
FINAL Feasibility Report

Old Fort Edward Junction Locks Trail Extension

Prepared for:

Adirondack | Glens Falls Transportation Council

11 South Street, Suite 203
Glens Falls, New York 12801

And

Village of Fort Edward

118 Broadway
Fort Edward, NY 12828

Revision 2
November 2023

Barton & Loguidice

Old Fort Edward Junction Locks
Trail Extension

Final Feasibility Report

November 2023

Prepared for:
Adirondack | Glens Falls Transportation Council
11 South Street, Suite 203
Glens Falls, New York 12801

And

Village of Fort Edward
118 Broadway
Fort Edward, NY 12828

Prepared by
Barton & Loguidice, D.P.C.
10 Airline Drive, Suite 200
Albany, New York 12205

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
EXECUTIVE SUMMARY.....	iii
1.0 Introduction.....	1
2.0 Inventory of Existing Conditions.....	2
2.1. Southern Connection along Argyle Street	2
2.2. Off-Road Route	3
2.3. Northern Connection along Canal Street	6
3.0 Concept Alternatives.....	7
3.1. Standards	7
3.2. Southern Connection along Argyle Street	7
3.3. Off Road Multi-Use Path.....	10
3.4. Northern Connection along Canal Street	12
3.5. Environmental / Permitting Requirements.....	12
3.6. Wayfinding Signage	14
3.7. Surface Course	14
4.0 Cost estimates	15
5.0 Funding Opportunities	16
Tables	
Table 2-1: Roadway Data.....	2
Figures	
Figure 1-1: Project Overview Map.....	1
Figure 2-1: Broadway Looking North and South at the Argyle Street Intersection	2
Figure 2-2: Argyle Street Facing East Towards Broadway	3
Figure 2-3: Existing Canal Junction Lock Infrastructure.....	3
Figure 2-4: Existing Conditions of Adjacent Towpath.....	4
Figure 2-5: Existing Conditions of the Stone Arch Bridge	5
Figure 2-6: Existing Conditions on Canal Street	6
Figure 3-1: Proposed Southern Connection to the EST	8
Figure 3-2: Sign plan for Uncontrolled Crosswalks at Intersections.....	9
Figure 3-3: Additional crossing signage options	10
Figure 3-4: Potential Bond Creek Bridge Option.....	10
Figure 3-5: Share the Road Sign	12
Figure 3-6: EST Wayfinding Signs	14

TABLE OF CONTENTS

Appendices

Appendix A – Existing Conditions Map

Appendix B – Conceptual Trail Plan

Appendix C – Stone Arch Bridge Assessment

Appendix D – Environmental and Traffic Data

EXECUTIVE SUMMARY

This report examines the feasibility of providing on-road and off-road bicycle and pedestrian accommodations between the Empire State Trail (EST) at the intersection of NYS Route 4 and Argyle Street and existing on-road bicycle and pedestrian facilities on Canal Street. Two different off-road alignments are being considered, one along the former canal alignment between the junction lock walls and the other along the former towpath just to the east of the canal junction locks. This report also assesses potential bridge crossing options over Bond Creek, and the necessary improvements to provide the continuous bicycle and pedestrian accommodations along Argyle Street and Canal Street, to connect the EST to this portion of the off-road trail.

Improvements to the southern connection to the EST consist of a new shared-use path along the north side of Argyle Street, new pedestrian crossing of Broadway at the intersection with Argyle Street, ADA accommodations, signage, pavement markings, and an improved parking area.

The two off-road alternatives will provide a 10 ft. wide crushed stone shared use path that follows within, or adjacent to the former canal junction lock structure. This project segment includes crossing Bond Creek with a new prefabricated bridge or the rehabilitation of the existing stone arch bridge that is on the original tow path alignment.

The northern connection to the EST consists of formalizing Canal Street as a Walk/Bike Roadway by installing Share the Road signage and the EST sign assembly.

The total costs for Construction, Engineering, and Construction Inspection for each project segment are shown below:

- Southern EST Connection on Argyle Street = \$216,000
- Off-road Alignment Alternative 1 = \$628,000
- Off-road Alignment Alternative 2 = \$717,000
- Northern EST Connection on Canal Street = \$6,000

1.0 INTRODUCTION

The Old Fort Edward Junction Lock, located northwest of the intersection of US Route 4 and Argyle Street, formerly connected the modern Champlain Canal to the Glens Falls Feeder Canal. The lock was abandoned in the 1940's and today, the concrete walls, steel components, and former towpath remain in place. The A/GFTC has retained Barton & Loguidice, DPC, (B&L) to examine the existing conditions of the Village of Fort Edward owned corridor from Argyle Street to Canal Street (including the former canal junction lock) and recommend improvements to transform this corridor into an off-road multi-use path. This report will also investigate existing conditions and required improvements associated with connecting the off-road corridor to the current route of the EST at both the southern end along Argyle Street, and along the northern end on Canal Street.

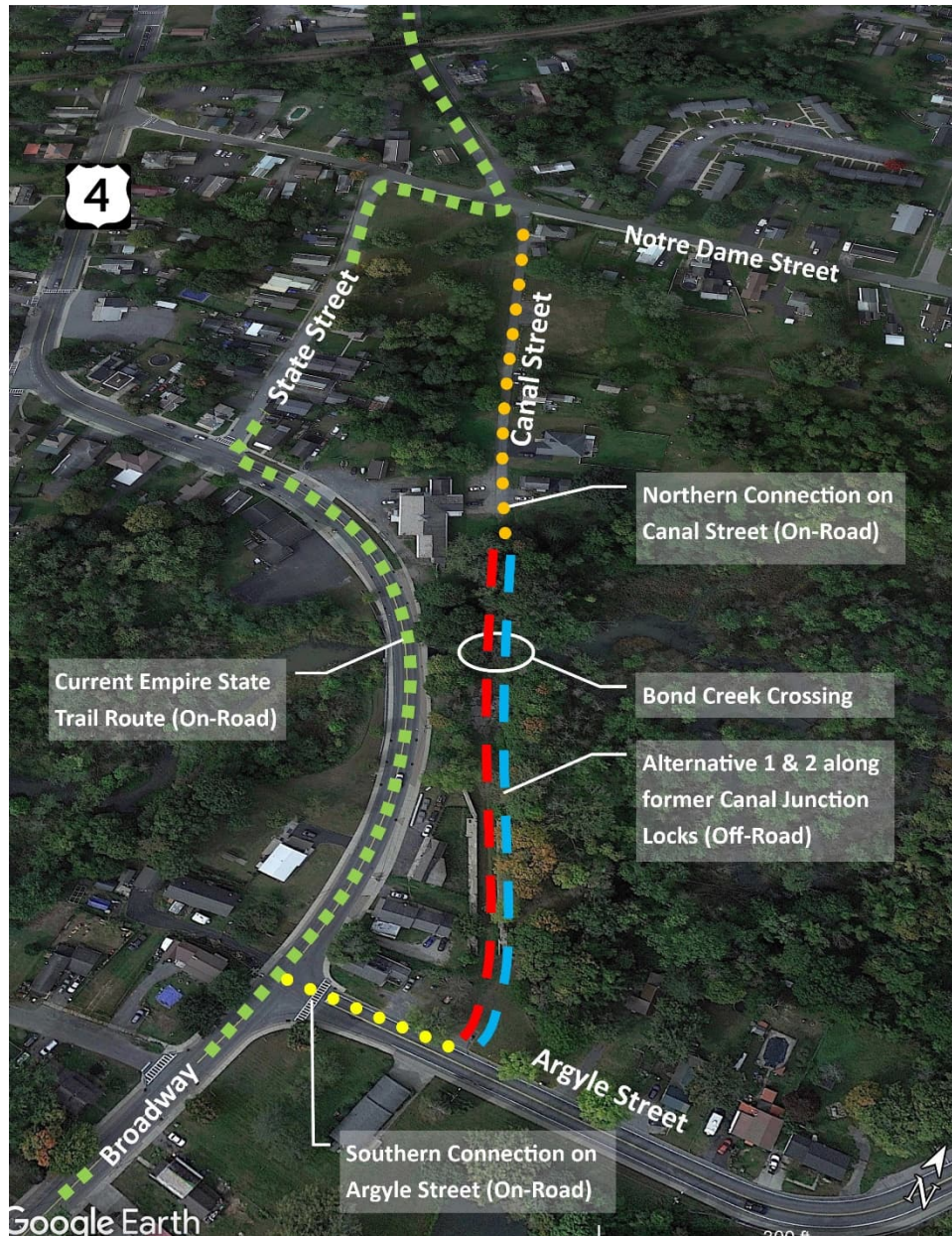


Figure 1-1: Project Overview Map

2.0 INVENTORY OF EXISTING CONDITIONS

A site visit was conducted on May 25, 2023 to inventory the existing project area conditions. The inventory included signing, striping, roadway widths, existing structures, and any noteworthy features or conditions. The existing conditions of the potential multi-use path routes are described below as well as displayed on the existing conditions map in Appendix A.

