1. Project Introduction & Description

The proposed federally-funded BridgeNY project includes the replacement of the Freese Road Bridge over Fall Creek (BIN 3209800) in the Town of Dryden, Tompkins County. This bridge replacement project will remove BIN 3209800 and reconstruct a new two-lane conventional bridge with an anticipated service life of 75 years with no load restrictions or postings.

Conditions and Needs:

BIN 3209800 is a single lane, two span, Pratt truss having a total length of 166 feet. Each span is 80 feet long and supported on a cast-in-place concrete abutment (south abutment), a cast-in-place concrete pier located in Fall Creek, and a steel sheet pile abutment (north abutment). The truss superstructure is elevated approximately 11 feet above the Creek in the main span. Span 1 (the southern span) acts primarily as an overflow channel with the second span (the northern span) carrying the primary flow of Fall Creek. The bridge currently provides a rail-to-rail travel width of 13’-1” measured between the box beam guiderails attached to the truss members.

The existing bridge was constructed in its current position in 1922 following storm damage of the original 140 foot long, single span bridge. The ‘new’ bridge relocated the two-span bridge at Sherwood Mills (estimated to have been constructed in the 1880s) to the current location and placed on new concrete abutments and a center pier. A series of repairs and rehabilitations have been completed occurring in 1952, 1978, 1981, 2004, 2008, and 2016 in order to:

- replace the original timber decking with steel grate decking,
- make repairs to the concrete abutments and center pier,
- install steel sheet piling at the north abutment and center pier,
- reinforce the bottom chords of the truss,
- install steel guiderailing,
- replace the bearings and make repairs to the concrete pedestals,
- replace diagonal truss members,
- and address NYSDOT issued Red Flags for a cracked weld, a faded load posting sign, and stringer pedestal undermining.

Currently there are no Red Flags present on the bridge. However, the bridge is load posted for 15 tons. This load rating is governed by the safe load capacity of the eight upper chord members in the truss and the ten floorbeams. In order to remove the posting the following members would need to be either replaced or supplemented:
all floor beams (10 in total),
all stringers (4 in total for the full length of bridge),
the open steel grate deck
eight diagonal members (includes both trusses),
two vertical members (includes both trusses),
and sixteen top chords (includes both trusses).

It has been identified that this load posting affects the school bus and emergency service operations, as well as the Town’s maintenance operations. Freese Road serves over 2000 vpd as a Local road extending between NYS Route 366 (hamlet of Varna) and Hanshaw Road. The bridge currently carries six times the volume recommended by the American Association of Highway Transportation Officials (AASHTO) for a single lane bridge. Anticipated nearby development could increase this volume.

The existing superstructure and substructure elements exhibit various levels of deterioration. There are 17 identified elements that are rated a CS-3 or worse, based on the classifications of the 2017 New York State Department of Transportation Bridge Inspection Manual. A rating of CS-3 represents a poor condition, meaning that the element has advanced deterioration but does not warrant a structural review. Elements with a rating of C-3 may need condition-based preventive maintenance. The members with CS-3 or worse ratings specific to the superstructure include the steel deck with concrete filled grid, steel stringers, steel truss (top chords, bottom chords, diagonals), expansion joint, bearings, wearing surfaces, steel protective coating (paint), steel curb, and steel secondary members.

Additionally, the bridge is classified as scour critical and is vulnerable to instability due to potential scour at the pier and abutments as they are lacking a deep foundation system (steel piles, etc.). In 1981, the original north abutment constructed on railroad rail piles washed out during a flood event and was replaced with the sheet pile abutment that exists today. The pier foundation is unknown, although it is likely that it is founded on a shallow spread footing similar to the original north abutment. Supplemental sheet piling has been installed around the pier since its original construction; however, this sheeting is not embedded below the design scour depth and is largely exposed on the northern side of the pier.

NYSDOT has identified that under a proposed single lane alternative, the bridge must provide a clear travel way of 14'-0” in accordance with the Bridge Manual. As previously noted, the box beam guiderail installed on the bridge (also a NYSDOT requirement) results in an existing clear width of 13’-1” and therefore does not meet NYSDOT standards for a single lane crossing. Due to the limited horizontal clearance the truss is vulnerable to collision.

Project Purpose and Needs:

The purpose of the project is to identify a feasible and prudent solution that addresses the structural deficiencies and nonstandard highway features while taking into account the historic significance of the Freese Road Bridge.

