requested that the report include detail of how to provide connectivity from the sidewalk to the doors of the school.

Copies of the meeting minutes for both meetings are included as **Appendices D** and **E**.

3.4 RELATIONSHIP TO LOCAL AND REGIONAL PLANS

The Lincoln Town Plan and the Addison County Regional Planning Commission (ACRPC) Regional Plan contain goals, policies, and recommendations in support of the proposed improvements. The Lincoln Town Plan identifies the following goals:

- *Transportation Goal #1: Maintain Lincoln’s road system to provide safe, cost effective travel options for its residents and visitors.*
 - *Base road improvements on protecting public safety, not increasing road capacity.*
- *Transportation Goal #2: Maintain and improve the roads in Lincoln according to the Vermont Road and bridge Standards.*
 - *Provide alternative transportation opportunities to Lincoln’s citizens and visitors.*
 - *Increase pedestrian and bicycle safety and accessibility in the area around Lincoln Village, the School, Town Forest and Lincoln Sports by applying for state and federal funds to build the infrastructure to implement the short and long-term recommendations in the Town of Lincoln 2011 Bicycle and Pedestrian Feasibility Report.*
 - *Incorporate appropriate sidewalks and/or bikeways into road and right-of-way improvements.*

The ACRPC Regional Plan contains the following goals:

- *Overall Goal D: Facilitate a transportation system that balances the goals of safety, convenience, cost, energy efficiency, environmental protection, economic growth and recreation.*
- *Pedestrian and Bicycle Facilities Goal #1: A walking network that is safe, enjoyable and well-maintained.*
- *Pedestrian and Bicycle Facilities Goal #1: Increased rates of walking and biking across all ages, abilities and the Region.*

- *Policy #3: Encourage the development of bike/pedestrian connections between the Region's population centers, by providing adequate travel space along significant routes.*

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:

- Maintain separation between the road and a pedestrian/bicycle facility.
- Minimize permanent easements.
- Minimize road crossings.
- Minimize permitting requirements.

4.1 ALTERNATIVES DEVELOPMENT

The alternatives include various alignments, consideration for both pedestrians and bicycles, and a “no build” alternative. These alignments are generally described as follows:

- Alternative 0: No Build
- Alternative 1: Eastern Alignment
- Alternative 2: Western Alignment

Early in the alternatives development, the steering committee discussed a sidewalk versus a shared use path. Based on a review of the existing conditions and available right-of-way, there is insufficient space for a shared use path without significant permanent easement acquisition. The shared use path alternative was not developed any further based on the need for easements. The committee encouraged other bicycle considerations, such as shared lanes or advisory bike lanes. These options are discussed later in this Section and can be added to either of the pedestrian alternatives.

Additional input from the steering committee included a preference for concrete surfaces over asphalt surfaces and a preference for a grass edge zone over curbing. Drainage was identified as a concern during the Local Concerns Survey and it was determined to be important to the Town that drainage not be significantly impacted. A curb would require the installation of storm drains, whereas a grass edge zone would allow the existing drainage patterns to remain in place.

4.1.1. ALTERNATIVE 0: 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 bicycles 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.

4.1.2. ALTERNATIVE 1: EASTERN ALIGNMENT

The proposed alignment for Alternative 1 is along the east side of River Road for the length of the study area. The sidewalk would be a 5-foot wide at-grade concrete sidewalk separated from the road with a grass edge zone. The grass edge zone should be 4-6 feet wide. The sidewalk should be sloped away from the road to allow for stormwater disconnection from the road.

The impacts and considerations of the sidewalk on the east side of the road north of the bridge include:

- The existing 10' wide box culvert (or bridge) will need to be extended approximately 10 feet to accommodate the sidewalk alignment. A new headwall and wingwalls will be required. The culvert extension will require a temporary easement at minimum, and likely a permanent easement depending on the sidewalk alignment and geometry of the wingwalls.



- A ledge outcrop would need to be removed to a distance of approximately 11-12 feet from the edge of the existing pavement and for a length of approximately 80 feet.
- Tree/shrub trimming would be required at 321 East River Road. The extent of tree trimming would be within the right-of-way, approximately 12 feet from the edge of existing pavement.
- The utility poles will likely not require relocation; however, this will need to be re-evaluated during final design once the alignment is finalized. If necessary, utility poles could be relocated into the grass edge zone.
- Mailboxes would need to be relocated into the grass edge zone.

As previously discussed, the bridge was originally designed to accommodate a sidewalk and has approximately 5 feet of available space. There are two options for a sidewalk on the bridge, including an at-grade sidewalk separated with a barrier or a raised sidewalk. The steering committee indicated a preference for a raised sidewalk on the bridge. The concrete sidewalk would need to be pinned to the existing bridge deck. The existing layout includes wider shoulders and wide travel lanes. The shoulders and travel lanes would need to be narrowed and shifted to the west. This will require adjustment to the roadway approaches in both directions.



