Supplemental Supporting Information for a Finding of Effect
Project: Bridge #2016 - Frank J. Wood Bridge / WIN 22603.00 / STP-2260(300)

Introduction

Title 36 of the Code of Federal Regulations Part 800-Protection of Historic Properties (36 CFR Part 800) is the Federal regulation which outlines compliance with Section 106 of the National Historic Preservation Act of 1966. 36 CFR 800.1 states:

> The section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties…The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects to historic properties.

Parts 800.2 through 800.15 outline specific steps and aspects of the regulation, including the identification of the Area of Potential Effect (APE; see Appendix A), historic properties, documentation, and assessment of effects.

The first purpose of this document is to memorialize Section 106 consultation discussions at consulting parties meetings for the Frank J. Wood Bridge project. These discussions included the APE, National Register of Historic Places eligibility of the historic resources (including the Frank J. Wood Bridge and the surrounding landscape), and potential adverse effects. The second purpose of this document is to present the Federal Highway Administration (FHWA) finding of effect for each alternate presented in the Summary of Alternatives (Appendix C).

FHWA has elected to address Section 106 comments received by the Section 106 consulting parties related to the eligibility of and potential effects to historic properties within the text of this document. Appendix D is a matrix summarizing the comments received with a reference to where the comment was addressed and or a summary response to the comment. Note: FHWA has determined that some of the comments received between October 24, 2016 and January 20, 2017 are not best answered through because they are not related to the eligibility of and the potential effect to historic resources. They be addressed separately at a future date.

FHWA recommends that pertinent definitions and terms of the National Park Service (Appendix B) be utilized as a reference guide as well as documentation available from the National Park Service and 36 CFR part 800 while reviewing this finding of effect and while forming any subsequent comments on this finding. Those definitions are specific to the Section 106 and National Register processes. They are key influencers in the National Register eligibility of historic resources as well as the application of adverse effects. Any word using specific National Park Service meaning will be bolded throughout the document.

Additionally, readers may find Title 36 of the Code of Federal Regulations Part 61– Procedures for State, Tribal, and Local Government Historic Preservation Programs (36 CFR Part 61) and its Appendix A helpful.

The document outline is as follows:

1. Project Purpose and Need
2. Federal Action
3. Area of Potential Effect
4. Determinations of eligibility, including:
    - **significance**
    - **integrity**
    - and the **essential physical features** of each resource
5. FHWA Finding of Effects
    a. Findings of effect for each alternate presented in the Summary of Alternatives (Appendix C)
    b. Findings of effect for each resource by alternate
6. Archaeology
7. Bibliography
8. Appendices
    a. Area of Potential Effect
    b. Definitions and Terms of the National Park Service
    c. Summary of Alternatives
    d. Section 106 Comments Received
    e. Documentation of previous determinations of eligibility for Cabot Mill
    f. Maine Historic Preservation Commission concurrence on Section 106 Architectural Inventory
    g. Photographs of resources included within the APE
    h. Email from C.Anderson to N.Baker
    i. Email from P.Adams to S.Landry

1. Purpose and Need

The purpose of the project is to address poor structural conditions and load capacity issues on the Frank J. Wood Bridge and to address pedestrian and bicycle mobility and safety concerns.

Bridge improvements are needed to improve the condition ratings of the superstructure and deck from a rating of 4 (poor condition) to 7 (good condition). Because of the age of the bridge, 85 years old, and the considerable number of heavy loading cycles it has already experienced, steel fatigue concerns on critical tension members need to be addressed to continue to carry heavy truck traffic on the existing truss. Additionally, the floor beams and stringers need improvements to bring their load rating factors to a 1.0 for all legal loads.

This bridge is classified by the Federal Highway Administration (FHWA) as structurally deficient with superstructure and deck condition ratings of 4 out of 9 (poor condition). The 3 truss spans are fracture critical, meaning that failure of certain steel tension members could cause any of the 3 spans to collapse. Some of the steel truss bridge components

are fatigue sensitive, susceptible to cracking and fracture as a result of heavy cyclic loading. The floor beams and stringers within the truss spans do not meet current design load or MaineDOT legal load standards.

Pedestrians on the east side of Routes 201/24 cannot cross the river without crossing the highway, and the existing mid-block pedestrian crossings are considered dangerous.[1] Bicycle traffic is seriously limited by the narrow, 2 ft, paved shoulder.

2. Federal Action

Federal funding from FHWA.

3. Area of Potential Effect (APE)

An APE is defined in 36 CFR Part 800.16, in part, as the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties." The Maine Historic Preservation Commission (MHPC), representing the State Historic Preservation Office (SHPO) concurred with this APE on June 26, 2016.

The proposed project is located in the towns of Topsham, Sagadahoc County, and Brunswick, Cumberland County. A map illustrating the APE is included in Appendix A. The north and south **boundaries** reflect changes in the built environment (e.g. introduction of Route 1 south of the Cabot Mill and new construction north of the Frank J. Wood Bridge) precluding inclusion of properties outside the **boundaries**. Given the attention this project has garnered after the initial historic survey was undertaken and as a result from input from the Section 106 consulting parties, architectural historians revisited areas within the Topsham Historic District east of the bridge on Route 24 and Bridge Street in December 2016 to assess sight lines to the bridge. The visual survey confirmed that the bridge is not easily visible from these areas of the district. Therefore areas outside the APE remain excluded from the APE.

4. Determinations of Eligibility

The National Park Service, administrator of the National Register, uses requirements published by the Secretary of the Interior to identify those professionals who are qualified to perform identification, evaluation, registration, and treatment activities. These qualifications, found in 36 CFR Part 61 Appendix A, are generally referred to as the Secretary of Interior's Professional qualifications. In the simplest terms, only those who meet the standards are qualified to make determinations of eligibility to be concurred with SHPO.

The National Park Service provides guidance that properties typically reveal **significance** at 50 years of age. Instances of properties gaining **significance** within 50 years are rare. Additionally, the National Park Service guides qualified professionals to consider historic use rather than current use and that physical embodiment of **significance** is generally based on exterior elements.

[1] See Attachment I; email communication between Patrick Adams, Bicycle & Pedestrian Program Manager, MaineDOT, to Stephen Landry, State Traffic Engineer, MaineDOT.

National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation (Bulletin 15) states "to qualify for the National Register, a property must be significant; that is, it must represent a significant part of the history, architecture, archaeology, engineering, or culture of an area, and it must have the characteristics that make it a good representation of properties with that aspect of the past."[2] An important step in determining whether or not a property is significant is establishing context. Bulletin 15 also states "the significance of a property can be judged and explained only when it is evaluated within its historic context".[3] A **historic context** identifies the circumstances of particular events. Context needs to be established to identify resources that may represent the physical embodiment a specific theme in American history. Establishing why something may be significant must be identified before physical embodiments of that **significance** can be identified. The National Register establishes thirty data categories and ten sub-categories as **areas of significance**. A property must have **significance** in at least one to be eligible for listing in the National Register. Typically, **historic contexts** exist somewhat separately from resources, e.g., context exists without physical embodiment.

Brookfield Dam

The Brookfield Dam was identified as a contributing resource to the National Register eligible (NR-E) Brunswick Topsham Industrial Historic District (BTIHD) during the initial survey. Ongoing Section 106 consultation has revealed its construction date is ca. 1985 which is outside the **period of significance** (**POS**) for the BTIHD (POS ends ca. 1950, see Determination of Eligibility of the BTIHD for more information). Additionally, it has not achieved **significance** in the last 50 years; therefore it is not eligible for listing in the National Register.

Frank J. Wood Bridge (#2016)

During the 2001 *MaineDOT Historic Bridge Survey: Phase II Final Report and Historic Context* review process, the Frank J. Wood Bridge was determined ineligible for individual listing, but determined a contributing resource to the NR-E BTIHD. This determination was again concurred with on June 16, 2016 (attached in Appendix F) as part of the Section 106 consultation process for this project. A property that contributes to a NR-E or listed historic district is afforded the same consideration under Section 106 as an individually eligible or listed property.

During the October 24, 2016 Section 106 Consulting Parties meeting it was questioned whether or not the individual eligibility of the bridge needed to be reconsidered due to the 15 years that have passed since completion of the bridge survey. FHWA determined that the individual eligibility should be re-examined.

Secretary of the Interior qualified Architectural Historians worked in concert with MaineDOT to gather information regarding events surrounding the construction of the bridge and the current status of Warren trusses in the state. Understanding these two

[2] National Register Bulletin 15, 7.
[3] National Register Bulletin 15, 7.

conditions provide the basis of potential **significance** under National Register **Criterion A** and **Criterion C**.

Beginning in 1932, Maine State Highway Commission (MSHC; precursor to the MaineDOT) published *Maine Highways*, an overview of the previous year's construction projects. The November 1932 issue contained a one-page feature, "New Bridge at Topsham-Brunswick: An Important Link." The feature notes that "for several years prior to 1931 the old steel bridge . . . has been unsatisfactory for the steadily increasing volume of traffic passing over Route 201" and "in many places portions of the original members had been entirely eaten away by rust." The feature also describes the construction approach as well as men associated with the effort. It does note that the bridge is named for Topsham resident Frank J. Wood. Wood was a vocal advocate for the realignment of Route 201 from the mill yard of the Pejepscot Paper Company (PPC) to the current route. MSHC Annual Reports from 1930, 1931, and 1932 do not reveal any information regarding significant events associated with the development and construction of the bridge.

MHPC provided a draft Historic American Engineering Record (HAER) for the PPC for review.[4] The narrative section of the draft HAER references that the Frank J. Wood Bridge construction effort bypassed the island the mill is located on, eliminating direct access to the island. It also confirms the date of the first bridge between the two communities at 1798.

The *Brunswick Record* published articles about the events leading to the construction of the Frank J. Wood Bridge from Fall 1929 to Spring 1931. Interestingly, many of the issues facing the current bridge faced the previous bridge. As indicated in the October 31, 1929 article "State Engineer to Start Survey and Estimate on Topsham Bridge at Once," the existing bridge had been unsafe for approximately 10 years and selectmen from Topsham and Brunswick were awaiting approval from MSHC to post the bridge at 4,000 pounds.

The articles reveal that initially the MSHC considered four replacement alternates. All were on the existing alignment with 4 different set of changes at the approaches to correct what the MSHC considered "dangerous curves." Topsham farmer Frank J. Wood, along with 49 others, petitioned MHSC to consider an upstream alignment, stating that the reconstruction-on-alignment costs did not include the cost of a temporary bridge and the costs to repair and maintain the bridge spanning Granny Hole stream (access on/off Bowdoin Mill island; the realignment would bypass this crossing). The group also noted the increased traffic on Route 201, an important route between Maine and Canada, presented challenges.

The group opined realignment as the best option because the new bridge would carry three lanes of traffic (presumably one for a trolley) while minimizing disruptions around the bridge during construction. Wood unsuccessfully petitioned Central Maine Power to remove the half-moon dam so that it could be rebuilt slightly downstream and integrated

[4] The HAER refers to the buildings and site at this location as the Bowdoin Mill.

into the bridge superstructure. The group's thought was a downstream dam would allow for a larger impoundment leading to increased power generation.

Research also showed numerous roadway and bridge projects in the area during the same period of the events described above. The additional research and investigation of the events surrounding the Frank J. Wood Bridge did not reveal any **significance** that would qualify the bridge individually eligible under **Criterion A** on the local, state, or Federal level.

Potential **significance** under **Criterion B** was also examined as the bridge was named for the man who proposed its alignment. Per NR bulletin 15, in order for the bridge to be eligible for listing under **Criterion B**, the bridge must be "associated with a person's productive life". In this case, the bridge would need to be associated with Frank J. Wood's productive life. All scholarly research shows that Frank J. Wood was a farmer; not a bridge engineer or builder. Therefore, the Frank J. Wood Bridge is not eligible for listing under **Criterion B**. Research did not reveal associations with other individuals' productive lives.

Potential **significance** under **Criterion C** was also examined, substantially through the MaineDOT historic bridge inventory. The bridge inventory was prepared by Lichtenstein Consulting Engineers (Lichtenstein) and the process was overseen by a Historic Bridge Committee (HBC) comprised of representatives from MaineDOT, FHWA, and MHPC. It is a comprehensive and accepted historic context for bridges in the State of Maine. The Phase II undertaking included: **historic context** for bridge technology, a narrative history of MSHC Bridge Division 1915-1955, electronic databases to store information, documentation of field investigations, survey forms, and eligibility determinations. The context developed for the bridge survey in 2000 remains pertinent today, even with the replacement of Warren trusses since that time.

After developing the context, Lichtenstein, working with the HBC, identified forty-six Warren truss bridges throughout the state. Thirty-eight of the forty-six were identified as constructed with riveted truss technology between 1888 and 1953, and the majority of which were constructed in response to the 1936 flood. The eight of the forty-six likely had more prominent features and are classified as another type of bridge, such as a moveable span, in additional to a Warren truss. Examples of these are the moveable spans of the former Memorial Bridge (Kittery), the former Sarah Mildred Long Bridge (Kittery), former Maine Kennebec Bridge (Richmond and Dresden), and Southport Bridge (Southport).

Of the forty-six bridges, seventeen were determined eligible for listing in the National Register. Of those seventeen bridges, fourteen were determined individually eligible under **Criterion A** and/or **Criterion C** for representations of early or late examples of riveted connection construction methodology, **associations** with Max Wilder, Chief Engineer of the MSHC, and/or associated with state-wide reconstruction after the devastating 1936 flood.

Three Warren truss bridges, the Frank J. Wood Bridge, Dock Bridge (#3284, Alna), and West Buxton Bridge (#3330, Buxton) were identified as contributing to historic districts

because the construction date of each bridge was within each district's **period of significance** (**POS**) and the bridge retained **integrity** of all seven aspects; however they did not have characteristics that convey **significance** individually under any **Criteria**. Since the conclusion of the bridge inventory, ten individually eligible Warren trusses have been replaced.

The bridge inventory identified an additional twenty-nine Warren truss bridges that were not determined eligible for listing in the National Register. Generally, the technology and events associated with each, including the 1936 flood event, were represented in earlier bridges. Since the conclusion of the bridge inventory twelve ineligible Warren trusses have been or are scheduled for replacement.

The **historic context** of steel truss bridges reveals that they were an established form and type by 1900 due to standardization. Standardization had been driven by a decrease in cost for raw material and advances in metallurgy, creating increased efficiency. The context notes, "Relatively few examples [of truss bridges] stand out as truly innovative or noteworthy from a history of bridge engineering."[5] All post-1920 truss bridges are riveted examples and are textbook designs with specifications regularly referenced by American Association of State Highway Officials (AASHO; now referred to as AASHTO) and American Society of Testing Materials (ASTM).

Examples of significant riveted Warren truss engineering are represented by the Ryefield Bridge (#0238, Harrison, 1912) and Gambo Falls Bridge (#0266, Windham, 1912). Each represent an early example of the established engineering of Warren trusses before an approximate 10-20 year period of statewide technological stagnation. At the same time, new technologies, such as steel stringers and reinforced concrete bridges, were emerging. These new technologies required less maintenance than trusses. While the engineering of post-1920 truss bridges is less noteworthy than previous truss design and construction methodology, there are some refinements of design that are significant, for example rolled sections (#2398, International Bridge, #3040 Piscataquis, #2565 Mill Pond, all 1929) and continuous design (trusses are uninterrupted over the pier; #3340, West Buxton, 1937).

While truss bridges have been replaced due to structural deficiency and functional obsolescence, the Frank J. Wood Bridge remains ineligible for individual listing. It does not represent emerging technology, nor is its construction associated with a significant event or person. Therefore it does not hold individual **significance** in any **area** under any **criteria**. However, the bridge remains eligible for listing as a contributing resource to the NR-E BTIHD and the FHWA is required to consider the effects its project may have on the bridge.

<u>Androscoggin River Falls</u>
This is a response to a comment made at the October 24, 2016 Consulting Parties Meeting regarding individual eligibility of the falls within the APE. The Frank J. Wood

[5] Bridge Survey, p II-2

Bridge spans the Androscoggin River slightly east of three natural falls, all of which have been slightly exposed in each site visit for this project.

Secretary of Interior Qualified Architectural Historians again consulted National Park Service Bulletin 15. The bulletin provides guidance on how landscapes interface with National Register Property and Resource Types (building, site, structure, object, and district) and the seven aspects of **integrity** (**location**, **design**, **materials**, **setting**, **workmanship**, **feeling**, and **association**). To be listed in the National Register, a property must fit the definition of one of the five resource types and retain sufficient **integrity** of the seven aspects.

The NR bulletin 15 defines a site as "a **location** of a significant event, a prehistoric or historic, occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the **location** itself possesses historic, cultural or archaeological value regardless of the value of any existing structure." It continues, "When the **location** of a prehistoric or historic event cannot be conclusively determined because no other cultural **materials** were present or survive, documentation must be carefully evaluated to determine whether the traditionally recognized or identified site is accurate."

Given these statements, architectural historians and archaeologists need to determine the following in regards to the falls:

- Was there an event there?
- Does the site, regardless of any building, structure, or object possess historic value?
- If neither are conclusive, does documentation prove the recognized or identified site accurately?

Throughout consultation, parties have indicated the falls were the site of early settlement. There is some evidence that prehistoric activity took place around the falls and the portages above and below the falls. Late 19th-century research cast doubt on the area's ability to support more than a village of 50 people. Research shows that initial European settlement happened further south in Brunswick and further east in Topsham. See Section 6: Archaeology for additional information, including SHPO communication.

Ultimately, research did not reveal specific events or the **location** of assumed events. Certainly the falls were identified as a power source at some point during the establishment of both communities; however, "the National Register [generally] excludes from the definition of 'site' natural waterways or bodies that served as determinants in the **location** of communities or were significant in the locality's subsequent economic development. While they may have been 'avenues of exploration,' the features most appropriate to document this **significance** are the properties built in **association** with the waterways."

Due to these factors, the landscape of the Androscoggin River Falls is not eligible for listing on the National Register; however, it is an integral part of the **setting**, **design**,

feeling and **association** of each of the National Register eligible or listed properties within the APE.

Summer Street Historic District
National Register-eligible
***Criterion C**—Architecture*
***Period of significance** ca. 1830–1880*

The Summer Street Historic District (SSHD) was determined eligible for listing in the National Register as part of Section 106 consultation for this project. It was initially included as part of the BTIHD; however MHPC did not concur with that determination, but indicated that the area was likely a standalone NR-E historic district. Since SHPO concurrence on June 16, 2016, MHPC identified an intensive level survey from the 1990s on file at MHPC. The information provides **historic context** of the neighborhood by discussing its residents and the development of the built environment.

The SSHD consists of six residences and one associated former carriage house. The district embodies distinctive characteristics of the Queen Anne and Stick styles (seen at 15 Summer Street, 19 Summer Street, and 21 Summer Street). Additionally, the single story homes on Street houses embody characteristics of vernacular architecture found throughout New England from the late 18th century to the early 19th century. The period is partially represented by single-story, gable-front massing with symmetrical fenestration patterns, granite foundation, and heavy brick chimney stack. Generally, these elements are not distinguishable as individuals; but when considered as a district they represent residential development with high style architectural detailing during the **POS** for the SSHD.

National Register Bulletin 16A: How to Complete the National Register Registration Form provides direction on defining the **POS** for a district stating, "For districts enter construction dates of only those buildings that individually had an impact on the character of the district as a whole."[6] As this district is significant for its Architecture under **Criterion C**, the **POS** is marked by the construction date of the earliest house and the end of the traditionally accepted period of its latest architectural style. The Frank J. Wood Bridge did not exist during the period for which the district's is significant. The **POS** starts with the estimated construction date of 17 Summer Street in 1830 and ends in 1880, the generally accepted end of Stick Style's evolution and influence. The context supports the **POS** for the district and its local **significance** under **Criterion C** for its Architecture. The SSHD is significant for its concentration of residential houses which embody distinctive characteristics of a type and period as well as possessing high artistic value.

The **essential physical features** of the district are the Stick and Queen Anne style details found on all but one of the properties, scale and massing of all the housing (which represents the styles and the period in which they were constructed), setback of each of

[6] National Register Bulletin 16A, 43.

the houses, and size and configuration of the lots that front Summer Street. The **integrity** of the district is intact.

Paramount aspects of **integrity** are **design**, **materials**, and **workmanship**. These three aspects convey the **significance** of the district's embodiment of the Federal period building and the Queen Anne and Stick architecture styles. **Setting** includes the Androscoggin River, two mill complexes, and permanent crossing[7].

The **POS** reflects the estimated construction date of the earliest Federal residence and the estimated construction of the latest Queen Anne/Stick style residence. A river crossing has always been a part of this historic district's **setting**. The **boundaries** includes the property's parcel lots and the area of land at the similar elevation across Summer Street. These small areas are included because of **association** through ownership identified in the intensive level survey **materials** at MHPC.

The Frank J. Wood Bridge is not part of the district's **integrity** of **setting**. Per NR Bulletin 15 "**setting** often reflects the basic physical conditions under which a property was built and the functions it intended to serve."[8] The Frank J. Wood Bridge, constructed later than the end of the **POS** of the SSHD, is therefore an intrusion and has no bearing on the basic physical conditions at the time of construction of the residences.

The district was intended to and continues to function as a residential neighborhood. An established river crossing likely played a role in its development; however, that bridge was not the Frank J. Wood Bridge. It has little bearing on the use in that it is one of three bridges at this **location** since the late 18th century. With each replacement the district retained its historic, intended use. The retention of a river crossing at this **location** will enable the district's current function to continue unimpeded.

Cabot Mill
National Register-eligible as Individual Resource
Contributing Resource to the NR-E Brunswick Topsham Industrial Historic District;
***Criteria A & C**—Industry and Engineering/Architecture*
***Period of significance** ca. 1850–ca. 1950*

[7] Note: A distinction can be made between a permanent crossing and a specific bridge at most locations where a span is required. A permanent crossing is a fixed structure (v. a ferry) and could include multiple specific bridges and may allow for slightly different alignment of those bridges. A permanent crossing may be associated with or the impetus for activity which qualify resources for listing under criteria in any number of areas of significance, e.g. tourism, community planning and development, industry, or commerce. This is particularly important when the POS for significant resources encompasses time prior to and after the construction of a particular crossing. The date of a first crossing may be the beginning of the POS for a larger district whose significance is contingent on a crossing. A specific bridge may hold significance as representation of a particular technology or due to its connection with a significant designer/contractor or significant activity **areas** commonly associated with **Criteria A**, such as community planning and development or industry. However, National Register eligibility depends on the integrity of the resource.
[8] National Register Bulletin 15, 45

The Cabot Mill is significant for its **association** with and physical representation of industrial activities on the site. This **significance** falls under **Criterion A** and **Criterion C**. The mill's **association** with the textile industry is well documented through scholarly research and it embodies characteristics of a period and type of construction. The **essential physical features** for this mill are its brick construction, rectangular massing, full-height, semi arched windows, and two projecting Renaissance Revival towers. These features are the manifestation of the engineering required to **design** an efficient, functional textile mill in the late 19th century coupled with high architectural style details. **Essential physical features** also include the proximity to a water source which provided power during the **period of significance**.

As the Cabot Mill is eligible for listing for its **association** with and physical embodiment of Industry, Architecture, and Engineering, four aspects of i**ntegrity**, **design**, **materials**, **setting**, and **workmanship** are paramount to conveying its **significance**. **Design**, **materials**, and **workmanship** are in good condition; however, **setting** has been compromised.

The Route 1 Connector was constructed after the mill's significant industrial period ended. The effort removed many buildings within close proximity of the mill, some of which were likely associated with the mill. Additionally, dams associated with the mill have been removed and hydro-electric dams, unassociated with the mill, have been constructed after manufacturing ceased on site. The mill's industrial activity coincided with three different river crossings adjacent to the east. The Androscoggin River is an **essential physical feature** to the mill's **integrity** of **setting** as it served as its power source. Without such there would be no Industrial **significance**.

The Cabot Mill's **POS** is ca. 1850 to ca. 1950. It takes the aforementioned events into consideration while honoring that **design**, **materials**, and **workmanship** are the critical aspects of **integrity**. The dates mark the estimated beginning and end of manufacturing and contains the construction of the two Renaissance Revival-style towers.

The **POS** also includes construction of the Frank J. Wood Bridge; therefore, unlike the SSHD, it plays a larger role in the **setting** of the NR-E mill. The mill's **association** with Frank J. Wood Bridge is a characteristic and contributes to its **integrity** of **setting**. Additionally, while the Frank J. Wood Bridge plays a role in the **setting**, the **historic context** of the area reveals that at least two other bridges provided a permanent crossing between Topsham and Brunswick in proximity to the Cabot Mill. Therefore, a permanent crossing plays a role in the Cabot Mill's **integrity** and **essential physical features**.

<u>Pejepscot Paper Company</u>
National Register-listed
Contributing Resource to the NR-E Brunswick Topsham Industrial Historic District
***Criteria A & C**—Industry and Engineering/Architecture*
***Period of significance** ca. 1868–1966*

The Pejepscot Paper Company (PPC) was listed in the National Register in 1974 for its statewide **significance** in the paper industry and Italianate-style Architecture. Its **significance** is held as the earliest paper manufacturer in the state and as a distinguishable early example of the Italianate style applied to an industrial structure. This **significance** falls under **Criterion A** and **Criterion C**.

Its **integrity** of **design**, **materials**, **workmanship**, and **setting** are paramount to conveying its **significance**. All seven aspects are in good to fair condition. The character of the property changed when the construction of the Frank J. Wood Bridge removed Route 201 from the center of the mill yard west to the opposite side of Bowdoin Mill Island. Additionally, buildings have been lost in the last 10-20 years due to removal or fire. These losses suggest that the **boundaries** of the listed property could shrink to reflect the current understanding and interpretation of the PPC. It may also mean that it can no longer convey certain aspects of its **significance**. However, this determination of effect considers the **boundaries** as they are listed in the National Register; therefore consideration of effects is given to **significance** and **essential physical features** as noted or implied in the National Register nomination.

The nomination and subsequent documentation from MHPC shows the **POS** is 1868 to circa 1966. These dates reflect the construction of the Italianate mill at the south of the island and the end activities associated with paper manufacturing on site. The mill functioned as a paper manufacturing company that processed raw **materials** into paper, first with direct water power, and later hydroelectric power.

Its **essential physical features** are the rectangular massing, gambrel roof, brick construction, and large windows set in a recessed panel. Additionally, its **association** with a permanent crossing is a critical part of the PPC's **setting** as well as its physical relationship with the Androscoggin River. The use of the resource was contingent on its proximity to a water power source and a suitable site to harness potential energy. Additionally, while the Frank J. Wood Bridge plays a role the **setting**, the **historic context** of the area reveals that at least two other bridges provided a permanent crossing between Topsham and Brunswick in near proximity to the PPC. Therefore, a permanent crossing plays a role in the PPC's **integrity** and **essential physical features**.

<u>Brunswick Topsham Industrial Historic District</u>
National Register-eligible
Criteria A & C—Industry and Engineering/Architecture
***Period of significance** ca. 1850–1966*

The NR-E BTHID was identified during the MaineDOT bridge inventory for its local **significance** in Industry and Architecture/Engineering. The BTIHD represents a small industrial area. The presence of the mills on opposite sides of the Androscoggin River are a physical embodiment of the economic successes represented by water power created by a natural falls. The communities on each bank share similar histories and development patterns. A permanent connection between the two, spanning the Androscoggin River, provided a link between the mills and continuity to Route 201. The district's **POS** has

borne witness to at least three bridges, all of which were critical to the districts' **association** with Industry. The crossings have been a transportation route for goods and employees.

The district is comprised of the following contributing resources: the Cabot Mill, PPC, and Frank J. Wood Bridge. The district represents industrial activity in two differing communities based around a single water power source, the Androscoggin River. It represents the local area's history of manufacturing economy and its architecture embodies the characteristics of the Italianate and Renaissance Revival styles in an industrial context. The district's **setting** of the Androscoggin River and its falls are a critical part of the district's **essential physical features**.

The district has been the site of three different bridge crossings, at least two on different alignments. A bridge crossing in this **location** is a critical **essential physical feature** of the district. Each bridge has provided a continuous transportation route between the two communities as well as points north and south.

The **POS** for the district begins in 1850 and ends circa 1966. Its **significance** coincides with the earliest and latest dates of **significance** of the two mills which contribute to this district. The Frank J. Wood Bridge is a contributing resource to this NR-E district due to its age of construction falling within the **POS** for the district and retention of its **integrity**.

The **essential physical features** of the district are two mill complexes, the physical formations of the Androscoggin River, and a permanent crossing. Its characteristics also include the three-span Warren truss Frank J. Wood Bridge. Additionally, while the Frank J. Wood Bridge plays a role the **setting**, the **historic context** of the area reveals that at least two other bridges provided a permanent crossing between Topsham and Brunswick in near proximity to the PPC. Therefore, a permanent crossing plays a role in the BTIHD **integrity** and **essential physical features**.[9]

5. Determination of Effects

One of the critical steps of Section 106 consultation is the Assessment of Effects (commonly referred to as a Determination of Effect). 36 CFR 800.5 states: "In consultation with the SHPO…the agency official shall apply the criteria of adverse effect to historic properties within the area of potential effects."

One finding of effect is made for a single project. The first sub-section below lists the finding of effects for each alternative. The second sub-section provides details of FHWA's assessment of effects to each historic resource (individual properties or districts) within the APE.

The second sub-section will begin with a brief overview of the **significance** of each resource, **essential physical features**, **integrity**, and the **POS**. It will be followed by a discussion of effect on the property for each alternate.

The criteria of adverse effect is defined at 36 CFR Part 800.5, in part, as when "an undertaking may alter, directly or indirectly, any of the characteristics of a history property that qualify the property for inclusion in the National Register in a manner that would diminish the **integrity** of the property's **location, design, setting, materials, workmanship, feeling, or association**."

Integrity is assessed in part by defining the **essential physical features** that must be present to represent **significance**, determine whether or not those **essential physical features** are visible to convey **significance**, and determine which aspects of **integrity** are particularly vital to the property.

In assessing the criteria of adverse effects, FHWA and MaineDOT considered the **significance**, **POS**, **integrity**, and the **essential physical features** as described above in concert with the proposed action of each Alternate presented in the Matrix of Alternatives. Some of the language used will be similar throughout.

MaineDOT and FHWA acknowledge that the actions associated with either rehabilitation option will be done in a manner that is consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties; therefore, FHWA finds that there is no adverse effect as a result of either rehabilitation alternative.[10]

Finally, while some minimization of harm has been identified for each alternate, further identification occurs when an alternate is selected.

Determinations of Effect for Each Alternate

No Build
No Historic Properties Affected

This alternate would result in a finding of no historic properties affected because aspects of **integrity** of all properties would remain the same. The planned maintenance of the Frank J. Wood Bridge would prevent demolition by neglect. Additionally, the maintenance methodology includes using **materials** that fit characteristics, **design**, and **materials** of the bridge and therefore, retain **integrity** without diminishing it.

Alternate 1 – Replacement Bridge on Existing Alignment
Adverse Effect

This alternate results in a finding of adverse effect due to the removal of the Frank J. Wood Bridge, a contributing resource to the BTIHD. The removal represents a degradation of the **integrity** of **design**, **materials**, **workmanship**, **feeling**, and **association** of the BTIHD. Additionally, the **integrity** of **setting** of the Cabot Mill and PPC would be diminished because the bridge represents one of the last remaining pieces of transportation infrastructure originating from the mills' **POS**.

[10] 36 CFR 800.5(a)(2)(ii).

Minimization of harm to resources includes retention of the current alignment, therefore, effects are limited or prevented (e.g. SSHD). Additionally pier placement will likely avoid area sensitive for archaeology.

Alternate 2 – Replacement Bridge on Curved Upstream Alignment
Adverse Effect

This alternate results in a finding of adverse effect due to the removal of the Frank J. Wood Bridge, a contributing resource to the BTIHD. The removal represents a degradation of the **integrity** of **design**, **materials**, **workmanship**, **feeling**, and **association** of the BTIHD. Additionally, the **integrity** of **setting** of the Cabot Mill and PPC would be diminished because the bridge represents one of the last remaining piece of transportation infrastructure that originated during the mills' **POS**. This alternative would also require a small right-of-way take from the Cabot Mill property.

Minimization of harm includes tying the current approaches to limit the number of right of way takes and impacts to other historic resources outside the APE.

Alternate 3 – Rehabilitation with Westerly Sidewalk Retention
No Adverse Effect

This alternate results in a finding of no adverse effect as the rehabilitation retains the Frank J. Wood Bridge, a contributing resource to the BTIHD. Rehabilitation would follow the Secretary of the Interior's standards for the Treatment of Historic Properties to include the replacement in kind of **materials** in the deck, super, and sub structures, to reflect the original **design** of the bridge, while keeping original **materials** in the trusses. A finding of no adverse effect acknowledges a change to the features that qualify a resource for listing in the National Register, but does not diminish them.

Minimization of harm include application of and compliance with the Secretary of Interior's Treatment of Historic Properties, therefore effects to surrounding resources are avoided.

Alternate 4 – Rehabilitation with Westerly Sidewalk Retention and Easterly Sidewalk Construction
No Adverse Effect

This alternative results in a finding of no adverse effect because the sidewalk would be designed following Secretary of the Interior's standards for the Treatment of Historic Properties. It would be constructed in a manner that is consistent with **materials**, type, and **design** of the Frank J. Wood Bridge. A finding of no adverse effect acknowledges a change to the features that qualify a resource for listing in the National Register, but does not diminish them.

Minimization of harm include application of and compliance with the Secretary of Interior's Treatment of Historic Properties, therefore effects to surrounding resources are avoided.

Alternate 5 – Replacement Downstream Parallel Alignment
Adverse Effect

This alternate results in a finding of adverse effect due to the removal of the Frank J. Wood Bridge, a contributing resource to the BTIHD. The removal represents a degradation of the **integrity** of **design**, **materials**, **workmanship**, f**eeling**, and **association** of the BTIHD. Additionally, the **integrity** of **setting** of the Cabot Mill would be diminished because the bridge represents one of the last remaining pieces of transportation infrastructure that originated during the Cabot Mill's **POS**. This alternate would require a small take from the PPC property.

Ways to minimize adverse effects for this alignment is limited to due to a need for increased right of way and a take from the PPC.

Detailed Descriptions of Effects to Each Historic Resource by Alternate

Summer Street Historic District
National Register-eligible
***Criterion C**—Architecture*
***Period of significance** ca. 1830–1880*
***Essential physical features**—Queen Anne & Stick Style architectural details, Federal-era massing and design, including single-story, gable-front massing with symmetrical fenestration patterns, granite foundation, and heavy brick chimney stack, parcel size, orientation to the road*

Alternate 1 – Replacement Bridge on Existing Alignment – No Effect
The introduction of a replacement bridge would not diminish the district's seven aspects of **integrity**. The architecturally significant district would still be able to convey that **significance** through its **essential physical features**. Its use would remain the same.

Alternate 2 – Replacement Bridge on Curved Upstream Alignment – No Adverse Effect
This alignment would introduce a small portion of new transportation infrastructure into the **setting**; however it does not diminish the **setting** because the new bridge will be of similar size. The removal of a truss from the area does not affect the setting because the truss of the Frank J Wood Bridge is not connected with the **significance** of the bridge.

A comment was made at the October 24, 2016 consulting parties meeting that a change in alignment may result in more light from cars crossing the bridge at night entering Summer Street houses, potentially changing the use.

A Professional Engineer specializing in Electrical Engineering was consulted regarding changes in headlight projection resulting from this alternative.[11] He found headlight projection lines and distances indicates that illumination from both low beam and high beam headlights would fall far short of the residences in the Summer Street neighborhood. When vehicles are headed north toward Topsham, vehicles would be

[11] Anderson, Carl, L. Electronic Communication with Norman Baker, PE.. January 19, 2017 *(Appendix H).*

approximately between 800' and 1000' from two Summer Street residences when the headlights are aligned in that direction. Typical headlight illumination is reported to be approximately 150'-160' for low beam, while the best high beams could illuminate only as far as 500'. As this is an urban setting, it is anticipated that a vast majority of vehicles will utilize low beams in this situation. Considering no interference from traffic or bridge railings and a maximum allowable high-beam projection of light, the increase in intensity of light on a house at a distance of 800', or the closest residential house, would be equal to 0.1 foot-candles. It is also anticipated that headlight projection toward Summer Street will be significantly diminished by the bridge rail.

FHWA maintains that these changes do not represent a change in use of the residential neighborhood, therefore there is no adverse effect to the SSHD as a result of this alternate.

Alternate 3 – Rehabilitation with Westerly Sidewalk Retention – No Effect
The rehabilitation of the bridge would not diminish the district's **integrity**. The bridge would be retained in its current configuration and the intended use of the district would remain the same.