2.1. Southern Connection along Argyle Street

The southern connection for the trail will extend from the existing EST on Broadway (US Route 4) east along Argyle Street (NYS Route 197) to the existing gravel parking area (approximately 175 ft.). At the intersection of Broadway and Argyle Street there is one crosswalk present to cross Argyle Street. There are no crosswalks or curb ramps installed to cross Broadway at this intersection. Sidewalks are present and in fair condition along both sides of Broadway, and on the south side of Argyle Street. There are no pedestrian, bicycle, or crossing signage present within the vicinity of the intersection.

Table 2.1 (below) contains traffic data for both Broadway and Argyle Street that was obtained from the NYSDOT Traffic Data Viewer.

Table 2-1: Roadway Data

Roadway	Broadway (US Route 4)	Argyle Street (NYS Route 197)
Functional Classification	Principal Arterial	Minor Arterial
National Highway System	Yes	No
AADT	7,555	3,147
Percent Trucks	7%	8%
Posted Speed Limit	30mph	30mph
85 th Percentile Speed	34mph	-

Broadway is curbed on both sides and currently has a centerline double-yellow pavement stripe with no edge lines. The pavement width is 27 ft. with 13.5 ft. between the curb and the centerline which constitutes a wide-curb lane according to the NYSDOT Highway Design Manual Chapter 2 to accommodate vehicles and bicyclists.



Figure 2-1: Broadway Looking North and South at the Argyle Street Intersection

Argyle Street consists of two 11 ft. travel lanes in both directions delineated by white edge lines and a center double-yellow line with a 4-ft. shoulder on the north side and a 1-ft. shoulder on the south. Both sides of the roadway are curbed, and the Right-of-Way width is approximately 56 ft., with approximately 25 ft. of available ROW on the north side of roadway between the curb and the ROW boundary.



Figure 2-2: Argyle Street Facing East Towards Broadway

2.2. Off-Road Route

The off-road segment of the proposed project utilizes the alignment of the former junction lock to connect Argyle Street to Canal Street. This connection consists of two different alternatives, one that utilizes the area between the lock walls, and one that uses the former towpath alignment. The off-road connection will also cross Bond Creek with a new prefabricated bridge or rehabilitation of the existing stone arch bridge that is on the tow path alignment.

2.2.1. Alternative 1 – Within the Lock Structure

The existing junction lock walls are 19 ft. wide on the southern portion of the structure, then widen to 42-50 ft. on the northern portion where the structure intersects with Bond Creek. The wide section of the lock structure has a concrete slab base that is relatively level. The concrete walls are approximately 8 ft. tall and in good condition. Some of the steel hardware, such as tie-off straps and valve doors, are still intact. See photos below.



Figure 2-3: Existing Canal Junction Lock Infrastructure

Construction debris has been disposed of within the structure walls over the years, such as granite curb pieces, bluestone sidewalk slabs, various other rubble, and plastic sewer pipes. There are also other lock infrastructure remains at the intersection with Bond Creek, such as block retaining walls, a stone arch bridge that carries the towpath on the east side, and another bridge like structure on the west. The northern bank of Bond Creek is contained by a block retaining wall and the southern bank appears to also be contained by a retaining wall as well, but this wall has since collapsed into the creek. There is minor vegetation growth within this area as it appears that it is regularly mowed and maintained. North of the Creek, heavy vegetation overgrowth has enveloped the area between the lock walls, which appear to be mostly intact. The lock structure ends at the southern terminus of Canal Street, adjacent to the Mills Apartments.

2.2.2. Alternative 2 – Along the Existing Towpath

The towpath on the east side of the lock structure is directly adjacent to the lock wall and can be accessed from the parking area off Argyle Street via a path just east of the structure. The path rapidly climbs 8 ft. in elevation to become level with the top of the lock walls. The path begins on a narrow plateau that is 8 ft. in width from the concrete wall to the top of bank and is heavily overgrown. The width of the plateau gradually increases in width to approximately 14 ft. Continuing north, the path then crosses Bond Creek over the existing stone arch structure. The path then continues in similar conditions to the southern terminus of Canal Street. See photos below for representative photos of the existing towpath.



Figure 2-4: Existing Conditions of Adjacent Towpath

An existing stone arch bridge carries the towpath over Bond Creek approximately 400 ft. to the North of the Argyle Street entrance. Record documents indicate that this bridge was built in 1830 as part of the Champlain Canal and the lock/gate system. The existing bridge consists of a dry-stacked stone arch with stone abutments, wingwalls and spandrel walls. The stone wingwalls tie-in to the existing stone/concrete walls along the creek and the remains of the canal structure.

A full structural assessment of the stone arch bridge was completed by the Village in May 2022 and can be found in Appendix C. Overall, the arch bridge is in poor condition with several areas of the stone structure that have partially failed. The stone abutment at the southwest corner of the bridge has partially failed with areas of voids, shifted and cracked stones. This condition at the abutment is resulting in loss of compression continuity in the arch stones as evidence by displaced and missing stones along the east and west fascia and spandrel walls. There are also several areas of the wingwalls that have missing stones and voids and the walls are displaced or bulging toward the creek. The structural assessment indicates that while the bridge appears to be stable at this time, the degradation will continue over time and could result in partial or complete failure of the bridge making it “unsafe for public access in its current condition”.



Figure 2-5: Existing Conditions of the Stone Arch Bridge

2.3. Northern Connection along Canal Street

Canal Street is a dead-end local Village roadway with approximately 12 ft. of available pavement width. There are currently no sidewalks or curbing. The roadway provides access to five residences and has a ROW width of approximately 60 ft. There is approximately 42 ft. of ROW width between the western edge of pavement and the ROW boundary. Existing traffic volumes are not available on the NYSDOT Traffic Data Viewer but is assumed to be a very low volume road only providing access to the five residences.



Figure 2-6: Existing Conditions on Canal Street

3.0 CONCEPT ALTERNATIVES

3.1. Standards

The proposed design layouts and recommendations are based on the following standards:

- AASHTO Guide for the Development of Bicycle Facilities 4th ed., 2012,
- NYSDOT Highway Design Manual (HDM),
- AASHTO *Policy on Geometric Design of Highways and Streets* 7th ed., 2018,
- FHWA *Manual on Uniform Traffic Control Devices* (MUTCD), 2009,
- NYS Supplement to the MUTCD,
- NACTO Urban Bikeway Design Guide, and
- EST Design Guide, October 2017
- AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges

3.2. Southern Connection along Argyle Street

To connect the southern entrance of the off-road trail to the EST along Broadway, installing an asphalt paved or concrete 10 ft. wide multi-use path on the north side of Argyle Street is proposed. The 175 ft. long path will start in the northeast quadrant of the intersection and extend along Argyle Street where it would meet the existing gravel parking area. From this point the alignment would turn north and become the off-road Junction Locks trail. A durable, impervious surface adjacent to Argyle Street, such as asphalt or concrete, is recommended for use within the NYSDOT ROW to reduce maintenance costs and increase service life. A buffer of 2-4 ft. between the existing curb and the path should be used to provide snow storage and a buffer between the active roadway for pedestrians and cyclists.