On the south side of the bridge, the impacts and considerations are more significant and include the following:

- South of the bridge, shift the roadway to the west approximately 5 feet for a distance of approximately 480 feet (including transition lengths) due to the steep slope down to the river on the east side of the road. This will include excavation and installation of subbase gravels and 4-inch thick pavement. The lane striping will also need to be removed and replaced.
- The sidewalk will need to be directly adjacent to the road and remain raised with curbing from the bridge to a distance of approximately 250 south to the end of the existing guardrail. At this point, the sidewalk can transition away from the road with a 5-foot wide grass edge zone.
- Relocate approximately 215 feet of split rail fence.
- North of the school, shift the roadway to the west approximately 6-7 feet for a distance of approximately 450 feet (including transition lengths) due to the steep slope down to the river on the east side of the road. This will include excavation and installation of subbase gravels and 4-inch thick pavement. The lane stripping will also need to be removed and replaced. The guardrail should remain in the same location.
- Narrow the grass edge zone to 3-4 feet wide along the guardrail north of the school, or utilize curbing with a raised sidewalk.
- Adjust or replace two catch basins for the road shift.
- Five utility poles will need to be relocated into the grass edge zone.
- Mailboxes will need to be relocated into the grass edge zone.
- Relocate one sign.

As one of the primary purposes of the potential sidewalk is to provide connectivity to the school, a transition from the sidewalk to the school entrance needs to be provided across the driveway and parking lot. The driveway entrance to the school is very wide and, in the morning, and afternoon, vehicle traffic in and out is at its peak, which would make it difficult to delineate a safe pedestrian space across the driveway. The steering committee

suggested routing the school access around the parking lot to avoid having children cross the driveway or parking lot. This can be accomplished by diverting off the road south of the guardrail and crossing through the north end of the parking lot, which would result in a loss of parking spaces. The sidewalk would follow around the east side of the parking lot and driveway to a point where it could connect into the existing walkway at the school without crossing significant traffic volume. It may be possible to shorten the length of the walkway by ending at the existing crosswalk; however, the circle behind the school may be used for drop off and pick up, which means there would be a significant volume of traffic at the existing crosswalk.

This school access route would require a bridge or culvert across a small stream. A bridge could span the entire length from River Road to the existing parking lot, although it would need to have a running slope no greater than 5%. A culvert would require fill to maintain a maximum slope of 5%. The culvert option would likely be a box culvert or arch culvert, to provide adequate bank full width. The culvert size should be confirmed during final design after confirmation of the stream's bank full width. For the purposes of this evaluation, a 10-foot wide, 6-foot high and 20-foot long box culvert was used.

4.1.3. ALTERNATIVE 2: WESTERN ALIGNMENT

The Alternative 2 sidewalk would have the same typical sidewalk cross section as Alternative 1, with a 5-foot wide crosswalk and grass edge zone. The proposed alignment for Alternative 2 follows the same alignment as Alternative 1 from the north end of the study area to the north side of the bridge. In this area, there are two major reasons for the sidewalk to be located on the east side of the road:

- The existing sidewalk is on the east side of the road. A continuation along the east side would not require a road crossing.
- The west side of the road is steeply sloped away from the road down to a field, which was identified as being archeologically sensitive. A pedestrian facility along the road in this area would require significant fill along this slope and would require additional investigations to determine the extent of archeological impacts.

From the north end of the bridge to the southern end of the study area, the sidewalk alignment would be along the west side of River Road. A crosswalk would be located north of the bridge to cross to the west side of the road. This landing area would require fill to move the steep slope away from the road. The sidewalk across the bridge would be the same as in Alternative 1, with the exception of being on the west side of the bridge and lanes shifted to the east.

On the south side of the bridge, the impacts and considerations include the following:

- A Class 2 wetland buffer would be impacted at 574 East River Road.
- There may be minor impacts to two separate Class 3 wetlands.

- The drainage channel along most of the length of River Road from the bridge to the school would need to be relocated to the grass edge zone. This may result in minor impacts to existing culverts.
- A ledge outcrop would need to be removed to a distance of approximately 6 feet from the edge of the existing pavement and for a length of approximately 60 feet.
- Replace two catch basins outside of the sidewalk alignment.
- Remove one large tree at 574 East River Road.
- One utility pole will need to be relocated into the grass edge zone.
- Mailboxes will need to be relocated into the grass edge zone.
- Relocate four signs.

The connection to the school entrance would be the same as in Alternative 1; however, a crosswalk would be required to cross the road. In this alternative, the crosswalk locations would need to be confirmed during final design to ensure proper sight distance. The minimum sight distance for a 30 mph speed limit is 200 feet.

4.1.4. BICYCLE CONSIDERATIONS

The options for bicycle accommodations are limited due to the proximity to the river and steep slopes along River Road. A shared use path, bicycle lanes and wide shoulders would require additional space along the road corridor, which would be very costly and difficult to create, if at all possible in some areas. Available options for bicycle facilities in areas with limited width include shared lanes and advisory shoulders. These bicycle facility options can be combined with either sidewalk alternative to create a fully accessible roadway for pedestrians and bicycles.



A shared lane is a bicycle facility where bicycles and vehicles share the full width of the road. There is no separate space for bicycles in the roadway. The minimum lane width for a shared lane is 11 feet, although greater widths are encouraged for higher speeds or traffic volumes or for less experienced users. The presence of a shared lane is typically identified with pavement markings called “sharrows” and signage. This type of facility is usually located on rural or neighborhood roads. The typical users vary by location. The neighborhood roads tend to have more children and families using the road for bicycles, while rural roads and areas with higher speeds or traffic volumes generally see more experienced cyclists.