Alternate 4 – Rehabilitation with Westerly Sidewalk Retention and Easterly Sidewalk Construction – No Effect
The rehabilitation of the bridge would not diminish the district's **integrity**. The bridge would be retained in its current configuration and the intended use of the district would remain the same.

Alternate 5 – Replacement Downstream Parallel Alignment – No Effect
A replacement bridge on a downstream alignment would not diminish the district's **integrity** as outlined in Alternates 2 and 3. The use would stay the same. Unlike Alternate 2, there is no change in the skew of the bridge; therefore light from passing cars would be projected at the same angles to near exactly to how it is currently, albeit further away from the SSHD.

<u>Cabot Mill</u>
National Register-eligible
Contributing Resource to the NR-E Brunswick Topsham Industrial Historic District
Criteria A & C—Industry and Engineering/Architecture
***Period of significance** ca. 1850–ca. 1950*
***Essential physical features**—rectangular massing, proximity to water power source, full height semi-arched windows, permanent crossing*

Alternate 1 – Replacement Bridge on Existing Alignment – Adverse Effect
A replacement bridge would result in a finding of adverse effect to the Cabot Mill's **integrity** of **setting** by removing one of the last pieces of the built environment constructed during the mill's established **POS**. While the Frank J. Wood Bridge is a part of the mill's **setting**, so is a permanent crossing connecting Topsham and Brunswick. Therefore, retention of a crossing on this alignment is considered a minimization of harm

to the BTIHD. Retention of this alignment, which is associated with the mill's **significance** is also considered a minimization of harm.

Alternate 2 – Replacement on Curved Upstream Alignment – Adverse Effect
A replacement bridge would result in a finding of an adverse effect to the Cabot Mill's **integrity** of **setting** by removing one of the last pieces of the built environment constructed during the mill's established **POS**. While a permanent crossing is considered a minimization of harm, this alternative represents an alignment not previously associated with the **significance** of the district. Therefore it has a greater magnitude of harm than Alternate 1.

Alternate 3 – Rehabilitation with Westerly Sidewalk Retention – No Adverse Effect
This alternate would result in a finding of no adverse effect because the current crossing would be retained and no change in use would occur.

Alternate 4 – Rehabilitation with Westerly Sidewalk Retention and Easterly Sidewalk Construction – No Adverse Effect
This alternate would result in a finding of no adverse effect because the current crossing would be retained and no change in use would occur.

Alternate 5 – Replacement Downstream Parallel Alignment – Adverse Effect
A replacement bridge would result in a finding of adverse effect to the Cabot Mill's **integrity** of **setting** by removing one of the last pieces of the built environment constructed during the mill's established **POS**. While retention of a permanent crossing is considered a minimization of harm; this alternative represents an alignment not previously associated with the **significance** of the district. Therefore it has a greater magnitude of harm than Alternate 1.

<u>Pejepscot Paper Company</u>
National Register-listed
Contributing Resource to the NR-E Brunswick Topsham Industrial Historic District
***Criteria A & C**—Industry and Engineering/Architecture*
***Period of significance** ca. 1868–1966*
***Essential physical features**—rectangular massing, gambrel roof, brick construction, tall windows set in a recessed panel, a permanent crossing, and physical relationship with the Androscoggin River.*

Alternate 1 – Replacement Bridge on Existing Alignment – Adverse Effect
This alternate would diminish the **integrity** of **setting**. While the Frank J. Wood Bridge is a part of the PPC's **setting**, so is a permanent crossing connecting Topsham and Brunswick. Therefore, retention of a crossing on this alignment is considered a minimization of harm to the PPC.

Alternate 2 – Replacement Bridge on Curved Upstream Alignment – Adverse Effect
This alternate would result in a finding of adverse effect because the removal of the Frank J. Wood Bridge would diminish the **integrity** of **setting** for the PPC. However, the **association** with a river crossing would be retained with a replacement bridge. The use of PPC would be retained as it is dependent on the crossing providing access. While a permanent crossing is considered a minimization of harm; this alternative represents an alignment not previously associated with the **significance** of the district. Therefore it has a greater magnitude of harm than Alternate 1.

Alternate 3 – Rehabilitation with Westerly Sidewalk Retention – No Adverse Effect
This alternate would result in a finding of no adverse effect because the current bridge would be retained and no change in use would occur. Rehabilitation would occur in concert with the Secretary of the Interior's Standards and Guidelines for the Treatment of Historic Properties; therefore, the **integrity** of **setting** would not be diminished.

Alternate 4 – Rehabilitation with Westerly Sidewalk Retention and Easterly Sidewalk Construction – No Adverse Effect
This alternate would result in a finding of no adverse effect because the current bridge would be retained and no change in use would occur. Rehabilitation would occur in concert with the Secretary of the Interior's Standards and Guidelines for the Treatment of Historic Properties; therefore, the **integrity** of **setting** would not be diminished.

Alternate 5 – Replacement Downstream Parallel Alignment – Adverse Effect
This alternate would result in a finding of adverse effect as the removal of the Frank J. Wood Bridge would diminish the PPC's **integrity** of **setting**. While a permanent crossing is considered a minimization of harm; this alternative represents an alignment not previously associated with the **significance** of the district. Therefore it has a greater magnitude of harm than Alternate 1.

<u>Brunswick Topsham Industrial Historic District</u>
National Register-eligible
Criteria A & C—Industry and Engineering/Architecture
***Period of significance** ca. 1850–1966*
***Essential physical features**—two mill complexes, Frank J. Wood Bridge, physical formations of the Androscoggin River, and a permanent crossing*

Alternate 1 – Replacement Bridge on Existing Alignment – Adverse Effect
This alternate would result in an adverse effect to the BTIHD due to the removal of the Frank J. Wood Bridge, a contributing resource.

Alternate 2 – Replacement Bridge on Curved Upstream Alignment – Adverse Effect
This alternate would result in an adverse effect to the BTIHD due to the removal of the Frank J. Wood Bridge, a contributing resource.

Alternate 3 – Rehabilitation with Westerly Sidewalk Retention – No Adverse Effect

This alternative would result in a finding of no adverse effect because the sidewalk would be constructed in a manner that is consistent with **materials**, type, and **design** of the Frank J. Wood Bridge. Rehabilitation would occur in concert with the Secretary of the Interior's Standards and Guidelines for the Treatment of Historic Properties.

Alternate 4 – Rehabilitation with Westerly Sidewalk Retention and Easterly Sidewalk Construction – No Adverse Effect
This alternative results in a finding of no adverse effect because the sidewalk would be constructed in a manner that is consistent with **materials**, type, and **design** of the Frank J. Wood Bridge. Rehabilitation would occur in concert with the Secretary of the Interior's Standards and Guidelines for the Treatment of Historic Properties.

Alternate 5 – Replacement Downstream Parallel Alignment – Adverse Effect
This alternate would result in an adverse effect to the BTIHD due to the removal of the Frank J. Wood Bridge, a contributing resource.

6. Archaeology

The MaineDOT has initiated preliminary consultation with MHPC regarding prehistoric and historic archaeology to identify areas to avoid within the APE. Only archaeologists that meet the Secretary of the Interior's Professional Standards can make determinations of eligibility and MHPC staff archaeologists will review and concur with these determinations. The specific locations of National Register-eligible Archaeological Sites are protected from public disclosure under the National Historic Preservation Act, as amended and Maine Statute 27 MRSA Section 371-378. Therefore the memorandum has not been included within determination of effect and instead is summarized.

On November 18, 2016 Dr. Arthur Spiess, Senior Archaeologist at MHPC provided MaineDOT a memorandum outlining known or suspected archaeological sensitive areas within the APE, specifically those near to all alignments presented in the Summary of Alternatives.

The memo informed MaineDOT of fourteen sensitive areas for historic archaeology. Site 1 also holds potential for pre-historic archaeology. However, at this time, no alternative under consideration is in the immediate area of Site 1. If the project changes and this site can no longer be avoided, testing would likely be required. Most historic sites are potentially associated with the development of the mills on either side of the river and the power generation dams.

Dr. Spiess noted, "Because there is no soil left on Shad Island and other exposed bedrock, archaeological excavation would be impossible. However, traces of building foundations cut in to the bedrock or affixed to the rock might be present. These would have be recorded (rather than excavated)." He continues, "Impacts to other areas with substantial soil depth would probably need testing by remote sensing or excavation."

MHPC, MaineDOT, and FHWA acknowledge that a field assessment may be necessary to identify the sites and their state of preservation when an alternative is selected.

7. Bibliography

A Brief History of Topsham. Topsham Maine. http://www.topshammaine.com/index.asp (Accessed March - December 2016).

Brunswick Record. "Bridge Contractors Look over Site of New Bridge, Bidders on Site Bids Open 5/5." April 30, 1931.

Brunswick Record. "Brunswick-Topsham Bridge Will be built in New and Better Location." September 18, 1930.

Brunswick Record. "Contracts Awarded for Construction of Bridge Brunswick to Topsham." May 7, 1931.

Brunswick Record. "Indications Point to Re-Location of New Brunswick-Topsham Bridge." September 4, 1930.

Brunswick Record. "New Location of Topsham Bridge is the Proposal of Frank J. Wood of Topsham." July 10, 1930.

Brunswick Record. "Relocation of Topsham Bridge Well Considered." August 21, 1930

Brunswick Record. "State Engineer to Start Survey and Estimate on Topsham Bridge at Once." October 11, 1929.

Brunswick Record. Other Various Articles. 1929-1931.

Code of Federal Regulations, Protection of Historic Properties, title 36, sec. 800

Code of Federal Regulations, Procedures for State, Tribal, and Local Government Historic Preservation Programs, title 36, sec. 61

Gardner, David, and Lisa Churchill-Dickson, eds. *Historic Bridges of Maine: 350 Years of Bridge and Roadway Design.* Augusta, ME: MaineDOT, 2015.

Lichtenstein Consulting Engineers. *MaineDOT Historic Bridge Survey, Phase II Final Report & Historic context.* Augusta, ME: MaineDOT, 2004

Maine Highways. Augusta, ME: Maine State Highway Commission. 1932.

Maine State Highway Commission Annual Reports. 1929-1932

McAlester, Virginia, and A. Lee McAlester. *A Field Guide to American Houses*. New York: Knopf, 1984.

National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation. Washington, D.C.; US Department of the Interior National Park Service, 2002.

National Register Bulletin 16A: How to Complete the National Register Registration Form. ; Washington, D.C.; US Department of the Interior National Park Service, 1997.

National Register of Historic Places, Brunswick Commercial Historic District, Brunswick, Cumberland County, Maine, National Register #15000968

National Register of Historic Places, Pejepscot Paper Company, Topsham, Sagadahoc County, Maine, National Register #74000192

National Register of Historic Places, Topsham Historic District, Topsham, Sagadahoc County, Maine, National Register #78000198

Reed, Roger. *Draft Bowdoin Mill Historic American Engineering Record.* Augusta, ME; MHPC. ca. 2000.

Spiess, Dr. Arthur. Technical Memorandum directed to Megan Hopkin, Historic Coordinator, MaineDOT. November 18, 2016.

Summer Street Intensive Survey file. Maine Historic Preservation Commission.

Town of Brunswick vertical file. Maine State Library.

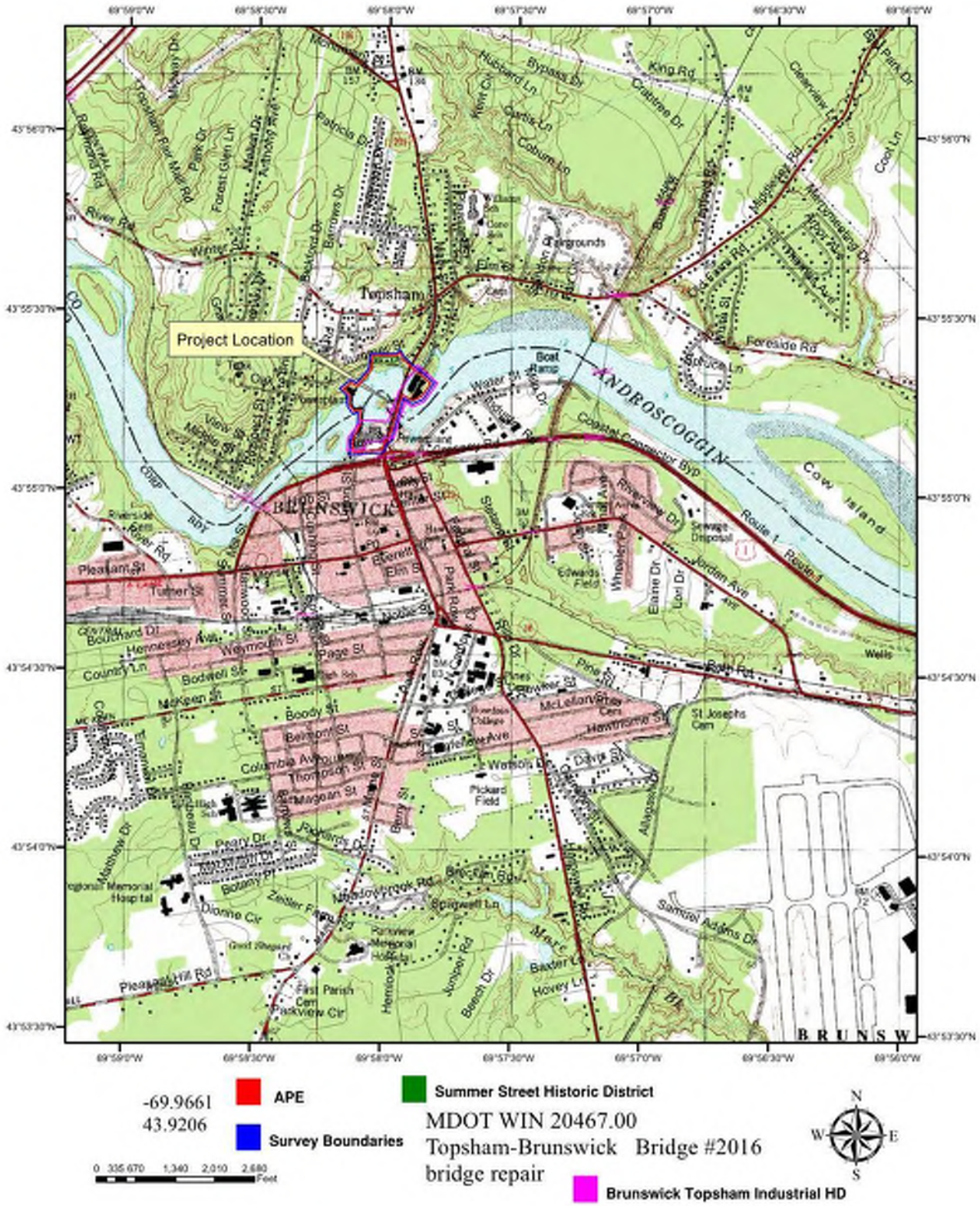
Wheeler, George Augustus. *History of Brunswick, Topsham, and Harpswell, Maine.* Boston, Alfred Mudge & Son, 1878.

Williams, Robert Chadwell. *Topsham: From the River to the Highlands.* Topsham, ME; Just Write Books, 2015.

Willis, Kate. *Brunswick 22603.00 Architectural Survey Report.* Augusta, ME: MaineDOT. April 26, 2016.

8. Appendices

Appendix A
Area of Potential Effect



Frank J. Wood Determination of Effect
January 2017

Appendix B
National Park Service Language

This appendix will provide the specific descriptions and definitions of key terms and language as each is applied in the Section 106 consultation process. The descriptions and definitions have come from two National Park Service National Register of Historic Places Program publications: National Register Bulletin Number 15: *How to Apply the National Register Criteria for Evaluation* and National Register Bulletin Number 16A: *How to Complete the National Register Form*. Additionally, language from 36 CFR Part 800: Protection of Historic Properties is referenced.

Areas of significance: Themes important in American history as demonstrated by scholarly research (NR Bulletin 15). Listed in NR Bulletin 16A as thirty data categories and ten data subcategories.

Association: One of the seven aspects of integrity; the direct link between an important historic event or person and a historic property; association requires the physical presence of physical features that convey a property's historic character; for example: a Revolutionary War battlefield whose natural and manmade elements have remained intact since the 18th century retains integrity of association.[12]

Boundary: Terminus of full extent of the significant resources and the land making up the property; should not include buffer zones; considers visual barriers that mark a change in historic character of the area that break the continuity of the district and visual changes in the character dye to different architectural styles, types or periods, or a decline in the concentration of contributing resources.

Criterion A: [Resources] that are associated with events that have made a significant contribution to the broad patterns of our history. "The events or trends…must be important within the associated context. Moreover, the property must have an important association with the event or historic trends." (16A, then 15)

Criterion B: [Resources] that associated with lives of persons significant in our past.

Criterion C: [Resources] that embody the distinctive characteristics of type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

Criterion D: [Resources] that have yielded, or may be likely to yield, information important in prehistory or history.

Design: One of the seven aspects of integrity: "the combination of elements that create the form, plan, space, structure, and style of a property. It includes…massing, arrangement of spaces, pattern of fenestration, textures, and style of ornamental detailing." For districts significant primarily for historic association or architecture value design applies to the relationship of the structures with landscape, streetscape rhythm, layout and materials of walkways and road.

Essential physical features: Features without which a property can no longer be identified as, for instance, a late 19th century dairy farm or an early 20th century commercial district.

Feeling: One of the seven aspects of integrity; a property's expression of the aesthetic or historic sense of a particular period of time. It results from the presence of physical

[12] A note for **Association** and **Feeling**: "because [they both] depend on individual perceptions their retention *alone* is never sufficient to support eligibility of a property for the National Register.

features that, taken together, convey the property's historic character. See footnote 6.

Historic context: "Those patterns or trends in history by which a specific occurrence, property, or site is understood and its meaning (and ultimately its significance) within history or prehistory is made clear."

Integrity: "The question of integrity is answered by whether or not the property retains the identity for which it is significant" "the ability of a property to convey its significance…always…grounded in an understanding of a property's physical features and how they relate to its significance." There are seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. The specific use of each in Section 106 is defined within this appendix.

Local historic context: Often referred to as a 'local level of significance', "an aspect of history of a town, city, county, cultural area, or region, or any portions thereof. It is defined by the importance of the property, not necessarily the physical location."

Location: One of seven aspects of integrity; "the place where the historic property was constructed or the place where the historic event occurred. The actual location of a historic property, complemented by its setting, is particularly important in recapturing the sense of historic events and persons."

Materials: One of the seven aspects of integrity; physical elements that were combined…during a particular period of time and in particular pattern or configuration to form a historic property. A property must retain key exterior materials dating from its period of historic significance.

National historic context: Often referred to as "National level of significance", "represent an aspect of the history of the United States…it must be of exceptional value in representing an important theme in the history of the nation." (15)

Period of significance (POS): "The length of time when a property was associated with important events, activities, or persons, or attained characteristics which qualify it for National Register listing. Base the period of significance on specific events directly related to the property, for example, the date of construction for a building significant for its design or the length of time a mill operated and contributed to local history."

Setting: One of the seven aspects of integrity; the physical environment of a property; refers to the character of the place in which the property played its historic role and "reflects the basic physical conditions under which a property was built and the functions *it was intended* [emphasis added] to serve."

Significance: Pages 45 through 50 of Bulletin 16A provide guidance on evaluating and stating significance. Generally, the guidance for evaluation is: what events took place on the significant dates, and why are those events important to the property, in what ways does the property physically represent its POS, and in what ways does it represent change after its POS, and what is the POS based on? Significance is inherently carried not by a single definition rather how a property fits within the National Park Service Criteria for Evaluation.

State historic context: Often referred to as a 'state level of significance', "represent an aspect of the history of the State as a whole. The property's historic context must be important statewide."

Workmanship: One of the seven aspects of integrity; is the physical evidence of the crafts of a particular culture during any given period. It can be based on common traditions or innovative period techniques. Examples include tooling, carving, painting, graining, turning, and joinery.

Appendix C
Summary of Alternatives

Frank J. Wood Bridge: Summary of Alternatives

Prepared by T.Y. Lin International
October 27, 2016

BACKGROUND

The Frank J. Wood Bridge is a critical link spanning the Androscoggin River between the Towns of Brunswick and Topsham, carrying US 201 and ME 24 and about 19,000 vehicles a day. Just 500 feet upriver of the bridge is a power generation dam harnessing the power of Brunswick Falls. On the southern, Brunswick side of the bridge sits the 250th Anniversary Park on the east and the bustling Fort Andross Mill Complex on the west. The Topsham approach adjoins a bank on the west side, and a dentist office and the Bowdoin Mill Complex on the east side. Both the Fort Andross and the Bowdoin mill complexes house a variety of shops, businesses, and restaurants, and the Frank J. Wood Bridge is a key pedestrian connection between the two of them and between the larger business districts and communities on each side. The bridge links the hearts of the two communities across the Androscoggin River, connecting Brunswick and Topsham.

Figure 1: The Frank J. Wood Bridge spanning the Androscoggin River between Brunswick and Topsham

The Frank J. Wood Bridge is an 85-year-old, 805 ft long steel truss that is now in poor condition. It was rehabilitated most recently in 1985, 2006, and 2015. It is a "fracture critical" structure, indicating it is vulnerable to sudden collapse if certain components fail. Because of this designation, more detailed and frequent inspections are required. Detailed inspections by MaineDOT in 2012, June 2016 and August 2016 found many deteriorated areas. A load rating done by MaineDOT in 2013 and updated in August 2016 found several truss members are not strong enough to meet load-carrying standards. The bridge is now posted for 25 tons. The

three-span steel through-truss (with spans of 310'-310'-175') and the concrete deck are currently in poor condition, and the bridge has a FHWA Sufficiency Rating of 25.4. There is corrosion and steel loss in the floor system supporting the deck (the transverse cross beams, longitudinal stringers, and transverse floor beams). Corrosion is continuing and speeding up, and will do so until the truss is rehabilitated comprehensively or the truss is removed.

Because of the ongoing deterioration of the truss, MaineDOT plans to do temporary repairs to address the worst issues so the truss can maintain its current load rating for up to five years. Steel will be added to the worst sections of the floor system beneath the deck and missing and deteriorated rivets will be repaired or replaced. These temporary repairs are needed to keep the 25 ton weight limit from being reduced more. As maintenance, this 5-year repair will be funded separately from the longer-term "capital improvement" project. However, a long-term solution needs to be implemented within the 5 year timeframe this maintenance buys. This report examines what the alternatives are for the long-term solution.

The travelway over the truss is 30 ft wide, with two 11 ft travel lanes and 4 ft shoulders. Though there are sidewalks on both sides of the road approaching the bridge, the existing truss carries a single sidewalk on the west side of the bridge. Because the outer 2 feet of the shoulders is made of an open steel grid, the usable shoulder width for bicycle travel is reduced to just 2 ft.

This bridge is eligible for listing on the National Register of Historic Places as part of the Brunswick-Topsham Industrial Historic District. It is also adjacent to the National Register-Listed Pejepscot Paper Company Historic District.

Accident data from 2009-2013 shows 27 accidents at the intersection of Maine Street and Bow/Cabot Street in Brunswick and 11 accidents at Summer Street and Main Street in Topsham. Also, there were 24 accidents just off the bridge on the Brunswick approach. The accident reports show that these accidents were primarily caused by driver inattention and distraction or by following too closely.

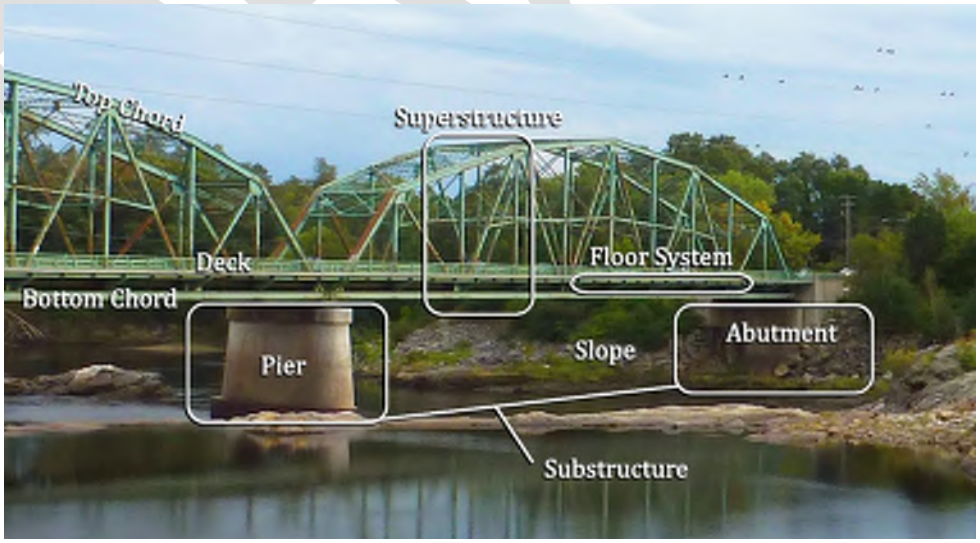


Figure 2: This report uses technical terms to describe various parts of the bridge. The superstructure is what many think of as a "bridge", including the floor system or girders below the deck, while the substructure is what supports the superstructure. The deck (what cars drive on) rests on the floor system, which is made up of floorbeams, stringers, and sometimes crossbeams. The floor system carries load from the deck to the truss bottom chord.

PURPOSE AND NEED

The purpose of the project is to address poor structural conditions and load capacity issues on the Frank J. Wood Bridge and to address pedestrian and bicycle mobility and safety concerns.

Bridge improvements are needed to improve the condition ratings of the superstructure and deck from a rating of 4 (poor condition) to 7 (good condition). Because of the age of the bridge, 85 years old, and the considerable number of heavy loading cycles it has already experienced, steel fatigue concerns on critical tension members need to be addressed to continue to carry heavy truck traffic on the existing truss. Additionally, the floor beams and stringers need improvements to bring their load rating factors to a 1.0 for all legal loads.

This bridge is classified by the Federal Highway Administration (FHWA) as structurally deficient with superstructure and deck condition ratings of 4 out of 9 (poor condition). The 3 truss spans are fracture critical, meaning that failure of certain steel tension members could cause any of the 3 spans to collapse. Some of the steel truss bridge components are fatigue sensitive, susceptible to cracking and fracture as a result of heavy cyclic loading. The floor beams and stringers within the truss spans do not meet current design load or legal load standards.

Pedestrians on the east side of Routes 201/24 cannot cross the river without crossing the highway, and the existing mid-block pedestrian crossings are considered dangerous. Bicycle traffic is seriously limited by the narrow, 2 ft, paved shoulder.

SUMMARY OF ALTERNATIVES

The following alternatives were considered:

1. New 800 ft bridge on the existing alignment.
2. New 835 ft bridge on a curved alignment upstream of the existing bridge.
3. Rehabilitation of the existing steel truss bridge.
4. Rehabilitation of the existing steel truss bridge, including the addition of a new east side sidewalk.
5. New 800 ft bridge on a parallel alignment downstream of the existing bridge.

The No Build alternative was also considered. The No Build alternative was included as a benchmark against which impacts of other alternatives can be compared. Short-term maintenance and minor rehabilitation is considered as part of the No Build alternative.

On Point Construction Services, a private consultant firm specializing in construction scheduling and estimating, joined the Project Team to review the constructability of the proposed alternatives, to develop construction schedules, and to estimate temporary bridge costs.

All of the alternatives were compared based on hydraulic requirements; environmental, right of way, and utility impacts; maintenance of traffic, constructability, maintainability, geotechnical site conditions; and construction, life cycle, and user costs.

REPLACEMENT ALTERNATIVES

Alternatives 1, 2, and 5 would provide a new bridge. Many characteristics of the new bridge would be the same for each of the replacement alternatives; these will be discussed below before the specifics of each alternative are presented.

A new bridge would be a multi-span steel girder bridge, with 4 or 5 spans. Steel girder bridges are easily the most cost-effective new structure type for this site. To increase the life span of the new structure, the concrete deck would likely be reinforced with Glass Fiber Reinforced Polymer (GFRP) rebar and the steel girders would be metalized. Metalization of the girders will reduce corrosion from spray from the turbulent river beneath the bridge. The new bridge would have concrete wall abutments and solid shaft piers, all founded on the shallow bedrock at this site.

Figure 3: Artist's rendering of a steel girder bridge

Any new bridge would include 11 foot lanes, 5 foot shoulders, and 5 foot sidewalks on each side. Having sidewalks on both sides of the bridge would connect the existing sidewalks on the approaches and would improve safety by reducing the need for pedestrians to cross the road. Having 5 foot shoulders and no adjacent bridge railing or truss verticals would dramatically improve the bridge for bicyclists. The current bridge has only 2 foot paved shoulders.

For new bridges on this site, the contractor would need a work trestle for access to construct the cofferdams and piers, to erect the structural steel superstructure, to place deck concrete, and to remove the existing bridge. A cost premium of $1 million is included in the estimate for each new bridge to account for this trestle. Installation of a work trestle at this site is unique due to the exposed and highly variable bedrock, exposure to high velocity flows, and proximity to the upstream dam.

Railings for a new bridge would meet all standards for vehicle and pedestrian safety. Railings go through stringent testing programs to ensure appropriate safety in a variety of situations. Only those railings that meet appropriate criteria can be used on a new bridge, based on the specific constraints of this site. MaineDOT's standard 4-bar steel pedestrian and traffic rail is recommended for this bridge, but input from the Towns of Brunswick and Topsham and the Section 106 consulting parties would be considered for the final selection of the rail type.

Figure 4: Rendering of a Possible New Bridge

During meetings with Officials from both Towns, requests were made to enhance the "River Walk Loop" that exists over the existing bridge and continues to the pedestrian bridge upstream of the dam. A new bridge at this site would include deck overlooks, where the sidewalk widens out to provide viewpoints of the river upstream and downstream. In addition, the bridge would be lighted and lamp posts and fixtures would be ornamental and closely match the street lighting in the approaches. The MaineDOT would consider input from the Towns of Brunswick and Topsham and the Section 106 consulting parties for the final selection of the bridge lighting during final design.

Alternative 1: New 800 ft Bridge on Existing Alignment

Alternative 1 is a new 800 ft, five span, steel girder bridge on the existing alignment. The new bridge would have the characteristics discussed above that are similar for any replacement bridge on this site.

Because the new bridge would be constructed on the existing alignment, the old truss would have to be removed completely before new construction could begin. The limitations on in-water work add to the construction duration. Without a temporary bridge, this alternative would have a traffic disruption period of over 2 years.

Given the tremendous user costs and other impacts such a disruption would cause, a temporary bridge is required for this alternative. This adds another year to the construction duration, bringing the total construction time to 3.5 years. Unfortunately, this also increases the river impacts even further—this alternative would need a work trestle and a temporary bridge beyond the impacts of the new structure itself. Permanent environmental impacts would include the wetland footprint impact of 4 piers and riprap protected abutment slopes within the river channel. Two of the piers would be located near the edges of the Brunswick side powerhouse outfall channel.

The construction cost of this alternative is estimated at $16,000,000 (including the cost of a temporary bridge).

Alternative 1 Summary:

- New 800 ft bridge on the existing alignment
- 11 ft travel lanes with 5 ft shoulders and 5 ft sidewalks each side
- Construction Cost: $16 million
- Life Cycle Cost: $16.7 million
- Construction Duration: approximately 3.5 years
- Maintenance of Traffic: on-site temporary detour
- River Impacts: temporary work trestle, temporary bridge, 4 in-water piers, new slopes at abutments
- Meets Purpose and Need

Alternative 2: New 835 ft Bridge on Curved Upstream Alignment

Alternative 2 is a new 835 ft, five span, steel girder bridge on a curved upstream alignment. A curved bridge reduces the length of approach roadway construction and reduces right of way impacts to abutting properties. This structure would have a short southern span to better align the spans to bridge the Brookfield power station outflow channel with a minimum

of impact. The remaining four spans would be continuous haunched steel girder spans with a concrete deck. The span arrangement and number of piers would be selected to minimize footprint impact within the channel and within the FERC Boundary and to maximize the efficiency of steel girder superstructure. Also, the existing hydraulic clearance over the river would be maintained as a minimum.

The estimated construction duration for this alternative is approximately 2.5 years. No temporary bridge is required since traffic could be maintained on the existing bridge during construction. A short term (about 2 month) single lane northbound road closure and detour as described in the "Maintenance of Traffic" section for the New Alignment maintenance of traffic option would be needed during the final tie-in.

The four piers and the abutment slopes would be permanent wetland environmental impacts. Two of the piers would be located near the edges of the Brunswick side powerhouse outfall channel. Temporary environmental impacts would include the construction of a work trestle from the Topsham bank of the river out to the proposed Pier 2 location.

Figure 5: A Possible Curved Upstream Bridge

The construction cost of this alternative is estimated to be $13,000,000.

The life cycle construction cost of this alternative (Alternative 2 – Replacement Bridge on Parallel Upstream Alignment) is estimated to be $13,700,000. The life cycle cost includes costs for future inspection and maintenance (painting and wearing surface replacement) anticipated to be needed out to 100 years.

Alternative 2 Summary:

- 835 ft replacement bridge on a curved, upstream alignment
- 11 ft travel lanes with 5 ft shoulders and 5 ft sidewalks each side
- Construction Cost: $13 million
- Life Cycle Cost: $13.7 million
- Construction Duration: approximately 2.5 years

- Maintenance of Traffic: on existing bridge
- River Impacts: temporary work trestle, 4 in-water piers, slopes at abutments
- Meets Purpose and Need

Alternative 5: New 800 ft Bridge on Parallel Downstream Alignment

Alternative 5 is listed here, since like Alternatives 1 and 2 it is a new bridge. It would be a new 800 ft, five span steel girder bridge located downstream of the existing bridge on a straight alignment, between the current bridge and the Bowdoin Mill Complex parking lot. For all of the bridge alternatives, a hydraulic analysis was run to estimate how the river would behave with new piers added in the river. This analysis showed that a downstream replacement bridge will raise water levels at the Bowdoin Mill Complex, particularly the end of the mill building where the Sea Dog Brewing Company is located. The models suggested that during the design flood, floodwaters would rise more than 6 feet higher than existing conditions near the deck area of the Sea Dog. No reasonable approach to reduce that water rise could be found, so Alternate 5 was rejected.

REHABILITATION ALTERNATIVES

Alternative 3 and Alternative 4 are both rehabilitation options, where the existing truss bridge is repaired. Detailed inspections of the truss were done by MaineDOT in 2012, June 2016 and August 2016, and a load rating was done by MaineDOT in 2013 and updated in August 2016. These reports outline what needs to be done to bring the existing truss bridge up to the standards established as the "Purpose & Need" for this project, which were described above.

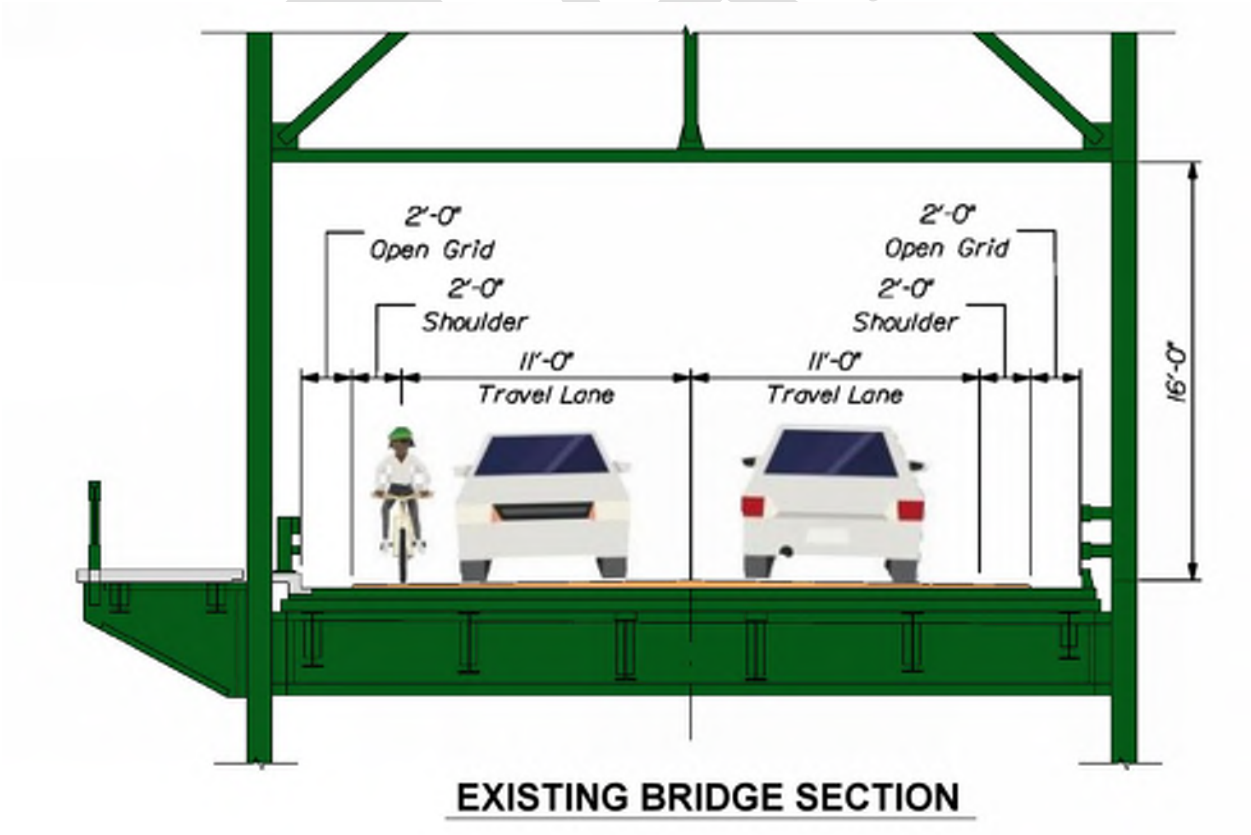


Figure 6: The existing truss bridge cross section

These repair needs will be described here, and the differences between the two rehabilitation alternatives will be discussed later. The needs are:

1. Replace existing bridge deck with a new reinforced concrete bridge deck with an integral concrete wearing surface. This includes the removal of the badly deteriorated transverse cross beams seen in Figure 7.