The multi-use path on the north side of the roadway can be constructed within the available 25 ft. of ROW and will provide simple access for both pedestrians utilizing the sidewalks and bicyclists utilizing the shared lanes along Broadway. However, consideration should be given to the property adjacent to this proposed portion of the trail. The property is a rental property that has the potential for several cars to park in the adjacent driveway. Potential options to reduce the impacts to the adjacent property on the north side of Argyle Street could include a reduction in the shoulder width on the north side of Argyle Street to 1-ft. to match the southern side. The NYSDOT HDM states that the minimum allowable shoulder width on curbed Urban Arterials with no accommodations for bicyclists may be 0-ft. Additional mitigation measures include installing vegetation screening between the new path and the building, or fencing to shield the view between path users and the residents. If this option is pursued for construction, the design team should consult with the Village and the property owner to make sure that the proposed plan is conveyed and what changes will be made.

Another alternative measure that was reviewed was utilizing the existing 4-ft.-wide shoulder on the north side of Argyle Street as a narrow bike lane, however, the NYSDOT HDM recommends the use of a 5 ft. shoulder for bicyclists on Urban Arterials, requiring the curb to be reset 1-ft. behind its current location. Additionally, the southern side of the roadway only has a 1-ft.

shoulder, the ROW required to widen the shoulder to 5 ft. is limited, and this alignment would require an additional road crossing on Argyle Street to be installed at the entrance to the off-road trail alignment.



Figure 3-1: Proposed Southern Connection to the EST

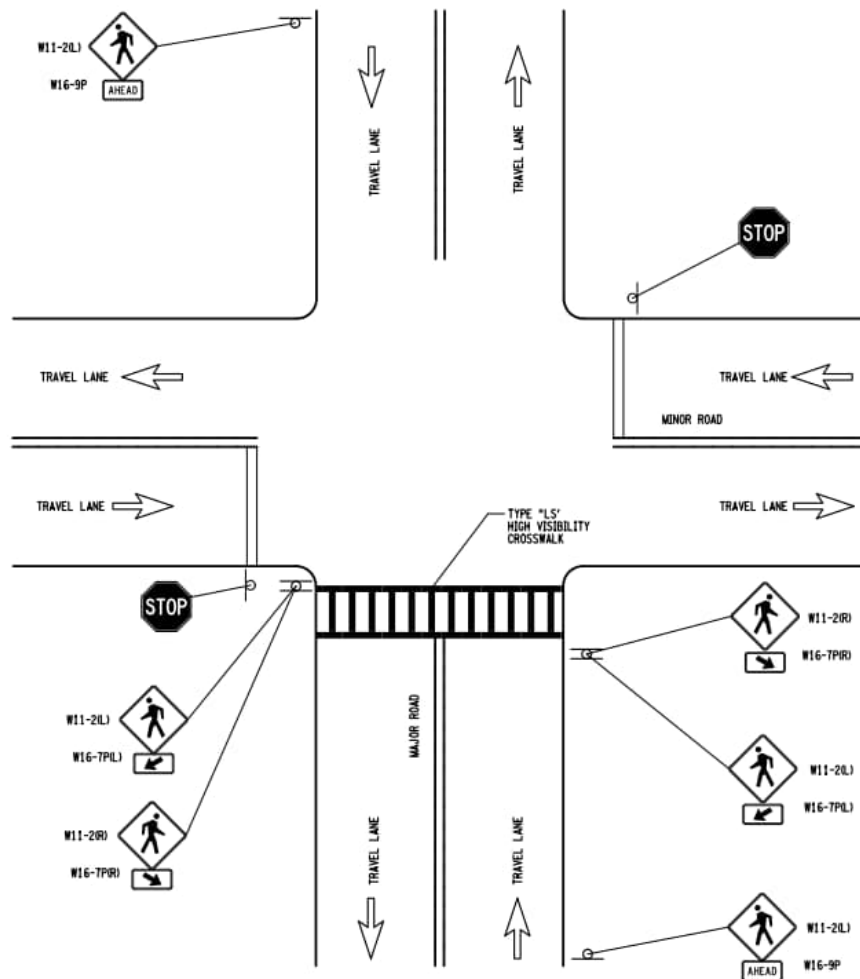
The concept shown in figure 3-1 includes a formalized gravel parking area with a new driveway shifted east on Argyle Street to provide direct route for the shared-use path to transition from Argyle Street to the off-road alignment. The minimum available ROW within the Village owned parcel is 85 ft., providing an opportunity to increase the area for vehicle parking.

A crosswalk across Broadway on the north side of the intersection with Argyle Street is proposed to line up the pedestrian circulation route on the west side of Broadway with access to the off-road portion of the trail connection on the north side of Argyle Street. The crossing provides the shortest direct route across Broadway to the Argyle Street path and is placed in the typical location at the intersection where drivers would expect to see a crosswalk. The crosswalk could be moved away from the intersection creating a mid-block crossing on Broadway, although this will require additional path construction to connect from the crossing location to Argyle Street as well as creating a layout that will allow an Argyle Street westbound right turning vehicle to now accelerate northbound before approaching the crosswalk. The crosswalk at the intersection where the right turning vehicle is at a stop is preferred.

This crossing location has an available stopping sight distance for vehicles traveling southbound on Broadway of 300 ft., and 600 ft. for vehicles traveling northbound which are both greater

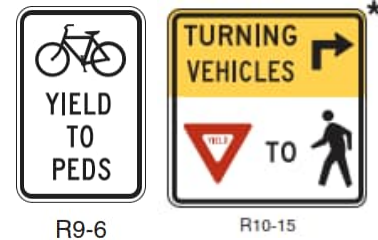
than the NYSDOT HDM Chapter 2 minimum Stopping Sight Distance of 250 ft. This value was determined using a design speed of 35 mph, which is slightly higher than the measured 85th percentile speed of 34mph in the vicinity of the project area.

For the proposed crossing of Broadway, the EST Guide lists a marked and signed crosswalk and Rectangular Rapid Flashing Beacons (RRFB) as the desired treatment. Several additional treatments could also be used based on engineering judgement. As a minimum treatment, ADA compliant features such as curb ramps and detectable warning units should be installed at the crossing and advanced pedestrian crossing signage and pavement markings should be installed on Broadway in accordance with Figure 3-2. The warning signs should be fluorescent yellow-green and should include the retroreflective signpost strip and the crosswalk should be "NYSDOT Type LS" that includes parallel stripes and ladder bars to enhance visibility.



Source: NYSDOT TSMI 17-07 PSAP Countermeasure Details, Drawing UC-2, Detail 3
 Figure 3-2: Sign plan for Uncontrolled Crosswalks at Intersections

Additional signage that should be installed at this crosswalk location include an R10-15 (“Turning Vehicles Yield to Pedestrians”) sign which reminds vehicles that are turning right from Argyle Street to yield the Right of Way to pedestrians in the crosswalk. Another sign that should be installed on the multi-use path at the crosswalk is an R9-6 sign which reminds cyclists that pedestrians have the right of way within a crosswalk and on the multi-use path, or to remind cyclists that may be on Broadway that they need to yield to pedestrians within the crosswalk.



Source: 2009 MUTCD

Figure 3-3: Additional crossing signage options

3.3. Off Road Multi-Use Path

The off-road segment of the path will utilize the alignment of the former junction lock to connect Argyle Street to Canal Street. This connection consists of two different alternatives, one that utilizes the area between the lock walls, and one that uses the former towpath alignment. The connection will also need to cross Bond Creek.

3.3.1. Alternative 1 – Within the Lock Structure

This alternative would direct the path from Argyle Street between the existing concrete lock walls and continue north to Canal Street. The existing walls are in good shape and would provide for a unique experience as pedestrians and cyclists travel through the former canal. There is minimal vegetation growth between Argyle Street and Bond Creek. The construction debris that was disposed of here would need to be removed.