- Need to improve Bridge Infrastructure to provide a safe, unposted, two-lane crossing,
Need to improve Pedestrian & Bicycle Infrastructure,
Need to correct non-standard & non-conforming design features to improve safety,
Need to eliminate and/or minimize impacts to the historic significance/integrity of the bridge,
Need to minimize environmental impacts to floodplains and wetland adjacent to site.

Proposed Alternatives:

Thirteen alternatives, including the Null Alternative, have been evaluated. A comparison of each of the 13 alternatives is included as Attachment A. The specific alternatives are listed below.

Alternatives:
1. Null
2. Bridge Rehabilitation – Single Lane – 13’-1” Travel Lane
3. Bridge Rehabilitation – Single Lane – 14’-0” Travel Lane
4. Bridge Rehabilitation – Two Lanes
5. Bridge Replacement – Single Lane – Steel Multi-Girder
6. Bridge Replacement – Single Lane – Steel Multi-Girder with Truss Façade
7. Bridge Replacement – Single Lane – Steel Multi-Girder with Existing Truss Bridge Reused as a Pedestrian Bridge on an Adjacent Alignment
8. Bridge Replacement – Two Lane – Steel Multi-Girder
9. Bridge Replacement – Two Lane – Steel Multi-Girder with Truss Façade
10. Bridge Replacement – Two Lane – Steel Multi-Girder with Existing Truss Bridge Reused as a Pedestrian Bridge on an Adjacent Alignment
11. Bridge Replacement – Two Lane – New Truss
12. Bridge Replacement – Two Lane – New Truss with Existing Truss Bridge Reused as a Pedestrian Bridge on an Adjacent Alignment
13a. Bridge Replacement – Two Lane – Steel Multi-Girder on Adjacent Alignment while maintaining pedestrian traffic on existing historic truss structure
13b. Bridge Replacement – Two Lane – Steel Multi-Girder on Adjacent Alignment abandoning use of historic truss for all vehicles and pedestrian transportation purposes.

A summary of the findings comparison for the thirteen alternatives considered is provided below.

It is understood the following alternatives would have “no impact” on the historic eligible truss:

- Alternate #1: Null Alternative
- Alternate #13a: Bridge Replacement – Two Lane – Steel Multi-Girder on Adjacent Alignment while maintaining pedestrian traffic on existing historic truss structure.
- Alternate #13b: Bridge Replacement – Two Lane – Steel Multi-Girder on Adjacent Alignment abandoning use of historic truss for all vehicles and pedestrian transportation purposes.
The Null Alternative is not considered feasible and/or prudent in that it ignores the basic transportation needs of maintaining a safe crossing of Fall Creek. It does not correct the structural, geometric, safety or functional non-standard features that presently exist. Additionally, no improvements to these deficiencies will lead to the potential collapse and potential injury or loss of life.

Based on these deficiencies the bridge poses serious and unacceptable safety hazards to both vehicular and pedestrian traffic and places unacceptable restrictions on transport and travel, therefore, will be removed from further consideration.

Alternative 13a and Alternative 13b (off-line bridge replacement with or without the existing truss continued to be used) will resolve the safety, structural, geometric concerns identified at this site while retaining the historical eligible truss bridge; however, it is not considered feasible and prudent due to the following:

- These alternatives will have significant negative impacts on the adjacent private properties by constructing a bridge and the associated approach roadway on an off-line alignment essentially in the front yard of two residences infringing on their setback from the road.
- These alternatives would require the bridge and a portion of the highway to be constructed outside of the existing highway boundary. Property acquisition would be required from three property owners (Kim Klein, Cornell University, and Laurie Snyder). It is understood that one or more of these property owners would be resistant to selling property to further this project and would therefore require an eminent domain process.
- These alternatives have the potential to impact potential archeological sensitive areas by constructing in a location not known to have been previously disturbed.
- These alternatives prevent allowing improvements to the hydraulic performance of this crossing by maintaining the existing span configuration and in-stream pier.
- These alternatives retain the historic eligible bridge supported on spread footing by abandoning it in place. Recognizing that this existing bridge is susceptible to continued scour and that there is currently inadequate scour protection, the existing bridge will inevitably continue to deteriorate to a point of collapse. This has the potential to create an unsafe condition where the newly constructed downstream bridge is susceptible to impact damage from the existing bridge. This collapse and debris buildup could create flooding to the nearby residential properties and infrastructure in the vicinity of the bridges.
- Alternative 13a only – this alternative will require the Town to take ownership and maintenance responsibilities for the existing historic eligible truss bridge. While the project will leave the bridge in a condition where it should not need significant maintenance for the next 20 years, the Town would have significantly more liability and responsibility that they do currently (the bridge is currently owned and maintained by Tompkins County). i.e. as previously identified, this bridge is susceptible to scour; therefore it could be damaged or completely collapse within the projected 20-year service life for which the Town would be responsible to address. Furthermore, at the end of the 20-year service life, the Town will be responsible for beginning a permanent maintenance program the cost of which would be borne by the Town’s taxpayers.
NYSDOT provided definitions for what is considered a ‘feasible and prudent alternative’:

raphic and prudent alternative.

(1) An alternative is not feasible if it cannot be built as a matter of sound engineering judgment.

(2) An alternative is not prudent if:

(i) It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;

(ii) It results in unacceptable safety or operational problems;

(iii) After reasonable mitigation, it still causes:

(A) Severe social, economic, or environmental impacts;

(B) Severe disruption to established communities;

(C) Severe disproportionate impacts to minority or low income populations; or

(D) Severe impacts to environmental resources protected under other Federal statutes;

(iv) It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;

(v) It causes other unique problems or unusual factors; or

(vi) It involves multiple factors in paragraphs (2)(i) through (3)(v) of this definition, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

Feasible considerations –
Alternatives 13a and 13b are possible to construct, however they are not feasible to construct. Constructing a new bridge downstream of a scour prone bridge having the potential to either damage the new bridge or cause flooding upon its collapse does not constitute ‘sound engineering judgement’.

Prudent considerations –
Alternatives 13a and 13b also have similar conditions that cause these alternatives to not be prudent. The Town’s Purpose and Need emphasizes three elements that are contradicted by these alternatives. First, safety is one of the Town’s top priorities and maintaining a scour critical bridge either for trail use or adjacent to a new bridge violates the Town’s desire for safety. Second, the Town identifies minimizing environmental impacts and the offline alternative requires unnecessary environmental impacts beyond those of the online alternatives. Third, these alternatives provide no improvement to the floodplain which is primarily driven by having to maintain the existing in-stream pier.
For all of the above reasons, these offline alternatives (Alternative 13a and 13b) are not considered feasible or prudent and have been removed from the further consideration.

It is understood the remaining eleven alternatives would have an “adverse effect” on the historic eligible truss:

The following three rehabilitation alternatives were considered to minimize the adverse effects on the historic eligible truss:

- Alternative #2: Bridge Rehabilitation – Single Lane – 13’-1” Travel Lane
- Alternative #3: Bridge Rehabilitation – Single Lane – 14’-0” Travel Lane
- Alternative #4: Bridge Rehabilitation – Two Lanes

All three alternatives would maintain the existing truss. Alternative 2 and 3 would retain the single lane crossing; Alternative 4 would widen the crossing to accommodate two lanes of traffic plus a shared use shoulder for pedestrian access.

Alternative 2 and 3 were eliminated from further consideration because they would not address the geometric deficiencies as well as safety and operational deficiencies as required by the Town’s purpose and need. Additionally, all three alternatives would require structural modifications to satisfy the required vehicular load rating requirements as outlined by NYSDOT and BridgeNY. The modifications required to the truss elements as well as the floorbeams, stringers, and deck vary in scope and will require either completely replacing the individual members or supplementing the members substantially where feasible. An evaluation for alternative 4 found that all existing truss members had insufficient capacity to accommodate the two-lane bridge. Therefore, by replacing all members this alternative would not remain as a bridge rehabilitation and would not retain the truss members considered as the historic eligible truss.

Recognizing that these alternatives would have a limited service life, would not meet the project objectives associated with geometric and safety deficiencies (Alternative #2 and #3), and would require significant structural member modifications or replacement essentially threatening its historic eligibility, it was concluded that these alternatives are not considered feasible or prudent and therefore have been eliminated from further consideration.

The following three single lane, replacement alternatives were eliminated because they would not address the geometric deficiencies as well as safety and operational deficiencies as required by the Town’s purpose and need:

- Alternative 5: Bridge Replacement – Single Lane – Steel Multi-Girder
- Alternative 6: Bridge Replacement – Single Lane – Steel Multi-Girder with Truss Façade
- Alternative 7: Bridge Replacement – Single Lane – Steel Multi-Girder with Existing Truss Bridge Reused as a Pedestrian Bridge on an Adjacent Alignment
The remaining five replacement alternatives were evaluated and all meet the project objectives, purpose and needs.