An advisory shoulder, also known as dashed bike lanes or advisory bike lane, allows for a shared use of the road where the bike lane and travel lane overlap. In this type of facility, the road centerline is removed, and two dashed lines are added to delineate three lanes. There is also an option to add pavement color in the shoulder area. The dashed lines delineate the shoulders, which are the designated areas for bicycle travel. A vehicle would typically travel partially in the shoulder area and partially in the center lane. When a vehicle encounters a bicycle on the roadway, the vehicle must move out of the shoulder and into the center lane. If there is oncoming traffic, the overtaking vehicle must wait behind the bicycle until the oncoming vehicle has passed. The Town of Lincoln is familiar with this facility as there are advisory shoulders on Quaker Street.

Advisory shoulders may be used in areas with lower speeds, generally less than 30 mph, and lower traffic volumes, less than 6,000. The center lane width should be 10-18 feet, with a preferred width of 12.5-16 feet. The shoulders should be 4-6 feet wide, with the narrower shoulder being used only when there is no curb present. The Federal Highway Administration has development minimum design elements for advisory shoulders. Bike lane signs and bicycle lane pavement markings in the dashed bicycle lanes are required in the Request to Experiment. Additionally, an unmodified two-way traffic warning sign is recommended.

Advisory shoulders are not covered in the Manual on Uniform Traffic Devices (MUTCD) and are therefore considered experimental and require an experimentation process as outlined in the MUTCD. As State statute requires towns and the State to follow MUTCD, advisory shoulders must be treated as experimental and require an approved “Request to Experiment” prior to installation. This approval is required regardless of how a project is funded.

In the case of River Road, children would likely not be using a shared lane or an advisory shoulder due to limited space, traffic volumes, and vehicle speeds. Children would likely ride their bicycles on the sidewalk. Ideally, the sidewalk would be widened to accommodate bicycles and pedestrians; however, there is insufficient space along the bridge and the southern half of the study area for a wider sidewalk. The northern section of the study area has adequate space to accommodate a wider sidewalk.

4.2 EVALUATION MATRIX

An evaluation matrix was prepared to compare the alternatives and is presented in **Table 4.1** on the following page. The evaluation matrix includes factors such as impacts, local issues, permitting and cost.

4.3 PREFERRED ALTERNATIVE

Based on input from the public and the Town, the preferred alternative includes the following components and is shown in **Figure 4.1**, included in **Appendix F**.

Table 4.1: Evaluation Matrix

Criteria	No Build	Alternative 1	Alternative 2
		East Side	West Side
Impacts			
ROW Acquisition	None	Minimal	Minimal
Stormwater/Drainage	None	Moderate	Significant
Elevations/Grading	None	Minimal	Moderate
Road Modification	None	Significant	None
Utility Relocation	None	Moderate	Moderate
Archeological & Historic	None	None	None
Prime Agriculture Soils	None	None	None
Hazardous Materials	None	None	None
Floodplains	None	None	None
T&E Species	None	None	None
Wetlands	None	Minimal	Moderate
Local & Regional Issues			
Maintenance	No Change	Minimal	Minimal
Character	No Change	Minimal	Minimal
Conformance to Town/Regional Plan	No	Yes	Yes
Satisfies Purpose & Need	No	Yes	Yes
Permits/Approvals			
19 V.S.A. 1111 Access Permit	No	No	No
Act 250	No	No	No
Floodplain	No	Potentially	Potentially
Stream Alteration	No	Yes	Yes
Stormwater Discharge	No	No	No
Stormwater Construction	No	No	No
Shoreline	No	No	No
Wetlands	No	Potentially	Yes
Miscellaneous			
Road Crossings	0	0	1
Cost			
Preliminary Estimated Construction Cost	\$0	\$640,000	\$570,000

- Approximately 2,565 linear feet of new 5-foot wide concrete sidewalk at-grade with a grass edge zone (3 to 5-feet wide).
- Approximately 170 linear feet of new 5-foot wide raised concrete sidewalk on the bridge and bridge approaches, pinned to the existing concrete bridge deck and approaches.
- Approximately 240 linear feet of new 5-foot wide raised concrete sidewalk with granite curb south of the bridge.
- Approximately 530 square yards of road extension, including new subbase and 4-inch thick pavement.
- Approximately 1,000 linear feet of lane restriping.
- New 10-ft wide by 6-ft tall by 20-ft long box culvert.

4.4 DESIGN CONSIDERATIONS

The anticipated impacts of the preferred alternative are summarized in **Figure 4.1**, and further discussed below.

4.4.1. LIGHTING

Lighting is not required for pedestrian and/or bicycle facilities. However, if a facility is going to be used frequently at night, lighting can increase user safety. The Steering Committee requested that lighting be considered as an “add-on” in the preferred alternative. The number of lights needed depends on the type of light fixtures and the light distribution pattern. Typically, 200 foot light spacing is adequate for conceptual design purposes. At least one control panel is required for the lighting. Longer wire lengths or the bridge may require a second control panel.