The major constraint to this alternative is the crossing of Bond Creek. There is currently no bridge in this location and no obvious alternative to cross the creek using the existing infrastructure. A pre-fabricated steel or concrete pedestrian bridge could be installed at this location to carry the trail over the Bond Creek. The prefabricated bridge would have a span length of approximately 30 ft. to cross the natural banks of Bond Creek. The steel or concrete bridge superstructure would be supported on concrete footings and abutments. The bridge would carry a width of 10 ft. to match the trail on the approaches and would include pedestrian railing along both sides.



Figure 3-4: Potential Bond Creek Bridge Option

Another constraint to this alternative is the northern section of this alignment is heavily vegetated and will require a significant amount of clearing and grubbing in order to construct the trail. There is also a section of the canal walls that the trail will also need to rise above as it approaches Canal Street. Otherwise, this alternative should be relatively straightforward to construct and could provide a unique walk-through history.

3.3.2. Alternative 2 – Along existing Towpath

This alternative includes the construction of a 10-ft. wide dedicated off-road multi-use path along the alignment of the former towpath adjacent to the eastern wall of the canal. This alignment would utilize the existing arch bridge to cross Bond Creek once repairs are performed. However, this alternative has several restrictions that need to be addressed in order to transform this into a useable trail meeting EST guidelines. These items to be addressed are:

- 8-ft. climb in elevation at the southern end of the canal structure to reach the tow path plateau on top. To be ADA compliant, the slope of the path must be 5% or less in grade, which would require at least a 160-ft. long ramp (nearly half of the length of the lock structure) and would require a significant amount of earthwork to meet this grade. Additional pedestrian railing would also be required adjacent to steep slopes or drop-offs.
- Significant amount of clearing and grubbing to widen the existing path to meet EST guidelines
- Railing would need to be installed on the top of the canal wall, and on the eastern side of the towpath to prevent users from falling down the steep slopes.
- The existing Stone Arch structure needs significant rehabilitation efforts to be improved for public use. It is noted that these repairs are short-term (10–15-year service life) structural repairs and do not consider historic restoration or historic preservation of the structure (if that is requested by the State Historic Preservation Office):
 - Remove stones and debris from the waterway
 - Clear trees adjacent to bridge to alleviate additional tree root damage to structure
 - Re-point joints and cracks in masonry substructures
 - Replace and grout missing stones along arch, spandrel walls and substructures
 - Grout voids in the southeast abutment along the creek
- The Arch structure is 11 ft. wide and will require railings to be installed along both sides.
- A review and determination of historical significance of the remaining canal structure should be obtained from the New York State Historic Preservation Office (SHPO) prior to pursuing this option. Any alterations to the existing structure are subject to their review which may require additional consultation and/or historically accurate construction materials and techniques.

3.4. Northern Connection along Canal Street

As discussed in section 2.4, Canal Street is a low volume dead-end local roadway that provides access to five residences. In accordance with the EST Guidelines, Canal Street is classified as a Walk/Bike Roadway which is a very low volume road (fewer than 400 vehicles per day) that is designed to serve pedestrians, bicyclists, and vehicles all within the asphalt roadway area. Due to the low volumes and narrow widths, centerlines should not be marked. Regular pull-off areas to allow for passing event should be provided and is accomplished on Canal Street by the existing driveways and the gravel parking area near Notre Dame Street. Canal Street is recommended to be signed with Share the Road signs as well as the EST assembly.



Source: 2009 MUTCD

Figure 3-5: Share the Road Sign

3.5. Environmental / Permitting Requirements

Preliminary investigations into Environmental and Cultural Resources and potential impacts and recommendations are included in the following discussion, along with the anticipated permitting needs. Additional detailed environmental investigations will be required during the Engineering phase, depending on the type of funding that is secured.

3.5.1. Surface Waters

Review of the New York State Department of Environmental Conservation (NYSDEC) Environmental Resource Mapper (ERM) indicated that Bond Creek is a mapped NYSDEC Class C Stream with C Standards, is identified as resource PWL:1101-0085, and is a tributary of the Upper Hudson River. The ERM also indicated that the creek is listed as a 303(d) stream due to nutrient loading and low dissolved oxygen. The banks of this surface water could be impacted by bridge installation or rehabilitation operations and would require review by the NYSDEC. There are no mapped NYS wetlands located within or adjacent to the project area.

The National Wetland Inventory (NWI) mapping was reviewed to determine whether any wetland polygons are depicted within the project limits. Multiple NWI polygons were identified, especially to the northwest of the existing towpath, and will need to be field confirmed during the design phase. See Appendix D for wetland polygon mapping and additional information regarding Bond Creek.

3.5.2. Flood Zone

The 100- or 500-year flood zone of Bond Creek does not encroach into the project area within the on-road portions of the project, or the off-road portions along the former canal junction locks, according to the FEMA Flood Insurance Rate Map. See Appendix D for the Flood map.

3.5.3. Historical Resources

A review of the New York State's Office of Historic Preservation's (SHPO) Cultural Resource Information System (CRIS) was completed. The review indicated that the corridor is not located within an historical district, and there are no recorded National Register (NR) Listed, Eligible buildings, or structures within or substantially contiguous to the proposed improvements. However, since the canal walls and arch bridge are over 50 years old, there is the potential for those structures to be historically significant and should be reviewed by SHPO for inclusion on the NR. There are also four buildings located on US Route 4 and Argyle Street that have an Undetermined Status according to the CRIS system. Coordination with SHPO should be progressed once the SEQR process begins and a Lead Agency for the project has been established or coordination with a permitting agency requiring SHPO coordination such as NYSDEC or USACE has begun.

3.5.4. SEQRA/NEPA Review

If Federal funding is obtained for the project, a review under the National Environmental Policy Act is required. The project will likely be categorized as a Categorical Exclusion. If State funding or a permit is required from a State Agency, then a review under the State Environmental Quality Review Act is required. The project will likely be categorized as an Unlisted Action and the Village of Fort Edward will be able to issue a Negative Declaration as the Lead Agency.

3.5.5. Anticipated Permits

- NYSDOT Highway Work Permit for work associated with the southern connection
- Blanket Section 401 Water Quality Certification (NYSDEC)¹
- Nationwide Permit 14 from the US Army Corps of Engineers (USACE)²
- Section 404 Clean Water Act (USACE)²

¹Required if work occurs within the banks of Bond Creek.

²Required if Federal wetlands are present and disturbed by the project.

3.6. Wayfinding Signage

The Village’s goal for this trail is to shift the existing alignment of the EST along Broadway and Notre Dame Street to this primarily off-road trail. All proposed wayfinding signage should be consistent with the EST Guidelines and will consist of the EST confirming/reassurance assembly that should be placed just beyond intersections or locations where a turn has been made. Also, the Route Sign Assembly with Auxiliary Arrow Panels will be used to indicate directional changes in the route.



Figure 3-6: EST Wayfinding Signs

3.7. Surface Course

It is anticipated that the surface course on the Village owned off-road segment will be crushed stone. Areas expected to be encroached upon by motor vehicles, or adjacent to existing roadways, should consider utilizing asphalt or concrete pavement.



Crushed stone aggregate surface course that is bound by clay particles has proven to be successful in demanding environments and the natural materials of this surface course appeals to the environmental setting of this project. Examples of this durable stone course system use includes NYS OPRHP Minnewaska State Park, the Rockefeller State Park Preserve, and the Ashokan Rail Trail in Ulster County.

4.0 COST ESTIMATES

Preliminary cost estimates were prepared for the three project area segments, including the two alternatives for the off-road trail alignment. The cost estimates were prepared with the assumption that the project would receive funding through a federal or state grant and constructed through the traditional design-bid-build process. Federal or state grant programs typically provide funding to cover 50% to 80% of the total project costs. The cost estimate table below includes the potential costs that would be the responsibility of the Town at the typical 20%, 25%, and 50% match requirements.