2. Repair the top of steel sidewalk support brackets. The top of each bracket is non-existent now due to corrosion or other past modifications.

3. Replace the bridge joints. Although these were replaced in 2015, replacement of the existing deck will require these to be replaced.

Figure 7: Deteriorated cross beams & deck

4. Replace the entire steel flooring system, including the longitudinal stringer beams and transverse floor beams. The floor system is heavily deteriorated and is below load carrying standards (see Figures 8 and 9).

Figure 8: Hole in floorbeam

Figure 9: Deteriorated floorbeam

Figure 10: Bottom chord corrosion and debris

5. Replace portions of the bottom chord of main trusses due to corrosion and distortion from pack rust, as seen in Figure 10.

6. Paint the entire steel truss superstructure, including all above and below deck components. Doing a comprehensive paint job on this structure is expected to cost about $4,000,000.

7. Replace all existing utility brackets that support the conduit and water lines on the truss. See Figure 11.

8. Remove and reuse the existing pedestrian sidewalk rail and bridge traffic rails. They will have to be removed to replace the deck and floor system.

9. Replace the abutment back walls due to the overall poor condition of these elements.

10. Repair areas of stone masonry with missing and loose stones at the south abutment by encasing the masonry in concrete due. See Figure 12.

Figure 11: Utility brackets

11. Replace cracked concrete bearing pedestals at Pier 2 supporting the east side truss of Span 3 near the Topsham end of the bridge. This work will also include removal, refurbishing, and resetting of the truss bearing at this support. See Figure 13.

Figure 12: Abutment masonry

Figure 13: Damaged concrete pedestals

Once all of the listed repairs are completed, the structure will meet all design strength requirements for the foreseeable future. All repairs would be completed using modern design standards and construction practices to help them last as long as possible.

The existing bridge deck is a lightweight, concrete-filled steel grid deck. To keep from adding more weight to the truss, a new bare concrete bridge deck without a paved surface will be required. Some of the main truss members already have borderline load ratings, so increasing the weight of the structure is not acceptable. To improve durability of the new deck, it would likely be reinforced with non-corrosive GFRP rebar. A comprehensive drainage system would be added to limit moisture and salt on the lower parts of the truss; the existing deck has open drainage which lets salt and water from the road drop right onto the steel.

The existing 30 ft available travelway matches the existing approaches and would provide two 11 ft travel lanes with 4 ft shoulders bound by rails located along the inside of the trusses. 10 ft travel lanes with 5 ft shoulders for bicyclists were considered briefly but dismissed as an option. The Department considers these narrower travel lanes as less safe given the high traffic volume, almost 19,000 vehicles per day, this bridge has.

A full road closure is needed to complete all major truss rehabilitation activities except painting. The construction and traffic disruption duration for this alternative is approximately 20 months. The user costs and other impacts require a temporary bridge for this alternative. When the temporary bridge is added in, construction duration for this alternative is approximately 3 years.

Rehabilitating the existing truss would preserve the existing river flow conditions and would have the least permanent environmental, right of way and utility impacts. It would also have the least impact to the National Register-Eligible historic bridge and districts. However, construction of a temporary bridge will still have temporary environmental impacts. Utilities on the truss will have to be temporarily relocated on the bridge during the rehab process.

Despite all efforts, a bridge rehabilitation will probably still require significant future maintenance. To get 75 more years of life, the bridge will need approximately 3 future paintings, 1 deck replacement, and 2 substructure rehabilitations, beyond the current project. All of these activities will disrupt traffic to varying degrees. Painting will disrupt traffic for about 8 months, and each deck replacement will disrupt traffic for about 6 months.

Based on past performance of the modern paint systems used by MaineDOT on similar truss bridges that also had pack rust, the truss will need to be painted about every 20 years. The current paint systems used today perform very well, replacing the previous lead-based paint systems. The paint successfully seals the steel and stops corrosion when installed. It spans the seams of the built-up steel members and prevents water and air from getting to the steel. However, once the paint cracks at all, existing pack rust will immediately reactivate (see Figure 14). The existing truss has pack rust in numerous locations. To effectively maintain structures with this condition, paint systems need replacement more frequently. Painting a truss like this currently costs an estimated $4,000,000. To prevent pack rust and other corrosion issues from destroying the truss, future paint jobs would have to be budgeted for and done on a regular cycle.

Figure 14: Pack rust is corrosion in the crevice between two plates of steel that are bolted or riveted together. As the rust progresses, it gradually pushes the pieces of steel apart, bending them and sometimes breaking bolts or rivets. The only way to truly fix pack rust is to take apart the plates of steel and clean them, which is usually not feasible.

Use of GFRP reinforcement would extend the life of a bare concrete deck, but without a high performance membrane and paved wearing surface that can be regularly replaced, 50 years of life is a good estimate. Based on the historic performance of similar aged bridges (currently 85 years old) and the age of the most recent major substructure rehabilitation (2006), additional substructure rehabilitations would be expected at years 20 and 50 following this current project.

Besides these major future maintenance efforts, there will be more frequent smaller repair efforts needed on the steel, bridge joints, and the aging substructure. This truss will also require Routine and Fracture Critical Bridge Inspections, costing about $60,000 every two years. These inspections will also disrupt traffic, requiring a single lane closure for 1 to 2 weeks. If

cracks in fatigue sensitive or fracture critical members are found in these inspections, more frequent inspections or immediate repairs will be required.

Alternative 3: Rehabilitation of Existing Steel Truss Bridge:

Alternative 3 would rehabilitate the existing truss as outlined above. It would still have only one sidewalk, so pedestrian mobility and safety would not be improved. The open grid decking along the outside of the existing shoulders would be replaced with a solid concrete deck, improving the situation for bicyclists. However, the shoulders would still be only 4 feet wide and the railing right at the edge of the shoulder restricts the useable width for bicyclists even more. It would still not be a very good bridge for bicyclists. Therefore, this alternative does not fully meet the pedestrian and bicyclist portion of the Purpose and Need for this project.

The construction cost of this alternative is estimated at $15,000,000. This cost includes a 15 percent contingency above the repair work that has already been identified. Rehabilitation projects nearly always discover issues not previously found in inspections, causing budget overruns.

The overall life cycle construction cost of this alternative, including estimates for all future maintenance on the truss out to 75 years of life, is projected to be $20,800,000.

Early in the investigation of alternatives at this site, this alternative was examined as a 30 year rehabilitation and either maintaining one lane of traffic on the bridge or allowing a 5 to 7 month bridge closure. A replacement after 30 years would yield the lowest life cycle cost of any rehabilitation option. Given changes to the rehabilitation scope since the latest bridge inspection and recognition of the user costs of the maintenance of traffic options, the initial cost of this alternative now must include a temporary bridge. The originally estimated construction cost of $8 million to rehabilitate the bridge now is $15 million after adding a full floor system replacement and an on-site temporary bridge detour.

Summary of Alternative 3:

- Rehabilitation of existing steel truss bridge
- 11 ft travel lanes with 4 ft shoulders each side and a 5 ft sidewalk on the West side
- Construction Cost: $15 million
- Life Cycle Cost: $20.8 million
- Construction Duration: approximately 3 years
- Maintenance of Traffic: on-site temporary detour
- River Impacts: temporary bridge, Abutment 1 repair work
- **Does not** meet Purpose and Need (pedestrian needs)

Alternative 4: Rehabilitation of Existing Steel Truss Bridge with Added East Sidewalk

Alternative 4 is also a rehabilitation of the existing truss, but with a second 5 foot sidewalk added on the opposite side of the bridge. This fully addresses the pedestrian issues at this site. Like Alternative 3, bicyclists would have 4 foot shoulders with adjacent traffic rails, a less than ideal situation. However, this would still be better than the current condition for bicyclists. Alternative 4 adequately meets the Purpose and Need for this project.

To add the additional weight of a second sidewalk, weight must be taken off the truss somewhere else. The existing bridge deck would need to be replaced with a new lightweight concrete filled Exodermic deck. An Exodermic deck system can be as much as fifty percent lighter than a conventional concrete deck of the same span. An Exodermic deck has exposed steel on the bottom of the deck, so future maintenance would be anticipated. Other lightweight deck configurations were also considered but no others were found light enough without even more expense. This alternative includes the addition of new structural steel framing, concrete deck, and pedestrian rail for the added 5 ft wide sidewalk on the east side of the bridge. Between the more expensive deck and the new sidewalk and framing, this option will have a construction cost about $2,000,000 more than Alternative 3.

The estimated construction duration for this alternative is approximately 3 years (similar to Alternative 3).

Hydraulic conditions, environmental impacts, right-of way impacts, utility impacts, maintenance of traffic and maintenance concerns for Alternative 4 would be the same as those noted for Alternative 3 with the exception of the impacts to the NR-Eligible Historic Bridge and Districts. The additional sidewalk is an addition that is not part of the NR-Eligible Historic Bridge.

The construction cost of this alternative is estimated at $17,000,000. The life cycle cost of this alternative, including estimates for all future maintenance on the truss out to 75 years of life, is estimated to be $23,200,000.

Summary of Alternative 4:

- Rehabilitation of existing steel truss bridge with added east sidewalk
- 11 ft travel lanes with 4 ft shoulders and 5 ft sidewalks each side
- Construction Cost: $17 million
- Life Cycle Cost: $23.2 million
- Construction Duration: approximately 3 years
- Maintenance of Traffic: on-site temporary detour
- River Impacts: temporary bridge, Abutment 1 concrete work
- Meets Purpose and Need

Repurpose Existing Bridge and Build a New Replacement Bridge

An additional alternative suggested by the public was to '*Restore and repurpose the historic bridge for pedestrian and bicycle use, and as a public historic park. Build a new bridge on alternative alignment.'* This is a combination of two alternatives discussed above, Alternatives 2 and 3. All work to preserve the existing bridge under Alternative 3 would still be required, except possibly rehabilitating the sidewalk. Conservatively, the construction cost of this rehabilitation could be reduced to $9.5 million (with the removal of the sidewalk), and there would be no need for a temporary bridge. This alternative would also require the cost of a new replacement bridge, Alternative 2, at $13 million, for a total construction cost of $22.5 million. The question of future ownership and maintenance responsibility for the truss would have to be addressed. Also, the effect on river water levels from having more piers permanently in the river channel would need investigation.

MAINTENANCE OF TRAFFIC

Four options were investigated to maintain traffic at this site during construction. They are not all feasible for all of the bridge improvement alternatives. Specifics for each alternative, along with estimated traffic disruption durations and user costs, are discussed later in this report.

1. Complete road closure with a detour. Detour all traffic along U.S. Route 1, State Route 196, and State Route 24.
2. Single lane closure with staged construction. One way, southbound traffic will be carried across the bridge on a 12 foot travelway and all northbound traffic will be detoured. This option can only work for certain construction activities, like painting. This traffic control method has been used successfully in the past on the Frank J. Wood Bridge.
3. On-site detour on temporary bridge. Construct a 2 lane temporary bridge parallel to the existing bridge and detour all traffic onto it. Traffic would only be disrupted during the construction of tie-ins to the existing roadway and to the new roadway upon conclusion of the project. These disruptions could be limited by requiring work be done during off-peak hours. Construction and removal of the temporary bridge would likely extend the total construction duration by about 1½ years (1 construction season for construction of the temporary bridge and half a season for its removal). The cost for a temporary bridge is estimated to be about $4 million.
4. New alignment. If a new bridge is constructed on a new alignment, the existing bridge could be used to maintain traffic during construction. Traffic would primarily be disrupted during construction of the final tie-in. Again, this could be mitigated by requiring work during off-peak hours. This option would result in the least traffic disruption.

Staged construction maintaining two-way traffic is not feasible due to the existing structure type and needed rehabilitation repairs. Alternating one-way traffic is not feasible because of the traffic volume and proximity of signalized intersections.

Traffic disruption results in indirect costs to the users of the bridge and to the surrounding businesses. A user cost may be estimated for the delays to the traveling public, assigning a dollar value to the disruption. Daily user costs were prepared by MaineDOT estimating costs associated with delays at intersections and additional miles traveled. The user cost for a complete road closure is estimated at almost $22,000 per day, while the user cost for a northbound lane closure is estimated at over $10,000 per day. This cost will be compared with that of a temporary bridge to determine whether paying for a temporary bridge is justified for a given construction alternative.

UTILITIES

A hydropower dam operated by Brookfield Renewable Energy Partners (Brookfield) is located about 500 ft upstream of the existing bridge crossing. No impacts (including hydraulic

impacts) to this facility are anticipated for any of the bridge improvement alternatives investigated.

Overhead utilities and a water main are carried by the existing bridge. Temporary support or relocation of these facilities within the limits of the existing bridge would be needed during a bridge rehabilitation.

With a bridge replacement, these facilities would need to be relocated. Some of the utility poles in the approaches would also need to be relocated. The overhead utilities would need to transition to underground in the approaches close to the replacement bridge ends. The overhead utilities and the waterline would be carried on the bridge below the bridge deck, between girders, out of sight.

RIGHT OF WAY

A bridge rehabilitation or bridge replacement on the existing alignment would not require permanent property impacts. However, temporary property rights would be needed for any temporary bridge.

Construction of a replacement bridge on a new upstream alignment would require permanent property acquisitions of parts of two properties on the west side of the south approach and one property on each side of the north approach. The south approach property impacts would include reconstruction of a retaining wall between the drive entrances to the small Fort Andross parking lot and the Brookfield hydroelectric station at the dam. The 250th Anniversary Park located at the southeast corner of the bridge is a Brunswick town park constructed on land leased from Brookfield. The only park impacts would be fill slopes within the existing State-owned right of way. The north approach would have a new 130-ft-long retaining wall along the northwest approach to limit impacts to the property and parking area. Reconstruction of the drive entrance to the Bowdoin Mill complex will require impacts beyond the existing MaineDOT right of way.

Temporary property rights would be needed to construct work access platforms like work trestles. These rights would be similar to temporary rights needed for a temporary bridge.

Additionally, for an upstream bridge replacement alternative, the abutments and three of the four bridge piers would be located within the limits of the Federal Energy Regulatory Commission (FERC) Boundary of the dam. Temporary property rights would be needed for construction access along the north side of the approaches and within the FERC Boundary.

ENVIRONMENTAL

Endangered species such as the shortnose sturgeon and Atlantic sturgeon spawn in the project area. This project is within Essential Fish Habitat and permanent and temporary impacts need to be avoided or minimized. In-water work must be avoided during crucial migrating periods. This restriction is in place from April 7 to August 30, and will be a significant constraint on construction durations. Impacts to the Brunswick Fishway at the Brookfield dam will be avoided and requests to shade the Fishway from moving shadows produced by construction equipment and the traveling public will be considered.

The existing bridge is eligible for listing on the National Register of Historic Places as part of the Brunswick-Topsham Industrial Historic District, which is considered National Register-Eligible. It is also abutting the National Register-Listed Pejepscot Paper Company Historic District.

If a temporary bridge is used to maintain traffic for either a bridge rehabilitation or bridge replacement, then temporary environmental impacts would be needed within the existing river channel to support the temporary bridge.

Figure 15: Two types of temporary impacts

Construction of a new replacement bridge would have environmental impacts that would need to be minimized or mitigated. Permanent impacts would include the piers and pier foundations within the channel. Foundation locations should avoid the Brunswick side powerhouse outfall river channel that leads to the dam fishway by taking advantage of ledge outcrops where possible. Also, if a temporary work trestle is needed for the construction of a new replacement bridge, temporary environmental impacts would need to be addressed.

Historic impacts and avoidance and minimization strategies will be determined through the ongoing Section 106, 4(f) and NEPA processes.

LIFE CYCLE COST ESTIMATE

Life cycle costs are considered in the comparison of bridge improvement alternatives. A life cycle cost estimate (LCCE) totals all estimated bridge costs throughout the life of each bridge improvement alternative and translates them to current dollar equivalents. The LCCE accounts for estimated construction costs on the current project and the translated present value of anticipated future inspection, maintenance, and rehabilitation. It also accounts for anticipated future bridge replacement dates for each alternative. Specifics of the life cycle costs for each alternative are discussed later in this report.

GRAPHIC COMPARISON

The graphic below compares Alternative 2 (the low cost replacement or new option) and Alternative 4 (the best rehab option). Three main areas are contrasted: maintenance of traffic during construction, future rehabilitation and maintenance, and total costs.

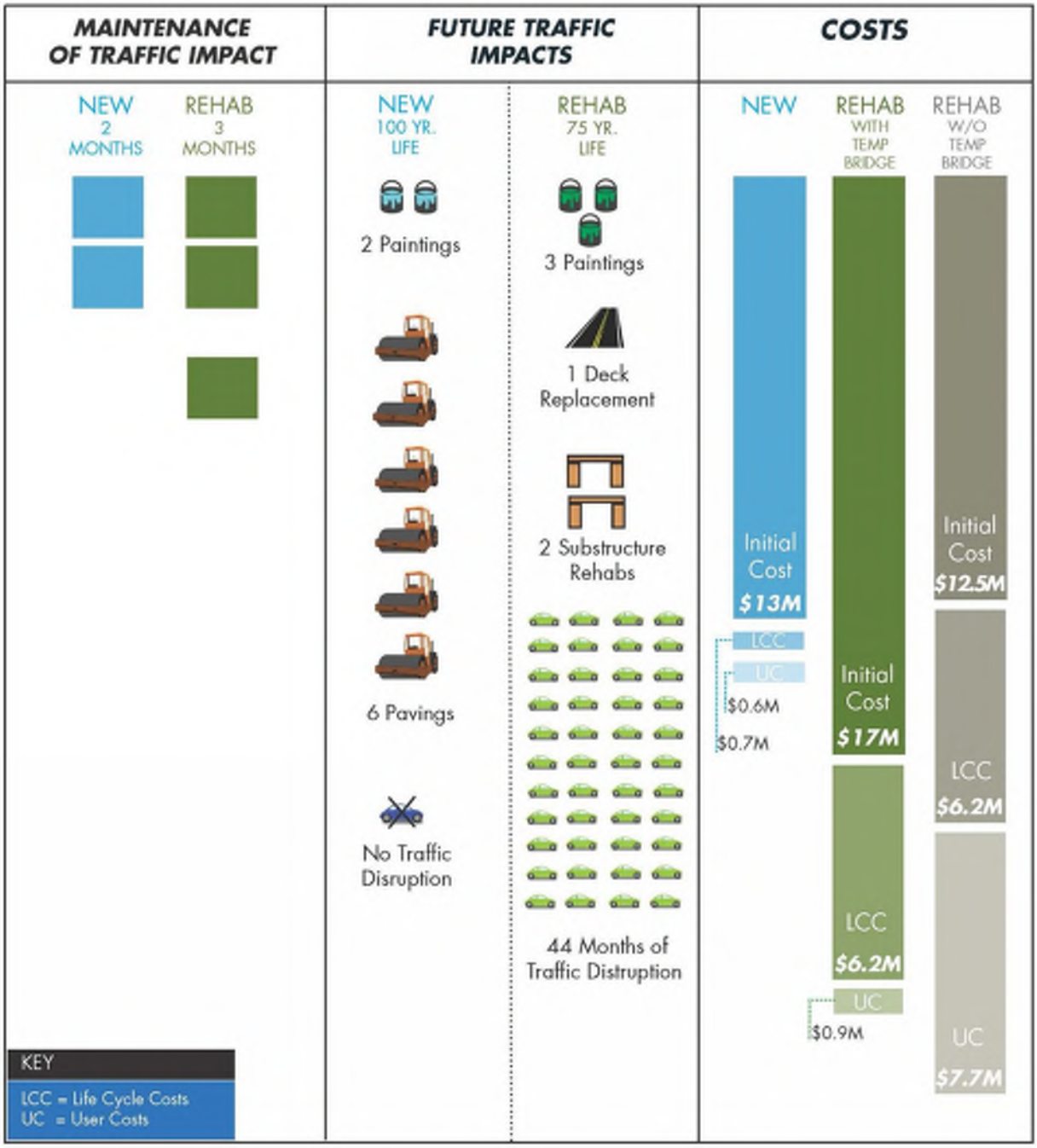


Figure 16 Graphical Comparison

Appendix D

Comments Received from October 27, 2016
to January 20, 2017

Frank J. Wood Bridge Project - Comments on the Section 106 process, draft Alternatives Matrix and draft Summary of Alternatives
(Meeting held on October 27, sent request for comments on November 4th with due date of December 2nd, 2016)

COMMENT #	COMMENTOR and DATE COMMENT RECEIVED	SUMMARY OF COMMENT	RESPONSE TO COMMENT
1	Nathan Holth representing HistoricBridges.org, (10/27/2016 via e-mail)	Focused on Alternatives and Rust removal.	This comment will be addressed outside this Finding of Effect. Furthermore, pack rust removal would be an aspect of either rehabilitation options. FHWA-ME has found that rehabilitation will not result in an adverse effect to historic districts.
2	John Graham representing Friends of the Frank J. Wood Bridge, (11/21/2016 via e-mail)	Request for the PDR.	This comment will be addressed outside of this Finding of Effect. However, any one of the replacement options will result in a finding of adverse effect to historic resources while the rehabilitation options will not.
3	Nathan Holth representing HistoricBridges.org, (11/21/2016 via e-mail)	Presents methodology to remove pack rust.	This comment will be addressed outside this Finding of Effect. Furthermore, pack rust removal would be an aspect of either rehabilitation options. FHWA-ME has found that rehabilitation will not result in an adverse effect to historic districts.
4	John Graham representing Friends of the Frank J. Wood Bridge, (11/21/2016 via e-mail)	Requests additional information regarding the current status of Warren Truss bridges in the Maine.	Please see Section 4: Determinations of Eligibility
5	Douglas C. Bennett, resident of Topsham and member of Topsham Lower Village Development Committee (11/23/2016 via e-mail)	Includes Op-Ed's published in local newspapers.	Comments received and will be considered.
6	John Graham representing Friends of the Frank J. Wood Bridge, (11/23/2016 via e-mail); notes on Summary of Alternatives	Request to clarify why P&N has changed, presents sidewalk location and terminus, requests MaineDOT look at specific bridge in Pennsylvania and New Jersey, general comment on style of PDR.	Most of comments will be addressed outside this Finding of Effect as it is more suited for the general project stakeholders process. However, one comment regarded the use of Route 24 (Elm Street) as a detour during construction. A significant concentration of the Topsham Historic District is located on Elm Street. A detour along this route would require the expansion of the APE to these areas and it is likely that the Topsham Historic District would experience an adverse effect due to the introduction of audible and visual elements not previously experienced due the to volume of traffic routed through this area.
7	John Shattuck, representing the Town of Topsham Board of Selectmen, (12/2/2016 via e-mail)	Highlights' Town of Topsham Select board's knowledge and opinion of historic aspects, costs, and preferred alternative.	Please see Section 4: Determination of Eligibility
8	John Shattuck, representing the Town of Topsham, (12/2/2016 via e-mail)	Town of Topsham's opinion and preference on alternative, includes general NEPA/public involvement issues.	This comment will be addressed outside this Finding of Effect it is more suited for the general project stakeholders process.
9	John Graham representing Friends of the Frank J. Wood Bridge, (12/2/2016 via e-mail)	106, reiterate eligibility, Summer St effects & Summer St & industrial HD; bridge & bridge survey	Please see Section 4: Determination of Eligibility and Section 5: Determination of Effect
10	John Shattuck, representing the Town of Topsham, (12/2/2016 via e-mail)	Section 106	Properties, individually or within a district, do not require inclusion, even support, from local entities or owners, to be determined eligible for listing in the National Register. That said, a majority of owners do need to support the formal listing on the National Register before a property is listed. Both listed and determined eligible properties are afforded the same consideration under Section 106.
11	Residents of Summer Street (rec'd 12/5/2016 via mail)	Section 106 and NEPA	Please see Section 4: Determination of Eligibility.
12	MaryAnn Naber, representing ACHP (12/7/2016 via e-mail)	Section 106; Alternative Analysis	Please see Section 5: Determinations of Effect. Alternatives analysis concerns will be addressed through a separate communication from FHWA-ME/MaineDOT.
13	Bill Morin (January 2017)	Eligibility and Effects	Please see Section 4: Determination of Eligibility and Section 5: Determination of Effect

From: Nathan Holth
To: Chase, Cassandra (FHWA)
Subject: Re[2]: Frank J. Wood - Draft Summary to Accompany Alternatives Matrix
Date: Thursday, November 03, 2016 11:14:13 AM

Cassie,
I will be out of office for the next week as well, but will try to get formal comments the week when I return. Meanwhile, any chance you can supply any additional supporting documentation to go along with the documents presented to date? (See concern #1 in my previous email below).
Thanks,
-Nathan

------ Original Message ------
From: "Chase, Cassandra (FHWA)" <Cassandra.Chase@dot.gov>
To: "Nathan Holth" <nathan@historicbridges.org>
Sent: 10/31/2016 2:16:40 PM
Subject: RE: Frank J. Wood - Draft Summary to Accompany Alternatives Matrix

> Hi Nathan,
>
> Thank you for calling in to last week's Section 106 consulting party meeting. I apologize for providing the Summary and Matrix to the group at the last minute. We were still working on drafting and compiling the information right up until the meeting. But, that's no excuse and I understand that it does not give the Consulting Parties a fair chance to review the information and provide input. As we committed to in last Thursday's meeting, we will be accepting comments on the draft alternatives matrix, draft alternatives summary, and our proposed effect determinations for the next three weeks. I will be sending a separate e-mail out to everyone indicating the specific date. I'm still coordinating with MaineDOT, but I should be sending that e-mail out soon.
>
> I am on leave for a few days, returning to the office on November 2nd. But, if you want to chat about any of this, I'd be more than happy too. I will make sure your other questions/comments are addressed too.
>
> Cassie
>
> Sent from my iPhone
>
> ---
>
> **From:** Nathan Holth [mailto:nathan@historicbridges.org]
> **Sent:** Thursday, October 27, 2016 1:33 PM
> **To:** Chase, Cassandra (FHWA); kitty@historicbridgefoundation.com; s.t.hanson@comcast.net; John Graham; sstern@gwi.net; John Shattuck; lsmith@brunswickme.org; Hopkin, Megan M; Chamberlain, Kristen; robin.k.reed@maine.gov; Kittredge, Joel; Martin, Cheryl (FHWA); Frankhauser Jr, Wayne;

Kate Willis; Emington, Wayne (FHWA); John Eldridge; Norman Baker; Drozd, Maria (FHWA); stevehinchman@gmail.com; amorris@gwi.net; sebordwell@gmail.com; Nancy BikeMaine.org; Folsom, Jeff; ckrussell@gwi.net; Curtis Neufeld (cneufeld@sitelinespa.com); Rod Melanson (rmelanson@topshammaine.com); Carol Eyerman (ceyerman@topshammaine.com); Douglas C. Bennett (dougb@earlham.edu); Victor Langelo (vlangelo@eclipseservices.com); Richard Cromwell (richcromwell1@gmail.com); Androscoggin Dental Care (fredwigand@gwi.net); katzthal@comcast.net; mnaber@achp.gov; david.gardner@maine.gov; Pulver, William; Pelletier, Steve (steve.pelletier@stantec.com); Deb Blum (dblum@brunswickme.org); kirk.mohney@maine.gov
Subject: Re: Frank J. Wood - Draft Summary to Accompany Alternatives Matrix

Cassie,
I wanted to give you and the other consulting parties a heads-up. This document is a very important part of the Section 106 process, and having received it only a couple hours prior to the meeting, this is not a lot of time for me to review and provide consultation input on a document of this importance. I have to schedule these meetings around a busy work schedule, and in preparation for this meeting today I have been too busy to review this document in full. It is therefore my request that no final decisions on a preferred alternative be decided at this meeting. I request more time (30 days would be typical) for the consulting parties to review the data after today's meeting before we come to final consensus on an alternative.

In briefly scanning the document, I have the following concerns that support my request:

1. In my experience with Section 106, a document like this is typically accompanied by additional supporting documents (often in an appendix). Is this information forthcoming at a later date? Specifically, I am looking for: detailed itemized cost estimate and scope of work breakdown for each alternative consider (standard table of work items with columns for quantity, price, total). Additionally, a more detailed explanation for the life cycle costs provided, including an itemized breakdown similar to the initial rehab breakdown I have described above. This is all important because I find the cost estimates for rehab to be unusually high with unusually little long-term benefit, and I believe the scope of work can be adjusted to better rehab this bridge for lesser life cycle cost.

2. A brief scan of the document reveals a critical factual error presented in one of the photo captions: "The only way to truly fix pack rust is to take apart the plates of steel and clean them." This is not true. DOT-approved procedures exist in multiple states for pneumatic removal of pack rust. The procedure simultaneously removes the pack rust, while also bringing the separated plates back into alignment and contact. I am particularly proud of my home state of Michigan which just completed this type of work using a DOT-approved procedure for pack rust removal on a fracture critical girder of a bridge for a limited access highway, with the work completed without closure to traffic. While I could bring this up verbally at the meeting, I would rather not have you take me at my word, but give me time to put together some specific information for you, the procedure used, photos of the work, etc.

I hope you can give my concerns some consideration.

Thanks,
-Nathan Holth

==========
Nathan Holth
Author/ Photographer/Webmaster
-----HistoricBridges.org-----
"Promoting the Preservation Of Our Transportation Heritage"
Mailing Address:
2767 Eastway Drive
Okemos, MI, 48864

269-290-2593
nathan@historicbridges.org
www.historicbridges.org
==========

------ Original Message ------
From: "Chase, Cassandra (FHWA)" <Cassandra.Chase@dot.gov>
To: "kitty@historicbridgefoundation.com" <kitty@historicbridgefoundation.com>; "Nathan Holth" <nathan@historicbridges.org>; "s.t.hanson@comcast.net" <s.t.hanson@comcast.net>; "John Graham" <John@johngrahamrealestate.com>; "sstern@gwi.net" <sstern@gwi.net>; "John Shattuck" <jshattuck@topshammaine.com>; "lsmith@brunswickme.org" <lsmith@brunswickme.org>; "Hopkin, Megan M" <Megan.M.Hopkin@maine.gov>; "Chamberlain, Kristen" <Kristen.Chamberlain@maine.gov>; "robin.k.reed@maine.gov" <robin.k.reed@maine.gov>; "Kittredge, Joel" <Joel.C.Kittredge@maine.gov>; "Martin, Cheryl (FHWA)" <Cheryl.Martin@dot.gov>; "Frankhauser Jr, Wayne" <Wayne.FrankhauserJr@maine.gov>; "Kate Willis" <kwillis@kleinfelder.com>; "Emington, Wayne (FHWA)" <wayne.emington@dot.gov>; "John Eldridge" <jeldridge@brunswickme.org>; "Norman Baker" <norman.baker@tylin.com>; "Drozd, Maria (FHWA)" <Maria.Drozd@dot.gov>; "stevehinchman@gmail.com" <stevehinchman@gmail.com>; "amorris@gwi.net" <amorris@gwi.net>; "sebordwell@gmail.com" <sebordwell@gmail.com>; "Nancy BikeMaine.org" <Nancy@BikeMaine.org>; "Folsom, Jeff" <Jeff.Folsom@maine.gov>; "ckrussell@gwi.net" <ckrussell@gwi.net>; "Curtis Neufeld (cneufeld@sitelinespa.com)" <cneufeld@sitelinespa.com>; "Rod Melanson (rmelanson@topshammaine.com)" <rmelanson@topshammaine.com>; "Carol Eyerman (ceyerman@topshammaine.com)" <ceyerman@topshammaine.com>; "Douglas C. Bennett (dougb@earlham.edu)" <dougb@earlham.edu>; "Victor Langelo (vlangelo@eclipseservices.com)" <vlangelo@eclipseservices.com>; "Richard Cromwell (richcromwell1@gmail.com)" <richcromwell1@gmail.com>; "Androscoggin Dental Care (fredwigand@gwi.net)" <fredwigand@gwi.net>; "katzthal@comcast.net" <katzthal@comcast.net>; "mnaber@achp.gov" <mnaber@achp.gov>;

"david.gardner@maine.gov" <david.gardner@maine.gov>; "Pulver, William" <William.Pulver@maine.gov>; "Pelletier, Steve (steve.pelletier@stantec.com)" <steve.pelletier@stantec.com>; "Deb Blum (dblum@brunswickme.org)" <dblum@brunswickme.org>; "kirk.mohney@maine.gov" <kirk.mohney@maine.gov>
Sent: 10/27/2016 11:53:42 AM
Subject: Frank J. Wood - Draft Summary to Accompany Alternatives Matrix

Good Morning,

Attached, please find a draft Summary of Alternatives to accompany the Alternatives Matrix that I sent out yesterday. We just finished putting this draft together. I will bring some copies of this and the draft alternatives matrix to this afternoon's meeting.

See you all then!

Cassie

Cassie Chase
Environmental Engineer
Federal Highway Administration – Maine Division
Office: 207-512-4921
Cell: 207-689-8007
Cassandra.chase@dot.gov

November 21st, 2016

Friends of The Frank J. Wood Bridge
10 Pleasant Street
Topsham, ME 04086

U.S. Federal Highway Administration
40 Western Avenue
Augusta, ME 04330

Attention Ms. Cassandra Chase, Environmental Engineer

Frank J. Wood Bridge MHPC # 1595-15

Dear Ms. Chase,

On behalf of the Friends of the Frank J. Wood Bridge and in response to your email of Nov. 4, 2016 seeking public comment, I wish to again request that the Preliminary Design Report(PDR) for all alternatives be released to the public. It is impossible to effectively and responsibly comment on the limited materials released by FHWA and MDOT to date without being able to review the underlying data, reports, engineering and cost estimates, traffic and pedestrian studies, and all other source information.

At the meeting held at the Topsham Public Library on February 25, 2015, MDOT promised that by the Fall of 2015 it would provide the public with a report of their findings and their recommendations. This never occurred. Rather, in April 2016 MDOT held a series of public meetings at which they declared that the decision had been made to build a new bridge - apparently before the Preliminary Design Report was completed.

Again at the July 106 Meeting I asked about the PDR and was informed it was a few weeks out and would be available by August. In the August 106 meeting my questioning was met with a similar postponed answer.

It is now November and no report has been made available. It is impossible for the public to verify and weigh the alternatives without any of the details, data or supporting information.

Please either release the full report with all of the details or provide a realistic date when the Preliminary Design Report will be released.

Sincerely,

John Graham

President- Friends of the Frank J Wood Bridge

Nathan Holth
2767 Eastway Drive
Okemos, MI 48864

269-290-2593
nathan@historicbridges.org

November 21, 2016

Cassie Chase
Environmental Engineer
Federal Highway Administration – Maine Division
Office: 207-512-4921
Cell: 207-689-8007
Cassandra.chase@dot.gov

Subject: Comments: Section 106 Consulting Party Comments: Frank J. Wood Bridge

Dear Ms. Chase:

I wish to offer the following comments in regards to above listed project.

First, I request an itemized scope of work and cost estimate for the proposed scope of work in regards to the rehabilitation of this bridge.