The Town’s preferred alternative which has the least impact to the area, does not require ROW acquisition, and retains the visual aesthetic similarities of the existing site while preserving the historic significant of the existing truss is Alternative 9 (Bridge Replacement – Two Lane – Steel Multi-Girder with Truss Façade). The Town believes this is the most feasible and prudent alternative with the least amount of adverse effect both to the surrounding property and that will preserve the most prominent components of the historic eligible truss.

2. Steps Taken to Identify Historic Properties or Historic Structures

- The New York State Cultural Resource Information System (CRIS) on the State Historic Preservation Office’s (SHPO) website was consulted to identify archaeologically sensitive areas and sites listed on the State and National Registers of Historic Places within the Area of Potential Effect (APE) identified for this project. The results were summarized and included in a Project Submittal Package (PSP) submitted to the Regional Cultural Resource Coordinator (RCRC) under separate cover.
- Review of the PSP for assessment of obligations under Section 106 of the National Historic Preservation Act (36 CFR Part 800) by the RCRC concluded that project activities may cause effects on historic properties.

3. Evaluation of Project Impact on Identified Historic Properties

According to a review of the CRIS and the Evaluation of National Register Eligibility – Task 3 of the Historic Bridge Inventory and Management Plan, it was determined that the Freese Road Metal Truss Bridge, BIN 3209800, which is within the Area of Potential Effect, is listed as eligible on the State and National Register Building List. The truss is a Post-Standardization Pratt Truss eligible under criterions A-1 for historical significance to the local community, C-5 for dating to a period of early standardization, and C-6 for the truss being multiple span. The preferred alternative removes BIN 3209800 and constructs a new bridge on the same alignment while maintaining the original trusses for aesthetic purposes on the façade.

In an effort to minimize the impacts/adverse effects the proposed alternative has on historic eligible truss, the Town of Dryden intends to mitigate the impacts by:

- Retaining the most prominent components of the bridge using the truss as a facade attached to the fascia beams of the proposed bridge replacement;
- Prepare a Historic American Engineering Record (HAER) document in accordance with the National Historic Preservation Act Section 106 requirements. This document will be provided to the SHPO and council to be archived;
• In addition, the Consultant will prepare technical and interpretive documentation, and displays for the Town of Dryden Historian. This will ensure that the historical and technical information of interest to the general public and Town residents is available and accessible locally and regionally. The proposed documentation and displays will include:
  - A photographic history from original construction to the present
  - Engineering and structural calculations and specifications
  - Current condition photographs
  - One of the two restored builders plates
  - A small interpretive display could be erected on public lands at the existing bridge site.

The project limits for the preferred alternative remain within the existing highway corridor. No archaeological sensitive areas were identified through either the review of the CRIS or by NYSDOT’s Cultural Resource Coordinator for this alternative. Additionally, the preferred alternative will not require acquisition of new right-of-way and does not result in the disturbance of soils previously undisturbed by past construction.

4. Basis for Recommended Project Filing

The project activities will impact on a National Register eligible structure.

The Criteria of Adverse Effect has been applied in accordance with 800.5(b) of the National Historic Preservation Act and has been found that that this undertaking will have an Adverse Effect on properties eligible for or listed on the National Register of Historic Places.

5. Public Involvement

This project has been and will continue to be coordinated with the SHPO, Town of Dryden, Tompkins County, neighborhood community groups, those with Consulting Party status, and other governmental agencies with jurisdiction in the project limits. A public information meeting was held on January 10, 2018 that provided an opportunity to present general concepts outlining the objectives and potential alternatives. A second public information meeting is expected to be held in September 2019.

Inclusion of several individuals given Consultant Party Status in the project. At their request, these individuals have been asked for input on relevant historic information on the bridge and site, as well as comments on the proposed alternatives.

6. Summary

In summary, the proposed project will ensure the continued linkage for the local community surrounding the hamlet of Varna. The Freese Road Bridge serves as an historic and essential element within the local and regional transportation system. It requires replacement due to existing structural, geometric, and safety assurance deficiencies. The rehabilitation of the existing structure is not feasible due to the identified structural deficiencies and design
limitations, which constrict the horizontal clearance. Environmental considerations associated with floodplain, hydraulics and wetlands preclude construction at alternate sites. Additionally, no municipality, either Town or County, will commit to the maintenance responsibilities of the existing bridge.