Description of Work	Southern (S) Connection	Alternative 1 - Within Lock Structure	Alternative 2 - Along Towpath	Northern (N) Connection	TOTAL (S + A1 + N)	TOTAL (S + A2 + N)
DEMO., CLEARING, & GRUBBING	\$ 5,000	\$ 25,000	\$ 75,000	\$ -	\$ 30,000	\$ 80,000
EARTHWORK	\$ -	\$ 11,000	\$ 16,000	\$ -	\$ 11,000	\$ 16,000
PEDESTRIAN / BICYCLE PATH	\$ 32,000	\$ 37,000	\$ 23,000	\$ -	\$ 69,000	\$ 55,000
PEDESTRIAN RAILING	\$ -	\$ -	\$ 65,000	\$ -	\$ -	\$ 65,000
SIGNING & STRIPING	\$ 12,000	\$ 1,000	\$ 1,000	\$ 4,000	\$ 17,000	\$ 17,000
LANDSCAPE & SITE AMENITIES	\$ 45,000	\$ 7,000	\$ 10,000	\$ -	\$ 52,000	\$ 55,000
PARKING LOT IMPROVEMENTS	\$ 38,000	\$ -	\$ -	\$ -	\$ 38,000	\$ 38,000
BOND CREEK CROSSING	\$ -	\$ 300,000	\$ 250,000	\$ -	\$ 300,000	\$ 250,000
ITEMIZED CONSTRUCTION COSTS SUBTOTAL:	\$ 132,000	\$ 381,000	\$ 440,000	\$ 4,000	\$ 517,000	\$ 576,000
CONTINGENCY (25%)	\$ 33,000	\$ 95,250	\$ 110,000	\$ 1,000	\$ 129,250	\$ 144,000
TOTAL CONSTRUCTION COSTS (2023)	\$ 165,000	\$ 476,250	\$ 550,000	\$ 5,000	\$ 646,250	\$ 720,000
AMOUNT INFLATED 4% (2025 DOLLARS)	\$ 179,000	\$ 516,000	\$ 595,000	\$ 6,000	\$ 701,000	\$ 780,000
ENGINEERING AND SURVEY	\$ 15,000	\$ 50,000	\$ 50,000	\$ -	\$ 65,000	\$ 65,000
CONSTRUCTION INSPECTION	\$ 22,000	\$ 62,000	\$ 72,000	\$ -	\$ 84,000	\$ 94,000
TOTAL PROJECT COSTS	\$ 216,000	\$ 628,000	\$ 717,000	\$ 6,000	\$ 850,000	\$ 939,000
Village Cost with 20% Grant Match	\$ 43,200	\$ 125,600	\$ 143,400	\$ 1,200	\$ 170,000	\$ 187,800
Village Cost with 25% Grant Match	\$ 54,000	\$ 157,000	\$ 179,250	\$ 1,500	\$ 212,500	\$ 234,750
Village Cost with 50% Grant Match	\$ 108,000	\$ 314,000	\$ 358,500	\$ 3,000	\$ 425,000	\$ 469,500

5.0 FUNDING OPPORTUNITIES

There are several potential funding opportunities that are available for pedestrian and bicyclist improvement and trail connection projects. The Village should be aware that all of the funding sources are reimbursement programs that will require the Village to expend the initial project costs and then receive reimbursements from the funding source. Most of the programs also require the local municipality to provide a portion of the total grant amount, which varies by program.

NYS DOT Transportation Alternatives Program (TAP) is available for projects that improve the quality of life of the community through the construction of pedestrian and bicycle facilities and pedestrian safety improvements. The program is a Set-Aside of funds from the Surface Transportation Block Grant Program. The FHWA has set aside a minimum of \$1.4 Billion annually for this program through 2026.

- The current round is open with applications due January 9, 2024
- 20% Local Match
- Federal Aid Procedures Apply
- Design & Construction: Minimum = \$500,000; Maximum = \$5 Million

Canalway Grant Program awards up to \$1 Million dollars annually for Canal related capital projects. Projects must be located along one of the four canals of the NYS Canal System, trail linkages, connections to existing trail segments, or along the historic canal alignment. In addition, the program supports projects that help to enhance or tie into the EST Initiative and/or provide connectivity to the EST. This program can be applied for through the NYS Consolidated Funding Application (CFA) in 2024.

- 50% Local Match
- Grant awards range from \$25,000 to \$150,000

A/GFTC Make the Connection Program is available to assist municipalities with funding to improve the region's non-motorized travel network. Project types that are considered in the program include new sidewalk and trail connections, pedestrian safety improvements, and pavement marking improvements. Make the Connection funding is available through the FHWA and administered by the A/GFTC.

- 20% Local Match
- Design Only Projects have a minimum of \$25,000
- Design & Construction or Construction Only Projects have a minimum of \$75,000
- Federal Aid Procedures Apply

NYSOPRHP Recreational Trails Program (RTP) provides funding for the development and maintenance of recreational trails or trail-related facilities. RTP funding is available through the FHWA and administered by the NYSOPRHP. RTP can be applied for through the NYS CFA in 2024

- 20% Local Match
- Federal Aid Procedures Apply
- Design & Construction: Minimum = \$25,000; Maximum = \$250,000
- \$1.9 Million available during the 2023 CFA application period

NYSOPRHP Environmental Protection Fund (EPF) provides funding for the development and planning of parks and recreational facilities open to the public to preserve these lands for recreation, or conservation purposes. EPF projects can be applied for through the NYS CFA in 2024.

- Grant will fund up to 50% of total project cost
- Design & Construction: Minimum = \$25,000; Maximum = \$500,000
- \$26.0 Million available during the 2023 CFA application period

Safe Streets and Roads for All (SS4A) Grant is a federal grant program initiated by the Bipartisan Infrastructure Law provides for \$5 billion in grants over 5 years. The second round of funding is open now through July 10, 2023 and provides funding to support planning and operational initiatives for all roadway users including pedestrians and bicyclists. The Federal DOT has set the minimum award amount at \$2.5 million for the FY 2023 period. However, they state that they reserve the right to modify the minimum and maximum amounts based on the available pool of applications.

- 20% local match
- Federal aid procedures apply
- Applications in previous years were due in July
- The project will need to be combined with other similar initiatives to meet the minimum award amount

Northern Border Regional Commission (NBRC), Catalyst Program is designed to stimulate economic growth and inspire partnerships that improve rural economic vitality across the NBRC region that includes public infrastructure and outdoor recreation projects. The 2023 application process has already passed so the spring 2024 program should be targeted.

- 100% Federal Funds (0% Local Match)
- Federal Aid Procedures Apply
- \$45 Million was available during the 2023 application period

APPENDIX A
EXISTING CONDITIONS FIGURE



State Street

Notre Dame Street

Canal Street

Current Empire State Trail Route (On-Road)

Northern Connection on Canal Street (On-Road)

Bond Creek Crossing

Alternative 1 & 2 along former Canal Junction Locks (Off-Road)

Southern Connection on Argyle Street (On-Road)

Argyle Street





"Bike in Lane" sign



Notre Dame Street

Utility poles and narrow ROW on east side of Canal Street

12' Pavement Width



ROW = 69'

Canal Street

Approximate NWI Wetland Boundary

ROW = 60'

Dense vegetation overgrowth

Existing Arch over the Bond Creek

Broadway (US Route 4)

Existing Towpath (14' available width)

Bond Creek

Existing Towpath (8' available width)

Existing Canal Lock Structure and construction debris (42' between walls)

ROW = 101'

Existing Canal Lock Structure (19' between walls)

Path Through History Signs

Property Boundary

ROW = 60'

Argyle Street (NYS Route 197)

ROW = 57'