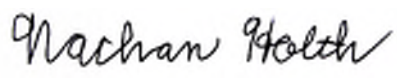
The October 27 Summary document in Figure 15 states the following: "*The only way to truly fix pack rust is to take apart the plates of steel and clean them, which is usually not feasible.*" This suggests that the Department's position on pack rust is that pack rust cannot be corrected or repaired without full disassembly of built-up members. This statement is not correct, and I request the re-evaluation of rehabilitation using methods of pneumatic pack rust removal currently in-use in other states. A summary follows:

Pack rust removal has been a part of historic truss bridge restoration for many years in states where historic truss preservation is common, such as the states of Indiana and Michigan. It may be new to Maine, in which case I hope I can educate and inspire its practice here. There is a special all-in-one procedure that both drives the actual pack rust out, while also bringing the deformed plates back into shape. The steel is heated to a specific temperature, and then hammered with a pneumatic hammer. Just this year, in Michigan, the DOT took this process which it had previously reserved for historic bridge projects, and expanded it for use on non-historic bridges as well with the rehabilitation of a riveted deck plate girder on a busy limited access highway. The Michigan Department of Transportation worked with Bach Steel, a Michigan fabricator/contractor that specializes in this work, to develop a procedure that worked well for the contractor, but also ensured it met the standards of the Department. Of additional interest, the work was completed without closure to traffic. This being the case, and being as the girders were fracture critical members, the DOT limited the number of rivets that could be removed at one time during the work. As it turned out however, the contractor was able to remove most of the pack rust without even removing the rivets, and without causing the rivets to break or otherwise fail. Also of concern is the temperature of the metal during the heating process. The procedure developed specified a maximum temperature that was allowed, and required the contractor to actively monitor the temperature of the steel throughout the heating process. The work was monitored by an on-site inspector.

Pack rust removal will not repair existing cracks in gusset plates, but it can prevent damage of this type by removing pack rust and reversing the effects of existing pack rust (bending of steel). I recommend the

Department consider this repair, and re-evaluate the project cost and life-cycle value in light of this procedure. I am including a brief project description from Bach Steel (which has a few photos), and I am also including the procedure as specified by the Michigan Department of Transportation.

Sincerely,



Nathan Holth

Author/Webmaster, HistoricBridges.org

Project: M-14 Huron River Bridge

Project Completed: 2016

Overview: The restoration methods Bach Steel uses for historic bridges can also be used to cost-effectively prolong the use of any metal bridge (whether historic or not). This is why we are excited to be part of the Michigan DOT's decision to employ pack rust removal repairs as part of the M-14 Huron River Bridge project in Ann Arbor. As far as we know MDOT has not done this work on non-historic bridges in the past. Elected officials are always talking about how bad America's bridges are... fixing what we have is a way to improve this problem at lesser cost than replacing existing bridges. Doing this work properly involves careful heating of the steel. The experienced Bach Steel crew closely monitors the temperature of the steel throughout the heating process to insure the integrity of the steel is not compromised. Working with MDOT, Bach Steel developed a procedure to ensure this work could safely be performed with the bridge open to traffic.

Overview of bridge.

Overview of the crew.

Driving the pack rust out.

Careful temperature monitoring during heating was a requirement on this job.

Phone:
517-581-6243

Email:
nels@bachsteel.com

Mailing Address:

Bach Ornamental and Structural Steel, Inc.
4140 Keller Road
Holt, MI 48842-1254

Website:

bachsteel.com

Facebook:

facebook.com/bachsteel

Pack Rust Removal Work Plan

DESCRIPTION:
This work shall be in accordance with the 2012 Standard Specifications for Construction of the Michigan Department of Transportation. This Work Plan shall cover work associated with removing pack rust between the bottom cover plates at the bearing areas of the primary girders and other areas of the primary girders on the R01 structure over the Huron River.

GENERAL:
The work shall include heating up areas of pack rust to 800°F with an oxy-fuel torch with a rosebud tip, temporarily placing a protective piece of steel over the heated area, applying impact force with a rivet gun or similar device. Apply a combination of heat and impact until the pack rust between the built up sections is removed. Moderate the application of heat to avoid annealing the steel or otherwise changing its properties by only heating short sections at a time.

MDOT personnel will oversee any heating operations to ensure area the temperatures do not exceed the per plan temperatures.

A video demonstration of this technique may be found at:

http://www.historicbridgerestoration.com

Areas chosen for pack rust removal shall be reasonably accessible to the Contractor to perform the above discussed procedure. Areas subject to this item shall be marked by the Engineer and completed by the Contractor prior to bridge cleaning operations. These areas are typically between the bottom cover plates at the bearing areas of the primary girders where they are exposed to the elements.

Areas selected for pack rust removal will be abrasive blasted to in accordance with section 715 of the Standard Specifications.

Rivets that are damaged during the pack rust removal work, or rivets that interfere with the work, shall be removed and replaced with high strength bolts of matching length and diameter.

The following job specific procedures will be followed for rivet removal on the R01 Structure:

Rivet Replacement in bottom girder flange plates at Piers 7 thru 10

Assuming Live Load (approx. 20% of total load):

- At the 3/8" cover plate, 10'-11" long, with rivet pitch = 4 ½", the maximum unbraced length allowed is 22 inches
- Therefore: Four rivets, in 1 outside row, can be concurrently removed.

- At the 5/8" cover plate, 17'-0" long (6'-1" exposure along flange), with rivet pitch = 4 ½", the maximum unbraced length allowed is 35 inches
- Therefore: Seven rivets, in 1 outside row, can be concurrently removed.
- See sketch (detail A)

Assuming No Live Load:

- At the 3/8" cover plate, 10'-11" long, with rivet pitch = 4 ½", the maximum unbraced length allowed is 26 inches
- Therefore: Five rivets, in 1 outside row, can be concurrently removed.

- At the 5/8" cover plate, 17'-0" long (6'-1" exposure along flange), with rivet pitch = 4 ½", the maximum unbraced length allowed is 43 inches
- Therefore: Eight rivets, in 1 outside row, can be concurrently removed.

Upon completion of pack rust removal, areas of effected by this operation shall be re-cleaned and coated in accordance with Section 715 of the Standard Specification.

Beam Plate Sealant shall be applied to all areas of the built up sections and plate areas of the bottom flange in the areas of pack rust removal to ensure sealing of any remaining voids. Sealant material shall be chosen from the QPL.

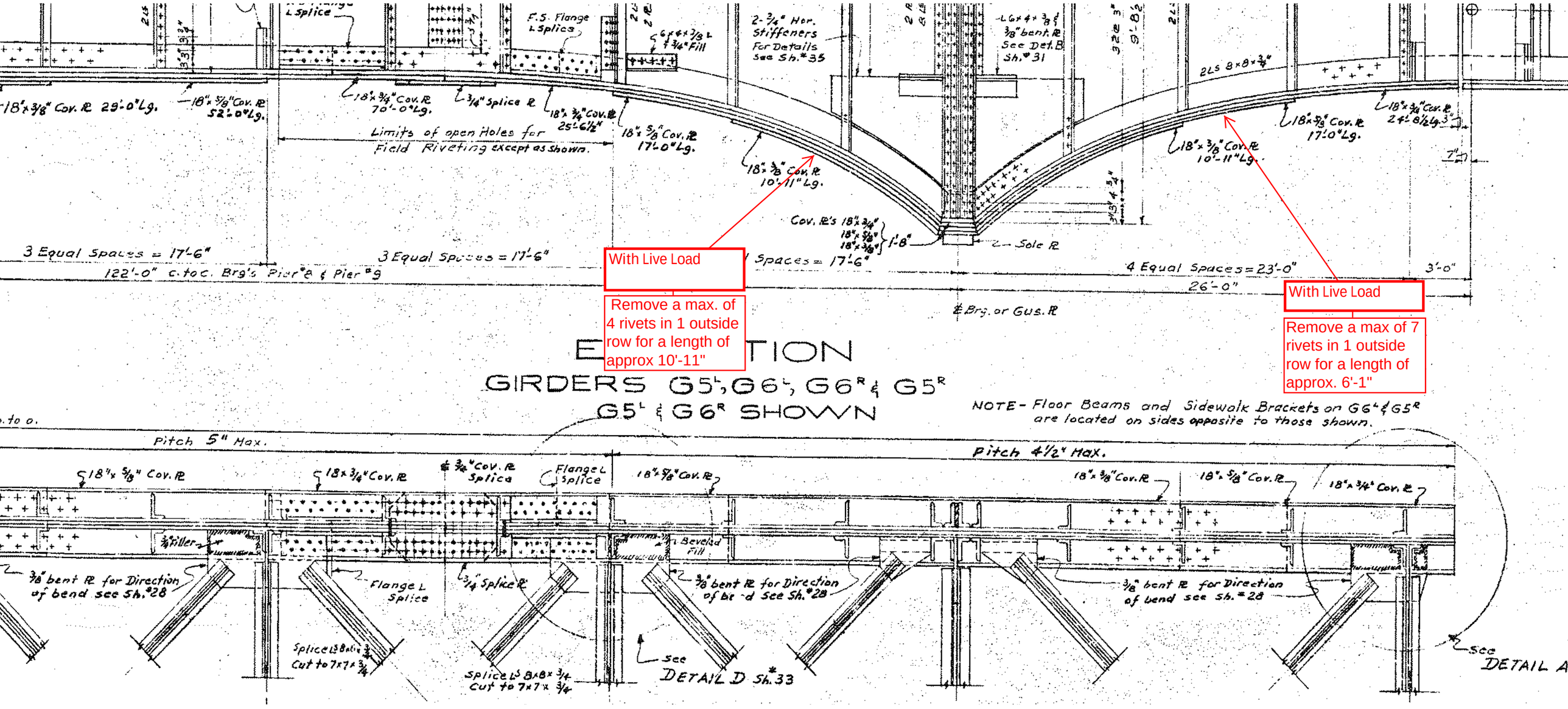
METHOD OF PAYMENT:

The work associated with this work plan shall be paid for in accordance with section 109.05.D (Force Account) of the 2012 Standard Specifications for Construction.

It is the intention of the contract team, to perform this work on one girder line under section 109.05.D and calculate the cost for this work to be prorated into a per linear foot (LFT) unit price for the remainder of the work.

The completed work as measured for pack rust removal will be paid for at the prorated unit contract unit price (LFT) for the following extra work and includes all material, equipment, access, incidentals, and labor to complete this item.

Work includes pack rust removal, rivet replacement with high strength bolts, cleaning and coating of these areas and sealant.



ELEVATION

GIRDERS G5L, G6L, G6R & G5R

G5L & G6R SHOWN

NOTE - Floor Beams and Sidewalk Brackets on G6L & G5R are located on sides opposite to those shown.

Piers 7 thru 10

Cassandra Chase and others involved in the Section 106 consideration of the Frank J. Wood Bridge--

I am forwarding to you for the section 106 comments a column I wrote for the *Brunswick Times Record* on November 11, and a subsequent piece in the *BTR* by John Graham, of the Friends of the Frank J. Wood Bridge on November 22:

http://www.timesrecord.com/news/2016-11-11/Opinion/Bringing_Economics_Into_the_Bridge_Decision.html

http://www.timesrecord.com/news/2016-11-22/Opinion/Adding_Apples_and_Oranges.html

I would add that the cost figures in the column I wrote are not mine but rather those of MDOT, and are drawn from the 10/26/2016 "Matrix of Alternatives Investigated" distributed at the 10/27 meeting of the section 106 process. As I wrote in the first piece, "when MDOT has put forward numbers showing renovation to be a costly proposition, the Friends have challenged the competence and integrity of those making the estimates."

Challenging the competence or integrity of public servants is the right of every citizen under the First Amendment. But it is a serious charge, and I see no reason, presented here or elsewhere, for others to join them in their aspersions.

Douglas C. Bennett
53 Elm Street, Topsham, ME 04086

The Times Record
Think locally.
Midcoast Maine's Only Daily Newspaper

2016-11-11 / Opinion

Bringing Economics Into the Bridge Decision

BY DOUG BENNETT
Guest Column

I hope you are paying attention, citizens of Brunswick and Topsham. A federally mandated legal process is playing out in the meeting rooms of our two town halls that could affect the economic viability of many businesses in our towns and affect the taxes we pay as well.

It's a section 106 process. People are speaking on your behalf, and you should know what they are saying.

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires Federal agencies to take into account the effects of their activities on historic properties. The historic property in question is the Frank J. Wood Bridge, which was constructed in 1932. The question is whether the Maine Department of Transportation can replace the bridge or whether instead it should renovate the bridge.

No one doubts that something needs to be done. Rust is degrading the bridge's structural integrity. Following an inspection this summer, it was posted with a maximum weight of 25 tons. Said Maine Department of Transportation (MDOT), "The inspection team of MaineDOT bridge engineers found rapid deterioration of structural steel which triggered a drop in the ranking of the bridge deck and superstructure from fair condition to poor condition."

Last spring, MDOT announced a plan to replace the bridge. That is when the section 106 process was triggered because replacement of the bridge could have an "adverse impact" on historic properties. An organization, the "Friends of the Frank J. Wood Bridge," was formed to press the case that the bridge is too important, too historic, to discard.

The section 106 process began in July. At a succession of meetings MDOT has laid out its understanding of the condition of the bridge, the alternatives (replacements or renovation) and the likely effects on recognized historic structures. At each meeting, the Friends of the Frank J. Wood Bridge have pressed their case. They question almost every assertion MDOT makes about condition, costs, setting and historic significance. Theirs are nearly the only voices from Topsham or Brunswick to be heard. Sometimes they suggest that they speak for nearly all of us.

Costs rarely play any part in the public arguments of the Friends of the Frank J. Wood Bridge. And when MDOT has put forward numbers showing renovation to be a costly proposition, the Friends have challenged the competence and integrity of those making the estimates. MDOT's estimates, however, are very much in line with the costs of bridge renovation projects elsewhere.

I admire citizen advocacy. I respect the conviction of the Friends of the Frank J. Wood Bridge that saving the bridge is of paramount importance to them. But I disagree with them and I expect most others in the community would as well in taking a fuller, sober look at choice before us.

At some point, the economics of the bridge have to be weighed. This state (as many others) is already struggling to find enough money to maintain its bridges and roads. What is the cost to taxpayers of historic renovation vs. the cost of replacement with a new bridge? How much would pursuing either course disrupt now-thriving businesses at either end of the bridge?

A recent study by MDOT's consultants on the bridge project put the construction cost of a new bridge expected to last 100 years at $13 million. Life cycle costs (adding in the costs of future repairs) would push this to $13.7 million.

On the other hand, renovation of the existing bridge to last 75 years, they estimate, would cost $17 million. This includes the cost of erecting a temporary bridge to carry traffic while the renovation proceeded.

Because of its age and manner of construction, such a renovated bridge would need considerably more maintenance than a new one, pushing its life cycle costs to $23.2 million. Moreover, that needed maintenance would cause much more traffic disruption, with recurring negative consequences for the businesses at either end of the bridge.

Agreed, the Frank J. Wood Bridge is "historic". But is it worth $10 million more in taxpayer cost to save it? Is it worth months of traffic disruption each of the many times such a renovated bridge would need to be repaired? (Think about that while the bridge is again being repaired this summer.)

Perhaps it is time we stopped letting the Friends of the Frank J. Wood be the only voices heard. The economic vitality of the towns at either end of the bridge is at stake. History counts, but the bridge is an artery that gives present life to both Brunswick and Topsham.

Doug Bennett is a member of the Brunswick/Topsham Bridge Design Committee.

The Times Record
Think locally.
Midcoast Maine's Only Daily Newspaper

2016-11-22 / Opinion

Adding Apples and Oranges

BY JOHN GRAHAM
Guest column

On Nov. 11, The Times Record published a guest column written by Doug Bennett on the fate of the Frank J. Wood bridge between Brunswick.

The thrust of Mr. Bennett's column was that the decision whether to renovate the current steel truss bridge or replace it with a concrete and steel highway bridge is basically an economic question. Mr. Bennett cited figures to " prove" that the difference between renovation and replacement is on the order of $10 million over the lifespan of each alternative.

The accuracy of the figures cited is highly questionable. The difference he cites is based on an assumption that renovation of the existing span will require $6.2 million for maintenance during its lifespan, an average of about $82,000 per year. He contrasts this with the life cycle cost of a new bridge, and concludes that a new concrete and steel bridge would be nearly maintenance-free over its 100 year life, and would cost only an average of $7,000 per year to maintain. If anyone imagines that concrete structures can have a 100- year life with little maintenance, a brief visit to Bath to observe the condition of the overhead viaduct that is being demolished would indicate the reality about concrete structures. In fact, the technical literature on the life span of concrete bridges indicates a hot debate on their useful life, with some engineers contending that for the ordinary concrete bridge built today, a lifespan of 50 to 60 years is more appropriate.

Even more inaccurate is the method of the calculation Mr. Bennett uses. Adding future maintenance costs to today's cost of construction is like adding apples and oranges. The calculations which financial analysts actually use to compare life cycle costs is to bring all costs back to their present value, to today's value. That method takes account of the fact that a dollar to be spent 75 years from now is worth far less than a dollar today. When the $ 6.2 million in maintenance Mr. Bennett projects over 75 years are reduced to their present value, they amount to about $2.5 million in today's terms. If that is added to the cost of renovation of the current bridge that Mr. Bennett uses, the total in present day terms is about $ 19.5 million, about $4 million less than what he gets by adding apples and oranges.

But the question of cost and lifespan is really secondary to what is far more important. The decision of whether to renovate a historic structure is really a question of values. For example, no doubt that one can often replace an historic structure with an ordinary new building at a cheaper cost. For example, the historic Bowdoin Mill and Fort Andross could have been demolished and replaced by modern office buildings, more efficient and perhaps less costly. But what a tragedy that would have been.

The replacement of the Frank Wood Bridge would likewise be a tragedy, as well as economically shortsighted. Financially, the difference cited by Mr. Bennett is minuscule compared to income that tourism brings to our area. Eighteen million tourists in Maine spend over $5 billion every year, the

largest industry in the state. And how do we in this area fare in the competition for those tourist dollars? Pretty well, it would seem. And why? Because we have made a conscious effort in this community to preserve its historic nature. The Frank J. Wood Bridge, and the mills at either end, are a major part of our historic environment. Literally tens of thousands of tourists come to our area because we have honored our historic past, bringing in tens of millions of dollars every year. Some communities in this country have even made their historic bridges into magnets for tourism, with art festivals, music festivals, community festivals centered on their historic bridges.

I understand that both Topsham and Brunswick and their business sectors want to preserve and improve the business climate. But it is a delusion to imagine that destroying an historic bridge, one of the last ones of its type in Maine, and replacing it with a concrete and steel highway bridge will make the community more attractive and more prosperous. Surely we can be more creative than that.

John Graham is president of the Friends of Frank J Wood Bridge and a member of the Topsham Historical Commission.

From:	Douglas C. Bennett
To:	Chase, Cassandra (FHWA)
Cc:	Martin, Cheryl (FHWA); Hopkin, Megan M; kitty@historicbridgefoundation.com; Scott Hanson; John Graham; sstern; John Shattuck; lsmith@brunswickme.org; Chamberlain, Kristen; robin k reed; Kittredge, Joel; Frankhauser Jr, Wayne; Kate Willis; Emington, Wayne (FHWA); John Eldridge; Norman Baker; Drozd, Maria (FHWA); stevehinchman@gmail.com; admorris; sebordwell@gmail.com; Nancy BikeMaine.org; Folsom, Jeff; Russell Caroline; Curtis Neufeld (cneufeld@sitelinespa.com); Rod Melanson; Carol Eyerman; Victor Langelo (vlangelo@eclipseservices.com); Richard Cromwell (richcromwell1@gmail.com); Fred Wigand; katzthal@comcast.net; mnaber@achp.gov; david gardner; Pulver, William; steve pelletier; Deb Blum (dblum@brunswickme.org); kirk mohney; Nathan Holth
Subject:	Economic Considerations on the Frank J. Wood Project -- Request for Comments on Section 106 Documents
Date:	Wednesday, November 23, 2016 7:50:55 AM
Attachments:	DCB, Comments on Economic Considerations 16.11.23.pdf

---

Cassandra Chase and others involved in the Section 106 consideration of the Frank J. Wood Bridge--

I am forwarding to you for the section 106 comments a column I wrote for the *Brunswick Times Record* on November 11, and a subsequent piece in the *BTR* by John Graham, of the Friends of the Frank J. Wood Bridge on November 22:

http://www.timesrecord.com/news/2016-11-11/Opinion/Bringing_Economics_Into_the_Bridge_Decision.html

http://www.timesrecord.com/news/2016-11-22/Opinion/Adding_Apples_and_Oranges.html

I would add that the cost figures in the column I wrote are not mine but rather those of MDOT, and are drawn from the 10/26/2016 "Matrix of Alternatives Investigated" distributed at the 10/27 meeting of the section 106 process. As I wrote in the first piece, "when MDOT has put forward numbers showing renovation to be a costly proposition, the Friends have challenged the competence and integrity of those making the estimates."

Challenging the competence or integrity of public servants is the right of every citizen under the First Amendment. But it is a serious charge, and I see no reason for others to join them in their aspersions.

This is my home, the country where my heart is;

Here are my hopes, my dreams, my sacred shrine.

But other hearts in other lands are beating,

With hopes and dreams as true and high as mine.

--Lloyd Stone, poet, 1912-93

From:	John Graham
To:	Chase, Cassandra (FHWA)
Cc:	Joel.C.Kittredge@maine.gov; Scott Hanson; Steve Hinchman
Subject:	106 Comments
Date:	Wednesday, November 23, 2016 10:33:48 AM
Attachments:	Comments to draft report- john graham1.pdf B-14_DawsonBridgeRehab.pdf

---

Hi Cassie,

Please see my personal comments in RED on the Draft Report, which I have attached. I find it very difficult if not impossible to comment on this without the full information, thus the need to have the formal request for the PDR earlier this week.

I do take serious issue with the change in the Purpose and Needs statement. This is unacceptable. The purpose keeps changing. It was originally an improvement and all notices to tribes, historical etc. went out with the original purpose. If the purpose has changed the process should start from the beginning again. Again the structural condition was not poor when this process started. A study needs to be done to prove that any pedestrian improvements are required- (MDOT guidelines say any bridge over 200' does not require 2 sidewalks). Mid-block cross walks will still exist with or without a new bridge. Bike lanes can be equal with either bridge. This new Purpose and Needs appears to be crafted to rule out the option of rehabbing the existing bridge and maintaining one sidewalk.

If one writes the purpose to fit the outcome they get the out come they desire (which MDOT has made clear this April was a new bridge was their desire). The agency in charge of maintaining the bridge, lets it fall into disrepair and then uses that as a reason to get their desired outcome is also not acceptable.

I expect a lot more detail, sources, and breakdown of costs before I, or anyone, can fully comment on this.

There are also several falsehoods in the report. For example the sidewalks on the downriver side do not go right to the bridge. Instead they stop well short of it on both sides. These are details that are either omitted to make an argument stronger or omitted because no real study has been preformed.

Further because of the lack of detail there are statements like : "Other lightweight deck configurations were also considered but no others were found light enough without even more expense." Which other options were considered, what are their costs, pros and cons? Please see the attached Dawsons Bridge rehab sheet below. It is impossible to know if this was considered or not? Again if the PDR in full would be released one could provide better comment to what was actually considered.

I would also like you to look into the New Hope-Lambertville Bridge between Penn and NJ. https://www.drjtbc.org/default.aspx?pageid=74 This bridge has only one sidewalk and connects two towns with robust shopping districts and can see as many as 14,000 people walk across it in a single weekend. This is also a good example of a bypass bridge (further way then ours) where the State moved the main Route to the bypass to ease truck and traffic in general. Why is this prudent in between these towns and not between ours?

The bridge is narrower and longer than ours and they have managed to save it and keep it as a focal point between their two historical downtowns.

The report still reads like a rhetorical overview of the project and alternatives with both language and photos that without further understanding or study, leads one to believe that the only option is a new bridge. I have read several MDOT prepared PDR's on other projects and the engineers report this summer on the downgrade of the bridge; there are great examples of the neutral detail rich reports I am looking for. MDOT

is capable of providing the public the full information. Please release it and provide the public adequate time to comment on it before any decision is made.

Personally, John Graham

John Graham
John Graham Real Estate
www.johngrahamrealestate.com
10 Pleasant Street
Topsham, ME 04086
207-491-1660

DAWSON BRIDGE REHABILITATION

EDMONTON, ALBERTA

DAWSON BRIDGE REHABILITATION, EDMONTON, ALBERTA

PROJECT OVERVIEW: NEW LIFE FOR A 100-YEAR-OLD STEEL TRUSS BRIDGE

In its 100th year of service, Dawson Bridge is now one of Edmonton's most modern bridges thanks to the innovative use of new technology. During its 2010 rehabilitation, its deteriorated concrete-on-timber deck was replaced with an SPS™ composite steel plate and elastomer lightweight deck system. Dawson is the largest bridge in the world with this innovative steel deck system, and the first designed with unique bolting details that entirely eliminate field welding.

The shop-fabricated lightweight steel deck drastically reduced the need for costly and difficult truss strengthening. Bolted quickly into position, the speed of deck installation allowed the entire rehabilitation project–truss strengthening, painting, deck replacement, and sidewalk widening–to be completed in one year, months faster and millions less expensive than a traditional concrete deck.

BRIDGE HISTORY

A five-span riveted steel through-truss, Dawson Bridge was originally constructed to carry electric trains to a coal mine located on the east bank of the North Saskatchewan River. With five simply supported spans of 43.3 m, 43.3 m, 43.3 m, 76.2 m, and 30.5 m from west to east, its overall length between abutment walls is 236.5 m. Today the bridge carries one lane of vehicular traffic in each direction–about 16,000 vehicles per day–along with many pedestrians and cyclists on its two sidewalks as part of the River Valley trail system.

The City of Edmonton commissioned a condition assessment for Dawson Bridge in 2007. That study revealed the superstructure was in need of significant repair, including total bridge deck replacement and truss repainting. Field inspection and structural analysis also identified numerous truss members that required strengthening or replacement in order to increase the level of safety to modern standards and to extend the service life of the bridge. The original narrow sidewalks were also identified as a detraction and potential safety hazard for pedestrians and cyclists.

Dawson Bridge is listed on the register of historic resources in The City of Edmonton and is one of very few structures in the city–of any kind–to reach its centenary. The project team was given the mandate to respect the historical appearance of the existing structure and make certain that the rehabilitation measures would not be apparent to the public once construction was complete.

INNOVATIVE REHABILITATION

During the design phase, a load rating of Dawson Bridge was conducted using an Alberta CS3 rating vehicle, the heaviest vehicle that might practically access the bridge considering its vertical clearance restrictions and location. That assessment concluded that numerous truss members must be strengthened or replaced in order to increase the level of safety and to extend the lifespan of the bridge.

The analysis work also showed that the scope of strengthening work could be reduced significantly by choosing a deck replacement option that lightens dead load on the bridge. By replacing the existing, deteriorated 165 mm semi-lightweight concrete deck with a lightweight steel deck, those weight savings could be applied to carrying additional live load and widening the sidewalks.

Two lightweight deck options were considered for the project: orthotropic steel deck and an innovative composite steel plate and elastomer decking system. Ultimately, the deck design best suited to the project was determined to be a composite steel plate and elastomer decking system patented by Intelligent Engineering (Canada) Ltd. of Ottawa. Called the Sandwich Plate System (SPS™), the system was originally developed for use in the marine industry for ship hulls and decks. Application of this new technology has recently begun in the bridge industry.

SPS makes use of two relatively thin steel face plates–10mm thick, in the case of Dawson Bridge–connected by an injected elastomer core. The final product is a composite panel with high stiffness and strength, but relatively low weight. The deck plates are fabricated in the shop using conventional steel fabrication techniques, and the liquid elastomer, which cures into solid form within an hour, is injected to form the core. For Dawson Bridge, the 10mm 350AT steel face plates sandwich a 25mm elastomer core, forming a composite deck panel only 45mm in total thickness.

The design team recommended to the City of Edmonton an intensive risk control program for the application of a new technology, especially considering that Dawson Bridge is a large and expensive asset for the City. Only a handful of bridges around the world have been built using SPS technology, and all have involved significant field welding that is both costly and difficult to maintain consistent quality.

As the first and most important step of the risk control program, the design team set out to develop new details for connection of the SPS deck panels in order to eliminate entirely the need for field welding. The new details, developed by the design team and detailed by Intelligent Engineering, involve using splice plates to connect adjacent deck panels with countersunk ASTM A325 bolts. To save weight and complexity, the top flange of the new floor stringers act as the bottom splice plate. Also as part of the risk control plan, full three-scale samples of the new connection detail were built and tested under fatigue loading at the structural engineering laboratory at the University of Alberta. Those tests demonstrated that the new connection detail can withstand fatigue loads nearly double in magnitude to those expected in actual in-service conditions.

Because the composite steel deck panels could be fabricated entirely in the shop and bolted quickly into position on the bridge, erection of the deck was completely in only six weeks. This speed allowed construction to be completed in 12 months, with the bridge closed on January 4, 2010 and reopened on December 20, 2010. If a traditional concrete deck had been used, the difficultly and expense of strengthening truss members would have been far greater and the construction schedule would have taken at least 18 months.

CONCLUSION

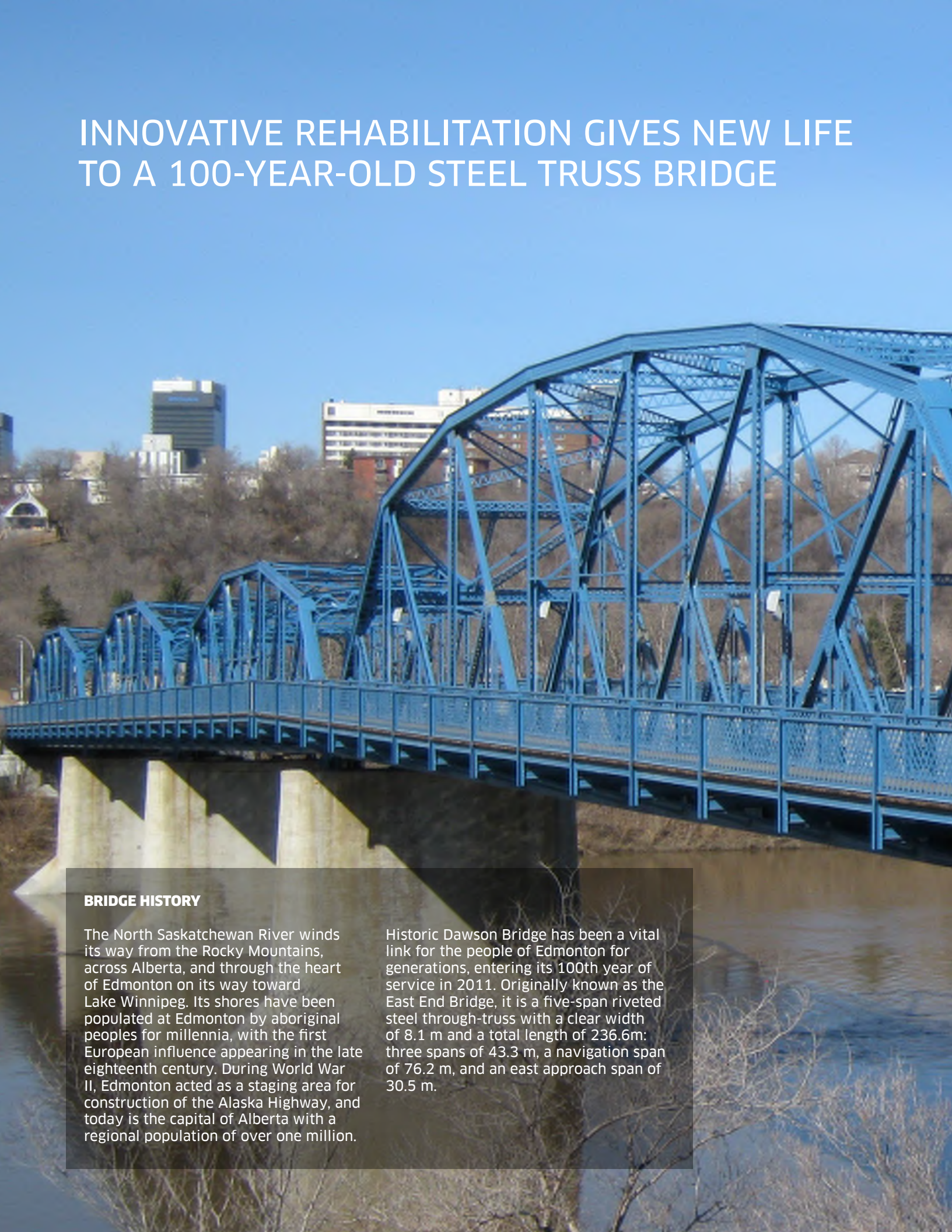
The rehabilitation project involved removing the existing deteriorated concrete deck, erecting new floor stringers, installing 1850 m^2 of innovative composite steel plate and elastomer decking, removing 17,500 rivets, tightening 37,500 new bolts, and blast cleaning and recoating of the entire structure with high-performance zinc/epoxy/urethane paint. New sidewalks 2.65m wide were also installed. Under budget at $17 million, Dawson Bridge reopened to traffic almost exactly on schedule on December 20, 2010.

The Dawson Bridge project has successfully advanced the state of the art in bridge engineering and has achieved millions in cost savings for the City of Edmonton, while allowing the rehabilitation work to be completed within a single construction season. Today, Dawson Bridge is fully rehabilitated with the world's largest SPS deck--and the only installation built entirely without field welding--standing prepared to serve generations of Edmontonians.

PROJECT AWARDS

CISC Alberta Steel Design Award of Excellence - Sustainability, March 2011

INNOVATIVE REHABILITATION GIVES NEW LIFE TO A 100-YEAR-OLD STEEL TRUSS BRIDGE

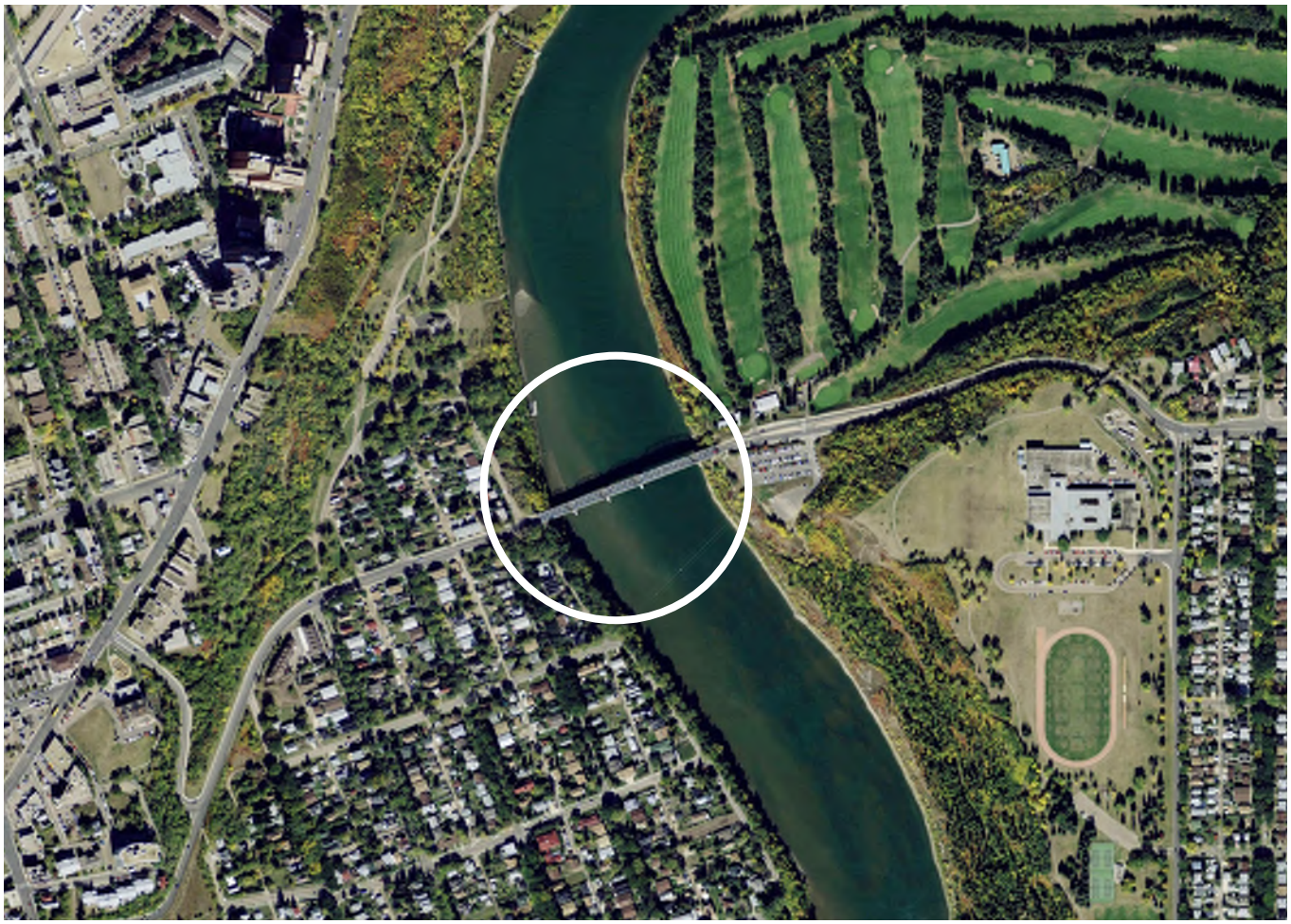


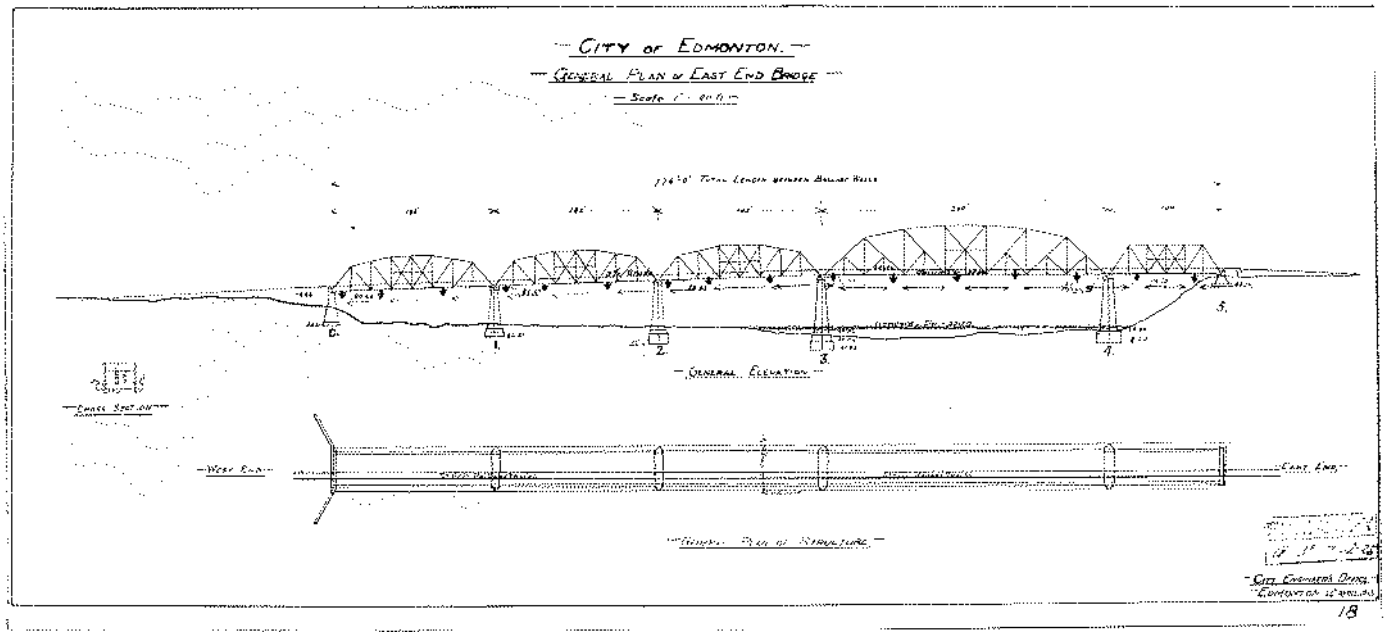
BRIDGE HISTORY

The North Saskatchewan River winds its way from the Rocky Mountains, across Alberta, and through the heart of Edmonton on its way toward Lake Winnipeg. Its shores have been populated at Edmonton by aboriginal peoples for millennia, with the first European influence appearing in the late eighteenth century. During World War II, Edmonton acted as a staging area for construction of the Alaska Highway, and today is the capital of Alberta with a regional population of over one million.