In recognition of the historic and engineering significance of the Freese Road Bridge components of the structure will be both preserved as well as documented to ensure its legacy locally and within the state archives.

Implementation of the Recommended Alternative meets the project objectives and satisfies the feasibility and prudence criteria under Section 4(f) of the United States Transportation Act.

6. Attachments

Attachment A: Alternative Comparison Table
Attachment B: Preferred Alternative Bridge Section and Aerial View
Attachment C: Location Map
Attachment D: Photos
ATTACHMENT A

ALTERNATIVE COMPARISON TABLE
<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
<th>Bridge Description</th>
<th>Impact to National Register eligible truss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>null</td>
<td>existing single lane truss; do nothing</td>
<td>remain in place</td>
</tr>
<tr>
<td>2</td>
<td>rehabilitation</td>
<td>single lane truss; minor rehab of truss maintaining the current capacity</td>
<td>minor rehab</td>
</tr>
<tr>
<td>3</td>
<td>rehabilitation</td>
<td>single lane truss; major rehab of truss to address members not currently providing the design capacity and to widen the bridge to 14'-0&quot; travelway</td>
<td>major rehab</td>
</tr>
<tr>
<td>4</td>
<td>rehabilitation</td>
<td>two lane truss - 10' lanes and 5' shoulders; requires all truss members to be replaced</td>
<td>replacement of all members</td>
</tr>
<tr>
<td>5</td>
<td>replacement</td>
<td>single lane conventional bridge</td>
<td>remove/relocate</td>
</tr>
<tr>
<td>6</td>
<td>replacement</td>
<td>single lane conventional bridge; existing truss as façade</td>
<td>façade</td>
</tr>
<tr>
<td>7</td>
<td>replacement</td>
<td>single lane conventional bridge; existing truss to be used as the separate pedestrian bridge. *requires new conventional bridge (alt. 5) to be lengthened to existing truss length</td>
<td>pedestrian bridge; minor rehab</td>
</tr>
<tr>
<td>8</td>
<td>replacement</td>
<td>two lane conventional bridge</td>
<td>remove/relocate</td>
</tr>
<tr>
<td>9</td>
<td>replacement</td>
<td>two lane conventional bridge; existing truss as façade</td>
<td>façade</td>
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<tr>
<td>10</td>
<td>replacement</td>
<td>two lane conventional bridge; existing truss to be used as the separate pedestrian bridge. *requires new conventional bridge (alt. 8) to be lengthened to existing truss length</td>
<td>pedestrian bridge; minor rehab</td>
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<td>remove/relocate</td>
</tr>
<tr>
<td>12</td>
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<td>pedestrian bridge; minor rehab</td>
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<td>replacement</td>
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</tr>
<tr>
<td>13b</td>
<td>replacement</td>
<td>new off-line conventional bridge; existing truss to be taken out of service but remain in place</td>
<td>remain in place</td>
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ATTACHMENT B

PREFERRED ALTERNATIVE BRIDGE SECTION AND AERIAL VIEW
ALTERNATIVE 9 - BRIDGE REPLACEMENT (TWO-LANE - STEEL MULTI-GIRDERS WITH NATIONAL REGISTER ELIGIBLE TRUSS FACADE)
ALTERNATIVE 9 - BRIDGE

ALTERNATIVE 9 - BRIDGE REPLACEMENT (TWO-LANE - STEEL MULTI-GIRDER WITH NATIONAL REGISTER ELIGIBLE TRUSS FACADE)
Freese Road over Fall Creek (BIN 3209800)

Project Location Map 1

Town of Dryden, Tompkins County, New York
Freese Road over Fall Creek (BIN 3209800)

Project Location Map 2

Town of Dryden, Tompkins County, New York
Photo No. 1  View of Bridge from Northwest Approach

Photo No. 2  View of Bridge from Southeast Approach
Photo No. 5  Southeast Abutment

Photo No. 6  Northeast Quadrant
Photo No. 7  Pier Face Looking Southeast

Photo No. 8  Pier Face Looking Northwest
Photo No. 9  Bridge Supported Utility

Photo No. 10  Deck and Truss, Looking Northwest