State Route Signs

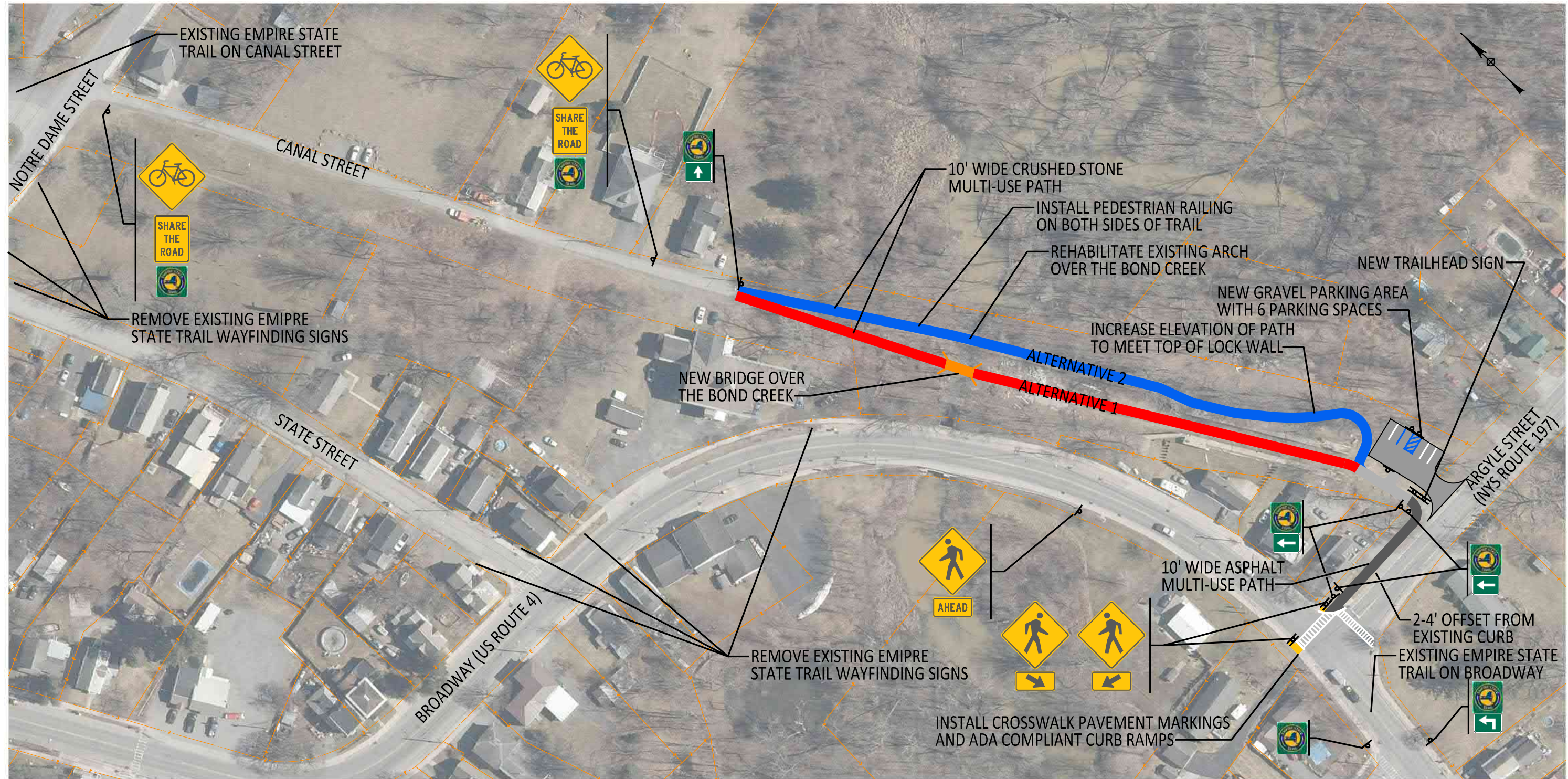


Existing Constraints/Opportunities June 2023

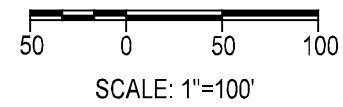


0 125 250 ft

APPENDIX B
CONCEPTUAL TRAIL PLAN



**CONCEPTUAL CANAL LOCK PATH LAYOUT
VILLAGE OF FORT EDWARD, WASHINGTON COUNTY**



AIGFTC
Adirondack/Glens Falls Transportation Council

Barton & Loguidice
JUNE 2023

APPENDIX C
STONE ARCH BRIDGE ASSESSMENT

Prepared For:

John Huggins
Project Coordinator, Health
Promotion Center
Glens Falls Hospital
100 Park Street
Glens Falls, NY 12801

Submitted by:

LaBella Associates
4 British American Blvd
Latham, NY 12110
(518) 273-0055



Limited Structural Stability Assessment
Stone Arch Bridge

MAY 16, 2022

PROJECT NO. 2221740

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 SYSTEM DESCRIPTIONS AND ASSESSMENTS..... 1

3.0 RECOMMENDATIONS.....3

4.0 CONCLUSION5

LIST OF FIGURES

Figure 1: Aerial View of the Project Site 2

APPENDICES

Appendix A: Photographic Documentation March 31, 2022

1.0 INTRODUCTION

LaBella Associates (LaBella) was engaged by Glens Falls Hospital (Client), to prepare a limited structural stability assessment of the stone arch bridge (subject structure) located in the Village of Fort Edward, Washington County, New York (project site).

This report was prepared at the request of the Client to assess the stability of the bridge and to provide our recommendations for repairs (if needed) to stabilize the bridge for use as part of a rural trail system. The assessment provides a description of the general condition of the subject structure including our observations, assessments and recommendations with concept level repair or replacement to address any identified or suspected deficiencies.

1.1 Scope

LaBella performed a limited visual assessment of the subject structure on Thursday, March 31, 2022. A photographic log of our observations is attached in **Appendix A** of this report. We met with John Huggins (Glens Falls Hospital), Pete Williams (Village of Fort Edwards), Michael Dickinson (Village of Fort Edwards) and Paul McCarty (local Historian) who provided access, answered questions / provided history to aide with the assessment.

Our observations and assessments were limited to those portions of the structural systems and components that were visible and accessible at the time of our visit. No destructive testing or sampling was performed.

The assessment is limited to the condition and stability of the bridge and is not a trail safety assessment. We assume fall hazards associated with this bridge (no railings) are similar to hazards located elsewhere along the trail and if railings are required, they will be provided as needed to commission the trail system.

2.0 SYSTEM DESCRIPTIONS AND ASSESSMENTS

A general description and assessment of the project site, subject structure, reported history, and use are provided herein. A photographic record of our visual observations is provided in **Appendix A**.

2.1 Record Documents

Record documents were limited to the original title sheet and schematic canal layout plan which identify an approximate construction date of 1830 and identifies the approximate location of the bridge relative to the original Champlain Canal.

2.2 Project Site

The subject structure is located approximately 400-feet north of the intersection of Argyle Street and Broadway and approximately 100-feet to the east of Broadway spanning "Little Wood Creek" in the Village of Fort Edward, Washington County, New York New York (project site). The subject structure is adjacent to an existing concrete foot bridge and a vehicular bridge along Broadway.

An overview photograph (aerial view) of the project site is provided in Figure 1.



Figure 1: Aerial View of the Project Site
(Aerial Photograph taken from google.com/maps)

2.3 History

The subject structure (bridge) was originally constructed circa 1830 as part of the Champlain Canal. The bridge was part of a lock and gate system which has since been abandoned. The bridge is currently utilized as part of an informal hiking trail.

2.4 Structural Systems Description

The subject structure is a dry-stacked stone arch bridge spanning the "Little Wood Creek". The bridge is supported by stone abutments founded on bedrock on each bank with stone wing walls to direct the flow of water in the creek and to control erosion. The stone abutments terminate and tie into concrete retaining walls which form the remains of the historic canal.

The bridge deck was not visible or accessible at the time of our site visit as it was covered with soil and vegetation.