If the Town chooses to install lighting, the Town should work with a light supplier to ensure the selected light is spaced properly for the light distribution pattern to ensure continuous lighting. There are a variety of light fixture and pole styles to blend in with the character of the project area. Neighboring properties typically prefer warmer, downcast lights as they have a lesser impact on the adjacent properties.

4.4.2. NATURAL RESOURCE IMPACTS

There are Statewide agricultural soils within the preferred alternative. As the improvements are located within the edges of the existing sidewalk, the soils impacted are previously disturbed soils. As noted in Section 2, there is typically no impact to the agricultural soils if the project is located directly adjacent to an existing road.

Two streams will be impacted for the culvert extension on the north end of the study area and the new culvert near the school. The streams will need to be bypassed during the installation of the culverts; however, they will both be returned to pre-existing conditions upon completion of the work.

There will be sidewalk construction within the floodplain on both sides of the bridge. Any construction work within a floodplain will require coordination with the local and State floodplain coordinators. The sidewalk construction adjacent to the bridge will not significantly change existing elevations and therefore is not anticipated to affect the flood elevation in this area. It appears that sidewalk construction between River Road and the school parking lot will be outside of the floodplain, however, this will need to be confirmed during final design. If this construction is located within a floodplain, it may affect flood elevations due to the increase in grade for the crossing and may require a permit.

There is a Class 2 wetland at 574 East River Road that will have a minor wetland buffer impact related to shifting the road. The wetland buffer is 50-feet from the wetland, which should be formally delineated during final design. The road shift length should be reviewed during final design to determine if the taper can occur north of the Class 2 wetland buffer area. There are also two Class 3 wetlands located adjacent to the road shifts; however, Class 3 wetlands do not have a buffer. It is unlikely that the road shift will directly impact these wetlands.

4.4.3. HAZARDOUS SITE REMEDIATION

There are two hazardous waste sites located near the proposed sidewalk alignment. One site is already closed and the other is pending closure. Both sites were related to underground fuel storage tanks. There is minimal risk of encountering hazardous material during the construction of the proposed sidewalk.

4.4.4. UTILITY IMPACTS

The preferred alternative may require the relocation of approximately 5 utility poles. It may be possible to reduce the sidewalk width at the utility poles to avoid relocation. This will need to be further evaluated during final design.

The preferred alternative will also require adjustment or replacement of two catch basins, related to the road shift. It may be possible to adjust the structure height to minimize impact, depending on how the existing catch basin is located horizontally and vertically in comparison to the shifted roadway.

There should be consideration to sloping the sidewalk away from the roadway to drain runoff away from the road. This would allow the sidewalk to be “disconnected” from the road in terms of stormwater runoff. This may not be possible in all areas due to topography and impacts to private property.

4.4.5. ARCHEOLOGICAL IMPACTS

As previously noted in Section 2, additional investigations will be required if the proposed facility extends into the two identified sensitive areas. One of these areas is located on the west side of the road, north of the bridge, and will not be impacted by the

preferred alternative. The other is located adjacent to the preferred alternative; however, construction activity would be within the existing right-of-way, adjacent to the road and therefore would not impact the archeologically sensitive area.

There are six identified historically important structures along the study area. Of these, there are only three historically important structures located adjacent to the preferred alternative. These include structures at 321, 574 and 639 East River Road. The remaining three historically important structures are on the opposite side of the road or north/south of the preferred alternative.

Efforts should be made to minimize impact to these properties. As long as all work remains within the existing right-of-way at these locations, there should be no impact to these structures. The next section will discuss these properties in terms of right-of-way impacts.

4.4.6. RIGHT-OF-WAY IMPACTS

The Town intends to keep the proposed sidewalk within the existing right-of-way, with the exception of the length on the school property. However, the culvert extension on the north end of the study area will likely require a permanent easement for the wingwalls.

Temporary easements are often obtained to a distance of approximately 10 feet behind the existing sidewalk. However, some municipalities routinely construct sidewalk facilities up to the existing right-of-way with no impact to private property. The need for temporary easements should be determined during final design, through consultation with the Town staff.

The anticipated right-of-way impacts are summarized in **Table 4.2**. All of the anticipated permanent easements would be for minimal areas of property.

Table 4.2: Anticipated Right-of-Way Impacts

Property Address	Historically Significant	Anticipated Temporary Easement	Anticipated Permanent Easement
293 East River Road	No	No	No
321 East River Road	Yes	Yes	Yes
574 East River Road	Yes	No	No
593 East River Road	No	Yes	No
639 East River Road	Yes	Yes	No
738 East River Road	No	No	No
772 East River Road	No	No	No
795 East River Road	No	Yes	Yes

Of the three properties adjacent to the preferred alternative that were identified as historically important, two of them have potential right-of-way impacts. The right-of-way

impact to 639 East River Road is temporary for the purposes of construction. There will be no permanent components placed outside of the right-of-way. As such, this impact will not be significant. Final design should consider if it is possible to construct a sidewalk at this location entirely within the right-of-way.