Historic Dawson Bridge has been a vital link for the people of Edmonton for generations, entering its 100th year of service in 2011. Originally known as the East End Bridge, it is a five-span riveted steel through-truss with a clear width of 8.1 m and a total length of 236.6m: three spans of 43.3 m, a navigation span of 76.2 m, and an east approach span of 30.5 m.


DIALOG™




CITY OF EDMONTON.
GENERAL PLAN OF EAST END BRIDGE
GENERAL ELEVATION
GENERAL PLAN OF STRUCTURE
CITY ENGINEERS OFFICE
18

Originally constructed to carry horse-drawn wagons and electric trains to the Dawson Coal Company mine located on the east bank, the bridge opened on October 8, 1912 with a construction cost of $145,000. Only the second bridge to cross the North Saskatchewan River at Edmonton, Dawson Bridge quickly became a vital link for the city's growth, allowing coal to be transported quickly into the heart of the city for industry and home heating.

After closure of the Dawson Mine in 1944, the bridge was converted to carry only highway vehicles. Today, the bridge has one lane of traffic in each direction and accommodates about 17,000 vehicles each weekday. As a link to Edmonton's extensive multi-use river valley trail system, the two sidewalks on Dawson Bridge serve many pedestrians and cyclists.

CONDITION ASSESSMENT

In 2007 The City of Edmonton commissioned DIALOG™ to conduct a condition assessment for Dawson Bridge. Field inspection revealed the superstructure in need of significant repair, including total replacement of the bridge deck and complete repainting of all steelwork. Structural analysis also identified numerous truss members requiring strengthening or replacement in order to increase the service life of the bridge and meet the safety requirements of the Canadian Highway Bridge Design Code 2006. In addition, the original narrow sidewalks—only 1.5 m wide—caused safety concerns due to mixed use by pedestrians and cyclists.

Especially problematic was the existing 165 mm steel-fibre-reinforced semi-lightweight concrete deck, cast in 1986 on top of old timber subdecking from the 1940's. Though its relatively light weight was beneficial for limiting dead loads, the thin concrete deck was too flexible to resist cracking. In particular, The City of Edmonton was experiencing continual maintenance problems with the methyl methacrylate thin membrane wearing surface at details where the concrete deck passed over the transverse floor beams. The concrete deck section was reduced to only 65 mm thick to clear the top flange of the floor beams, making it nearly impossible to control cracking.

As part of the assessment, a load rating of Dawson Bridge was conducted using a 4-axle, 63.5 tonne Alberta CS3 rating vehicle, the largest vehicle that might practically access the bridge considering its vertical clearance restrictions and location. That assessment concluded that numerous truss members must be strengthened or replaced in order to meet the required level of safety and to extend the lifespan of the bridge.

Dawson Bridge is listed on the register of historic resources in The City of Edmonton and is one of very few structures in the city—of any kind—to reach its centenary. The project team was given the mandate to respect the historical appearance of the existing structure and make certain that the rehabilitation measures would not be apparent to the public once construction was complete.

TRUSS REHABILITATION

The original truss members of Dawson Bridge are built-up rivetted members with an I-shaped cross-section, with steel angles forming the flanges and lattice plates crossing back and forth between the flanges to form the web. All members were originally connected by 19 mm or 22 mm rivets.

The load rating results showed that it was necessary to strengthen or replace several of the existing truss members. For the replacement members, the new members are constructed to the same dimensions as the original, but they have solid plates welded together to form the flanges and the webs. The original lattice pattern of the web is duplicated by plasma-cut holes in the new web plate, an economical modern construction technique that maintains the historical appearance of the members.

An analysis of estimated remaining fatigue life showed that the fatigue life of many of the riveted connections on the bridge has theoretically been consumed. Fortunately, the steel inspection carried out as part of this assessment did not reveal any fatigue cracking. In response, a simple fatigue strengthening strategy was implemented by to reduce the risk of structural problems over the remaining service life of the Dawson Bridge replacing all rivets at critical connection locations with high strength pre-tensioned bolts.

After completion of all truss strengthening and rivet replacement work, the entire superstructure was blast cleaned and recoated with a three-part organic zinc/epoxy/polyurethane system. This system is anticipated to last 25 years before overcoating is required.

One change from the original appearance is that the new sidewalks are nearly twice as wide as the original sidewalks. However, steelwork detailing for the new sidewalk brackets was done using geometry that matches the historical nature of the bridge. The new, wider sidewalk dramatically improves the experience for pedestrians and cyclists using this bridge as part of the River Valley trail system.

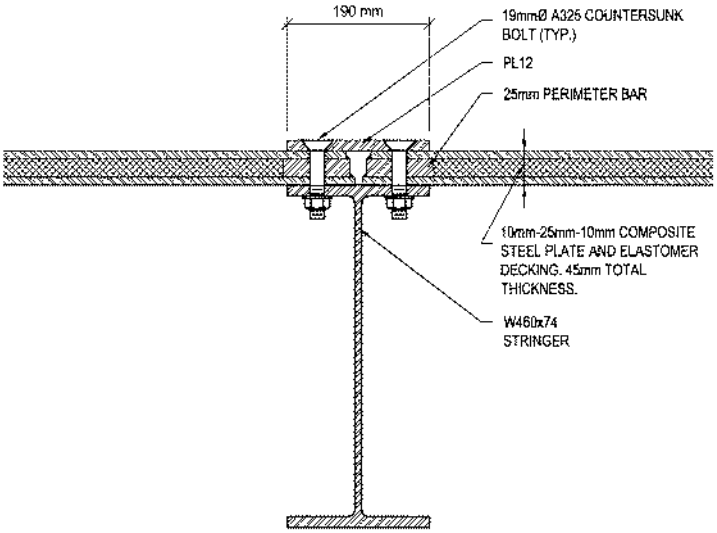
LIGHTWEIGHT DECK: INNOVATION AND RISK CONTROL

As options for rehabilitation were developed, it became clear that the bridge could be rehabilitated economically only if a lightweight deck replaced the existing deteriorated concrete deck. A traditional concrete deck would require costly replacement or strengthening of many truss members along with difficult upgrading of existing connections. Additionally, it might cause overload for the piers, abutments, and foundations. By replacing the existing semi-lightweight concrete deck with a lightweight steel deck, the design team concluded that the dead load savings could be applied to carrying additional live load and widening the sidewalks. Only steel offered viable lightweight deck options: grating, orthotropic deck, or an innovative composite steel plate and elastomer system called the Sandwich Plate System (SPS™) patented by Intelligent Engineering (Canada) Ltd.

Grating was quickly eliminated as an option for the deck because increased road noise would be detrimental to the nearby Riverdale community. Orthotropic steel deck was judged a suitable option, but detailing would be challenging where the deck had to clear the tops of the floor beams without raising the grade line, and orthotropic deck may be susceptible to fatigue cracking. After considerable research, the design team recommended SPS to The City of Edmonton, judging that SPS technology offered the best combination of light weight, thin profile, and ease of erection for the Dawson Bridge Rehabilitation project.

The SPS composite steel plate and elastomer system was originally developed by Intelligent Engineering Ltd. for ship hulls and decks in the marine industry. Application of this technology began about a decade ago in the bridge industry, and SPS has been installed on several bridges worldwide. The technology is gradually gaining acceptance by bridge engineers.

SPS makes use of two relatively thin steel face plates connected by an injected thermosetting elastomer core. The final product is a composite panel with high stiffness and strength, but relatively low weight.



Deck panels are fabricated in the shop using conventional steel fabrication techniques. First, solid “perimeter bars” are welded along each edge of the bottom plate using a continuous fillet weld. The top plate is then lowered onto the perimeter bars and fillet welded all around forming a panel with a sealed void. The liquid elastomer, which cures into solid form within an hour, is injected through a port to form the core. For Dawson Bridge, the 10 mm steel face plates sandwich a 25 mm elastomer core, forming a composite deck panel with a total thickness of only 45 mm. These prefabricated panels are typically 1.9 m wide and 8.5 m long.

Risk is inherent in the application of all new technologies in all industries. Perceived risk—and its associated liability—often dissuades engineers from trying innovations that might advance the state of the art in their area of practice. Potential liability places a constriction on the pace of innovation that, in the long run, is most often a disservice to society. Striking the right balance between innovation and risk control is the key to success. Thus, when DIALOG recommended SPS—a relatively new technology—to the City of Edmonton, that recommendation came with the proviso that an intensive risk control program must be implemented, especially since Dawson Bridge is an important and expensive asset. The City of Edmonton is a progressive bridge owner that welcomes innovation, and they directed the design team to proceed with SPS as the basis of design for the deck.

The risk control plan developed for the deck comprised six key elements:

- Extensive background research in the available literature;
- Site visits by the design team to other bridges with SPS decks, and interviews with the bridge authority managing those structures;
- Development of improved connection details in consultation with Intelligent Engineering;
- Fatigue testing of full-scale sample connections in the laboratory;
- Enhanced quality control and quality assurance programs during deck fabrication and erection; and,
- Monitoring of deck performance over the lifetime of the bridge as part of the City of Edmonton's bridge maintenance program.

DIALOG judged the most important aspect of the risk control plan to be the development of new connection details between adjacent SPS deck panels. Of the handful of bridges around the world built using SPS technology, all have involved significant field welding—a method that is costly and makes quality control difficult. Risks associated with field welding include fit-up out-of-tolerance, the potential for excessive heat input that might debond the elastomer from the steel, and undesirable weld flaws that might inadvertently result in premature fatigue cracking.

Taking to heart the golden rule "shop weld and field bolt," the DIALOG design team developed unique bolted details for connecting the SPS deck panels. These details completely eliminate the need for field welding. Bolted connections drastically increase speed of erection, significantly reduce cost, and improve fatigue performance from Detail Category D (depending on the specifics of the weld geometry) to Detail Category B when using slip-critical connections.

To connect adjacent SPS deck panels, a top splice plate is fastened by a single row of countersunk pretensioned 19 mm ASTM A325 bolts. Countersunk bolts provide a flat surface for the finished deck, except for the thickness of the splice plate itself. This surface, once grit blasted, is prepared to receive a waterproof membrane and asphalt. In order to make deck detailing and construction simpler, the SPS deck in each span is planar with no cross-fall. To achieve positive drainage, the asphalt varies in thickness from 100 mm at the crown to 40 mm at the shoulders.

Longitudinal deck splices are designed to align with floor stringers below. This arrangement enables the top flange of the stringers to act as the bottom splice plate for the connection, saving both weight and complexity. The new stringers chosen—W460x74—are larger than required for flexural strength but offer a flange wide enough to accept a row of bolts on each side. At transverse deck joints, located away from floor beams to avoid clashes, bolted splice plates are used both top and bottom. In all cases enough bolts are used so that sealing requirements are met and negative moments in the deck can be transferred across the supporting stringers. This very simple approach to connections makes the deck very easy to fabricate and simple to erect. Using similar bolting details, the traffic barriers along the length of the bridge are also bolted down through the deck to the edge stringer.

Also as part of the risk control plan, three small 1:1-scale samples of the longitudinal bolted deck connection detail were built and tested under fatigue loading at the University of Alberta with the assistance of Professor Gilbert Grondin, Ph.D., P.Eng. Those tests demonstrated that the new connection detail can withstand fatigue loads nearly double in magnitude to those expected in actual in-service conditions.

REAPING THE BENEFITS OF INNOVATION

Because the composite steel deck panels could be fabricated entirely in the shop and bolted quickly into position on the bridge, erection of the deck was completed in only six weeks during July and August 2010. This speed allowed the $17 million rehabilitation to be finished in only 12 months: the bridge closed to traffic on January 4, 2010, and reopened on December 20, 2010. A traditional concrete deck would have extended the project schedule to at least 18 months, added millions of dollars of extra truss strengthening work, and caused numerous other technical issues.

The Dawson Bridge project has successfully advanced the state of the art in bridge technology and has achieved cost savings for the City of Edmonton, while allowing the rehabilitation work to be completed within a single construction season. Today, Dawson Bridge is fully rehabilitated with the world's largest SPS deck—the only installation built entirely without field welding—and it stands prepared to serve Edmontonians for many generations to come.

DAWSON BRIDGE REHABILITATION – PROJECT CREDITS

Owner
The City of Edmonton

Prime Consultant Bridge Engineering
DIALOG

Civil Engineering
Al-Terra Engineering Ltd.

General Contractor
ConCreate USL Ltd.

Steel Detailing and Fabrication – Stringers and Connections
Empire Iron Works Ltd.

Steel Detailing and Fabrication – Sidewalks and Truss Upgrades
Steel Design and Fabricators Ltd. (SDF)

Steel Design and Detailing – Composite Steel Plate and Elastomer Decking
Intelligent Engineering Canada Ltd.

Steel Fabricator – Composite Steel Plate and Elastomer Decking
Cemilas B.V.

Steel Erector
Steel Design and Fabricators Ltd. (SDF)

Paint
Certified Coatings Specialists Inc.

Comments- John Graham

Frank J. Wood Bridge: Summary of Alternatives

Prepared by T.Y. Lin International October 27, 2016

BACKGROUND

The Frank J. Wood Bridge is a critical link spanning the Androscoggin River between the Towns of Brunswick and Topsham, carrying US 201 Has a study been done as to why 201 still needs to connect to route 1 through Topsham's Main Street rather than the 196 bypass?

and ME 24 and about 19,000 vehicles a day. Just 500 feet upriver of the bridge is a power generation dam harnessing the power of Brunswick Falls. On the southern, Brunswick side of the bridge sits the 250th Anniversary Park on the east and the bustling Fort Andross Mill Complex on the west. The Topsham approach adjoins a bank on the west side, and a dentist office and the Bowdoin Mill Complex on the east side. Both the Fort Andross and the Bowdoin mill complexes house a variety of shops, businesses, and restaurants, and the Frank J. Wood Bridge is a key there is also a pedestrian bridge 1000' +/- feet upstream pedestrian connection between the two of them and between the larger business districts and communities on each side. The bridge links the hearts (or is the heart) of the two communities across the Androscoggin River, connecting Brunswick and Topsham.

It should be also noted that less then a half mile down street is a bypass bridge.

Figure 1: The Frank J. Wood Bridge spanning the Androscoggin River between Brunswick and Topsham

The Frank J. Wood Bridge is an 85-year-old, 805 ft long steel truss that is now in poor (the deck and lower cords are in poor condition- the upper supper structure is in fair or better- condition. It was rehabilitated (this is miss leading- it has had repairs but rehabilitation leads one to think more than repairs where done.- repairing the bridge joints in 2015 is not "rehabilitating the structure…) most recently in 1985, 2006, and 2015. It is a "fracture critical" structure, indicating it is vulnerable to sudden collapse if certain components fail. Because of this designation, more detailed and frequent inspections are required. Detailed inspections by MaineDOT in 2012, June 2016 and August 2016 (all bridges are required to be inspected every two years. Is it MDOT's policy to remove all "fracture critical" bridges? It must be also stated that the bridge was not in that condition when the original conclusion to replace the bridge was made. If one waits long enough and is responsible to maintain they can always make this conclusion… the deck and carrying cords can feasibly and prudently be replaced so this argument should be left out of any final conclusion.)found many deteriorated areas. A load rating done by MaineDOT in 2013 and updated in August 2016 found several truss members are not

---

strong enough to meet load-carrying standards (this is not accurate- it was the deck and one lower true cord.…) The bridge is now posted for 25 tons. The three-span steel through-truss (with spans of 310'-310'-175') and the concrete deck are currently in poor condition, and the bridge has a FHWA Sufficiency Rating of 25.4. There is corrosion and steel loss in the floor system supporting the deck (the transverse cross beams, longitudinal stringers, and transverse floor beams). Corrosion is continuing and speeding up, and will do so until the truss is rehabilitated comprehensively or the truss is removed.

Because of the ongoing deterioration of the truss, MaineDOT plans to do temporary repairs to address the worst issues so the truss can maintain its current load rating for up to five years. Steel will be added to the

worst sections of the floor system beneath the deck and missing and deteriorated rivets will be repaired or replaced. These temporary repairs are needed to keep the 25 ton weight limit from being reduced more. As maintenance, this 5-year repair will be funded separately from the longer-term “capital improvement” project. However, a long-term solution needs to be implemented within the 5 year timeframe this maintenance buys. This report examines what the alternatives are for the long-term solution.

The travelway over the truss is 30 ft wide, with two 11 ft travel lanes and 4 ft shoulders. Though there are sidewalks on both sides of the road approaching the bridge,(this is also false. one the downriver side the Topsham sidewalk is 100’ plus feet and on the Brunswick side it is 300’ plus feet away from the bridge. the existing truss carries a single sidewalk on the west side of the bridge. Because the outer 2 feet of the shoulders is made of an open steel grid, the usable shoulder width for bicycle travel is reduced to just 2 ft.

This bridge is eligible for listing on the National Register of Historic Places as part of the Brunswick-Topsham Industrial Historic District. It is also adjacent to the National Register-Listed Pejepscot Paper Company Historic District.

Accident data from 2009-2013 shows 27 accidents at the intersection of Maine Street and Bow/Cabot Street in Brunswick and 11 accidents at Summer Street and Main Street in Topsham. Also, there were 24 accidents just off the bridge on the Brunswick approach. The accident reports show that these accidents were primarily caused by driver inattention and distraction or by following too closely. (none of this seems relevant- since none of the accidents happened on the bridge and a new bridge improves none of the intersections where the accidents happened- why include it? And if you do include it please explain how a new bridge with increased speeding will help?)


TFA
RO

Figure 2: This report uses technical terms to describe various parts of the bridge. The superstructure is what many think of as a "bridge", including the floor system or girders below the deck, while the substructure is what supports the superstructure. The deck (what cars drive on) rests on the floor system, which is made up of floorbeams, stringers, and sometimes crossbeams. The floor system carries load from the deck to the truss bottom chord.

PURPOSE AND NEED

The purpose of the project is to address poor structural conditions and load capacity issues on the Frank J. Wood Bridge and to address pedestrian and bicycle mobility and safety concerns. (this I have serious concerns with. The purpose keeps changing. It was originally an improvement and all notices to tribes, historical etc. went out with the original purpose. If the purpose has changed the process should start from the beginning again. Again the structural condition was not poor when this process started. A study needs to be done to prove that any pedestrian improvements are required- (they are not and MDOT guidelines say any bridge over 200' does not require 2 sidewalks. Bike lanes can be equal with either bridge.

If one writes the purpose to fit the outcome they get the out come. This is not acceptable!

Bridge improvements are needed to improve the condition ratings of the superstructure and deck from a rating of 4 (poor condition) to 7 (good condition). Because of the age of the bridge, 85 years old, and the considerable number of heavy loading cycles it has already experienced, steel fatigue concerns on critical tension members need to be addressed to continue to carry heavy truck traffic on the existing truss. Additionally, the floor beams and stringers need improvements to bring their load rating factors to a 1.0 for all MaineDOT legal loads.

This bridge is classified by the Federal Highway Administration (FHWA) as structurally deficient with superstructure and deck condition ratings of 4 out of 9 (poor condition). The 3 truss spans are fracture critical, meaning that failure of certain steel tension members could cause any of the 3 spans to collapse. Some of the steel truss bridge components are fatigue sensitive, susceptible to cracking and fracture as a result of heavy cyclic loading. The floor beams and stringers within the truss spans do not meet current design load or MaineDOT legal load standards. (again is it MDOT's policy to remove all Fracture critical bridges?)

Pedestrians on the east side of Routes 201/24 cannot cross the river without crossing the highway, and the existing mid-block pedestrian crossings are considered dangerous. Bicycle traffic is seriously limited by the narrow, 2 ft, paved shoulder. (There are six mid-block cross walks from Route 196 to the bridge and at least that many on Maine Street in Brunswick. MDOT's sponsored bike path across from the Topsham town hall just had one installed. A pedestrian study needs to be done. If one looks at pedestrian patterns a second side walk does not stop the requirement for mid block crossings.

SUMMARY OF ALTERNATIVES

The following alternatives were considered:

1. New 800 ft bridge on the existing alignment.

2. New 835 ft bridge on a curved alignment upstream of the existing bridge.

3. Rehabilitation of the existing steel truss bridge.

4. Rehabilitation of the existing steel truss bridge, including the addition of a new east
   side sidewalk.

5. New 800 ft bridge on a parallel alignment downstream of the existing bridge.

The No Build alternative was also considered. The No Build alternative was included as a benchmark against which the impacts of other alternatives can be compared. Short-term maintenance and minor rehabilitation is considered as part of the No Build alternative.

On Point Construction Services, a private consultant firm specializing in construction scheduling and estimating, joined the Project Team to review the constructability of the proposed alternatives, to develop construction schedules, and to estimate temporary bridge costs.

All of the alternatives were compared based on hydraulic requirements; environmental, right of way, and utility impacts; maintenance of traffic, constructability, maintainability, geotechnical site conditions; and construction, life cycle, and user costs.

REPLACEMENT ALTERNATIVES

Alternatives 1, 2, and 5 would provide a new bridge. Many characteristics of the new bridge would be the same for each of the replacement alternatives; these will be discussed below before the specifics of each alternative are presented.

A new bridge would be a multi-span steel girder bridge, with 4 or 5 spans. Steel girder bridges are easily the most cost- effective new structure type for this site. To increase the life span of the new structure, the concrete deck would likely be reinforced with Glass Fiber Reinforced Polymer (GFRP) rebar and the steel girders would be metalized. Metalization of the girders will reduce corrosion from spray from the

Figure 4: Artist's rendering of a steel girder bridge

turbulent river beneath the bridge. The new bridge would have concrete wall abutments and solid shaft piers, all founded on the shallow bedrock at this site.

Any new bridge would include 11 foot lanes, 5 foot shoulders, and 5 foot sidewalks on each side. Having sidewalks on both sides of the bridge would connect the existing sidewalks on the approaches and would improve safety by reducing the need for pedestrians to cross the road. Having 5 foot shoulders and no adjacent bridge railing or truss verticals would dramatically improve the bridge for bicyclists. The current bridge has only 2 foot paved shoulders.

For new bridges on this site, the contractor would need a work trestle for access to construct the cofferdams and piers, to erect the structural steel superstructure, to place deck concrete, and to remove the existing bridge. A cost premium of $1 million is included in the estimate for each new bridge to account for this trestle. Installation of a work trestle at this site is unique due to the exposed and highly variable bedrock, exposure to high velocity flows, and proximity to the upstream dam.

Railings for a new bridge would meet all standards for vehicle and pedestrian safety. Railings go through stringent testing programs to ensure appropriate safety in a variety of situations. Only those railings that meet appropriate criteria can be used on a new bridge, based on the specific constraints of this site. MaineDOT’s standard 4-bar steel pedestrian and traffic rail is recommended if a new replacement bridge ends up being the preferred alternative, but input from the Towns of Brunswick and Topsham and the Section 106 consulting parties would be considered for the final selection of the rail type.

Figure 5: Rendering of a Possible New Bridge

During meetings with Officials from both Towns, requests were made to enhance the “River Walk Loop” that exists over the existing bridge and continues to the pedestrian bridge upstream of the dam. A new bridge at this site would include deck overlooks, where the sidewalk widens out to

provide viewpoints of the river upstream and downstream. In addition, the bridge would be lighted and lamp posts and fixtures would be ornamental and closely match the street lighting in the approaches. The MaineDOT would consider input from the Towns of Brunswick and Topsham and the Section 106 consulting parties for the final selection ofthebridgelightingduringfinal design.

Alternative 1: New 800 ft Bridge on Existing Alignment

Alternative 1 is a new 800 ft, five span, steel girder bridge on the existing alignment. The new bridge would have the characteristics discussed above that are similar for any replacement bridge on this site.

Because the new bridge would be constructed on the existing alignment, the old truss would have to be removed completely before new construction could begin. The limitations on in-water work add to the construction duration. Without a temporary bridge, this alternative would have a traffic disruption period of over 2 years.

Given the tremendous user costs and other impacts such a disruption would cause, a temporary bridge is required for this alternative. This adds another year to the construction duration, bringing the total construction time to 3.5 years. Unfortunately, this also increases the riverimpactsevenfurther—thisalternativewouldneedaworktrestleandatemporary bridge beyond the impacts of the new structure itself. Permanent environmental impacts would include the wetland footprint impact of 4 piers and riprap protected abutment slopes within the river channel. Two of the piers would be located near the edges of the Brunswick side powerhouse outfall channel.

The construction cost of this alternative is estimated at $16,000,000 (including the cost of a temporary bridge).

Alternative 1 Summary:

- New 800 ft bridge on the existing alignment
- 11 ft travel lanes with 5 ft shoulders and 5 ft sidewalks each side
- Construction Cost: $16 million
- Life Cycle Cost: $16.7 million
- Construction Duration: approximately 3.5 years
- Maintenance of Traffic: on-site temporary detour
- River Impacts: temporary work trestle, temporary bridge, 4 in-water piers, new
  slopes at abutments
- Meets Purpose and Need

Alternative 2: New 835 ft Bridge on Curved Upstream Alignment

Alternative 2 is a new 835 ft, five span, steel girder bridge on a curved upstream alignment. A curved bridge reduces the length of approach roadway construction and reduces right of way impacts to abutting properties. This structure would have a short southern span to better align the spans to bridge the Brookfield power station outflow channel with a minimum of impact. The remaining four spans would be continuous haunched steel girder spans with a concrete deck. The span arrangement and number of piers would be selected to minimize footprint impact within the channel and within the FERC Boundary and to maximize the efficiency of steel girder superstructure. Also, the existing hydraulic clearance over the river would be maintained as a minimum.

The estimated construction duration for this alternative is approximately 2.5 years. No temporary bridge is required since traffic could be maintained on the existing bridge during construction. A short term

(about 2 month) single lane northbound road closure and detour as described in the “Maintenance of Traffic” section for the New Alignment maintenance of traffic option would be needed during the final tie-in.

The four piers and the abutment slopes would be permanent wetland environmental impacts. Two of the piers would be located near the edges of the Brunswick side powerhouse outfall channel. Temporary environmental impacts would include the construction of a work trestle from the Topsham bank of the river out to the proposed Pier 2 location.

Figure 6: A Possible Curved Upstream Bridge

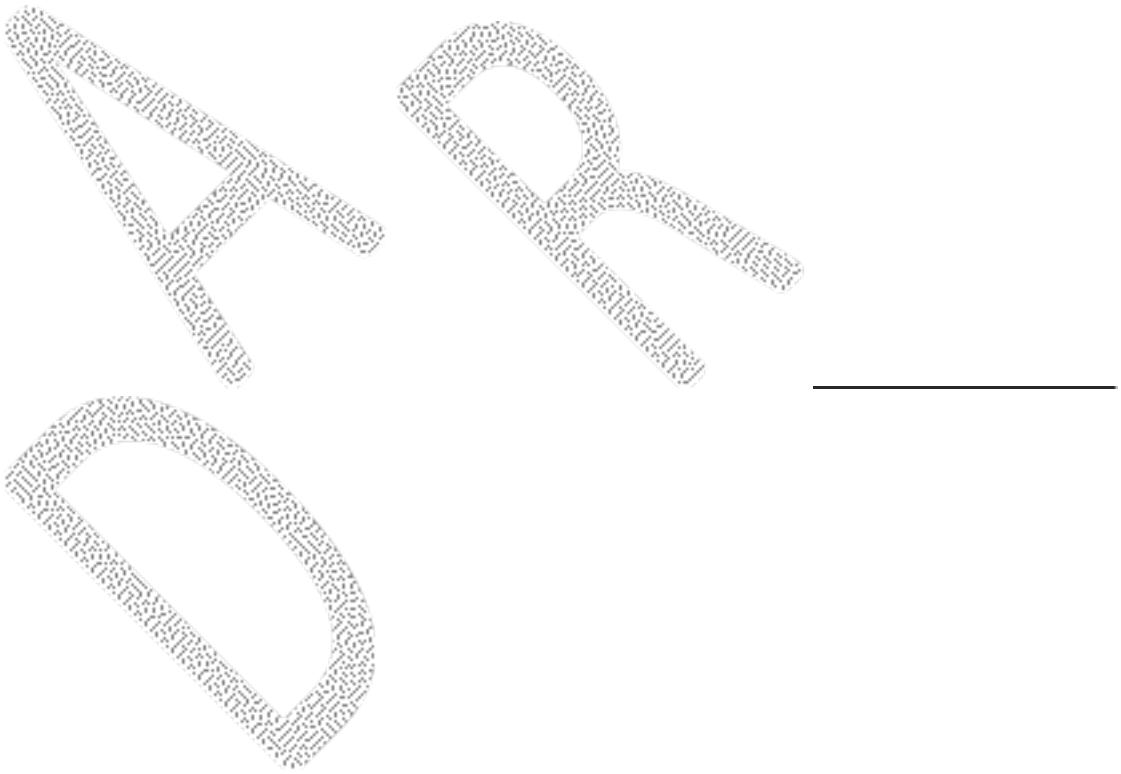
The construction cost of this alternative is estimated to be $13,000,000.

The life cycle construction cost of this alternative (Alternative 2 – Replacement Bridge on Parallel Upstream Alignment) is estimated to be $13,700,000. The life cycle cost includes costs for future inspection and maintenance (painting and wearing surface replacement) anticipated to be needed out to 100 years.

Alternative 2 Summary:

- 835 ft replacement bridge on a curved, upstream alignment

- 11 ft travel lanes with 5 ft shoulders and 5 ft sidewalks each side
- Construction Cost: $13 million
- Life Cycle Cost: $13.7 million
- Construction Duration: approximately 2.5 years
- Maintenance of Traffic: on existing bridge
- River Impacts: temporary work trestle, 4 in-water piers, slopes at abutments
- Meets Purpose and Need



Alternative 5: New 800 ft Bridge on Parallel Downstream Alignment

Alternative 5 is listed here, since like Alternatives 1 and 2 it is a new bridge. It would be a new 800 ft, five span steel girder bridge located downstream of the existing bridge on a straight alignment, between the current bridge and the Bowdoin Mill Complex parking lot. For all of the bridge alternatives, a hydraulic analysis was run to estimate how the river would behave with new piers added in the river. This analysis showed that a downstream replacement bridge will raise water levels at the Bowdoin Mill Complex, particularly the end of
the mill building where the Sea Dog Brewing Company is located. The models suggested that during the design flood, floodwaters would rise more than 6 feet higher than existing
conditions near the deck area of the Sea Dog. No reasonable approach to reduce that water rise could be found, so Alternate 5 was rejected.

REHABILITATION ALTERNATIVES

Alternative 3 and Alternative 4 are both rehabilitation options, where the existing truss bridge is repaired. Detailed inspections of the truss were done by MaineDOT in 2012, June 2016 and August 2016, and a load rating was done by MaineDOT in 2013 and updated in August 2016. These reports outline what needs to be done to bring the existing truss bridge up to the standards established as the “Purpose & Need” (because of “newly drafted Purpose and Need” this alternative has still not been seriously looked into) for this project, which were described above.

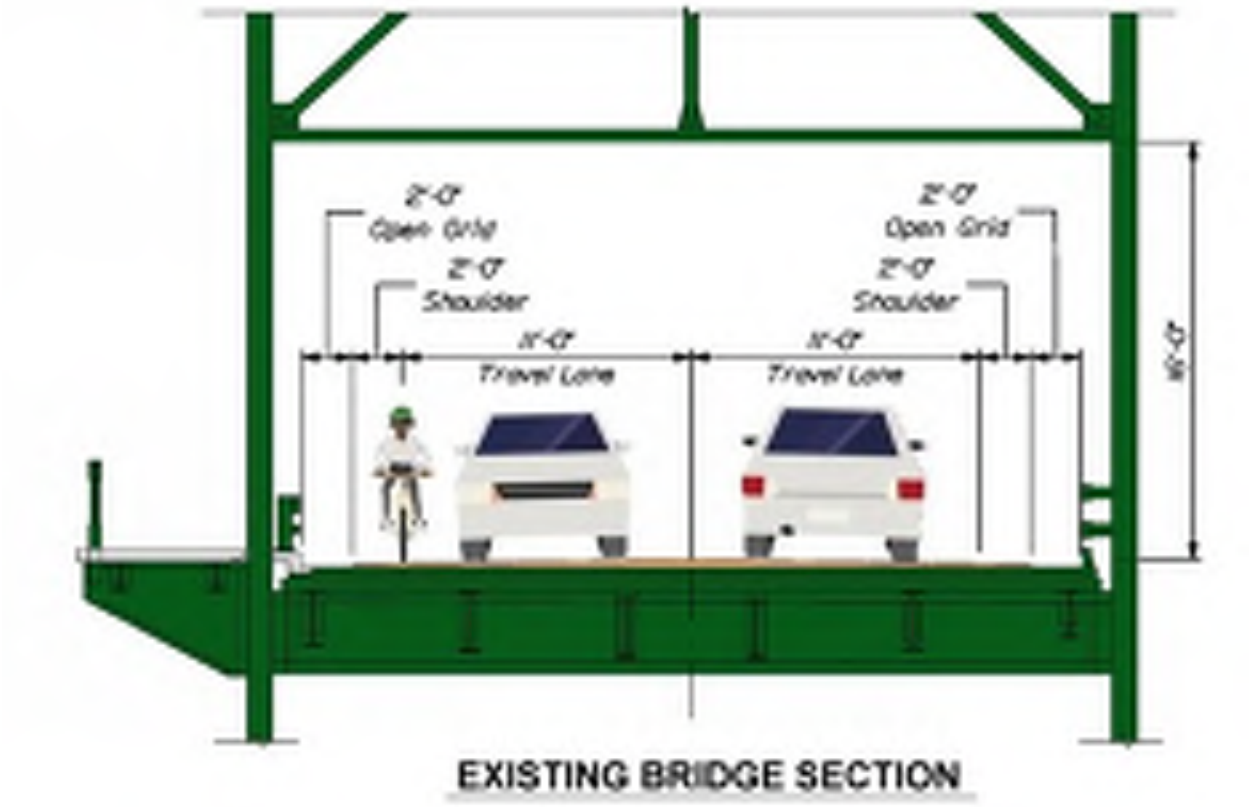


Figure 7: The existing truss bridge cross section

These repair needs will be described here, and the differences between the two rehabilitation alternatives will be discussed later. The needs are:

1. Replace existing bridge deck with a new reinforced concrete bridge deck with an integral concrete wearing surface. This includes the removal of the badly deteriorated transverse cross beams seen in Figure 8.