2.5 Observations and Assessments

While on site, we observed the following conditions and offer the following assessments:

1. The abutment and wing wall has partially failed at the southwest corner of the bridge (outlet). Abutment stones have fallen into the creek, there are voids within the abutment, and stones have shifted and cracked. Reference Photographs #1, and 4-7.
 - a. While the bridge appeared stable at the time of the assessment (the arch is mostly continuous and bearing on sound material), this condition is in a dynamic state of failure, will continue to degrade, and eventually lead to complete failure of the bridge. Predicting failure timing is difficult and therefore the bridge is considered unsafe for public access in its current condition.
2. One stone is missing / broken within the primary arch along the east elevation. Reference Photograph #1 and 8.
 - a. This missing piece of stone (in addition to the displaced arch stones along the west elevation) is likely due to the displaced stones and voids at the southwest abutment. As the abutment continues to erode and settle, additional shifting (sagging) of the arch and loss of compression continuity is expected which can lead to progressive or catastrophic failure.
3. Displaced stones were observed at the northeast wingwall (inlet).
 - a. This condition is not directly impacting the stability of the bridge but may lead to progressive failure and slope erosion.
4. The southeast wing wall has displaced toward the creek (bulging) resulting in gaps and cracks in the wall. Reference Photograph #3. This condition is not directly impacting the stability of the bridge but may lead to progressive failure and slope erosion.
5. The bridge deck was not observable as it was covered with soil and vegetation including small trees. Tree roots can cause significant damage to structures as they grow and put pressure on joints and allow moisture infiltration. Reference Photograph #9.
6. Debris at the inlet was partially blocking the flow of water at the time of the site visit. Reference Photograph #2.

3.0 RECOMMENDATIONS

In general, the structure is in fair to poor condition and while temporarily stable, requires repairs to make safe for public access as part of a trail system.

We understand the initial budget for repairs has not been established and this report is intended to support planning and budgeting. However, we understand there will likely be limited funding available, and the priority will be to focus on short-term stability (approximately 10-15 year extension of service life).

Depending on the level of investment, desired extension of service life, and need to maintain hydraulic capacity, multiple options are available. Two of the options representing the extremes (minimum repairs to make the bridge safe compared vs a full historic preservation) are discussed herein. The final solution may lie somewhere between these two extremes.

1. In our opinion, the least expensive option to make the bridge safe for public access is to generally point cracks and grout voids solid. This option will stabilize the structure and make safe for public access in the short term (likely 10-15 years) and includes the following:
 - a. Remove debris in the waterway.
 - b. Cut trees from within 10-feet of the bridge to minimize additional root damage.
 - c. Point joints and cracks solid, specifically including along both sides of the arch framing, the southeast wing wall (where bulging) and the northeast wing wall (where displaced at the end of the wall).
 - i. Darker colored mortar (to match the stones) will conceal the joints to some extent, however, adding mortar will change the aesthetics and historic character of the structure (considering this has historically been a dry-stacked stone structure).
 - d. Replace and grout the missing stone along the west elevation arch and north abutment (utilizing stainless steel pins as needed to maintain stone position).
 - e. Grout voids in the southeast abutment solid.
 - i. This may inherently lock some stones in place that are protruding into the creek. Loose stones can be removed, but the hydraulic capacity of the waterway may be reduced compared to a fully free-flowing channel. It is not clear how long the channel has been obstructed or what the hydraulic demand is (and if the obstructions are acceptable). We would recommend a cursory hydraulic study as part of this option to ensure adequate capacity.
 - f. Since this type of repair is considered short-term, we recommend establishing a monitoring program administered by a qualified design professional to track future displacement. We recommend initial inspections occur every 6 months for 2 years, after that, the frequency may be reduced pending the results of the initial monitoring program.
2. If additional funding is available and / or increased service life is required (or a hydraulic study requires stones to be removed from the channel), it may be possible to preserve the historic character of the bridge, extend the service life of the bridge to

30+ years and restore the full hydraulic capacity of the channel. This likely includes shoring the bridge to rebuild failed portions of the stone abutment at the southeast corner, excavating behind the southeast wing wall to rebuild plumb, and rebuilding portions of displaced stones to make flush, plumb and tight. This type of restoration is significantly more expensive than option 1 noted above and likely includes the following:

- a. Remove debris in the waterway.
- b. Cut trees and remove roots from within 10-feet of the bridge.
- c. Remove loose stones in the waterway and salvage for re-use.
- d. Provide temporary shoring along the entire arch (likely a series of scaffolding towers extending down to bedrock in the stream bed) which may require special permitting depending on the type and class of waterway.
- e. Remove soil from the top of the bridge and inspect the top of the arch structure for integrity and condition.
- f. Rebuild the southeast abutment utilizing dry-stack traditional methods of construction to make solid utilizing salvaged materials to the greatest extent possible (especially for stones exposed to view).
- g. Remove and reposition shifted stones along the arch.
- h. Replace any missing or broken stones.
- i. Excavate behind the southeast wingwall, remove, salvage stones and rebuild the wing wall plumb and tight.
- j. Remove, salvage and rebuilt the end portion of the northeast wing wall.
- k. Grout undercut sections of abutment solid.
- l. Replace the bridge deck with a concrete topping pitched to drain water away from the bridge. Stone sub base may be required below the slab to achieve the required elevations.

4.0 CONCLUSION

While the bridge is temporarily stable, there are local conditions that are in a dynamic state of failure which is difficult to predict when failure may occur. Therefore, repairs are required to make the bridge safe for public access. Depending on the level of investment, this may include short term repairs such as pointing joints and filling voids solid or longer-term historic preservation repairs including temporary shoring and rebuilding significant portions of the bridge.

The recommended work should be performed by a qualified contractor and may be subject to permit from local authorities having jurisdiction (AHJ). Special permitting may also be

required depending on the type and class of the waterway (such as army corps and / or DEC permits) including watershed protection plans (to control debris / mortar / grout from entering the waterway).

Closing: LaBella makes no express or implied warranties concerning the building systems assessed herein. LaBella does not adopt the warranty of the manufacturer of the components of structure assessed, or the warranty of the Builder or Owner of the structure. An assessment of the building mechanical, electrical or plumbing systems is outside the scope of this report. This report does not constitute a code review of requirements for any proposed use or change of occupancy. This report constitutes the complete and exclusive expression of the opinions of LaBella.

Thank you for the opportunity to assist you in this matter. Please feel free to call me directly at (518) 266-7329 with any questions, comments or requests for further clarification.

Sincerely,



Lanson A. Cosh, PE, NYSCCEO
Senior Structural Engineer

Attachments:

Appendix A: March 31, 2022, Photographic Documentation

Appendix A:
Photographic Documentation
March 31, 2022



Photograph (1): General view. West Elevation (outlet). Displaced stone (red arrow), voids in abutment (green arrow) missing stone (yellow arrow).



Photograph (2): General view. East Elevation (inlet). Debris restricting flow. Displaced stones (red arrow). Leaning / bulging wing wall (blue arrow). Missing cap stones (yellow arrow). Missing stone / undercut at north abutment (green arrow).



Photograph (3): General view. East Elevation. Displaced stones.



Photograph (4): Void within southwest abutment (red arrow), displaced stones (yellow arrow).



Photograph (5): Closeup view of void at southwest abutment as shown in Photograph #4.



Photograph (6): Cracked stones at southwest abutment.



Photograph (7): Displaced stones / voids at southwest abutment.



