



VTrans Fall 2022 Transportation Alternatives (TA) Grant Application

Thoroughly read the ***Vermont Transportation Alternatives Fall 2022 Application Guide*** before you begin your application. It includes important program information and step-by-step instructions. Pay particular attention to the application process requirements. **Applications are due in hand or by e-mail by December 14, 2022.** Please e-mail the completed application to: Scott.robertson@vermont.gov

Stebbins Road Culvert Replacement
(Project Name/Title)

(802) 644-8290
(Phone)

Jonathan DeLaBruere
(Municipality contact person responsible for the management of this project)

townadmin@cambridgevt.org
(e-mail address)

Cambridge
(Town)

\$ 32,000
Amount of **Federal Funds requested** (no more than 80% of the project cost estimate).

05464
(Zip Code)

\$ 8,000
Amount of Local Match. Example:
Federal Award = \$300,000 (80% of total)
Local Match = \$75,000 (20% of total)
Total Project Cost = \$375,000 (100% of the total)

PO Box 127, Jeffersonville, VT 05464
(Mailing Address)

County: Lamoille County

Town/Village/City: Cambridge Town

Specific location, street, or road: Stebbins Road

Regional Planning Commission: Lamoille County Planning Commission

If a linear project, what is the length in feet? N/A

Is the project on or intersecting to a State maintained highway? Yes No

- *Note: If yes, be sure to include documentation that you have notified the VTrans District Transportation Administrator of the intent to apply for TA funding and have provided them with a brief (one paragraph) description of the proposed project.*

Project type being applied for: **Scoping** **Design/Construction**

The municipality understands that a typical construction project utilizing Transportation Alternatives Program funds will take roughly three years (min.) in the Design and ROW phases prior to going to construction (as pointed out in the TA Program Application Guide)? Yes No

Does this project have a previously completed scoping or feasibility study? Yes No

Note:

Attach a map(s) of the project area and clearly show the limits of the project as well as surrounding benefits from the proposed improvement. If the project is within or adjacent to a designated downtown, village or growth center, clearly indicate the relationship of the proposed project to the boundary of the designated area. Color photos of the area are also recommended.

Fiscal Information:

Accounting System Automated Manual Combination

SAM Unique Identifier # XA7BW77YDGY5

Fiscal Year End Month 12 - December

Property Ownership:

If the proposed project is on private property that will need to be acquired by the Municipality through purchase, easement, or eminent domain (includes temporary construction rights) in accordance with the "Uniform Act", then the municipality is committed to exercising its right of **eminent domain** to acquire the rights to construct the project if necessary. Yes No

Funding:

Does this project already have existing funding? If so, please describe. Yes No

[Click here to enter text.](#)

Will you accept an award less than you applied for? Yes No

- If yes, please indicate whether local funds will be used to make up the shortfall, or if the project scope will be reduced. If the project scope is to be reduced, describe what part of the project (please be specific) you would accept partial funding for.

Local funds will be used to make up the shortfall should we be awarded less than requested.

A support letter from the governing body of the applicant municipality or organization and an acknowledgement and source of the local match and commitment to future maintenance responsibility for construction projects is required (must be dated within 1 year of the application). Is a letter of support attached?

Yes No

Regional Planning Commission Letter of Support:

In order to apply, the project must have a letter of support from the regional planning commission. Is a letter of support attached?

Yes No

Application Scoring Criteria:

- 1. Please give a brief description of the project (be sure to indicate the primary facility type being applied for and be concise). (10 points max.)**

This project involves upgrading and resizing an existing culvert on Stebbins Road to be designed and constructed in a way that meets/exceeds VTrans hydraulic standards and allows for aquatic organism passage. Due to Stebbins Road being on the slope of Mount Mansfield, this culvert sees high flows during storm events and spring snow runoff. This stream is an un-named tributary to the Brewster River, and ultimately flows to the Lamoille River and then Lake Champlain. The town has completed a preliminary hydraulics assessment, but requires additional engineering and alternative design investigation before the town can apply for design/construction funding.