2. Repair the top of steel sidewalk support brackets. The top of each bracket is non- existent now due to corrosion or other past modifications.

3. Replace the bridge joints. Although these were replaced in 2015, replacement of the existing deck will require these to be replaced.

Figure 8: Deteriorated cross beams & deck

4. Replace the entire steel flooring system, including the longitudinal stringer beams and transverse floor beams. The floor system is heavily deteriorated and is below load carrying standards (see Figures 9 and 10).

A

Figure 10: Hole in floorbeam

Figure 9: Deteriorated floorbeam

5. Replace portions of the bottom chord of main trusses due to corrosion and distortion from pack rust, as seen in Figure 11.

6. Paint the entire steel truss superstructure, including all above and below deck components. Doing a comprehensive paint job on this structure is expected to cost about $4,000,000.

Figure 11: Bottom chord corrosion and debris

7. Replace all existing utility brackets that support the conduit and water lines on the truss. See Figure 12.

8. Remove and reuse the existing pedestrian sidewalk rail and bridge traffic rails. They will have to be removed to replace the deck and floor system.

9. Replace the abutment back walls due to the overall poor condition of these elements.

10. Repair areas of stone masonry with missing and loose stones at the south abutment by encasing the masonry in concrete due. See Figure 13.

Figure 12: Utility brackets

11. Replace cracked concrete bearing pedestals at Pier 2 supporting the east side truss of Span 3 near the Topsham end of the bridge. This work will also include removal, refurbishing, and resetting of the truss bearing at this support. See Figure 14.

Figure 13: Abutment masonry Figure 14: Damaged concrete pedestals

Once all of the listed repairs are completed, the structure will meet all design strength requirements for the foreseeable future. All repairs would be completed using modern design standards and construction practices to help them last as long as possible. (So this is Prudent?)

The existing bridge deck is a lightweight, concrete-filled steel grid deck. To keep from adding more weight to the truss, a new bare concrete bridge deck without a paved surface will be required. Some of the main truss members already have borderline load ratings, so increasing the weight of the structure is not acceptable. To improve durability of the new deck, it would likely be reinforced with non-corrosive GFRP rebar. A comprehensive drainage system would be added to limit moisture and salt on the lower parts of the truss; the existing deck has open drainage which lets salt and water from the road drop right onto the steel. (this needs further study. There are other alternatives that exist that provide light weight and are able to be paved

The existing 30 ft available travelway matches the existing approaches and would provide two 11 ft travel lanes with 4 ft shoulders bound by rails located along the inside of the trusses. 10 ft travel lanes with 5 ft shoulders for bicyclists were considered briefly but dismissed

as an option. The Department considers these narrower travel lanes as less safe given the high traffic volume, almost 19,000 vehicles per day, this bridge has. (this is not acceptable. I require more details then the Department decided. The bridge is posted at 25 mile per hour. We want safe slow traffic not a highway. Please provide studies and sources. We also know the Department wants a new bridge. The burden of proof is on the Department and statements like this do not build the department credit.

A full road closure is needed to complete all major truss rehabilitation activities except painting. The construction and traffic disruption duration for this alternative is approximately 20 months. The user costs and other impacts require a temporary bridge for this alternative. When the temporary bridge is added in, construction duration for this alternative is approximately 3 years. (has serious thought been given to using the bypass? It takes an extra 2 minutes to drive around. With proper signage and a temp light at the elm street bipass connection in Topsham this is a feasible alternative if it cuts down on the closure time significantly.

Rehabilitating the existing truss would preserve the existing river flow conditions and would have the least permanent environmental, right of way and utility impacts. It would also have the least impact to the National Register-Eligible historic bridge and districts. However, construction of a temporary bridge will still have temporary environmental impacts. Utilities on the truss will have to be temporarily relocated on the bridge during the rehab process.

Despite all efforts, a bridge rehabilitation will probably still require significant future maintenance. To get 75 more years of life, the bridge will need approximately 3 future paintings, 1 deck replacement, and 2 substructure rehabilitations, beyond the current project. All of these activities will disrupt traffic to varying degrees. Painting will disrupt traffic for about 8 months, and each deck replacement will disrupt traffic for about 6 months. (yes maintenance is required. The deck option needs further study and all road maintenance causes disruption. Main Street Topsham was paved this summer and it took over 2 months of disruption.

Based on past performance of the modern paint systems used by MaineDOT on similar truss bridges that also had pack rust, the truss will need to be painted about every 20 years. The current paint systems used today perform very well, replacing the previous lead-based paint systems. The paint successfully seals the steel and stops corrosion when

installed. It spans the seams of the built-up steel members and prevents water and air from getting to the steel. However, once the paint cracks at all, existing pack rust will immediately reactivate (see Figure 15). The existing truss has pack rust in (see Nathan Holt's reply)

Figure 15: Pack rust is corrosion in the numerous locations. To effectively maintain **crevice between two plates of steel that are**

structures with this condition, paint systems need

replacement more frequently. Painting a truss like

bolted or riveted together. As the rust progresses, it gradually pushes the pieces of steel apart, bending them and sometimes

this currently costs an estimated $4,000,000. To **breaking bolts or rivets. The only way to**

prevent pack rust and other corrosion issues from destroying the truss, future paint jobs would have to be budgeted for and done on a regular cycle.

truly fix pack rust is to take apart the plates of steel and clean them, which is usually not feasible.

Use of GFRP reinforcement would extend the life of a bare concrete deck, but without a high performance membrane and paved wearing surface that can be regularly replaced, 50 years of life is a good estimate. Based on the historic performance of similar aged bridges (currently 85 years old) and the age of the most recent major substructure rehabilitation (2006), additional substructure rehabilitations would be expected at years 20 and 50 following this current project.

Besides these major future maintenance efforts, there will be more frequent smaller repair efforts needed on the steel, bridge joints, and the aging substructure. This truss will also

require Routine and Fracture Critical Bridge Inspections, costing about $60,000 every two years.(can I get details on this… this seems extremely high- MDOT just did 2 inspections this summer and it cost $60,000 for a truck and two guys? They wrote an excellent report in less then 2 weeks. Please provide a detailed breakdown of costs and man hors. These inspections will also disrupt traffic, requiring a single lane closure for 1 to 2 weeks. If cracks in fatigue sensitive or fracture critical

members are found in these inspections, more frequent inspections or immediate repairs will be required.

Alternative 3: Rehabilitation of Existing Steel Truss Bridge:

Alternative 3 would rehabilitate the existing truss as outlined above. It would still have only one sidewalk, so pedestrian mobility and safety would not be improved. (this is a false statement and used only to disqualify this option. The open grid decking along the outside of the existing shoulders would be replaced with a solid concrete deck, improving the situation for bicyclists. However, the shoulders would still be only 4 feet wide and the railing right at the edge of the shoulder restricts the useable width for bicyclists even more. how is a railing any different then a 9" curb- ones bike peddle is still restricted by the same? It would still not be a very good bridge for bicyclists. Therefore, this alternative does not fully meet the pedestrian and bicyclist portion of the Purpose and Need for this project. Again if one changes the purpose and need to fit the desired outcome of course it doesn't. There are feasible and prudent options and a lot more studies that are required before this statement can be thrown out there.

The construction cost of this alternative is estimated at $15,000,000. This cost includes a 15 percent contingency above the repair work that has already been identified. Rehabilitation projects nearly always discover issues not previously found in inspections, causing budget overruns.

The overall life cycle construction cost of this alternative, including estimates for all future maintenance on the truss out to 75 years of life, is projected to be $20,800,000.

Early in the investigation of alternatives at this site, this alternative was examined as a 30 year rehabilitation and either maintaining one lane of traffic on the bridge or allowing a 5 to 7 month bridge closure. A replacement after 30 years would yield the lowest life cycle cost of any

rehabilitation option. Given changes to the rehabilitation scope since the latest bridge inspection and recognition of the user costs of the maintenance of traffic options, the initial cost of this alternative now must include a temporary bridge. The originally estimated construction cost of $8 million to rehabilitate the bridge now is $15 million after adding a full floor system replacement and an on-site temporary bridge detour.

Summary of Alternative 3:

- Rehabilitation of existing steel truss bridge
- 11 ft travel lanes with 4 ft shoulders each side and a 5 ft sidewalk on the West side
- Construction Cost: $15 million
- Life Cycle Cost: $20.8 million
- Construction Duration: approximately 3 years
- Maintenance of Traffic: on-site temporary detour
- River Impacts: temporary bridge, Abutment 1 repair work
- **Does not** meet Purpose and Need (pedestrian needs)

Alternative 4: Rehabilitation of Existing Steel Truss Bridge with Added East Sidewalk

Alternative 4 is also a rehabilitation of the existing truss, but with a second 5 foot sidewalk added on the opposite side of the bridge. This fully addresses the pedestrian issues at this site. Like Alternative 3, bicyclists would have 4 foot shoulders with adjacent traffic rails, a

less than ideal situation. However, this would still be better than the current condition for bicyclists. Alternative 4 adequately meets the Purpose and Need for this project. (so in the above one side walk option- the bike lanes are not adequate but on this one they aren't? One can't use the same argument for and against the same Purpose and needs. I have repeatedly asked for a study that proves a second side walk is necessary. If a proper study was done it would show that mid block cross walks are necessary- on the Topsham side the next block is 1/2 mile to Elm Street. There are solutions like under the abutments(below the bridge cross walks)… This needs further study.

To add the additional weight of a second sidewalk, weight must be taken off the truss somewhere else. The existing bridge deck would need to be replaced with a new lightweight concrete filled Exodermic deck.(if this deck will last 75 years with maintenance and without the second side walk take pavement- why wasn't it used in the first rehab option? An Exodermic deck system can be as much as fifty percent lighter than a conventional concrete deck of the same span. An Exodermic deck has exposed steel on the bottom of the deck, so future maintenance would be anticipated. Other lightweight deck configurations were also considered this is great- can you provide a list and explanation of each option considered, its pros and cons, cost and why it was ultimately not used. DETAILS. but no others were found light enough without even more expense. This alternative includes the addition of new structural steel framing, concrete deck, and pedestrian rail for the added 5 ft wide sidewalk on the east side of the bridge. Between the more expensive deck and the new sidewalk and framing, this option will have a construction cost about $2,000,000 more than Alternative 3.

The estimated construction duration for this alternative is approximately 3 years (similar to Alternative 3).

Hydraulic conditions, environmental impacts, right-of way impacts, utility impacts, maintenance of traffic and maintenance concerns for Alternative 4 would be the same as those noted for Alternative 3 with the exception of the impacts to the NR-Eligible Historic Bridge and Districts. The additional sidewalk is an addition that is not part of the NR-Eligible Historic Bridge.

The construction cost of this alternative is estimated at $17,000,000. The life cycle cost of this alternative, including estimates for all future maintenance on the truss out to 75 years of life, is estimated to be $23,200,000. Every figure in this needs an appendix that breaks it down to specifics, materials, man hours, contingencies, etc…

Summary of Alternative 4:

- Rehabilitation of existing steel truss bridge with added east sidewalk

- 11 ft travel lanes with 4 ft shoulders and 5 ft sidewalks each side

- Construction Cost: $17 million

- Life Cycle Cost: $23.2 million

- Construction Duration: approximately 3 years

- Maintenance of Traffic: on-site temporary detour

- River Impacts: temporary bridge, Abutment 1 concrete work

- Meets Purpose and Need

  Repurpose Existing Bridge and Build a New Replacement Bridge

  An additional alternative suggested by the public was to '*Restore and repurpose the historic bridge for pedestrian and bicycle use, and as a public historic park. Build a new bridge on alternative alignment.'* This is a combination of two alternatives discussed above, Alternatives 2 and 3. All work to preserve the existing bridge under Alternative 3 would still be required, except possibly rehabilitating the sidewalk. Conservatively, the construction cost of this rehabilitation could be reduced to $9.5 million (with the removal of the sidewalk), and there would be no need for a temporary bridge. This alternative would also require the cost of a

new replacement bridge, Alternative 2, at $13 million, for a total construction cost of $22.5 million. The question of future ownership and maintenance responsibility for the truss would

have to be addressed. Also, the effect on river water levels from having more piers permanently in the river channel would need investigation.

MAINTENANCE OF TRAFFIC

Four options were investigated to maintain traffic at this site during construction. They are not all feasible for all of the bridge improvement alternatives. Specifics for each alternative, along with estimated traffic disruption durations and user costs, are discussed later in this report.

1. Complete road closure with a detour. Detour all traffic along U.S. Route 1, State Route 196, and State Route 24. Can this be explained and the cost of $22,000 per day be broken down as with

the increased speed in which the rehab could be achieved?

2. Single lane closure with staged construction. One way, southbound traffic will be carried across the bridge on a 12 foot travelway and all northbound traffic will be detoured. This option can only work for certain construction activities, like painting. This traffic control method has been used successfully in the past on the Frank J. Wood Bridge.

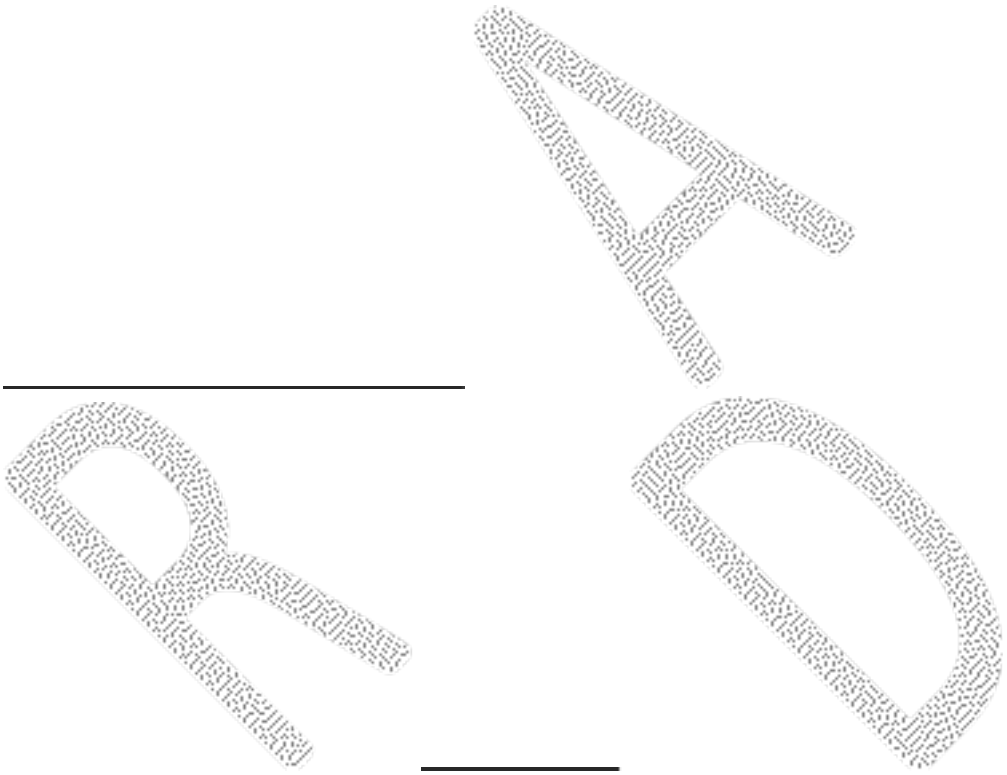
3. On-site detour on temporary bridge. Construct a 2 lane temporary bridge parallel to the existing bridge and detour all traffic onto it. Traffic would only be disrupted during the construction of tie-ins to the existing roadway and to the new roadway upon conclusion of the project. These disruptions could be limited by requiring work be done during off-peak hours. Construction and removal of the temporary bridge would likely extend the total construction duration by about 1 1⁄2 years (1 construction season for construction of the temporary bridge and half a season for its removal). The cost for a temporary bridge is estimated to be about $4 million.

4. New alignment. If a new bridge is constructed on a new alignment, the existing bridge could be used to maintain traffic during construction. Traffic would primarily be disrupted during construction of the final tie-in. Again, this could be mitigated by requiring work during off-peak hours. This option would result in the least traffic disruption.

Staged construction maintaining two-way traffic is not feasible due to the existing structure type and needed rehabilitation repairs. Alternating

one-way traffic is not feasible because of the traffic volume and proximity of signalized intersections.

Traffic disruption results in indirect costs to the users of the bridge and to the surrounding businesses. A user cost may be estimated for the delays to the traveling public, assigning a dollar value to the disruption. Daily user costs were prepared by MaineDOT estimating costs associated with delays at intersections and additional miles traveled. The user cost for a complete road closure is estimated at almost $22,000 per day, while the user cost for a northbound lane closure is estimated at over $10,000 per day. This cost will be compared with that of a temporary bridge to determine whether paying for a temporary bridge is justified for a given construction alternative. (can we see this in details?)



UTILITIES

A hydropower dam operated by Brookfield Renewable Energy Partners (Brookfield) is located about 500 ft upstream of the existing bridge crossing. No impacts (including hydraulic impacts) to this facility are anticipated for any of the bridge improvement alternatives investigated.

Overhead utilities and a water main are carried by the existing bridge. Temporary support or relocation of these facilities within the limits of the existing bridge would be needed during a bridge rehabilitation.

With a bridge replacement, these facilities would need to be relocated. Some of the utility poles in the approaches would also need to be relocated. The overhead utilities would need to transition to underground in the approaches close to the replacement bridge ends. The overhead utilities and the waterline would be carried on the bridge below the bridge deck, between girders, out of sight.

RIGHT OF WAY

A bridge rehabilitation or bridge replacement on the existing alignment would not require permanent property impacts. However, temporary property rights would be needed for any temporary bridge.

Construction of a replacement bridge on a new upstream alignment would require permanent property acquisitions of parts of two properties on the west side of the south approach and one property on each side of the north approach. The south approach property impacts would include reconstruction of a retaining wall between the drive entrances to the small Fort Andross parking lot and the Brookfield hydroelectric station at the dam. The 250th Anniversary Park located at the southeast corner of the bridge is a Brunswick town park constructed on land leased from Brookfield. The only park impacts would be fill slopes within the existing State-owned right of way. The north approach would have a new 130-ft-long retaining wall along the northwest approach to limit impacts to the property and parking area. Reconstruction of the drive entrance to the Bowdoin Mill complex will require impacts beyond the existing MaineDOT right of way.

Temporary property rights would be needed to construct work access platforms like work trestles. These rights would be similar to temporary rights needed for a temporary bridge.

Additionally, for an upstream bridge replacement alternative, the abutments and three of the four bridge piers would be located within the limits of the Federal Energy Regulatory Commission (FERC) Boundary of the dam. Temporary property rights would be needed for construction access along the north side of the approaches and within the FERC Boundary.

ENVIRONMENTAL

Endangered species such as the shortnose sturgeon and Atlantic sturgeon spawn in the project area. This project is within Essential Fish Habitat and permanent and temporary impacts need to be avoided or minimized. In-water work must be avoided during crucial migrating periods. This restriction is in place from April 7 to August 30, and will be a substantial constraint on construction durations. Impacts to the Brunswick Fishway at the Brookfield dam will be avoided and requests to shade the Fishway from moving shadows produced by construction equipment and the traveling public will be considered.

The existing bridge is eligible for listing on the National Register of Historic Places as part of the Brunswick-Topsham Industrial Historic District, which is considered National Register- Eligible. It is also abutting the National Register-Listed Pejepscot Paper Company Historic District.

If a temporary bridge is used to maintain traffic for either a bridge rehabilitation or bridge replacement, then temporary environmental impacts would occur within the existing Androscoggin River.

Construction of a new replacement bridge would have environmental impacts that would need to be minimized or mitigated. Permanent impacts would include the piers and pier foundations within the channel. Foundation locations should avoid the Brunswick side powerhouse outfall river channel that leads to the dam fishway by taking advantage of ledge outcrops where possible.

Figure 3: Two types of temporary impacts

Also,ifatemporaryworktrestleisneededfortheconstructionofa newreplacement bridge or to rehabilitate the existing bridge, temporary environmental impacts would occur and would need to be addressed.

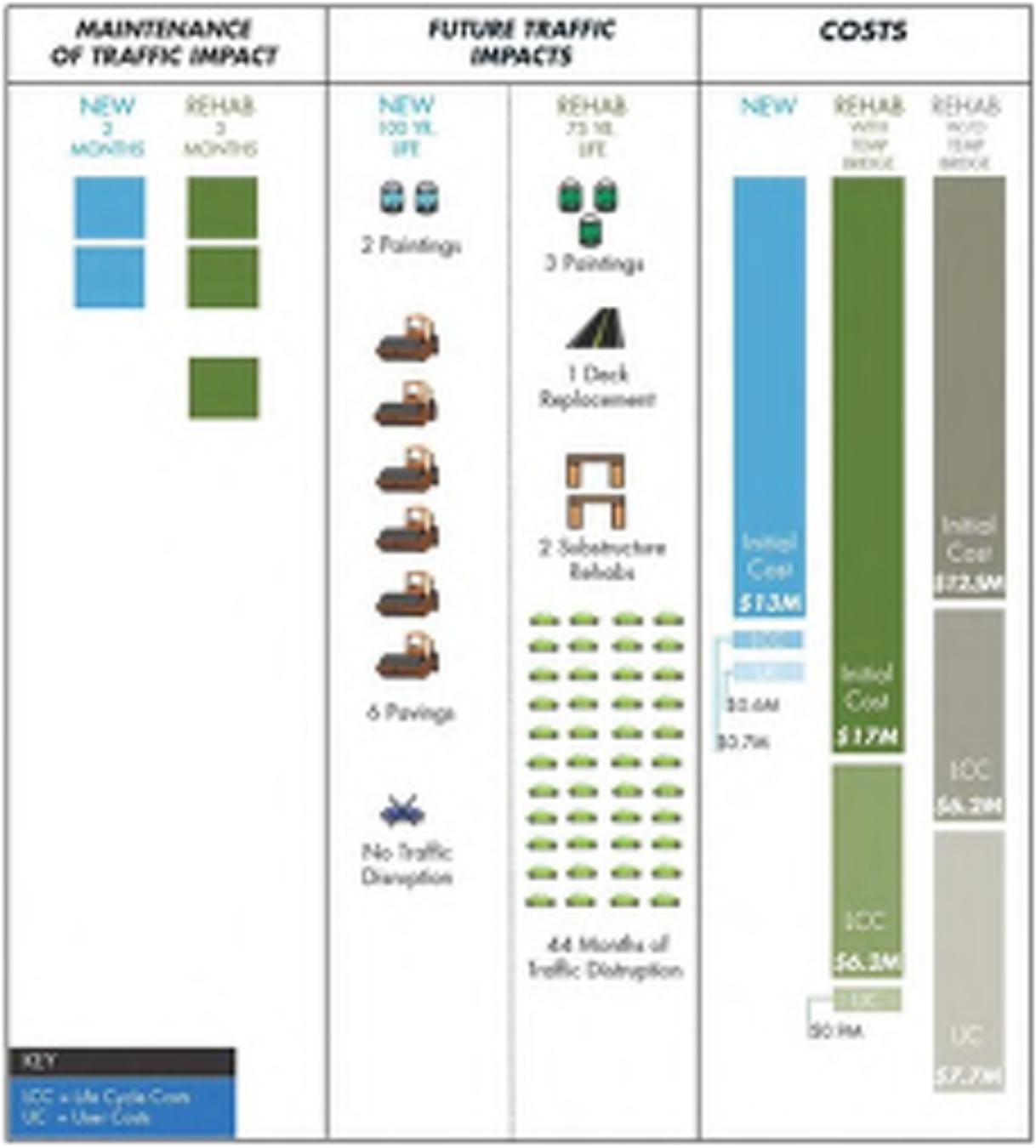
Historic impacts and avoidance and minimization strategies will be determined through the ongoing Section 106, 4(f) and NEPA processes.

LIFE CYCLE COST ESTIMATE

Life cycle costs are considered in the comparison of bridge improvement alternatives. A life cycle cost estimate (LCCE) totals all estimated bridge costs throughout the life of each bridge improvement alternative and translates them to current dollar equivalents. The LCCE accounts for estimated construction costs on the current project and the translated present value of anticipated future inspection, maintenance, and rehabilitation. It also accounts for anticipated future bridge replacement dates for each alternative. Specifics of the life cycle costs for each alternative are discussed later in this report.

GRAPHIC COMPARISON

The graphic below compares Alternative 2 (the low cost replacement or new option) and Alternative 4 (the best rehab option). Three main areas are contrasted: maintenance of traffic during construction, future rehabilitation and maintenance, and total costs.


MAINTENANCE OF TRAFFIC IMPACT
NEW
2 MONTHS
REHAB
2 MONTHS
FUTURE TRAFFIC IMPACTS
NEW
100 YR. LIFE
2 Paintings
6 Pavings
No Traffic Disruption
REHAB
75 YR. LIFE
3 Paintings
1 Deck Replacement
2 Substructure Rehabs
44 Months of Traffic Disruption
COSTS
NEW
REHAB
REHAB
Initial Cost
$13M
$0.6M
$0.7M
Initial Cost
$17M
LCC
$6.2M
$0.9M
Initial Cost
$12.5M
LCC
$6.2M
UC
$7.2M
KEY
LCC = Life Cycle Costs
UC = User Costs

pavingings have impacts- even at night they effect local night time businesses.

From:	John Shattuck
To:	Chase, Cassandra (FHWA); Kittredge, Joel
Cc:	Dave Douglass; Marie Brillant; Roland Tufts; Ruth Lyons (Seleperson); Bill Thompson; Rich Roedner
Subject:	Topsham Selectmen"s §106 Review comments
Date:	Friday, December 02, 2016 12:35:03 PM
Attachments:	2016-12-01 Topsham BOS §106 Comments.pdf

CASSIE & JOEL: Attached please find the Topsham Selectmen's comments submitted for your consideration as you develop your report on the §106 Review. Please don't hesitate to let me know if you would like the original hardcopy of the attached letter. Thank you, John

--
John Shattuck
Director, Economic & Community Development
Town of Topsham
100 Main Street
Topsham ME 04086

Office: (207) 373-5097
Mobile: (207) 650-0012
Email: jshattuck@TopshamMaine.com

Topsham because: http://youtu.be/Y_luU6wJMOU

Board of Selectmen
100 Main Street
Topsham, ME 04086

Phone: 207-725-5821
Fax: 207-725-1731

December 1, 2016

Cassandra Chase
Environmental Engineer
Federal Highway Administration – Maine Division
US Department of Transportation

Joel Kittredge
Project Manager
Maine Department of Transportation

Re: Frank J. Wood Bridge §106 Review

Dear Ms. Chase & Mr. Kittredge:

Please accept our thanks for your attention to the critically important issues of historic and environmental impacts involved in deciding whether the current Frank Wood Bridge should be rehabilitated or replaced.

As you are aware, in June of this year we unanimously adopted a resolution supporting the replacement of the Frank Wood Bridge for a variety of reasons enumerated in the resolution, which is attached. We write today to reiterate our conviction that replacement is still the best option and that the case for replacement has only grown stronger as additional information has been made available by the Maine Department of Transportation, as well as through your review process and the efforts of the Brunswick-Topsham Bridge Design Advisory Committee.

This §106 Review has attracted strong interest and requests for consulting party status designation from a wide array of individuals and organizations, including a number located far from our community and many without any prior history of involvement in historic preservation, or involvement in local government as elected officials, staff professionals or even as volunteers. In a review process that includes relatively few statutorily entitled consulting parties under 36 CFR §800.2, we would respectfully note that we are such a statutorily designated consulting party, as well as being the only Review participant representing a local government.

We agree that a careful review of historic and environmental impacts are essential to a balanced and fully informed decision on the disposition of the bridge, but we also recognize that they cannot be the

sole and controlling considerations in reaching that decision. Accordingly, we respectfully request that you carefully consider the following additional input of duly-elected local officials with respect to the environmental, historic, and financial impacts of this decision.

Environmental impacts

With regard to the differing environmental impacts of rehabilitation or replacement, we believe that there can be little doubt that replacement will present far less risk of environmental degradation to the river than would inevitably result from a major, lengthy initial rehabilitation and reconstruction project, followed by many recurring (if smaller scale) rehabilitation, repair and rebuilding cycles to ensure that this incredibly intricate web of aged and continuously corroding metal remains structurally sound and safe to use. This is a bridge that has been shedding lead paint and lead-impregnated steel into the Androscoggin River for more than eight decades. The obsolete materials and the equally obsolete structural technology employed in the design of this bridge guarantees that corrosion will continue to occur at the thousands of joints, through-bolts and layered plates throughout the bridge and will require repeated repainting to slow, but not defeat, the ongoing decay.

Despite improvements in paint formulations, and the best efforts at containment during repeated reconstruction and repainting, it's indisputable that this structure will continue to deposit far more paint and metal corrosion byproducts into the river than would a new bridge. A replacement bridge, built with vastly more corrosion-resistant modern materials, and with far less (and enormously less fragmented) exposed metal will require much less extensive and less frequent painting and maintenance – with the result that adverse environmental impacts will be hugely reduced.

Our State and riverfront communities have invested substantial resources in the restoration of the shamefully degraded environment of the Androscoggin River. If maintaining that success and further restoring our river is important – and it definitely is – then the choice between rehabilitation and replacement should not be a close call.

Historical impacts

With regard to the differing historical impacts of rehabilitation or replacement, we believe that replacement offers far superior opportunities to recognize, celebrate and enjoy the historic significance of both the natural and built environments at this unique site. To date, the §106 Review has included repeated assertions that the Frank Wood Bridge is historically important from both engineering and aesthetic perspectives, and that it constitutes an inseparable, intrinsic piece of a single fabric incorporating the bridge and our two communities' waterfront mills.

Based on the historic record, we respectfully disagree.

While the Boston Bridge Works certainly built some beautiful bridges, this technologically simple bridge, with little consideration or expense devoted to aesthetic elements, is not one of their artistic successes – a comparison to the company's Tyngsborough Bridge is illustrative. In the 1930s, as is still the case today, Maine was a state with limited economic resources and a disproportionately high number of road miles and river crossings in relation to its small population. The current bridge was

chosen from a pattern book, with cost considerations paramount, to meet critical transportation needs, not to make an aesthetic statement.

Another telling comparison lies just a few hundred yards upstream from the current bridge: the Androscoggin Swinging Bridge. This 124-year-old bridge was built by the John A. Roebling's Sons Company, one of the premier bridge designers and builders of their day, perhaps best known for building the Brooklyn Bridge. Even though it was built 40 years earlier, the Swinging Bridge's tower and cable suspension engineering was a far more sophisticated building technique than the through-truss method employed in the Wood Bridge. Truss bridge technology was the predominate approach in bridge construction beginning in the 1870s, but, when the Wood Bridge was built, this method was already being abandoned across the most of country in favor of concrete girder and beam bridges or suspension bridges, for longer spans.

The Swinging Bridge is not simply a National Register eligible structure; it has been listed on the National Register of Historic Places since 2004, and in 2011 the Maine Section of the American Society of Civil Engineers recognized it as a Maine Historic Civil Engineering Landmark. This bridge is intimately tied to the history of both our towns and the mill workers it was built to serve, and is particularly significant in illuminating the social and cultural history of that time.

While aesthetic evaluations are necessarily subjective, we believe that most in our communities would agree that, with its elegant arcs and lines, the Swinging Bridge is far more appealing than the boxy, asymmetrical Wood Bridge superstructure, which obscures views of Topsham's and Brunswick's historic waterfronts, and the river itself, from all of us.

The contention that the Wood Bridge constitutes an inseparable, intrinsic piece of a single fabric incorporating the bridge and our two communities' waterfront mills is discredited by the history of the bridge. The Wood Bridge was built well over a century later than the Brunswick mill, and more than 60 years later than Topsham's Pejepscot Mill. Indeed, the Wood Bridge replaced a bridge that actually connected directly to the Pejepscot Mill, where Topsham's Main Street ran through the center of the mill complex. So, the placement of Wood Bridge actually disregarded this historic connection to the mill and realigned Main Street, substantially disrupting the fabric of Topsham's historic Lower Village and displacing long-standing buildings to make way for the rerouted Main Street.

By contrast, the Maine Department of Transportation's proposed replacement bridge would tie in to the existing road alignments in both Topsham and Brunswick with minimal disruption, and with no buildings displaced.

Even a relatively casual review of the history of the Pejepscot Falls reveals that the current bridge is merely one of at least nine bridges constructed in this area and, more importantly, that the enduring historic significance of this location arises from the existence of the Pejepscot Falls across centuries, not from the ephemeral bridges that have been built nearby. The falls were the site of very lengthy habitation and intensive fishing by Native Americans long before European colonists arrived. This was the site of the earliest Colonial precursors of our two towns, as settlers were drawn here by the abundant fishing resource and, later, by the hydro power provided by the falls.

Insisting on the preservation of what is only the most recent of the many bridges at this site disproportionately elevates an ancillary structure, and a brief instant of time, over the full and rich historical context of this location. Such an approach is historic distortion, not meaningful historic preservation. Simply put, the history of this site is much bigger than any one bridge.

We believe that the construction of the proposed replacement bridge would do far more to preserve and respect our local historic legacy – both natural and built – than would the protracted and repeated rehabilitation of a single structure that is not historically significant on technological, aesthetic or cultural grounds. The mere accumulation of years does not create significance.

Unlike the Wood Bridge, the proposed replacement bridge would enable all of us to enjoy unobstructed views of the historic waterfronts of both towns, particularly the historic and appealing Cabot and Pejepscot Mills, which both preceded the Wood Bridge by many years and which were both built with far more attention to aesthetic impact. We would also gain open, sweeping views of our beautiful river for the first time in living memory.

These views constitute a genuine historic – and natural - legacy that is worthy of restoration, preservation and celebration.

We recognize that, by law, the §106 Review is focused solely on historic and environmental issues. And, for the reasons set forth above, we believe that replacement of the exiting bridge is clearly the superior alternative, even based solely on historic and environmental impacts.

But, as elected officials, we are also accountable to our constituents for thoughtful, effective and efficient use of their taxes and for prudent stewardship of public property and resources, including infrastructure.

Financial impacts

The Maine Department of Transportation's draft Matrix of Alternatives, released on October 26th, 2016, includes preliminary cost information, which compellingly reinforces the already strong case for the replacement alternative. We understand that the two alternatives that are most likely to be the final options are: Upstream replacement (Alternative 2) and Rehabilitation with the addition of a second sidewalk (Alternative 4). The Matrix projects that the initial construction cost for Alternative 2 will be 13 million dollars, while for Alternative 4 the initial rehabilitation cost will be 17 million dollars, nearly a third more expensive. The Matrix reports that estimated life cycle costs, even discounted for present value, would be nearly 10 million dollars more for the rehabilitation alternative.

Although our municipality would not bear these costs directly, Topsham's residents, and all the residents of Maine, will bear these costs. Given our State's limited economic resources, and our growing but chronically underfunded infrastructure needs, expending 10 million dollars more than necessary for this bridge infrastructure would be neither prudent nor reasonable.

It is our understanding that some advocates for the rehabilitation alternative have proposed eliminating key elements of the preferred rehabilitation plan (Alternative 4), apparently for the sole purpose of

bringing down the higher cost of rehabilitation in comparison to replacement. The much enhanced pedestrian and cycling facilities of a new bridge enjoy broad public support and would be a major contributor to our Board's long-term efforts to develop the Lower Village and improve the connection between Topsham's and Brunswick's Main/e Streets and historic downtowns.

In addition to unnecessary maintenance costs, a decision to rehabilitate will impose a dramatically greater financial hardship on local business and travelers. Closures would be more frequent with a rehabilitated bridge, as clearly documented in MDOT's 2016-10-27 draft Summary of Alternatives. Each one of these closures will mean less business for our local businesses, and will generate losses that they must simply endure without compensation. Even though we understand that these business losses are not a formal part of your evaluation, they are nonetheless the very real and substantial consequences of a rehabilitation decision. By contrast, a replacement decision would minimize business losses in the short and long term. With the daily trip count at this crossing already approaching 19,000 vehicles a day, closures will impose a heavy burden not just on our town, but will disrupt traffic and commerce across our region.