The right-of-way impact to 321 East River Road includes both temporary and permanent easements for the culvert extension. This work is not located directly in front of or adjacent to the structure and will not impact the structure. As such, it should not be a significant impact.

4.4.7. PERMITTING

The permitting requirements for the proposed pedestrian and bicycle facilities were previously presented in **Table 4.1** and are further described below.

If the total impervious area planned, new and/or redeveloped, exceeds one acre, a Stormwater Discharge Permit is required. The full extent of sidewalk replacement within the study area is approximately 0.3 acres of impervious area, therefore a Stormwater Discharge Permit should not be required.

A Construction General Permit will be required if the total earth disturbance is 1 acre or more. The preliminary estimate for earth disturbance is approximately 0.7 acres for the full extent of sidewalk construction in the study area. It does not appear that a Construction General Permit will be required, however, this should be re-evaluated during final design.

Stream alteration permits will be required for the culvert extension on the north end of the study area and for the new culvert at the school. The local floodplain coordinator will need to be contacted to provide a determination on the need for a floodplain permit. If the work within the floodplain is limited to the sidewalk adjacent to the bridge, either a permit will not be required, or the Town's floodplain coordinator may issue a permit based on no impact. If the sidewalk or culvert near the school is located within the floodplain, a permit will be required and more evaluation may be required to determine the impact to the floodplain.

Wetlands permitting may be required if the road shift work is located within 50 feet of the Class 2 wetland, located on the north end of the parcel for 574 East River Road. If the road shift can be shortened and tapered back to existing prior to the wetland buffer, no permit would be required.

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.

4.4.8. TRAFFIC CONTROL

The construction of the proposed improvements will require work within the travel way and along the shoulder of the road. The VTrans Work Zone Safety and Mobility Policy and Guidance provides a process to determine the project significance and a checklist to determine traffic control needs.

The project significance is based on a variety of factors, including speed limit, AADT, multi-project interaction, project location, non-automobile modes, duration of project, level of impact to high-volume or critical traffic generators, and network reliability. The assessment for this project is as follows:

- Speed Limit: 30 mph
- AADT: Approximately 1,230
- Multi-Project Interaction: Unknown at this time
- Project Location: Not Downtown/Village
- Non-Automobile Modes: Low to moderate volume of bicycle and pedestrian traffic, with potential for moderate impact when school is in session
- Duration of Project: Unknown at this time (due to likely phasing)
- Level of Impact to High-Volume/Critical Traffic Generators: Low to none
- Network reliability: Low

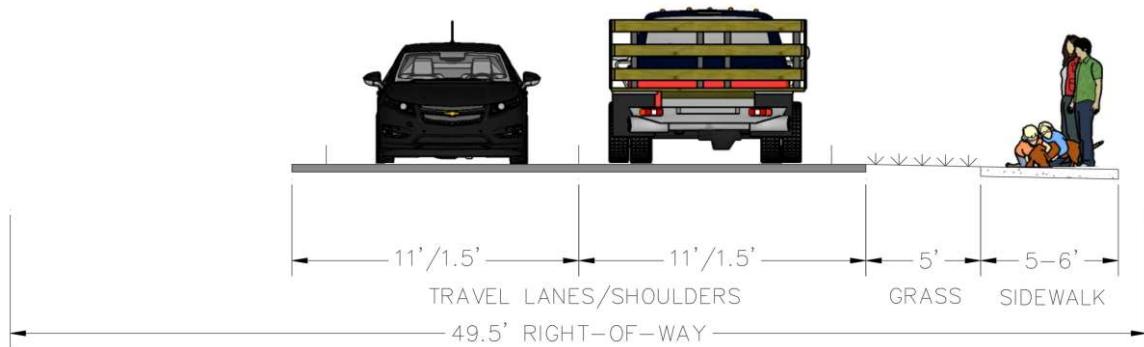
Based on the preliminary evaluation above, this project will likely fall into Category D, which is not considered significant; however, the Traffic Management Plan (TMP) Checklist is required. Temporary Traffic Control, Transportation Operation and Public Information Plans are likely not required, which shall be confirmed with the checklist. A preliminary TMP Checklist is included in **Appendix E**.

The project-specific traffic plan will be developed during the design phase of the project to address any potential lane closures or road closures, as well as typical construction signage. It is unlikely that a road closure will be possible on River Road, due limited reliability in the road network in this area. Lane closures will be necessary throughout the work area. All lane closures shall comply with the Manual of Uniform Traffic Control Devices (latest edition) for signage and flaggers.

4.5 TYPICAL CROSS SECTION

The preferred alternative includes the addition of a new 5-foot wide sidewalk along the east side of the road. In some locations, this will require shifting the road to the west due to steep slopes and the river. In the road shift areas, the proposed cross section will remain the same as the rest of the project area. The proposed typical cross section is shown in **Figure 4.2**.