- 2. What is the feasibility of this project? Feasibility (or Scoping) study applications will not be scored on this criterion. Also, please describe the extent of project development completed to date. (10 points max.)**

N/A – Scoping Study Application

- 3. Does this project address a need identified in a local or regional planning document? If so, please describe. (5 points max.)**

Yes, both.

The Cambridge Town Plan specifically identifies that “All bridges and culverts shall be built and maintained to meet or exceed standards recommended by VTRANS to ensure minimal impact on rivers and streams.”

The Lamoille County Regional Plan specifically identifies “Increas[ing] the percentage of culverts... utilizing aquatic organism passage (AOP) design features” as a key land use goal in rural areas of the County.

- 4. Does this project benefit a State Designated Center per the link below (i.e., downtowns, villages, or neighborhood growth centers recognized by the Vermont Department of Economic, Housing and Community Development? (10 Points Max.)**

<http://maps.vermont.gov/ACCD/PlanningAtlas/index.html?viewer=PlanningAtlas>

Yes

- 5. Provide a project cost estimate below (project costs below include both federal dollars and local dollars). Projects will be scored based on whether the cost appears realistic for the size and scope of the project. For scoping studies, use PE and Local Project Management lines only. Note: If you are applying for additional funds for an existing project, show the amount being requested for this grant in the PE, ROW, Construction, Construction Engineering, and Municipal Project Management rows below. Also, be clear regarding total project cost and other funding amounts and sources in the additional funding comments box below. (10 points max.)**

| | |
|--|------------------------|
| Preliminary Engineering (PE) <i>(Engineering, Surveying, Permitting)</i> | \$ 36,000 _____ |
| Right-of-way / Acquisition (ROW) <i>(appraisals, land acquisition and legal fees)</i> | \$ 0 _____ |
| Construction <i>(construction costs with reasonable contingency)</i> | \$ 0 _____ |
| Construction Engineering <i>(cost to provide inspection during construction)</i> | \$ 0 _____ |
| <i>Municipal Project Management Costs (minimum of 10% of total PE, ROW and Construction Phases).</i> | \$ 4,000 _____ |
| Total Project Cost | \$ 40,000 _____ |

Addition Funding Comments: (ex. Total and additional funding for existing projects)

[Click here to enter text.](#)

6. **Select the eligibility category below (A, B, C or D) that best fits your project and answer the corresponding questions for that category (choose only one category). 10 bonus points will be awarded to projects that are primarily Bicycle or Pedestrian facilities.**

A. Bicycle and Pedestrian Facilities (includes Safe Routes for Non-Drivers and Conversion of abandoned railroad corridors.

- (i) Will the project contribute to a system of pedestrian and/or bicycle facilities?

(10 points max.)

[Click here to enter text.](#)

- (ii) Will the project provide access to likely generators of pedestrian and/or bicyclist activity? **(10 points max.)**

[Click here to enter text.](#)

- (iii) Will the project address a known, documented safety concern? **(10 points max.)**

[Click here to enter text.](#)

B. Community Improvement Activities:

- i. Explain how the project improves the economic wellbeing of the community and/or provide a benefit to state tourism? **(10 points max.)**

[Click here to enter text.](#)

- ii. Describe the anticipated impact to the public; degree of visibility, public exposure and/or public use. **(10 points max.)**

[Click here to enter text.](#)

- iii. Answer only one of the following based on the type of project:

- a) Construction of turnouts, overlooks, and viewing areas as related to scenic or historic sites. *To what extent will the project provide a view of a highly unique and scenic area?* **(10 points max.)**

[Click here to enter text.](#)

- b) Preservation or rehabilitation of historic transportation facilities. *Describe the historic significance of the historic transportation facility and the importance of the facility to the state.* **(10 points max.)**

[Click here to enter text.](#)

- c) Archeological planning and research related to impacts from a transportation project. *Describe the associated transportation project and benefit of the proposed activities.* **(10 points max.)**