In summary, we believe that expending 10 million more discounted dollars than necessary to maintain a decaying bridge would be irresponsible and indefensible in this period of limited finances, especially when one considers that a rehabilitated bridge will:

- be less accessible and functional for all users,
- be more detrimental to the environment,
- obstruct our shared legacy of historic built and natural view-sheds,
- repeatedly disrupt travelers and businesses with far more frequent and longer closures,
- have a shorter functional life,
- and cost substantially more to maintain.

.

Thank you for your attentive consideration of our concerns.

Sincerely,

David Douglass

William Thompson

Marie Brillant

Ruth Lyons

Roland Tufts

From:	John Shattuck
To:	Chase, Cassandra (FHWA); Kittredge, Joel
Cc:	Dave Douglass; Marie Brillant; Roland Tufts; Ruth Lyons (Seleperson); Bill Thompson; Rich Roedner
Subject:	§106 Review comments - local resolutions, letters and published comments
Date:	Friday, December 02, 2016 3:04:23 PM
Attachments:	2106-12-02 §106 comments - resolutions, letters & published comments.pdf

CASSIE & JOEL: Attached please find a packet of the below-listed local resolutions, letters and published comments in support of the replacement of the Frank Wood Bridge with a new bridge. Please note that the packet includes resolutions from the Topsham Selectmen, the municipal economic development corporations of both Topsham and Brunswick, the Southern Midcoast Maine Chamber of Commerce representing over 500 businesses in the Brunswick-Topsham region served by the bridge, as well as the Brunswick Bicycle Pedestrian Advisory Committee and the Bicycle Coalition of Maine. Please don't hesitate to let me know if you would like the hardcopies of these documents of the attached letter. Thank you, John

RESOLUTIONS & LETTERS SUPPORTING NEW BRUNSWICK-TOPSHAM BRIDGE

RESOLUTIONS

2016-05-12 Topsham Lower Village Development Committee
2016-05-26 Southern Midcoast Maine Chamber of Commerce
2016-06-01 Brunswick Development Corporation
2016-06-01 Topsham Development, Inc. Board of Directors
2016-06-02 Topsham Board of Selectmen
2016-06-22 Brunswick Bicycle Pedestrian Advisory Committee
2016-08-15 Bicycle Coalition of Maine

LETTERS

2016-06-01 Curtis Picard to Topsham Board of Selectmen
2016-06-03 Douglas Bennett to Topsham Board of Selectmen
2016-10-26 Sue Spann-ReMax Riverside to §106 Review
2016-10-27 Kevin Clark-Sitelines to §106 Review

PUBLISHED COMMENTS

2016-05-04 Bruce Van Note guest column – Times Record
2016-07-20 Douglas Bennett guest column – Times Record
2016-11-11 Douglas Bennett guest column – Times Record

--
John Shattuck
Director, Economic & Community Development
Town of Topsham
100 Main Street
Topsham ME 04086

Office: (207) 373-5097
Mobile: (207) 650-0012
Email: jshattuck@TopshamMaine.com

Topsham because: http://youtu.be/Y_luU6wJMOU

RESOLUTIONS & LETTERS SUPPORTING NEW BRUNSWICK-TOPSHAM BRIDGE

RESOLUTIONS

2016-05-12 Topsham Lower Village Development Committee
2016-05-26 Southern Midcoast Maine Chamber of Commerce
2016-06-01 Brunswick Development Corporation
2016-06-01 Topsham Development, Inc. Board of Directors
2016-06-02 Topsham Board of Selectmen
2016-06-22 Brunswick Bicycle Pedestrian Advisory Committee
2016-08-15 Bicycle Coalition of Maine

LETTERS

2016-06-01 Curtis Picard to Topsham Board of Selectmen
2016-06-03 Douglas Bennett to Topsham Board of Selectmen
2016-10-26 Sue Spann-ReMax Riverside to §106 Review
2016-10-27 Kevin Clark-Sitelines to §106 Review

PUBLISHED COMMENTS

2016-05-04 Bruce Van Note guest column – Times Record
2016-07-20 Douglas Bennett guest column – Times Record
2016-11-11 Douglas Bennett guest column – Times Record

RESOLUTIONS

Resolution Regarding the Bridge Between Topsham and Brunswick
Topsham Lower Village Development Committee
Adopted: May 12, 2016

The Lower Village Development Committee endorses construction of a new bridge to replace the current Frank J. Wood Bridge, noting that the new bridge will connect the two village centers of Topsham and Brunswick and should be designed, in function and appearance, to further the residential and commercial purposes of the two historic village centers. More specifically:

1. We want a new bridge design that works in a manner that complements the 196 Coastal Connector Bridge, which is really a by-pass bridge. Each should be expected to serve different purposes, and drivers should be encouraged to choose which bridge they use based on those intended different purposes.
   The By-Pass Bridge should
   - move traffic quickly around the towns to destinations beyond the town centers.

   The Maine/Main Street Bridge should
   - connect meaningfully and purposefully to two village centers.

2. We want a new bridge design that encourages economic development in the two villages the bridge connects. It should
   - facilitate walkability in the village centers at either end, and
   - facilitate cars parking and turning in the villages at either end and allowing cars to turn left or right onto Main/Maine Street when errands are completed.

3. We want a new bridge design that provides both safety and the feeling of safety for cyclists and pedestrians as well as motor vehicle drivers. More specifically, the design should
   - facilitate pedestrian crossing at either end where the bridge connects to the villages.
   - move traffic in a manner that makes the village streets at either end *complete streets*: streets that work for cars, bicycles and pedestrians, streets that work for children and seniors as well as other adults, and streets that work for those with disabilities.

4. We want a new bridge design that is attractive and appropriate in appearance to its setting because we know that viewscape is important to people choosing to live in Brunswick and Topsham. More specifically, the design should
   - be appropriate in appearance to the historic setting when viewed from the villages.
   - allow views of the river.
   - allow views of the mills and surrounding historic settings from the bridge.

_____

Douglas Bennett
On behalf of the Lower Village Redevelopment Committee

Southern Midcoast
MAINE CHAMBER
Increasing Prosperity in our Region

Southern Midcoast Maine Chamber
RESOLUTION REGARDING THE TOPSHAM-BRUNSWICK BRIDGE
Adopted: May 26, 2016
http://www.midcoastmaine.com/blog/post/southern-midcoast-maine-chamber-resolution-regarding-the-topsham-brunswick-bridge-adopted-may-26-2016

WHEREAS: The Directors of the Southern Midcoast Maine Chamber of Commerce acknowledge and respect the long service of the Frank J. Wood Bridge, but also express the following very strong concerns regarding continued reliance on this 84-year-old bridge:

- Accelerating deterioration in the condition of the existing bridge
- Increasing maintenance and inspection costs associated with a rehabilitated bridge
- Very substantial adverse impacts to local businesses arising from the repeated, lengthy closures required for rehabilitation of the existing bridge
- Much lower life-cycle costs of a new bridge
- Significantly improved and safer transportation facilities provided by a new bridge for all users, including pedestrians and bicyclists
- The fact that the bridge would still need to be replaced – at even higher cost – at the end of the limited additional useful life resulting from a rehabilitation
- The recommendation of the Maine Department of Transportation that the existing bridge be replaced, based upon more than a year of careful consideration of all alternatives, including rehabilitation

BE IT RESOLVED, THEREFORE: That the Directors of the Southern Midcoast Maine Chamber of Commerce fully support the replacement of the Frank J. Wood Bridge with a new bridge that includes improved access and safety for all users, including pedestrians and bicyclists, and minimizes the current and future financial impacts on our communities. Furthermore, to ensure local input on the design of the bridge, the Directors encourage the Towns of Brunswick and Topsham to establish a joint Design Advisory Committee to work with the Maine Department of Transportation to optimize the final design for the new bridge.

Brunswick Development Corporation
85 Union Street
Brunswick, Maine 04011

June 1, 2016

Joel Kittredge, Project Manager
Maine Department of Transportation
16 State House Station
Augusta, Maine 04333-0016

Dear Mr. Kittredge:

The Brunswick Development Corporation (BDC) was created in 1995 to encourage and promote the development of business enterprises within the Town of Brunswick, Maine for purposes of stimulating economic development by, among other things, providing incentives for businesses to locate and expand in Brunswick and to construct and expand facilities incorporating new techniques, and for purposes of maintaining and improving the economic health of the Town, lessening the burdens of government, and providing for additional employment opportunities and increased tax base within the Town. Infrastructure improvements, such as rehabilitating or replacing the current Brunswick-Topsham bridge, fall within the parameters of stimulating economic development in Brunswick and as such are of concern to the BDC.

Based on the presentations that the Maine Department of Transportation (DOT) has made to the Brunswick Town Council and the general public in the Brunswick-Topsham area on April 19, 2016 and April 27, 2016 respectively, it appears that continued investment in the 84 year old Frank J. Wood bridge would not be the preferred option, due to the rehabilitation costs, limited life cycle, and expensive, labor-intensive follow-up maintenance. While the BDC Board recognizes that the existing bridge has advocates for its rehabilitation, we also appreciate the benefits that can accrue to the Brunswick and Topsham communities if a new bridge is put in place, such as improved access and safety for pedestrians and bicyclists, observation "bump-outs" for upstream and downstream viewing of the river, reduced maintenance and inspection costs, and a longer life cycle. In addition, the prospect of the potential closures, associated with the rehabilitation of the existing bridge, that are anticipated to be for five to seven months per year for two or three years, constitutes an unacceptable burden on our Town's businesses, particularly those in our downtown.

Therefore, the BDC Board voted at its May 20, 2016 meeting to support the recommendation of the Maine DOT that the existing bridge be replaced, based upon more than a year of careful consideration of all alternatives, including rehabilitation. We appreciate the Maine DOT opportunity to provide comments on its recommendation and applaud its invitation to Brunswick and Topsham municipalities to appoint representatives to a Design Advisory Team to help increase the new bridge's aesthetic appeal for both communities.

Sincerely,

Larissa Darcy
BDC President

Cc: John Eldridge, Brunswick Town Manager

TOPSHAM DEVELOPMENT, INC.
RESOLUTION REGARDING THE TOPSHAM-BRUNSWICK BRIDGE
Adopted: 2016-06-01

WHEREAS: The Directors of Topsham Development, Inc. acknowledge and respect the long service of the Frank J. Wood Bridge, but also express very strong concerns regarding continued reliance on this 84-year-old bridge and note that the following considerations all demonstrate the need for a new Topsham-Brunswick bridge:

- Accelerating deterioration in the condition of the existing bridge
- Increasing maintenance and inspection costs associated with a rehabilitated bridge
- Very substantial adverse impacts to local businesses arising from the repeated, lengthy closures required for rehabilitation of the existing bridge
- Much lower life-cycle costs of a new bridge
- Significantly improved and safer transportation facilities provided by a new bridge for ***all*** users, including pedestrians and bicyclists
- The fact that the bridge would still need to be replaced – at even higher cost – at the end of the limited additional useful life resulting from a rehabilitation
- The recommendation of the Maine Department of Transportation that the existing bridge be replaced, based upon more than a year of careful consideration of all alternatives, including rehabilitation

BE IT RESOLVED, THEREFORE: That the Directors of Topsham Development, Inc. fully support the replacement of the existing bridge with a new bridge that includes improved access and safety for all users, including pedestrians and bicyclists. Furthermore, to ensure local input on the design of the bridge, the Directors encourage the Towns of Brunswick and Topsham to establish a joint Design Advisory Committee to work with the Maine Department of Transportation to optimize the final design for the new bridge.

Don Spann
Chair, Topsham Development, Inc.

TOPSHAM BOARD OF SELECTMEN
RESOLUTION REGARDING THE TOPSHAM-BRUNSWICK BRIDGE
ADOPTED: June 2, 2016

WHEREAS: The Topsham Selectmen acknowledge and respect the long service of the Frank J. Wood Bridge and its familiar presence as an admired element of Topsham's Lower Village.

AND WHEREAS: We also take notice and assert our deep concern regarding the following critical issues in connection with our community's continued reliance on this 84-year-old bridge:

- Accelerating deterioration in the condition of the existing bridge
- Increasing maintenance and inspection costs associated with a rehabilitated bridge
- Very substantial adverse impacts to local businesses arising from the repeated, lengthy closures required for rehabilitation of the existing bridge
- Much lower life-cycle costs of a new bridge
- Significantly improved and safer transportation facilities provided by a new bridge for all users, including pedestrians and bicyclists
- The fact that the bridge would still need to be replaced – at even higher cost – at the end of the limited additional useful life resulting from a rehabilitation
- The recommendation of the Maine Department of Transportation that the existing bridge be replaced, based upon more than a year of careful consideration of all alternatives, including rehabilitation.

BE IT RESOLVED, THEREFORE: The Topsham Selectmen fully support the replacement of the existing bridge with a new bridge that includes improved access and safety for all users, including pedestrians and bicyclists.

BE IT FURTHER RESOLVED: To ensure that the final design of the new bridge best meets both the State's responsibility to meet the public's transportation needs, and incorporates, to the degree that is financially feasible, the aesthetic and functional needs and preferences of Topsham and Brunswick, we will appoint, jointly with Brunswick, a Design Advisory Committee to work with the Maine Department of Transportation to optimize the final design for the new bridge.

BE IT FURTHER RESOLVED: Pursuant to 36 CFR § 800.2(c)(3), a representative of a local government with jurisdiction over the area in which the effects of an undertaking may occur is entitled to participate as a consulting party. The Town of Topsham asks that its status as an entitled consulting party be recognized and hereby appoints John Shattuck, Topsham Economic and Community Development Director, to be the Town's representative in the §106 process for the Frank J. Wood Bridge.

TOWN OF BRUNSWICK
BICYCLE & PEDESTRIAN ADVISORY COMMITTEE

To: Members of Town Council

Date: June 22, 2016

At BBPAC's May 19, 2016 monthly meeting, BBPAC Committee members voted unanimously to recommend Council support of the construction of a new bridge rather than the restoration of the Frank S. Wood Bridge.

At our June 16, 2016 BBPAC meeting, we unanimously reaffirmed our support for the new bridge option.

In addition, we disagree with some of the public statements made by the Friends of the Frank J. Wood Bridge.

- In order to cut costs, they recommend the elimination of the downriver canter- levered side walk (page 13); We feel that having a sidewalk in both directions is a positive enhancement for pedestrians in the new bridge design and a necessity if the old bridge is restored,
- The report states that 'safe pedestrian sidewalks are still lacking on both sides' (page 15) of the new bridge. A raised five foot sidewalk, separated from the travel lane by a five foot bicycle lane, seems relatively safe. Most Town sidewalks do not meet that standard.
- The assertion that 'bike lanes will be equal on either bridge' (page 15) is misleading. The 5' bike lanes are only possible as in the FJWB Report they have reduced the travel lane width on the old bridge to ten feet to accommodate two 5' bike lanes. The Committee does not feel 10' is sufficient for unrestricted opposing vehicular traffic, and therefore, this renders the bike lanes unsafe.

Respectfully Submitted,

BBPAC Co-Chair Will Wilkoff,
BBPAC Co-Chair Rich Cromwell

All Bicycle & Pedestrian Advisory Committee meetings are televised and open to the public. All are invited to attend and participate. For additional information please call the Brunswick Department of Planning & Development (725-6660).

Public Comment Regarding:
Frank J. Wood Bridge (BR #2016)
Route 201, Brunswick & Topsham, ME
MaineDOT WIN: 22603.00

August 15, 2016
Reference File: Maine DOT Record of Public Meeting "Public+Meeting+Minutes 4-27-16.pdf"

Summary Statement
The Bicycle Coalition of Maine is a statewide organization that works to make Maine better for bicycling and walking. We support well-designed development and streets that create environments that are safe and welcoming for those traveling on foot or bike.

We are writing to comment on the proposed rehabilitation or replacement of the Frank J. Wood Bridge, and its impacts on the safety and convenience of vulnerable users of the bridge. Because the proposed replacement bridge appears to offer more benefits for similar costs than rehabilitating the existing bridge (including better accommodation for vulnerable users and a longer lifespan), we believe that the best use of public funds is to replace the Frank J. Wood Bridge.

Project Discussion

The Frank J Wood Bridge is an approximately 84 year old bridge that serves as a critical connection between Topsham and Brunswick. The bridge needs considerable maintenance, and is being considered for either rehabilitation or replacement.

The bridge is a truss design that some people find very attractive and historic, and a vocal group of proponents prefers rehabbing the existing bridge to preserve its aesthetic and historical qualities. According to Maine DOT, the cost of rehabilitating the existing bridge will run approximately $10 million dollars, and will add about 30 years to the life of the bridge.

Alternatively, the bridge could simply be replaced with a lower profile, more modern design that some locals also find very attractive, and which significantly improves the conditions for walkers and bicycle riders. According to Maine DOT, the cost of replacing the bridge will run to approximately $10-12 million, and will create a bridge with an expected life span of 100 years or more.

We choose to make no comment on the relative aesthetic merits of the new versus the old bridge, but rather to focus on the fact that this bridge is an important piece of transportation infrastructure that needs to serve all users safely. In our view, the *function* of the bridge is more significant than its historic or aesthetic properties, and in our view, the existing bridge is deficient in providing safe transportation functionality for vulnerable users.

The existing bridge has one sidewalk on the west, upstream side, which appears to provide decent accommodation for pedestrians. The proposed rehab would include an additional sidewalk on the other side, which we do feel would further improve pedestrian access to both sides of Rt. 201.

P.O. Box 15272, Portland, ME 04112
207-623-4511 | www.bikemaine.org

The existing bridge has no bicycle accommodations and is a very uncomfortable, and for some, unsafe, place to ride. The shoulders include approximately 2 foot storm water grates running the length of the bridge that reduce a nominal 4 foot shoulder to about 2 feet of space outside the travel lanes. As a result, bicycles currently are advised to take the lane while crossing the bridge, as the travel lane is too narrow to be safely shared by bicycles and motor vehicles. This creates real and perceived conflicts between bicycle riders and motor vehicle drivers. Even if the existing travel lanes were reduced to 10 feet, the usable space for bicycle riders would remain too narrow for acceptable accommodation on a bridge in this urban location. Options like cantilevering on a multi-use path or widening the deck are likely to not be feasible due to cost and structural challenges. For this reason, rehabilitation does not appear to offer much in the way of improved conditions for bicycle riders.

The proposed replacement bridge will offer much better conditions for *both* walkers and bicycle riders.

The proposed replacement bridge features 5 foot bike lanes and 5 foot sidewalks, with small expansions apparently possible to include fishing or overlook spots near the ends. Travel lanes appear to be spec'd at 11 feet. **While we feel that these accommodations are a significant improvement over current conditions, we strongly urge that even narrower travel lanes be considered to improve compliance with posted 25 mph speed limits and to create additional space for wider or buffered bike lanes.** FHWA design guidelines do not warrant 11 foot travel lanes unless there is more than 8% heavy truck traffic on the roadway, which would need to be studied.

Ultimately, the Bicycle Coalition of Maine's position is that the best use of public funds would be to replace the bridge. The costs of the two alternatives are roughly comparable ($10 million versus $12 million), but the benefits are not. Rehabbing the existing bridge only extends the life of the bridge by about 30 years, while outright replacement provides up to 100 years of use. Rehabbing the existing bridge would preserve the currently sub-standard and unacceptable bicycle and pedestrian accommodations. Replacing the bridge would provide expanded and improved conditions for vulnerable users.

Thank you for the opportunity to comment, and please contact us if you have any questions.

Sincerely

Nancy Grant
Executive Director
Bicycle Coalition of Maine

James C. Tassé, PhD
Assistant Director
Bicycle Coalition of Maine

P.O. Box 15272, Portland, ME 04112
207-623-4511 | www.bikemaine.org

LETTERS

CURTIS PICARD

18 Roberts Hill Road • Topsham, ME 04086

June 1, 2016

David Douglass, Chair
Members of the Board of Selectmen
Town of Topsham
Topsham, ME 04086

RE: Letter of Support for the Replacement of the Frank J. Wood Bridge

Dear Chairman Douglass and members of the Board of Selectmen:

I am writing as a resident of Topsham on the issue of the Frank J. Wood Bridge. After having attended more than one of the information sessions regarding either replacing or rehabbing the bridge, I feel that I have enough information to support replacement. Here's why:

- In my view, the reasonable extra cost with replacing the bridge will provide a better, safer structure connecting Topsham and Brunswick.
- The useful life of a new bridge is dramatically longer than a restored existing structure. A new bridge for $13 million for 100 years is a much better investment of limited resources than spending $10 million for another 30 years useful life of the existing bridge.
- The new design will open up views of the river; provide safer bike and pedestrian lanes and I like the idea of adding scenic view bump outs along the bridge in key areas.
- The length of time needed to do the work along with the expected bridge closures / lane shut down is dramatically lessened by replacement because the replacement bridge work can go on while the existing bridge continues to be open.
- I have strong concerns that extended periods of lane closures or bridge shut downs will irreparably harm the businesses on both sides of the bridge.
- Finally, I also support the creation of a bridge advisory task force to work with MDOT on the final designs of new bridge.

Thank you for considering my comments.

Sincerely,

Curtis Picard

53 Elm Street
Topsham, Maine 04086
June 3, 2016

To Members of the Board of Selectmen:

I was present at last evening's meeting of the Board of Selectmen, and listened to the public comments about the question of replacing or renovating the Frank J. Wood Bridge. I did not offer comments myself having spoken at the previous meeting urging replacement but also urging a redesign of the proposed new bridge. I have also joined other members of the Lower Village Development Committee in a resolution you have received urging replacement and also outlining considerations in designing a new bridge.

I did hear the passionate comments of those urging renovation and their urging that "all the facts be heard." I took notes on the renovation bridge projects they named as examples of successful renovations. It caught my attention that while they criticized the cost estimates of MDOT, they used those same estimates as a basis for what renovation would cost if (say) a second sidewalk were eliminated. What I did not hear was any statement of costs of the other renovation projects they held up as exemplars. The costs of those projects are, of course, a matter of public record. The report they submitted to you as members of the BOS has much information about those projects, but nothing about their costs. I know the five of you to be attentive to taxpayer dollars, and I appreciate that about each of you. Here is what the Friends of the Frank J. Wood omitted to include in their presentations:

The Tyngsborough Bridge (Tyngsborough, MA) project (2009-12) cost $19 million for a bridge 547 feet in length, took three years to complete with the use of a constructed temporary bridge.

The Duck Bridge (Lowell, MA) project (2010-12) cost $16 million for a bridge 610 feet in length, and took two years to complete with a temporary pedestrian bridge. (Vehicular traffic was re-rerouted.)

I could not find cost figures for the Aiken Street Bridge (Lowell, MA). This 780 foot bridge was renovated in 1998.

In the past, the Friends of the Frank J. Wood Bridge have held up the Checkered House bridge (Richmond, VT) as an exemplar, and it appears on their Facebook page. This 350 foot bridge renovation (2011-13) cost $13.9 million, and took two years to complete with a temporary bridge. The Friends Facebook page also features the Healdsburg Bridge (Healdsburg, CA), a 438 foot bridge that was closed for a year when it was renovated (2015) at a cost of $12 million.

These figures strongly suggest that the cost of a renovated bridge might well exceed the cost of a new bridge. Our bridge is longer than each of these and passes over a river with stronger water flow. When I found these cost figures this morning, they led me to question the sincerity of the 'we need all the information' posture of the Friends of the Frank J. Wood Bridge.

What especially catches my attention beyond the cost of renovation is the length of time each bridge was closed to allow renovation. We have businesses at each end of the bridge that would be seriously harmed by a lengthy bridge closure. Both Topsham and Brunswick have worked hard to encourage economic development as something both good in its own right and also as something that generates tax revenues that ease tax burdens on homeowners. A bridge closure of a year or two or three would be devastating to the businesses at either end of the bridge.

Economic development was hardly mentioned last evening and it should be a driving consideration in how to proceed. That consideration speaks strongly for replacement.

Of course I do not know the end resolute of the section 106 process, but I expect it will be a recommendation not that we renovate the bridge but rather that we document the 1932 bridge with text and photos as we move to replace it. I salute your resolution supporting replacement last evening.

There are serious design issues with the preliminary sketches of the new bridge. A few of those were mentioned last evening, but the question of design got lost in the campaign to save the bridge. I urge you to appoint Topsham members of a joint Topsham/Brunswick committee to work with MDOT on design of a new bridge.

Sincerely yours,

Douglas C. Bennett

COST PROJECTIONS TO FRANK J. WOOD BRIDGE – John Shattuck 2016-06-06 To the below excerpts from Douglas Bennett's letter to the Topsham Selectmen, I have inserted (**in blue**) my simple projections of FJWB rehab costs based on the lineal rehab costs of the completed projects cited by the Friends of the Frank J. Wood Bridge. All these bridges (like the Frank J. Wood Bridge) are two lane bridges with deck widths of 30′ or less.

EXCERPTS - Douglas Bennett letter:

Here is what the Friends of the Frank J. Wood omitted to include in their presentations:

The Tyngsborough Bridge (Tyngsborough, MA) project (2009-12) cost $19 million for a bridge 547 feet in length, took three years to complete with the use of a constructed temporary bridge.

FJWB is 1.5 times longer – projected cost: $28.3 million

The Duck Bridge (Lowell, MA) project (2010-12) cost $16 million for a bridge 610 feet in length, and took two years to complete with a temporary pedestrian bridge. (Vehicular traffic was re-rerouted.)

FJWB is 1.3 times longer – projected cost: $21.4 million

In the past, the Friends of the Frank J. Wood Bridge have held up the Checkered House Bridge (Richmond, VT) as an exemplar, and it appears on their Facebook page. This 350 foot bridge renovation (2011-13) cost $13.9 million, and took three years to complete with a temporary bridge.

FJWB is 2.3 times longer – projected cost: $32.4 million

The Friends Facebook page also features the Healdsburg Bridge (Healdsburg, CA), a 438 foot bridge that was closed for a year when it was renovated (2015) at a cost of $12 million.

FJWB is 1.9 times longer – projected cost: $22.3 million

These figures strongly suggest that the cost of a renovated bridge might well exceed the cost of a new bridge. Our bridge is longer than each of these and passes over a river with stronger water flow. When I found these cost figures this morning, they led me to question the sincerity of the 'we need all the information' posture of the Friends of the Frank J. Wood Bridge.

Per MDOT 2015-11 estimate for the cost of a bridge replacement in the same location, a temporary bridge would cost $4 million

Cassandra Chase
Environmental Engineer
Federal Highway Administration – Maine Division
US Department of Transportation

Kristen Chamberlain
Bridge, Multi Modal and Traffic Team Leader
Environmental Office
Maine Department of Transportation

Re: Frank J. Wood Bridge §106 Review

I write this as a Lower Village business owner, to provide input to the work your committee is addressing in comparing the value of replacement vs repair of the Frank Wood Bridge.

I hope you will strongly consider the impact of repairing the bridge, as it will create significant disruption of the access and traffic flow during not only the time of initial repair/re-building (which will take months, if not years to complete), but also for years in the future as maintenance of the aged structure requires. Paramount in consideration during this discussion should be the issue of community safety, which is placed in jeopardy with a repair process as well as ongoing structural concerns with the existing bridge.

The building process for a new structure will have much less impact on traffic to and from the Lower Village, and therefore less negative impact on the existing and future businesses. Personally, I believe the "open" concept appearance of the proposed bridge will be visually appealing. It will by design provide expansive views down the river in one direction, and of the rocks/falls in the opposing direction. One needs only to drive over the new bridge connecting Lisbon and Durham to recognize the astounding view and difference that we will have. It will be a staggeringly beautiful change for this community.

I support and certainly recognize the value of preserving history, evidenced by the investment my husband and I dedicated to restoring our office space in the Bowdoin Mill. That said, I also value the environment. Literally daily I think of the shedding of rusted surface and lead-based paint into the Androscoggin from the existing bridge. I support total removal of this contaminant from our area, and the river we all respect.

Thank you for considering my thoughts.

Sue Spann
Owner/Broker
RE/MAX Riverside
1 Bowdoin Mill Island Suite 101
Topsham, Maine 04086

Sue

RE/MAX
Riverside
1 Bowdoin Mill Island, Suite 101
Topsham, ME 04086
Office: 207.725.8505
Fax: 207.725.8509

October 27, 2016

RE: Frank J. Wood Bridge
Topsham - Brunswick

To whom it may concern,

As a local small business owner, local property owner and a taxpayer, it is unfathomable to me how it can be proposed that a single extra dollar be spent beyond that necessary to prolong the life of the current bridge until a replacement can be constructed. We are "kicking the can down the road" in two respects, forcing our children to both make a decision that we should be making today and then asking them to pay what will undoubtedly be a far greater cost for a replacement bridge, after millions have been wasted on extending the life of an obsolete structure.

The existing "green" bridge is neither the first nor the last bridge that will connect to the two villages. We should be celebrating the successes and the future of the two communities, as well as the extensive history that has taken place on the banks of the Androscoggin and the falls. The "green" bridge has existed for but a snippet in time compared to the broader history of the area and yes it should be commemorated for its contribution to that rich history.

Not only do the economics of the rehabilitation costs versus a replacement bridge not make sense, the economic impacts to the two downtowns during two to three years of seasonal closing will be devastating.

I urge all to support the construction of a new bridge and with it commemorate the rich history of fishing, living, industrial enterprises and previous bridges via visual and written documentation within a riverside park on each bank of the mighty Androscoggin.

Thank you,

Kevin P. Clark

Kevin P. Clark, PLS
President

SITELINES P.A. **ENGINEERS - PLANNERS - SURVEYORS - LANDSCAPE ARCHITECTS**
8 CUMBERLAND STREET, BRUNSWICK, MAINE 04011 PHONE: 207-725-1200 FAX: 207-725-1114

PUBLISHED COMMENTS

GUEST COLUMN: We Will Love Our New Bridge

2016-05-04 By Bruce Van Note © Times Record

Bruce Van Note owns a home near the bridge and is a Topsham Planning Board member. A UMaine engineering graduate, he has worked as a surveyor, lawyer, mediator and at MaineDOT in executive policy positions under three Maine governors. He is the director of Policy and Planning at the Maine Turnpike Authority.

The 84-year old Frank J. Wood Bridge between Brunswick and Topsham is structurally deficient, doesn't have enough room for pedestrians and bicyclists, and needs to be replaced. Given the value that we place on history and local control, that can be a tough pill to swallow. Thus it is understandable that some good people will react with skepticism, want to save the old bridge, and maybe even take some unwarranted shots at the messenger, MaineDOT. Change is hard. But there is good news from experience in other Maine towns where some people felt the same way: We will love our new bridge.

The reasons we need a new bridge are straightforward:

Bridges Don't Last Forever

When well built and maintained, bridges last about as long as people do. The existing bridge is 84 years old. That's a good long life. Even if the state spent the $10 million or so that it would take to strengthen, patch, and paint it and add a second sidewalk as desired by the towns, we would get only 30 more years of bridge life. Of course, old bridge supporters will want a rehab to cost less and last longer. But as anyone who has renovated an old house knows, things usually get worse, not better, once you start tearing things apart. Most people will accept the unbiased judgments of state professional bridge engineers who have the training, experience and obligation to make state bridge engineering decisions.

Safety Must Be Primary

Although the old bridge is safe today, it is what engineers call a "fracture critical, non-redundant structure." This means that there are few if any back-up support beams and if the old bridge fails, it could fail fast. To prevent that, even after a rehab the old bridge would require detailed inspections at least every two years, costing about $60,000 each time.

Rehabilitation Would Be Very Disruptive

To rehabilitate the old bridge, it will need to be closed or restricted to one-way traffic for most of 2 years, and possibly up to 3 years. This would inconvenience commuters and likely devastate local businesses. With a new bridge, the old bridge would continue to be used during construction, and the impact may be as little as a few weeks.

A New Bridge is the Only Cost Effective Solution

The proposed new bridge will cost about $13 million and will last 100 years. Again, the rehab option would cost about $10 million and last 30 years. So for about 30 percent more money, we'll get more than three times the bridge life. Although we value preservation, we demand public financial discipline, and the new bridge is a fiscal "no-brainer." MaineDOT is footing the bill in a context of juggling 2,300 bridges and 8,800 miles of highways statewide with inadequate funding. Given this, doubters should ask themselves why MaineDOT would want to spend more up front if they could just "patch and pray" and spend the money elsewhere. The answer is because they have a duty to find a long-term, safe and cost effective solution.

Experience in other towns provides perspective. Near Bucksport, the Waldo-Hancock suspension bridge that carried Route 1 over the Penobscot River reached the end of its useful life after 72 years. Many mourned the loss and wanted to save it or build a larger replica with more sidewalls. Today, the new Penobscot Narrows Bridge seamlessly compliments nearby historic Fort Knox and is an icon to local communities.

In Naples, a moveable swing bridge that carried Route 302 over the waters between Long Lake and Brandy Pond needed improvement after 60 years of service. Again, some local residents wanted to save it, or replace it in kind with more sidewalks. Fast forward a few years, and local officials celebrated "our new bridge" at their ribbon cutting ceremony, the abutting causeway is humming with business activity and area kids take prom photos there this time of year.

The point is that once we engage in a respectful and grounded manner, the project will turn out great.

Let's work with MaineDOT on their design of the new bridge. My initial reaction to it was that it provides liberating open vistas, greatly enhances the pedestrian and bicycle experience, and has a simple and utilitarian look that fits the site's industrial past. Others disagree, and that's OK. Let's collaborate, evaluate, and offer reasonable suggestions to MaineDOT. They will continue to listen and work with us.

Perhaps we can honor the site's history with a riverfront park near its Topsham abutment including interpretive panels highlighting its early place name (Pejepscot Falls), previous bridges, mills, floods, etc. Perhaps we can calm traffic and add character through the use of materials, textures, colors, or striping. Perhaps we can make it "ours" with suggestions regarding railings, lighting, ties to the Riverwalk, and the pedestrian bump-outs. Other ideas will emerge. Some will work; some won't. But in the end, the process will work, and in a few years, we will love our new bridge.

GUEST COLUMN: To Honor the Frank J. Wood Bridge – And Much More

2016-07-20 By Douglass Bennett © Times Record

Douglas C. Bennett is a resident of Topsham's Historic District and a member of the town's Lower Village Development Committee

http://www.timesrecord.com/news/2016-07-20/Opinion/To_Honor_the_Frank_J_Wood_Bridge__And_Much_More.html

To insure the safety of all who use it, and also to insure the vitality of the two communities it links, the Frank J. Wood Bridge should be replaced, not renovated. Because the Frank J. Wood Bridge is a historical structure beloved by those who use it, we need to find appropriate ways to memorialize and celebrate this bridge as we replace it.

It is the river and the weather that are weakening the Frank J. Wood through rust. No act of preservation can reverse the damage already incurred. Repair and paint might extend the life of the bridge a few decades at most, but at nearly the cost of a new bridge and requiring long closures during renovation. Even with conscientious maintenance (something not seen in decades), a repaired Frank J. Wood Bridge would be vulnerable to failure. In that case, a vital artery between the two towns would be lost for years with ruinous economic consequences. A new bridge would last decades longer, require much less closure in its construction, and present much less risk.

This is not, however, a simple trade-off between historic preservation, on the one hand, and current community needs, on the other. Sometimes the best way to preserve history is not by freezing our attention at some point in the past but rather by telling the story of the changes that have transformed a place.

Today, nearly all of us picture the Frank J. Wood Bridge as the crossing between the towns of Brunswick and Topsham Maine. Connecting Maine Street (Brunswick) to Main Street (Topsham), town center to town center, it allows passage of cars, trucks, bicycles and pedestrians across the Androscoggin at the river's head of tide, just below the Androscoggin Dam. Cabot Mill and Pejepscot Mill stand sentinel at either end. Countless recent photographs of this apparently timeless scene show the bridge spanning the river, the dam in the background, the two mills at either end, a sunny sky dotted with puffy clouds.

But this iconic picture obscures more than it reveals about the river crossing point. Change not constancy has been the normal state of affairs. It has not been one timeless bridge that has spanned the river. The seasons and the currents have broken down a succession of bridges.

For Native Americans in the centuries before white settlement, there was no bridge. The lower falls of the Androscoggin were a place where they fished for salmon and sturgeon. In the first century of white settlement, there was still no bridge. White settlers, too, fished the lower falls, salted their catch and shipped it elsewhere. Before 1795, passage across the river was by foot in winter and otherwise by boat. On some days in some seasons, that passage was perilous because the river raged.

1795 was the year of the first bridge, a wooden bridge of course and likely covered like its several wooden successors. Fifteen years later, in 1811, a 'freshet' (a spring flood) carried off this first bridge. The bridge was built again.

In 1814 and again in 1827 these bridges were also carried off by a flood and rebuilt, in 1827 with stone abutments. In 1842 a fire destroyed the bridge and again it was rebuilt. All these bridges were privately built and maintained, their owners charging a fee for passage. In 1871, the two towns bought the still-wooden bridge.