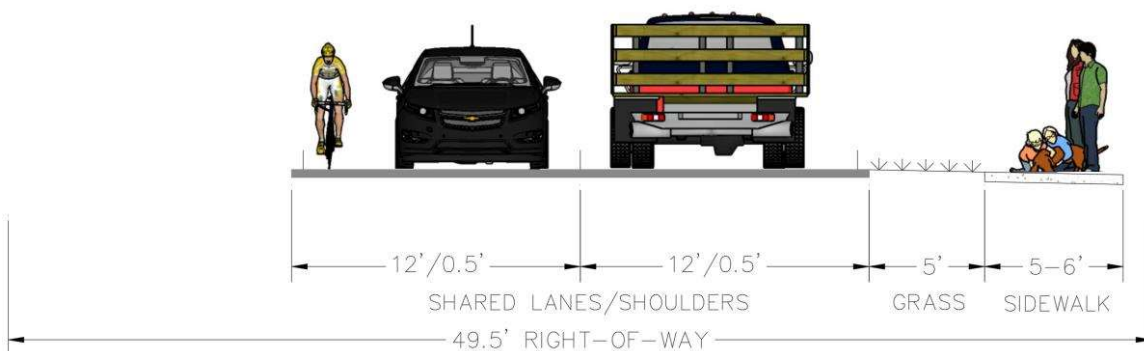
Figure 4.2: Typical Cross Section



The sidewalk width is shown as 5-6 feet wide. As previously discussed, the sidewalk north of the bridge could be installed at 6-feet wide to better accommodate children on bicycles. The sidewalk on the bridge and south of the bridge would remain at 5-feet wide.

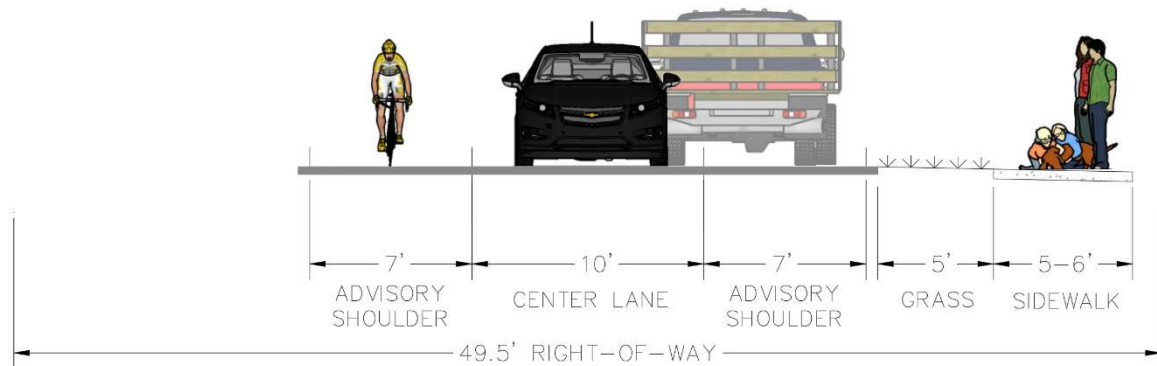
If the Town chooses to install shared lanes, the typical section will remain the same; however, the white line on each side of the road may be placed closer to the edge of pavement to incorporate the shoulder width into the travel lane, as shown in **Figure 4.3**.

Figure 4.3: Shared Lane Typical Section



If the Town chooses to install advisory shoulders, the road line striping will be installed as shown in **Figure 4.4**. This includes eliminating the yellow centerlines and installing white dashed lines to create three lanes. The road width and the sidewalk cross section remain the same.

Figure 4.4: Advisory Shoulder Typical Section



4.6 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 the preferred alternative is \$795,000 in 2021 dollars, which includes a 25% contingency.

A separate “add-on” cost for lighting, including its own contingency, is included in the cost estimate.

Table 4.4 summarizes the optional construction cost estimates that may be added into the project. These include the following items:

- Shared Lanes: \$3,000
- Advisory Shoulders: \$6,500
- Lighting: \$270,000
- 6-ft Wide Sidewalk (north section only): \$13,000

The Town may select either shared lanes or advisory shoulders for the preferred bicycle facility. The Town may also elect to not include a bicycle facility or install one as a separate project in the future. The lighting and wider sidewalk (in the north section only) may also be added to the project. In contrast to the bicycle facility options, these options cannot be completed as a separate project without additional cost as they may require rework of the sidewalk if done separately.

Table 4.5 presents the total project costs for the preferred alternative. The construction cost is estimated at \$795,000 based on construction in 2021. However, if design is started in 2022 based on a funding application in 2021, the project will not likely reach construction until 2025. As such, the construction cost estimate has been inflated at 3% per year. Therefore, for planning purposes the total project cost is estimated at \$1,265,000 based on construction costs of \$950,000 in 2025.