[Click here to enter text.](#)

- d) Vegetation management in transportation rights of way to improve roadway safety, prevent invasive species, and provide erosion control. *Describe the extent of the current problem and the impact on the site and surrounding area.* **(10 points max.)**

[Click here to enter text.](#)

C. Environmental Mitigation Activity Related to Stormwater and Highways

- i. Please describe how this application provides environmental mitigation relating to stormwater and highways. **(10 points max.)**

“Sizing and maintaining culverts correctly will prevent flooding problems that can lead to erosion and repairs. Placing culverts and other outlets based upon road slope will control the volume and velocity of discharges and reduce the amount of sediment entering the surface water.” VT Better Roads Manual (2019)

- ii. What information or data is provided to substantiate the current stormwater problem and associated environmental impacts? **(10 points max.)**

The hydraulic study completed by Tyler Billingsley of East Engineering in March 2020 shows that the current condition of the culvert is/could negatively impact both the upstream (wetland) and downstream (outlet scour and sediment transport). Currently there is no access for aquatic organism passage.

- iii. What substantiating data or information is provided to show that the proposed application is an effective and maintainable solution to the problem? **(10 points max.)**

Since Hurricane Irene in 2011, flood resilience has become an important topic in Vermont with numerous laws, documents, and standards being created in the years following that event. Act 64 (VT Clean Water Act), VT Better Roads Manual, and the VTrans Road and Bridge Standards are great examples of some of this literature. There are many other examples of success from resizing culverts including the following link from the Ausable River Association.

<https://www.ausableriver.org/blog/why-build-large-culverts>

D. Environmental Mitigation Activity Related to Wildlife

- i. Please describe how this application will reduce vehicle-caused wildlife mortality or will restore and maintain connectivity among terrestrial or aquatic habitats. **(10 points max.)**

[Click here to enter text.](#)

- ii. What information or data is provided to substantiate the current problem and associated environmental impacts? **(10 points max.)**

[Click here to enter text.](#)

- iii. What substantiating data or information is provided to show that the proposed application is an effective and manageable solution to the problem? **(10 points max.)**

[Click here to enter text.](#)

March 27, 2020

Town of Cambridge
 Attn: Bill Morey, Highway Manager
 PO Box 127
 85 Church Street, 2nd Floor
 Jeffersonville, VT 05464

RE: Hydraulic Study – Stebbins Road (TH44)
 GPS Coordinates: 44.621440 N / -72.829629W
 Waterbody: un-named tributary to the Brewster River

Project Understanding

East Engineering has completed a preliminary hydraulic study for the above referenced site and has summarized details of the study in subsequent sections of this letter report. A site visit was conducted on March 11, 2020 to visually inspect and measure the stream, road, and culvert conditions. Measurements should be refined/confirmed, and this study revised (if necessary), once the Town moves into the design phase of the culvert replacement project.

Hydrology

The following physical characteristics are descriptive of this drainage basin:

| | |
|---|----------------------------|
| Drainage Area: | 1.41 square miles |
| Land Cover/Use: | Primarily Wooded and Rural |
| Stream Channel Slope in Vicinity of Crossing (~1,000’): | 0.5% |
| Percentage of water bodies/wetlands (NLCD 2006): | 0.48% |

The following flow rates were obtained from the United States Geological Survey (USGS) StreamStats and is based on several factors including drainage basin and historical precipitation:

| Recurrence Interval (Years) | Flow Rate in Cubic Feet Per Second (CFS) |
|-----------------------------|--|
| Q2 | 76 |
| Q10 | 161 |
| Q25 | 218 |
| Q50 | 268 (Design Flow) |
| Q100 | 323 (Check Flow) |