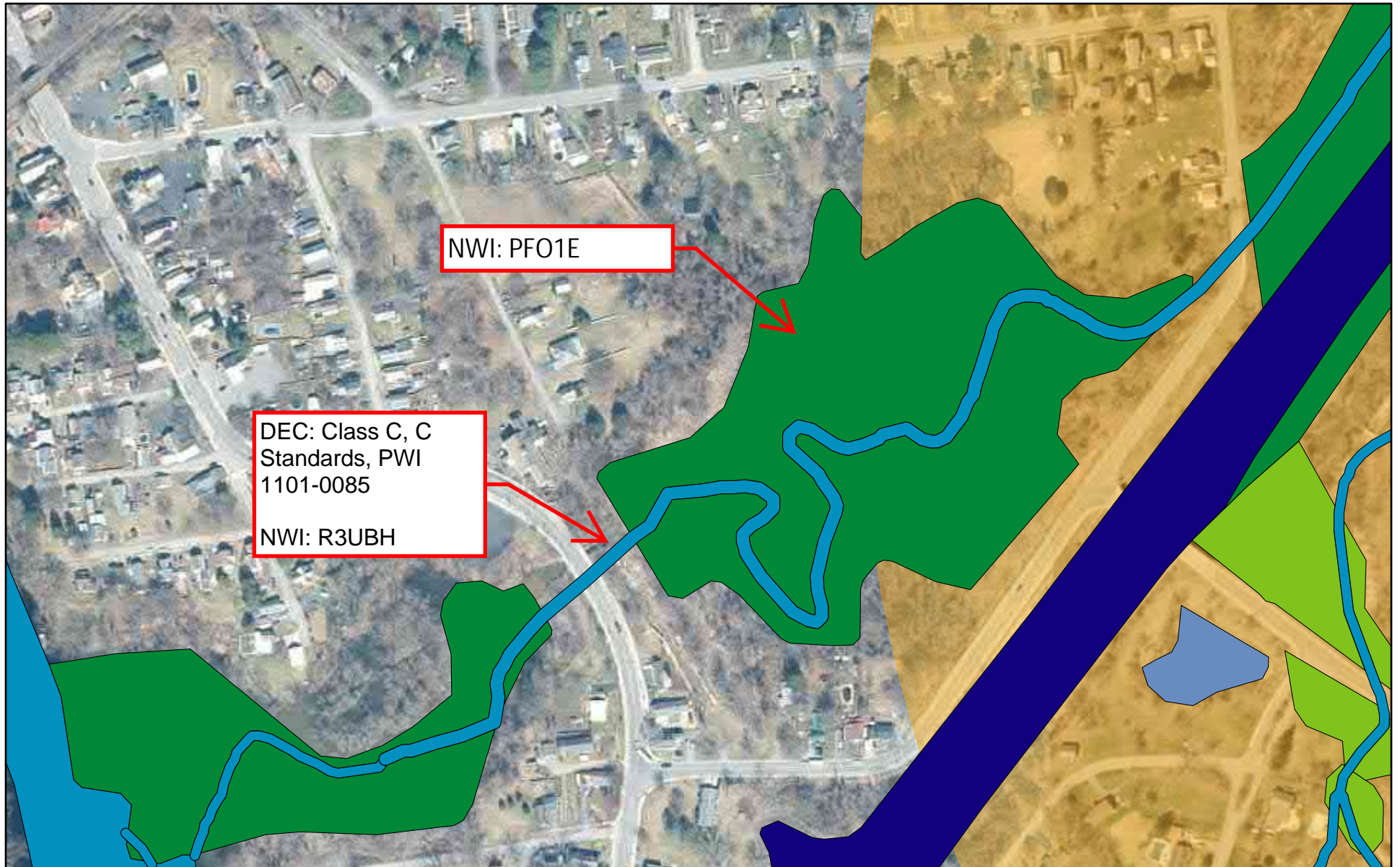
Photograph (8): Missing / displaced stones along the west elevation.



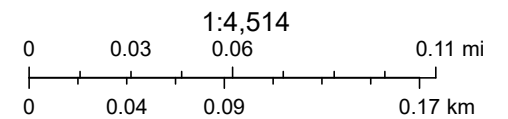
Photograph (9): View of trail along top of bridge. Vegetation / trees growing along bridge.

APPENDIX D
ENVIRONMENTAL / TRAFFIC DATA

Old Fort Edward Junction Lock Trail



May 21, 2023



New York State, Maxar, Esri, HERE, Garmin, iPC

Minor Tribs to Upper Hudson (1101-0085)

Need Verific

Waterbody Location Information

Revised: 12/06/2006

Water Index No: H-319 thru 343 (selected) **Drain Basin:** Upper Hudson River
Hydro Unit Code: 02020003/020 **Str Class:** C Upper Hudson-Hoosic
Waterbody Type: River **Reg/County:** 5/Saratoga Co. (46)
Waterbody Size: 101.4 Miles **Quad Map:** HUDSON FALLS (H-26-3)
Seg Description: total length of sel. tribs, Hudson Falls to Glens Falls

Water Quality Problem/Issue Information

(CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
Aquatic Life	Stressed	Possible

Type of Pollutant(s)

Known: ---
Suspected: ---
Possible: D.O./OXYGEN DEMAND, Nutrients

Source(s) of Pollutant(s)

Known: ---
Suspected: ---
Possible: AGRICULTURE, INDUSTRIAL, Urban Runoff

Resolution/Management Information

Issue Resolvability: 1 (Needs Verification/Study (see STATUS))
Verification Status: 1 (Waterbody Nominated, Problem Not Verified)
Lead Agency/Office: DOW/BWAR **Resolution Potential:** Medium
TMDL/303d Status: n/a ()

Further Details

Aquatic life support in Bond Creek may experience minor impacts/threats due to nutrient loadings and low dissolved oxygen from agricultural activities and other nonpoint source runoff in the watershed. This assessment applies to this one tributary; other tribs included in this segment listing are UnAssessed.

The stream originates near excavation and construction projects in Queensbury. The flow continues through the Floyd Bennet Air Field and Warren-Washington County Industrial Park. The lower reach of the stream traverses and meanders over several hundred acres of highly erodable agricultural lands. The stream then empties into the Champlain Canal in Hudson Falls and then the Upper Hudson in Fort Edward.

This segment includes the total length of all selected/smaller tribs to the Upper Hudson from Snook Kill (-318) below Fort Edward to/including Clendon Brook (-343) near West Glens Falls. Tribs within this segment, including Bond Creek (-319), Cold Brook (-327) and Clendon Brook (-343, are primarily Class C,C(T). Some portions designated as Class AA are listed separately.



Station 180014
US4
BROADWAY
from START 4/197 OLAP/MAIN ST to END 4/197 OAP/BRIDGE ST

Direction: Combined Total

Calculation Year: 2019
AADT Type: Actual
AADT: 7555

Truck AADT Type: Actual
Truck AADT: 532
Truck Percentage: 7

NHS: Y
Functional Class: 14
Route_ID: 100141021

Average Speed (mph): 30
DHV: 664
DDHV: 405
Morning Peak: 651
Afternoon Peak: 479
Evening Peak: 728

Retired:
Retired Year:
Retired Notes:

Related tables:

Volume Statistics

Class Statistics

Speed Statistics

Station 180041
NY197

from **START 4/197 OLAP/MAIN ST to CR 42**

Direction: Combined Total

Calculation Year: 2019
AADT Type: Estimate
AADT: 3147

Truck AADT Type: Actual
Truck AADT: 265
Truck Percentage: 8

NHS:
Functional Class: 16
Route_ID: 100141021

Average Speed (mph): 54
DHV: 291
DDHV: 157
Morning Peak: 270
Afternoon Peak: 181
Evening Peak: 311

Retired:
Retired Year:
Retired Notes:

Related tables:

Volume Statistics

Class Statistics

Speed Statistics

LATITUDE	43.2655
LONGITUDE	-73.58357
SPECIFIC_RECORDER_PLACEMENT	275' S of Notre Dame St
CHANNEL_NOTES	
DATA_TYPE	Speed Statistics
SPEED_LIMIT	30
YEAR_	2018
MONTH_	9
DAY_OF_FIRST_DATA	17
FEDERAL_DIRECTION	Combined Total
FULL_COUNT	Y
AVG_WKDAY_BIN_1	72
AVG_WKDAY_BIN_2	437
AVG_WKDAY_BIN_3	3156
AVG_WKDAY_BIN_4	3756
AVG_WKDAY_BIN_5	609
AVG_WKDAY_BIN_6	40
AVG_WKDAY_BIN_7	1
AVG_WKDAY_BIN_8	0
AVG_WKDAY_BIN_9	0
AVG_WKDAY_BIN_10	0
AVG_WKDAY_BIN_11	0
AVG_WKDAY_BIN_12	0
AVG_WKDAY_BIN_13	0
AVG_WKDAY_BIN_14	0
AVG_WKDAY_BIN_15	0
AVG_WKDAY_UNCLASSIFIED	
AVG_WKDAY_TOTALS	8071
AVG_SPEED	30
FIFTYTH_PERCENTILE_SPEED	31
EIGHTYFIVETH_PERCENTILE_SPEED	34
PERCENTILE_EXCEEDING_55	0
PERCENTILE_EXCEEDING_65	0
FLAG_FIELD	
BATCH_ID	306805

Related tables:

The experience to
listen
The power to
solveSM

Barton
&Loguidice

www.bartonandloguidice.com