Table 4.3: Preliminary Construction Cost Estimate

Item Description	Quantity	Unit	Unit Price	Total Price
Clearing and Grubbing, Including Individual Trees and Stumps	1	LS	\$ 12,600.00	\$ 12,600.00
Removing Medium Trees	0	EA	\$ 1,350.00	\$ -
Common Excavation	810	CY	\$ 23.00	\$ 18,630.00
Solid Rock Excavation	125	CY	\$ 55.00	\$ 6,875.00
Subbase of Crushed Gravel	644	CY	\$ 50.00	\$ 32,200.00
Marshall Bituminous Concrete Pavement	145	TON	\$ 220.00	\$ 31,900.00
Precast Concrete Catch Basin	2	EA	\$ 3,300.00	\$ 6,600.00
Precast Concrete Box Culvert Extension	1	LS	\$ 50,000.00	\$ 50,000.00
Precast Concrete Box Culvert	1	LS	\$ 80,000.00	\$ 80,000.00
Vertical Granite Curb	440	LF	\$ 52.00	\$ 22,880.00
Remove and Reset Mailbox	3	EA	\$ 150.00	\$ 450.00
Portland Cement Concrete Sidewalk, 5 inch	1440	SY	\$ 90.00	\$ 129,600.00
Portland Cement Concrete Sidewalk, 8 inch	100	SY	\$ 104.00	\$ 10,400.00
Portland Cement Concrete Sidewalk on Bridge, 5 inch	115	SY	\$ 110.00	\$ 12,650.00
Detectable Warning Surface	10	SF	\$ 50.00	\$ 500.00
Remove and Reset Fence	215	LF	\$ 13.00	\$ 2,795.00
Remove and Reset Guardrail	65	LF	\$ 10.00	\$ 650.00
Flaggers	1700	MHRS	\$ 42.00	\$ 71,400.00
Mobilization/Demobilization	1	LS	\$ 106,734.80	\$ 106,734.80
Traffic Control	1	LS	\$ 20,000.00	\$ 20,000.00
4 Inch White Line, Waterborne Paint	1870	LF	\$ 0.08	\$ 149.60
4 Inch Yellow Line, Waterborne Paint	1870	LF	\$ 0.08	\$ 149.60
Crosswalk Marking, Waterborne Paint	0	LF	\$ 6.60	\$ -
Removal of Pavement Markings	1870	SF	\$ 0.80	\$ 1,496.00
Restoration	1	LS	\$ 16,000.00	\$ 16,000.00
Remove and Reset Sign	1	EA	\$ 340.00	\$ 340.00
SubTotal Construction Cost				\$ 635,000
Contingencies (25%)				\$ 160,000
Total Construction Cost (2021)				\$ 795,000

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 12463 when the cost estimate was completed in August 2021.

Table 4.4: Preliminary Construction Cost Estimates for Add-Ons**Add: Shared Lane**

Item Description	Quantity	Unit	Unit Price	Total Price
Symbol, Waterborne Paint	28	EA	\$ 20.00	\$ 560.00
Traffic Signs	8	EA	\$ 94.00	\$ 752.00
Sign Post (12 ft high)	8	EA	\$ 143.00	\$ 1,144.00
SubTotal Construction Cost				\$ 2,456
Contingencies (25%)				\$ 544
Total Construction Cost (2021)				\$ 3,000

Add: Advisory Shoulder

Item Description	Quantity	Unit	Unit Price	Total Price
4 Inch White Line, Waterborne Paint	-925	LF	\$ 0.08	\$ (74.00)
4 Inch Yellow Line, Waterborne Paint	-1870	LF	\$ 0.08	\$ (149.60)
Symbol, Waterborne Paint	28	EA	\$ 20.00	\$ 560.00
Removal of Pavement Markings	3780	LF	\$ 0.80	\$ 3,024.00
Traffic Signs	8	EA	\$ 94.00	\$ 752.00
Sign Post (12 ft high)	8	EA	\$ 143.00	\$ 1,144.00
SubTotal Construction Cost				\$ 5,256
Contingencies (25%)				\$ 1,244
Total Construction Cost (2021)				\$ 6,500

Add: Lighting

Item Description	Quantity	Unit	Unit Price	Total Price
Wired Conduit	3050	LF	\$ 27.00	\$ 82,350.00
Special Provision (Electrical Service Cabinet)	2	EA	\$ 17,000.00	\$ 34,000.00
Special Provision (Light)	16	EA	\$ 6,000.00	\$ 96,000.00
Electrical Allowance (N.A.B.I.)	1	LS	\$ 2,000.00	\$ 2,000.00
SubTotal Construction Cost				\$ 214,350
Contingencies (25%)				\$ 55,650
Total Construction Cost (2021)				\$ 270,000

Add: 6' Wide Sidewalk (North Only)

Item Description	Quantity	Unit	Unit Price	Total Price
Solid Rock Excavation	9	CY	\$ 55.00	\$ 495.00
Concrete Sidewalk	104	SY	\$ 90.00	\$ 9,360.00
SubTotal Construction Cost				\$ 9,855
Contingencies (25%)				\$ 3,145
Total Construction Cost (2021)				\$ 13,000

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 12463 when the cost estimate was completed in August 2021.