Channel Morphology

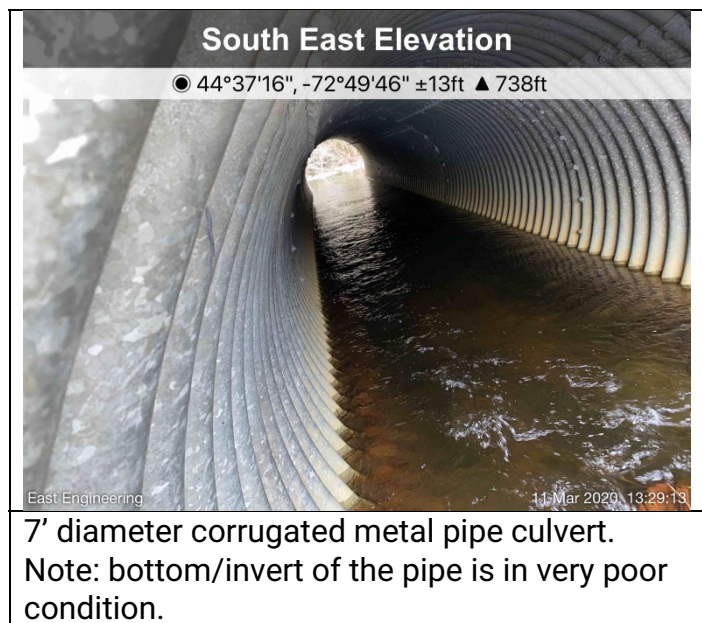
The channel for this perennial stream is generally sinuous and meandering with an approximate channel slope of 0.5%. The channel bed is primarily smaller aggregates (sands, silts, etc.) and no large boulders or bedrock outcroppings were observed. The outlet channel is scoured with a large plunge pool (considering the size of tributary), likely due to the existing culvert being undersized. The upstream channel in this area is part of a State mapped wetland complex, which has significant beaver activity (problematic to the Town over the past few years). The bankfull width in the stream in the vicinity of the project was measured at approximately 14'-15', which is consistent with published hydraulic geometry curves.



Existing Conditions

The existing structure is a 7-foot diameter corrugated metal pipe culvert (galvanized), which provides approximately 38 ft² of waterway opening, and is 60 feet long. The bottom portion of the pipe was visible and appears to be significantly corroded, with several holes. The culvert is in poor condition and is at/near the end of its useful service life. There are not headwalls/wingwalls on either the inlet or outlet of the pipe.

The structure is not in compliance with the VTrans Hydraulic Manual, does not meet bankfull width requirements, and potentially restricts aquatic organism passage (AOP). Hydraulic calculations for the existing culvert were



completed using *HY-8 Culvert Hydraulic Analysis Program*, published by the US Department of Transportation, Federal Highway Administration. Results show that headwater depths are within a few feet of the edge of road embankment during larger precipitation/snowmelt events, which is consistent with reports from Town staff.

Replacement Recommendations

The span, geometry, and installation method of the replacement structure should meet several criteria, including:

- Vermont Stream Alteration General Permit
- VTrans Hydraulic Manual Standards
- Aquatic Organism Passage (AOP)
- Site Conditions

Based on preliminary sizing information, the following structures should be considered. Minimum requirements include a 14' clear span, 5' clear height, and ~65 ft² of waterway opening. The structure criteria should be further evaluated during final design to ensure compatibility with site conditions and permitting requirements.

1. Precast Concrete Box Culvert (3-sided or 4-sided): The structure should have a 14' span and minimum clear height of 5' above the stream channel. The precast concrete culvert structure should have cutoff walls, headwalls and wingwalls (or equivalent) for scour protection. This structure will result in headwater depths of approximately 3.9' at Q50 and 4.4' at Q100 (no roadway overtopping).
2. Metal Arch or Box Culvert (Galvanized Steel or Aluminum): Exact structure dimensions vary by manufacturer, however, a structure with approximate dimensions of 14'-0" (span) x 5'-0" (clear height) will provide the required waterway opening, and minimum span. Pipe arches and box culverts are manufactured with both closed bottoms and open bottoms. This structure will result in headwater depths of approximately 4.1' at Q50 and 4.8' at Q100 with no roadway overtopping.
3. Any similar structure that meets the minimum requirements of this analysis and the site conditions.

General Comments

Regardless of the selected replacement structure, several common items should be implemented on the project.

4. For all structures:
 - a. Both US Army Corps of Engineers and Vermont Agency of Natural Resources (Stream Alteration and Wetlands) should be contacted during

the design phase to ensure the proposed project complies with applicable permitting standards, including the minimum span requirement.

- b. Headwalls and wingwalls should be used to transition from the road grade to the stream banks. Properly sized wingwalls will mitigate road bank erosion issues and also provide additional protection from stream undermining/scouring. Alternatively, rock armoring or boulder walls may be considered in lieu of wingwalls. Boulder walls and rock armoring should be sized to endure all flow events.
 - c. As previously noted, approximate dimensions were obtained for the hydraulic calculations in this report. After a topographic site survey and prior to final design, field dimensions should be confirmed, hydraulics should be re-calibrated, and changes should be made if necessary.
 - d. Type E2 Stone should be utilized on this site for stabilization and armoring.
5. If a closed-bottom structure is used:
- a. The inverts should be buried to a level of 2' below natural channel elevation to comply with AOP requirements.
 - b. The cutoff walls/footings should be a minimum of 4' below the invert of the stream, or to ledge, to prevent undermining.
 - c. Retention sills should be spaced at 8' increments and be "V" shaped (12" at sides, 8" in middle).
6. If an open-bottom structure is used:
- a. Footings should extend 6' below the invert of the streambed, or to ledge, to prevent undermining of the structure.
7. Metal culvert structures have specific requirements regarding backfill and cover between top of structure and roadway elevation. The site should be able to provide adequate cover; however, this should be evaluated during final design.

Please let me know if there are any questions or you need any additional information.

Sincerely,



Tyler Billingsley, P.E.
Engineer / Owner



TOWN OF CAMBRIDGE

(802) 644-2251

www.cambridge.VT.gov

Tuesday, December 6, 2022

Scott Robertson, P.E.
VTrans Municipal Assistance Bureau
Vermont Agency of Transportation
219 North Main Street
Barre, VT 05641

To Scott:

The Cambridge Selectboard fully supports the FY2023 Transportation Alternatives application being submitted by Town Administrator, Jonathan DeLaBruere, for the purpose of applying for scoping study funding to replace a culvert on Stebbins Road. This topic has been an agenda item at our previous Selectboard meeting and was discussed as a priority for the Selectboard and Highway Department. The local match for this project will be raised from property taxes by incorporating the required amount into the municipal budget if the town is awarded the grant. We also commit to the responsibility of any and all future maintenance of this construction project/culvert.

Thank you for your consideration.

Sincerely,

Cody Marsh
Selectboard Chair



Lamoille County Planning Commission

PO Box 1637
52 Portland Street, Second Floor
Morrisville, Vermont 05661
www.lcpcvt.org

(802) 888-4548 • e-mail: lcpc@lcpcvt.org • fax: (802) 888-6938

December 14, 2022

Scott Robertson
Municipal Assistance Section
Vermont Agency of Transportation
219 North Main St.
Barre, VT 05641

Dear Mr. Robertson,

The Lamoille County Planning Commission is pleased to offer this letter of support for the Town of Cambridge's application to the VTrans Transportation Alternatives Program for funds to study alternatives for a culvert replacement on Stebbins Road.

The project will study alternatives to replace an undersized culvert with a new, larger structure that meets VTrans hydraulic standards. In addition to making the Town's road network more resilient in the face of increased flood risks, the project will also improve aquatic organism passage. The Lamoille County Regional Plan specifically identifies "*Increas[ing] the percentage of culverts... utilizing aquatic organism passage (AOP) design features*" as a key land use goal in rural areas of the County.

The project will address critical needs of the Town highway network while also furthering the goals of the Regional Plan. Please feel free to contact our office if you have any questions.

Sincerely,

Seth Jensen
Deputy Director