Table 4.5: Preliminary Total Project Cost Estimate

DESCRIPTION	TOTAL COST
Construction Cost (2021) with 25% Contingency ¹	\$795,000
Construction Cost (2025) with 25% Contingency	\$950,000
Engineering:	
Design Phase Engineering ²	\$95,000
Construction Phase Engineering ²	\$95,000
Local Project Management ³	\$115,000
Right-of-Way ⁴	\$10,000
Total Project Cost (2025)	\$1,265,000
 Add-Ons:	
Shared Lane⁵	
Construction Cost (2025)	\$3,400
Advisory Shoulder⁵	
Construction Cost (2025)	\$7,300
Lighting	
Construction Cost (2025)	\$305,000
Design Phase Engineering ⁶	\$10,000
Construction Phase Engineering ⁶	\$5,000
Local Project Management ³	\$30,000
<i>Total – Lighting</i>	<i>\$350,000</i>
6-foot Wide Sidewalk	
Construction Cost (2025)	\$15,000
Construction Phase Engineering ⁷	\$2,000
Local Project Management ³	\$2,000
<i>Total – Wide Sidewalk</i>	<i>\$19,000</i>

Notes:

1. Construction costs are shown in **Table 4-3** and **Table 4-4**. The construction cost includes 25% contingency.
2. Engineering costs are estimated at 10% of the construction cost for both the design and construction phases.
3. Local Project Management costs are estimated at 10% of the construction, engineering and right-of-way costs.
4. Right-of-way costs are estimated based on similar sized projects.
5. The addition of shared lanes or advisory shoulders is not expected to increase engineering, project management or right-of-way costs.
6. The addition of lighting is expected to increase engineering costs. The increases in engineering costs are based on similarly sized projects.
7. The wider sidewalk on the north section is expected to increase construction phase engineering costs due to an increase in contract time. The increase is estimated at 10% of the construction cost.

5 FISCAL IMPLEMENTATION

As presented in Section 4, the proposed project consists of the following improvements:

- Approximately 2,565 linear feet of new 5-foot wide concrete sidewalk at-grade with a grass edge zone (3 to 5-feet wide).
- Approximately 170 linear feet of new 5-foot wide raised concrete sidewalk on the bridge and bridge approaches, pinned to the existing concrete bridge deck and approaches.
- Approximately 240 linear feet of new 5-foot wide raised concrete sidewalk with granite curb south of the bridge.
- Approximately 530 square yards of road extension, including new subbase and 4-inch thick pavement.
- Approximately 1,000 linear feet of lane restriping.
- New 10-ft wide by 6-ft tall by 20-ft long box culvert.

The estimated total project cost for these improvements is \$1,265,000 based on a 2025 construction cost estimate of \$950,000. The construction costs were inflated by 3% per year to estimate construction costs in the future, with non-construction costs increased accordingly. The selected add-ons (if any) will need to be added into the scope of work and total project cost described above.

5.1 FUNDING ALTERNATIVES

The Town of Lincoln 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 Municipal Assistance Bureau, 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 80% Federal/State and 20% 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 in June.

The Transportation Alternatives Program, also administered by the Municipal Assistance Bureau, 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. The use of “in-kind” services requires approval from VTrans and is

not guaranteed. Grant applications are accepted annually and are generally due in November.

5.2 PHASING CONSIDERATIONS

This project is large enough that it could be constructed in phases in order to take advantage of multiple rounds of funding. Based on the Town's separate evaluation of a shared use path across a donated parcel of land, the logical place to split this project is at the north side of the bridge. This would provide connectivity from the end of the existing sidewalk to the potential shared use path.

Table 5.1 provides a breakout of the total cost estimate for Phase 1. This includes new 5-foot wide concrete sidewalk, 5-foot wide grass edge zone, and culvert extension. It is recommended that the add-on for the wider sidewalk be included in the Phase 1 project to provide additional space for children on bicycles, which would make the sidewalk 6-feet wide.

Table 5.1: Phase 1 Preliminary Total Project Cost Estimate

DESCRIPTION	TOTAL COST
Construction Cost (2021) with 25% Contingency	\$260,000
Construction Cost (2025) with 25% Contingency	\$310,000
Engineering:	
Design Phase	\$40,000
Construction Phase	\$40,000
Local Project Management	\$40,000
Right-of-Way	\$5,000
Phase 1 Total Cost Estimate	\$435,000
Recommended Add-On (Wider Sidewalk)	\$20,000
Phase 1 with Wider Sidewalk Total Cost Estimate	\$455,000

Notes:

1. Engineering costs are estimated at 12-13% of the construction cost for both the design and construction phases. This is greater than the percentage used in **Table 4.5** due to the smaller project size and duplication of some tasks in both phases.

It is not recommended that a bicycle facility be installed only for the Phase 1 segment. If a bicycle facility is to be installed, it should be a longer length facility. This could be for the full length of the study area, or preferably, for the full length of River Road from the village center to the school.

If the Town chooses to install lighting, the Phase 1 cost of lighting has a total project cost estimate of \$125,000 based on a 2025 construction cost estimate of \$105,000.

5.3 PROJECT SCHEDULE

The proposed project schedule for the Phase 1 sidewalk project funded through the VTrans Bicycle and Pedestrian Program or Transportation Alternatives Program is shown in **Table 5.2**. This schedule is achievable if grant funding is obtained in 2022. This schedule can also be easily adjusted to accommodate any funding award date as the general timeline will remain the same.

Table 5.2: Proposed Phase 1 Project Schedule

Project Task	Date
Receive Approval of Scoping Study	October 2021
Town Approval of Grant Application	May 2022
Submit Grant Application	June 2022
Receive Notice of Grant Award	September 2022
Grant Agreement Executed	December 2022
Procurement for Design Services	January 2023
Design Phase	2023-2025
Construction	2025