In 1877, the towns replaced the wooden bridge with an iron bow bridge. A wrought iron bridge built by the King Iron Company (Cleveland) was washed away in 1914, and replaced.

In 1932, after all these others (at least eight), the current Frank J. Wood Bridge, a riveted Warren thru truss bridge was purchased from Boston Bridge Works and erected.

Each of these bridges might have been a worthy candidate for preservation had any of them stood up to the elements. It would be great to see each and every one of them today as we view the crossing.

Through all these years this river crossing has been a site of intense economic activity. Fishing was a significant activity until industry turned the river too foul to support any living thing. In the early 19th century, there were shipyards just below the current bridge site on the Topsham side. These are long gone, but today recreational fishing has returned to the lower Androscoggin.

Beginning in the late 18th century, making use of water-power from the falls, mills were constructed on both sides, first sawmills, then paper and cotton mills. These mills, too, were regularly wrecked by spring floods, then rebuilt, often larger. Parts of the Cabot Mill (Fort Andross) on the Brunswick side date from the early 19th century. The Pejepscot Mill (originally the Topsham Paper Mill) was constructed in 1868. While today they frame our picture of the Frank J. Wood Bridge, both mills have looked out on several other bridges at the site.

Various dams have crossed the falls channeling, taming and harnessing the river's power. A dam at this site began generating electric power in the 1890s. The current

Androscoggin Dam was last rebuilt several decades ago.

It is not only the one bridge that stands today we should honor. Instead, it is this river crossing, its relentless changes, and its succession of bridges, mills, dams and shipyards that we should lift up. We should see them all.

There is already a park (the 200th Anniversary Park) on the Brunswick side, where several earlier bridges once abutted. Topsham is planning a park in its Lower Village. The abutments of

the Frank J. Wood and the adjacent land should be part of that new park. Those two parks could be used to show the succession of bridges and to help residents of the two communities and visitors, too, understand how Brunswick and Topsham were established, thrived together and changed.

One further aspect of a prospective park on the Topsham side should be lifted up because it, too, concerns a bridge. The Granny Hole stream powered the Pejepscot Mill. It is a partly natural, partly human-expanded channel that carried Androscoggin River water around the mill. Until recently, a small, iron 19th century through truss bridge allowed passage over the Granny Hole stream. It was removed for safety reasons, but it would be useful to again have a passage where it once crossed. The bridge is now in storage. It could be renovated and restored as part of this new park to carry light traffic and to help tell the wonderful story of the bridges, dams and mills that made the two towns. That would be history well preserved.

GUEST COLUMN: Bringing Economics Into the Bridge Decision
2016-11-11 By Doug Bennett © Times Record
Doug Bennett is a member of the Brunswick/Topsham Bridge Design Committee.
http://www.timesrecord.com/news/2016-11-11/Opinion/Bringing_Economics_Into_the_Bridge_Decision.html

I hope you are paying attention, citizens of Brunswick and Topsham. A federally mandated legal process is playing out in the meeting rooms of our two town halls that could affect the economic viability of many businesses in our towns and affect the taxes we pay as well. It's a section 106 process. People are speaking on your behalf, and you should know what they are saying.

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires Federal agencies to take into account the effects of their activities on historic properties. The historic property in question is the Frank J. Wood Bridge, which was constructed in 1932. The question is whether the Maine Department of Transportation can replace the bridge or whether instead it should renovate the bridge.

No one doubts that something needs to be done. Rust is degrading the bridge's structural integrity. Following an inspection this summer, it was posted with a maximum weight of 25 tons. Said Maine Department of Transportation (MDOT), "The inspection team of MaineDOT bridge engineers found rapid deterioration of structural steel which triggered a drop in the ranking of the bridge deck and superstructure from fair condition to poor condition."

Last spring, MDOT announced a plan to replace the bridge. That is when the section 106 process was triggered because replacement of the bridge could have an "adverse impact" on historic properties. An organization, the "Friends of the Frank J. Wood Bridge," was formed to press the case that the bridge is too important, too historic, to discard.

The section 106 process began in July. At a succession of meetings MDOT has laid out its understanding of the condition of the bridge, the alternatives (replacements or renovation) and the likely effects on recognized historic structures. At each meeting, the Friends of the Frank J. Wood Bridge have pressed their case. They question almost every assertion MDOT makes about condition, costs, setting and historic significance. Theirs are nearly the only voices from Topsham or Brunswick to be heard. Sometimes they suggest that they speak for nearly all of us.

Costs rarely play any part in the public arguments of the Friends of the Frank J. Wood Bridge. And when MDOT has put forward numbers showing renovation to be a costly proposition, the Friends have challenged the competence and integrity of those making the estimates. MDOT's estimates, however, are very much in line with the costs of bridge renovation projects elsewhere.

I admire citizen advocacy. I respect the conviction of the Friends of the Frank J. Wood Bridge that saving the bridge is of paramount importance to them. But I disagree with them and I expect most others in the community would as well in taking a fuller, sober look at choice

before us.

At some point, the economics of the bridge have to be weighed. This state (as many others) is already struggling to find enough money to maintain its bridges and roads. What is the cost to taxpayers of historic renovation vs. the cost of replacement with a new bridge? How much would pursuing either course disrupt now-thriving businesses at either end of the bridge?

A recent study by MDOT's consultants on the bridge project put the construction cost of a new bridge expected to last 100 years at $13 million. Life cycle costs (adding in the costs of future repairs) would push this to $13.7 million.

On the other hand, renovation of the existing bridge to last 75 years, they estimate, would cost $17 million. This includes the cost of erecting a temporary bridge to carry traffic while the renovation proceeded.

Because of its age and manner of construction, such a renovated bridge would need considerably more maintenance than a new one, pushing its life cycle costs to $23.2 million. Moreover, that needed maintenance would cause much more traffic disruption, with recurring negative consequences for the businesses at either end of the bridge.

Agreed, the Frank J. Wood Bridge is "historic". But is it worth $10 million more in taxpayer cost to save it? Is it worth months of traffic disruption each of the many times such a renovated bridge would need to be repaired? (Think about that while the bridge is again being repaired this summer.)

Perhaps it is time we stopped letting the Friends of the Frank J. Wood be the only voices heard. The economic vitality of the towns at either end of the bridge is at stake. History counts, but the bridge is an artery that gives present life to both Brunswick and Topsham.

OPINION: Letters to the Editor
2016-05-03 By Nancy Randolph
https://brunswicktimesrecord.our-hometown.com/news/2016-05-03/Opinion/LETTERS.html

I attended the MDOT Public Hearing about the replacement or rehabilitation of the Frank J. Wood Bridge.

I agree that the bridge is iconic in this region. I don't think it is unique and we all know that although it was built in 1932 it is aging. The steel is pitted and its strength degraded. It is unsafe for people on bicycles, its sidewalk is inadequate to the need.

I did a little research about the metal truss bridges and about replacement rather than rehabilitation.

Virginia completed a study in 2006 about what it takes to rehabilitate a metal truss bridge. Based on my reading of this report, I think MDOT's estimate for rehabilitation is actually much too low.

I understand wanting to keep things the same. I also know that a true rehabilitation of this bridge would require (as with the historic Swinging Bridge) dismantling, testing every part, replacing many parts. Much of the replacement parts would be made in China where initiatives in low cost bridge building and repair methods have been exploding.

I do believe our bridge should be replaced. I think 8-10 inch esplanades [or separate bike lanes and sidewalks] should be on each side of the bridge for people on bicycles, people pushing strollers, people using their lunch time out for a stroll, maybe even benches for lunch or just for a waterside break in the day. I envision planters and lights (such as on Bowdoin Mill Island) being placed between the road bed and the pedestrian/bicycle/ park area.

Let's make our town connection better and safer. Spend the extra money not on retaining an icon that doesn't serve to a new icon of 21st century community building. Let's gather a group of engineers, citizens, architects and charrette a design for the 21st Century. This is possible. Let's do it.

Join your community neighbors Monday, May 9 from 6-8 p.m. in the Topsham Municipal Building's 1st floor conference room.

Nancy E. Randolph,
Topsham

From:	John Graham
To:	Chase, Cassandra (FHWA); Joel.C.Kittredge@maine.gov
Cc:	nathan@historicbridges.org; Kitty Henderson; mnaber@achp.gov; Steve Hinchman; Scott Hanson
Subject:	Friends of the Frank J Wood Bridge formal response.
Date:	Friday, December 02, 2016 4:20:51 PM
Attachments:	RE_Cabot Mill DOE (2).pdf C. Mitchell email about Cabot Mill eligibility 10-2013.pdf FJWB-Cabot Mill 106.pdf

---

Hi Cassie,

Please see the attached formal response on the eligibility of the Cabot Mill plus two supporting documents. Please confirm that you received this.

Thanks,

John

President - Friends of the Frank J Wood Bridge

John Graham
John Graham Real Estate
www.johngrahamrealestate.com
207-491-1660
10 Pleasant Street
Topsham, ME 04086

Friends of The Frank J. Wood Bridge
10 Pleasant Street
Topsham, ME 04086

U.S. Federal Highway Administration
40 Western Avenue
Augusta, ME 04330

Attention Ms. Cassandra Chase, Environmental Engineer

Frank J. Wood Bridge MHPC # 1595-15

Cabot Mill National Register eligibility:

Dear Ms. Chase,

The Friends of the Frank J. Wood Bridge requests that this be placed in the formal record of both the 106 and the 4f in response to Cabot Mill National Register eligibility and the adverse impacts of removing the bridge.

MDOT and their team have repeatedly stated that removal of the Frank J. Wood Bridge would have no impact on the National Register eligibility of the Cabot Mill property. We believe their confidence in this assertion is unfounded.

The determination of eligibility for the Cabot Mill property is found in a May 4, 1999 Memorandum from Earle G. Shettleworth, Jr., SHPO, to Judith Lindsey-Foster, MDOT, OES, subject: Historic Bridge Survey – Truss Bridges – National Register eligibility review. On pages 4-5 of that memo, it states:

"The bridges in Brunswick and Rumford are located in proximity to concentrations of historic resources that merit nomination to the Register as historic districts. In Brunswick, this includes the already listed Bowdoin Mill (located in Topsham) and the Cabot Mill on the other side of the river. The Frank J. Wood Bridge forms a link between these two industrial complexes and is, in its own right, a product of the industrial age. …"

This determination of eligibility for the Cabot Mill unmistakably says that the Frank J. Wood Bridge is the link uniting the two mill complexes into a single district. There is no reasonable argument to assume that a district would still exist without the Frank J. Wood Bridge linking Cabot Mill to the Bowdoin Mill on the other side of the river.

It is also worth noting that this determination of eligibility does not include the hydro dam or power facilities. MDOT's team has continued to include those elements as contributing to a potential district in spite of having been informed that they date from the 1980's and are not historic. While there have been dams on the site since the early 19th century, this dam is considerably less than the 50 years old that is required for a resource to be contributing to a National Register district. Statements included in the report that claim this dam powered the two mill complexes are inaccurate. The existing dam had never powered either mill. The Bowdoin/Pejepscot Paper Company mill was powered by a lower dam that no longer exists.

Earlier dams approximately on the site of the current dam powered Cabot Mill, but the existing dam was constructed thirty years after production stopped in the Cabot Mill. It was built to produce electrical power for the grid and continues in that use. When the American Woolen Company – Foxcroft Mill historic district in Dover-Foxcroft, ME was nominated to the National Register in 2012 (NR #12001068) the dam was excluded from the district at the insistence of Christi Mitchell because it had been rebuilt in the 1980's. The existing dam at Brunswick-Topsham does not contribute to the potential industrial historic district comprised of the Cabot Mill, Frank J. Wood Bridge, and Bowdoin/Pejepscot Mill.

Kirk F. Mohney's June 16, 2016 letter to Megan M. Hopkin, Subject: Bridge Improvements/ replacement, Brunswick; MHPC #1595-15 states, "The MDOT also concludes that the dam located upstream of these three resources is a contributing feature of the district, and although we do not disagree, we would also include any extant hydroelectric generating facilities constructed during the period of significance that retain integrity." This statement is clearly based on the inaccurate indication in the MDOT report that the dam was historic and related to the functioning of the two mills. Since neither the existing dam nor the existing hydroelectric facilities are from the period of significance or connected to the operation of either mill, MHPC needs to be provided with more accurate information and asked to clarify if they still don't disagree with the inclusion of the dam as a contributing resource in the potential district.

It appears that MDOT's team has attempted to include the dam in the potential district simply because the removal of the bridge would appear less impactful if it was one of four resources in the potential district, rather than one of three. There is no case for the dam's inclusion in a potential district and, in fact, removal of the Frank J. Wood Bridge would almost certainly eliminate the possibility of a district including the Bowdoin Mill and Cabot Mill properties based on past determinations by Maine Historic Preservation Commission.

The construction of a modern concrete bridge between the two mill properties would further weaken any argument for a district by introducing a major contemporary element that would negatively impact the setting, feeling, and associations of the historic mill properties.

MDOT's team has introduced a 2010 Section 106 review for cell phone towers on the Cabot Mill as evidence of a determination of individual NR eligibility for the mill. Based on the wording of that document, referencing an" industrial complex," and the absence of any evidence that an actual determination of individual eligibility for the mill has ever been done, it is clear that the "Industrial complex" referred to is the industrial complex described in the May 1999 memo above, the potential district that includes the Bowdoin Mill, Frank J. Wood Bridge, and Cabot Mill.

In an email to architectural historian Scott Hanson on the subject of the potential eligibility of the Cabot Mill property, dated October 13, 2013, Christi Mitchell wrote, "Roger Reed did a fairly intensive survey form for the Cabot Mill in 1992. Some time ago the mill was considered eligible within the context of a small historic district that included the Pejepscot Mill, the bridge, and the Cabot Mill. *However, if this is a tax credit question, I would say that it needs to be evaluated on its own*."

This statement from Maine's National Register Coordinator (now Assistant Director of MHPC) clearly indicates that Cabot Mill's eligibility needs to be confirmed. It has only been determined eligible as part of a district including the Frank J. Wood Bridge and Bowdoin Mill. Demolition of the Frank J. Wood Bridge and construction of a modern concrete highway-style bridge between the two mills will fundamentally alter the basis of the 1999 determination of eligibility. The potential effect of demolishing the Frank J. Wood Bridge on the Cabot Mill (including the possible use of historic tax credits for rehabilitation) cannot be assessed without doing an individual determination of eligibility for the property.

Period of Significance. In the MDOT report, the period of significance for the eligible Brunswick-Topsham Industrial Historic District is identified as "ca. 1850 to ca. 1930." The oldest resource within the eligible district is the granite portion of the Cabot Mill Picker House, built in 1836. The period of significance needs to be changed to reflect this fact.

Summer Street:

MDOT's team has concluded that the demolition of the Frank J. Wood Bridge and construction of a modern concrete highway-style bridge would have no adverse impact on the eligible potential district on Summer Street.

According to statements made at the last Section 106 meeting on this project, that conclusion is based on a belief that "Setting" "Feeling" and "Association" do not need to be considered when considering the seven aspects of integrity.

The National Register Bulletin, *How to Apply the National Register Criteria for Evaluation* is the official guidance on the subject from the National Park Service. It addresses "Understanding the Aspects of Integrity."

Regarding "Setting," it states:

> Setting is the physical environment of a historic property. Whereas location refers to the specific place where a property was built or an event occurred, setting refers to the *character* of the place in which the property played its historical role. It involves *how*, not just where, the property is situated and its relationship to surrounding features and open space.
>
> Setting often reflects the basic physical conditions under which a property was built and the functions it was intended to serve. In addition, the way in which a property is positioned in its environment can reflect the designer's concept of nature and aesthetic preferences.
>
> The physical features that constitute the setting of a historic property can be either natural or manmade, including such elements as:
>
> - Topographic features (a gorge or the crest of a hill);
> - Vegetation;
> - Simple manmade features (paths or fences); and
> - Relationships between buildings and other features or open space.

> These features and their relationships should be examined not only within the exact boundaries of the property, but also between the property and its *surroundings*. This is particularly important for districts.

Regarding "Feeling" and "Association," it states:

> Feeling is a property's expression of the aesthetic or historic sense of a particular period of time. It results from the presence of physical features that, taken together, convey the property's historic character. For example, a rural historic district retaining original design, materials, workmanship, and setting will relate the feeling of agricultural life in the 19th century. A grouping of prehistoric petroglyphs, unmarred by graffiti and intrusions and located on its original isolated bluff, can evoke a sense of tribal spiritual life.
>
> Association is the direct link between an important historic event or person and a historic property. A property retains association if it is the place where the event or activity occurred and is sufficiently intact to convey that relationship to an observer. Like feeling, association requires the presence of physical features that convey a property's historic character. For example, a Revolutionary War battlefield whose natural and manmade elements have remained intact since the 18th century will retain its quality of association with the battle.
>
> Because feeling and association depend on individual perceptions, their retention *alone* is never sufficient to support eligibility of a property for the National Register.

It appears that MDOT's team has misunderstood the meaning of this last paragraph, specifically "their retention *alone* is never sufficient to support eligibility of a property for the National Register," and concluded that these aspects of integrity do not have to be considered at all. There is no basis for this conclusion.

In terms of Setting, the Summer Street neighborhood needs to be considered in relationship to topographic features and relationships between buildings and other features or open space. Specifically, the neighborhood needs to be considered in relationship to the river. From the identified period of significance through the present the neighborhood has had an open view across the river with visibility of the water, the falls, and the wildlife attracted to the water. Bridges crossing the river since the first built in 1796, including the Frank J. Wood Bridge, have all been far enough downstream of the neighborhood to leave the view of the river unimpeded.

The guidance in the Bulletin states, "<u>These features and their relationships should be examined not only within the exact boundaries of the property, but also between the property and its *surroundings*. This is particularly important for districts.</u>" It is not possible to make a reasonable argument that building a new concrete highway-style bridge that curves upstream of the location of the Frank J. Wood Bridge, blocking the views of the river from the Summer Street neighborhood, will not have an adverse impact on the setting of the potential district.

In Kirk Mohney's June 16, 2016 letter to Megan Hopkin, cited above, he states, "As to the inclusion of the houses along Summer Street in Topsham in this industrial district, it is the Commission's opinion that unless documentation can be found that establishes a direct link between their construction and/or occupants to the operation of the mills, this area should

not be included. However, these properties may be eligible for listing in the Register as a separate residential historic district, the extent of which has not been determined."

A review of the 1940 U.S. Census data for Summer Street shows that 16 residents from the 18 households on the street worked in the mills in various capacities. Earlier censuses were not reviewed but it is highly likely that similar results will be found in the Census data from the other decades of the period of significance for the potential industrial district. Additionally, the Pejepscot Paper Company owned the house at 15 Summer Street and used it to house the Mill Agent for a period of time.

If the relationship between these houses and the industrial properties and bridge is such that they collectively form an eligible district, as suggested in Kirk Mohney's letter, the demolition of the Frank J. Wood Bridge and construction of a modern concrete highway-style bridge in the midst of all these resources would certainly have an adverse impact on the eligible district.

Frank J. Wood Bridge As an Example Of the Warren Truss Type To Be Preserved:

On page 5 of Earle Shettleworth's May 4, 1999 memo to MDOT regarding the bridge survey, he wrote:

> We have two additional matters to raise at this time regarding the opinions of eligibility and ineligibility expressed in both your memo and this one. The first relates to the long term survivability of a particular truss type over time. As it stands, representative examples of each truss type (as well as visually distinctive subtypes) are included on our eligible lists. The Commission believes that the preservation of one or more of each example should be a high priority in managing these resources. Although we recognize that the bridge management phase of the survey will address this issue, we are concerned that until such time that this plan is developed and implemented, the bridges which we have identified may continue to deteriorate or be replaced with the potential result that a bridge type is no longer represented in the inventory. We recommend, therefore, the institution of a policy that enables our agencies to periodically review the status of the inventory, and to take any necessary measures (such as reevaluating our present non-eligibility determinations) in order to assure the continued existence of particular bridge types.

Unfortunately, the number of National Register eligible truss bridges in Maine has been dramatically reduced since this inventory was done in 1999. The recommendations of the Commission have not been followed to plan for preserving examples of each type and no update of the inventory has been done. Without an updated inventory it is not possible to state how many of each type of truss bridge have been demolished or how many, if any, of each type remain.

Friends of the Frank J. Wood Bridge have been saying since spring that this bridge should be preserved as an example of the type. Sited near the juncture of Route 1 and Interstate 295 and with the adjoining mills and adjacent historic districts, it is uniquely well suited to be the

example that is preserved. We reiterate our point on that and point to Earle Shettleworth's statement above as evidence that our position is well grounded and reasonable.

Sincerely,

John Graham

President- Friends of the Frank J Wood Bridge

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

ANGUS S. KING, JR.
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

MEMORANDUM

To: Judith Lindsey-Foster, MDOT, OES
From: Earle G. Shettleworth, Jr., SHPO
Date: May 4, 1999
Subject: Historic Bridge Survey -- Truss Bridges -- National Register eligibility review

The Commission has completed its assessment of the 94 truss bridges which have been surveyed by Lichtenstein & Associates, as well as the National Register eligibility recommendations made by your consultant and discussed at the HBS Committee on April 15.

It is my opinion, in concurrence with the recommendations contained in your memo of April 1, 1999, that the following previously unevaluated bridges merit nomination to the National Register of Historic Places either under Criterion A or C or a combination thereof:

Town	Bridge Name	Bridge #
Arrowsic	Max L. Wilder Memorial	2026
Ashland	B&ARR/SA5	0159
Augusta	Memorial	5196
Biddeford	Elm Street Bridge	1351
Buxton	West Buxton	3340
Caribou	Aroostook River	5572
Durham	Durham	3334
Fort Kent	International	2398
Gardiner	New Mills	2605
Harmony	Bailey	1022
Hollis	Bar Mills	3333
Hollis	Canal	1525
Howland	Piscataquis	3040
Kittery	Memorial Bridge	2546
Kittery	Sarah Mildred Long	3641
Portland	St. John Street Underpass	0327
Salem Twp.	Mill Pond	2565

PHONE: (207) 287-2132

FAX: (207) 287-2335

MAINE HISTORIC PRESERVATION COMMISSION
55 Capitol Street
State House Station 65
Augusta, Maine 04333

Town	Bridge Name	Bridge #
Thomaston	Wadsworth Street	2904

Bridges that appear in the following list were previously determined to be eligible by the MHPC during Section 106 consultation on individual undertakings, and these determinations were affirmed by the present survey:

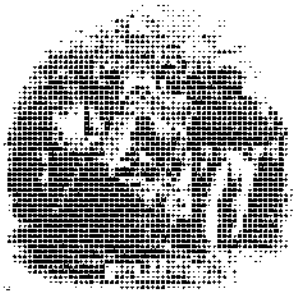
Town	Bridge Name	Bridge #
Auburn	South Bridge	3330
Berwick	Grants RR Overpass	5429
Berwick	Hobbs RR Overpass	5352
Fairfield	Kennebec River Center	1522
Fairfield	Kennebec River East	3106
Fairfield	Kennebec River West 1573	
Gilead	Androscoggin River	5084
Harrison	Ryefield	0238
Madawaska	International	2399
New Sharon	New Sharon	2608
Windham	Gambo Falls	0266
Yarmouth	Granite Street Overpass	0210

The following wooden truss bridges are presently listed in the National Register:

Town	Bridge Name	Bridge #
Andover	Lovejoy	1001
Corinth	Robyville	1003
Fryeburg	Hemlock	1004
Lincoln Plt.	Bennett	1005
Littleton	Watson Covered	1006
Newry	Artist Covered	1007
Parsonsfield-Porter	Parsonsfield-Porter Covered	1010

The Commission concurs with MDOT's recommendations that the bridges contained in the following list do not appear to meet the National Register criteria:

MAINE HISTORIC PRESERVATION COMMISSION
55 Capitol Street
State House Station 65
Augusta, Maine 04333



Town	Bridge Name	Bridge #
Abbot	Old Covered	3507
Andover	Merrill	3215
Auburn	Littlefields	3338
Bangor	Bangor-Brewer (replaced)	2038
Bath	Carlton	3007
Bowdoinham	Brooklyn	5190
Brownfield	Covered	3417
Brownfield	Boynton	0712
Brownville	Brownville Junction	3222
Canton	Gilbertville	2312
Chester	Penobscot River	3790
Chesterville	Williams #2	3181
Clinton	Sebasticook	3321
Coplin Plt.	Nash	3070
Detroit	Village	3309
Dresden	Middle Bridge	3341
East Machias	Jacksonville	3219
Edmunds Twp.	Tide Mill #2	3171
Falmouth	RR Crossing	2702
Greene	Turner Center	3426
Grindstone	Grindstone Twp.	0814
Guilford	Sangerville Station	2801
Hallowell	Vaughn Street (replaced)	0566
Hancock	Hancock-Sullivan	2973
Hollis	Bonny Eagle Covered	2190
Howland	Penobscot River	2660
Kenduskeag	Village	2975
Leeds	Foss	2290
Leeds	Stinchfield	5002
Limington	Nasons Mill	5165
Limington	Steep Falls	3328
Medford	Piscataquis River	0484
Medway	East Branch Penobscot	2256
Milbridge	Great North	3280

MAINE HISTORIC PRESERVATION COMMISSION
55 Capitol Street
State House Station 65
Augusta, Maine 04333

Town	Bridge Name	Bridge #
Milford	Second Otter	2754
Milo	Pleasant River	3244
Naples	Songo Lock	3499
Old Town	Irving	2405
Passadumkeag	Hathaway	3505
Peru	Androscoggin River	2019
Phillips	Meeting Place	2545
Rumford	High Bridge	5188
Rumford	Ridlonville	3327
T3 Indian Purchase	West Branch Bridge	3666
Taunton	West Outlet	3113
Turner	Turner	2874
Union	Fairgrounds	6134
Upton	Andover Dam	3090
Willimantic	Arnold	2023
Yarmouth	MCRR Crossing	3313

During the Historic Bridge Committee's meeting on April 15, 1999, we indicated that the Dock Bridge (#3284) in Alna might be a contributing resource in a rural historic district that includes the village of Alna and the surrounding landscape that retains much of its agricultural character. Since then we have confirmed this observation, and have discussed this finding with Lisa Dickson. In addition, we raised a concern about the exclusion of the Back River Bridge (#3016) in Arrowsic as an example of a deck truss. After further deliberation about the visual distinctiveness of this bridge, the Commission believes that it should be considered eligible. Likewise, it is our opinion that the following four bridges -- which the MDOT considers to be ineligible -- appear to meet the National Register criteria:

Town	Bridge Name	Bridge #
Brunswick	Frank J. Wood	2016
Leeds	North Turner East	3214
Rumford	Martin Memorial	3248
Turner	North Turner West	1474

The bridges in Brunswick and Rumford are located in proximity to concentrations of historic resources that merit nomination to the Register as historic districts. In Brunswick, this includes the

MAINE HISTORIC PRESERVATION COMMISSION
55 Capitol Street
State House Station 65
Augusta, Maine 04333

already listed Bowdoin Mill (located in Topsham) and the Cabot Mill on the other side of the river. The Frank J. Wood Bridge forms a link between these two industrial complexes and is, in its own right, a product of the industrial age. We consider the Martin Memorial Bridge in Rumford, like the Dock Bridge in Alna, to be part of an eligible historic district at Rumford Point. The North Turner East and North Turner West bridges offer an experience of moving through and over three different steel truss types (a camelback, a Parker, and a pony) in an undisturbed rural setting. The Commission believes that this group should be viewed as a district, in much the same way that the Kennebec River East, Center, and West bridges in Fairfield/Benton were found to be eligible. Inasmuch as the latter bridges will be replaced in the near future, the existence of such groupings is uncommon in Maine.

We have two additional matters to raise at this time regarding the opinions of eligibility and ineligibility expressed in both your memo and this one. The first relates to the long term survivability of particular truss types over time. As it stands, representative examples of each truss type (as well as visually distinctive subtypes) are included on our eligible lists. The Commission believes that the preservation of one or more of each example should be a high priority in managing these resources. Although we recognize that the bridge management phase of the survey will address this issue, we are concerned that until such time that this plan is developed and implemented, the bridges which we have identified may continue to deteriorate or be replaced with the potential result that a bridge type is no longer represented in the inventory. We recommend, therefore, the institution of a policy that enables our agencies to periodically review the status of the inventory, and to take any necessary measures (such as reevaluating our present non-eligibility determinations) in order to assure the continued existence of particular bridge types.

The second issue relates to how the MDOT will obtain public input on the methodology used to make determinations of eligibility. As you know, the Advisory Council's regulations for implementing Section 106 directs an Agency Official to seek input from the public in gathering information about historic properties (Part 800.4(a)(1)(iii)). In view of the fact that the bridge survey has not formally sought such input, and that such input may have a bearing on our evaluations of eligibility, we recommend that a strategy be devised to solicit the opinions of the public on the present phase of the survey. This information is important to consider before we finalize the list of eligible bridges.

If you have any questions relating to our findings and recommendations, please do not hesitate to contact me or Kirk Mohney of my staff.

From:	Mitchell, Christi
To:	Scott Hanson (scotthanson@sutherlandcc.net)
Subject:	Cabot Mill
Date:	Thursday, October 03, 2013 3:39:19 PM

Hi Scott,

Roger Reed did a fairly intensive survey form for the Cabot Mill in 1992. Some time ago the mill was considered eligible within the context of a small historic district that included the Pejepscot Mill, the bridge, and the Cabot Mill. However, if this is a tax credit question, I would say that it needs to be evaluated on its own.

Christi A. Mitchell
Architectural Historian
Maine Historic Preservation Commission
55 Capitol Street
State House Station 65
Augusta, Maine 04333-0065
(207) 287-2132 x 2
fax: (207) 287-2335
www.maine.gov/mhpc

"People ought to know about the past. If it's something to be proud of, they ought to take example from it; if it ain't, then they ought to buckle down and see to it that the present times should be better." Ruth Moore, The Walk Down Main Street.

From:	John Shattuck
To:	Chase, Cassandra (FHWA); Kittredge, Joel
Cc:	Dave Douglass; Marie Brillant; Roland Tufts; Ruth Lyons (Seleperson); Bill Thompson; Rich Roedner
Subject:	Town of Topsham §106 Review comments
Date:	Friday, December 02, 2016 7:31:09 PM
Attachments:	2016-12-02 §106 comments - Town of Topsham.pdf

CASSIE & JOEL: Attached please find additional Town of Topsham comments, limited to more technical aspects of historic and financial impacts, submitted for your consideration as you develop your report on the §106 Review. Please don't hesitate to let me know if you would like a hardcopy of the comments. Thank you, John

--
John Shattuck
Director, Economic & Community Development
Town of Topsham
100 Main Street
Topsham ME 04086

Office: (207) 373-5097
Mobile: (207) 650-0012
Email: jshattuck@TopshamMaine.com

Topsham because: http://youtu.be/Y_luU6wJMOU

TOWN OF TOPSHAM
100 Main Street
Topsham ME 04086

TOWN OF TOPSHAM §106 REVIEW COMMENTS

HISTORIC IMPACTS

At the 2016-10-27 §106 Review meeting, the Preliminary Effect Determinations Presentation, regarding historic impacts of the various alternatives for the rehabilitation or replacement of the Frank Wood Bridge made frequent references to the "Brunswick-Topsham Industrial Historic District" and the "Summer Street Historic District." While these districts were apparently demarcated for the purposes of the historic impact analysis, it should be noted that there is no "Brunswick-Topsham Industrial Historic District" that has been delineated or designated by either Brunswick or Topsham as a historic district. Additionally, there is no "Summer Street Historic District" that has been delineated or recognized by Topsham as a historic district. Topsham voters considered, but rejected, the inclusion of a portion of Summer Street in the Topsham Historic District, which has been listed on the National Register of Historic Places since 1978.

More tellingly, the Frank Wood Bridge is not included or referenced in either the Topsham Historic District or the Brunswick Commercial Historic District, which was added to the National Register of Historic Places in January of this year. Neither is the Cabot Mill included in the Brunswick Commercial Historic District.

As noted by the Topsham Selectmen in their 2016-12-01 comments submitted to the §106 Review:

> The contention that the Wood Bridge constitutes an inseparable, intrinsic piece of a single fabric incorporating the bridge and our two communities' waterfront mills is discredited by the history of the bridge. The Wood Bridge was built well over a century later than the Brunswick mill, and more than 60 years later than Topsham's Pejepscot Mill. Indeed, the Wood Bridge replaced a bridge that actually connected directly to the Pejepscot Mill, where Topsham's Main Street ran through the center of the mill complex. So, the placement of Wood Bridge actually disregarded this historic connection to the mill and realigned Main Street, substantially disrupting the fabric of Topsham's historic Lower Village and displacing long-standing buildings to make way for the rerouted Main Street.

Finally, the Comprehensive Plans of Topsham and Brunswick do not identify the Frank Wood Bridge as an historic or economic asset, and neither Plan includes the preservation of the bridge as a community goal.

FINANCIAL IMPACTS

The draft Matrix of Alternatives Investigated was provided to the §106 Review by the Maine Department of Transportation (MaineDOT) on 2016-10-26. This document estimated that the initial construction cost for the upstream replacement of the Wood Bridge (Alternative 2) would be 13 million dollars, while the initial construction cost for the rehabilitation of the Wood Bridge (Alternative 4) would be 17 million dollars, or nearly a third more expensive. This report also stated that the Life Cycle Cost Estimate (including initial construction) for the upstream replacement of the Wood Bridge (Alternative 2) would be 13.7 million dollars, while the estimated cost for the rehabilitation of the Wood Bridge (Alternative 4) would be 23.2 million dollars, or more than two thirds – and nearly 10 million dollars - more expensive.

As explained in MaineDOT's 2016-10-27 draft Summary of Alternatives, at p. 19, the Estimated Life Cycle Costs are discounted to provide the present value of estimated initial and future costs: "The LCCE accounts for estimated construction costs on the current project and the translated present value of anticipated future inspection, maintenance, and rehabilitation." A 4% discount rate was used to calculate the present values.

In order to ensure a fair and consistent comparison of alternative project costs, MaineDOT regularly uses such a present value calculation in determining Life Cycle Cost Estimates (LCCE). This is an entirely appropriate approach but, as is the case with a number of generally accepted auditing standards, such an fixed method can sometimes yield arbitrary results that do not reflect real-world economic realities.

The below table is excerpted from a document entitled "Summary Costs for Service Life of Alternatives," which I requested and received from the Maine Department of Transportation on 2016-11-21. The table is excerpted only in that I have included just the two bridge alternatives that appear to be the most likely potential outcomes of the §106 Review. This table provides the total estimated costs of initial construction plus anticipated future inspection, maintenance, and rehabilitation costs for replacement of the Wood Bridge (Alternative 2) and the rehabilitation of the Wood Bridge (Alternative 4) ***without a present value discount.*** The totals resulting from this method are most illuminating:

Work Effort	Alt #2 Repl 2 SW Serv. Life 100 yrs	Alt #4 Rehab 2 SW Serv. Life 75 yrs
Initial Construction Cost	$13.0 M	$17.0 M
Inspection	(50) $0.1 M	(38) $2.2 M
Maintenance	(100) $0.1 M	(74) $3.0 M
Paint	(2) $3.5 M	(3) $12.0 M
Deck Replacement	------	$2.0 M
Substructure Rehab	------	(2) 2.0 M
Wearing Surface Replacement	(6) $0.6 M	------
Total	**$17.3 M**	**$38.2 M**

(x) – denotes number of times effort is completed during the alternative's service life.

Without a present value discount, a simple arithmetic total of the estimated costs of initial construction plus anticipated future costs of inspection, maintenance, and rehabilitation results in a total, undiscounted cost for the upstream replacement of the Wood Bridge (Alternative 2) of 17.3 million dollars, while the total, undiscounted cost for the rehabilitation of the Wood Bridge (Alternative 4) would be 38.2 million dollars, or nearly 21 million dollars more expensive - more than twice the total cost of replacement.

No doubt some will argue that only costs with a present value discount provide an accurate comparison, but several simple, objective factors illustrate that costs calculated with a present value discount do ***not*** accurately reflect the real-world economic realities of the actual costs of funding these two bridge alternatives in the future.

A simple definition of present value is: "… the current worth of cash to be received in the future with one or more payments, which has been discounted at a market rate of interest." (http://www.accountingtools.com/present-value-definition). In practical terms, present value is compound interest in reverse: in other words, present value is the amount of cash that would need to be ***invested or saved today***, in order to have a specific amount (or pay a specific cost), at a specific date in the future. The prerequisite for a specific present value to yield a targeted amount in the future is that the present value amount, in cash, ***is actually invested or saved today***, so that the rate of return/interest, compounded over the intervening years, will result in the desired future amount.

The problem with using this approach in connection with future bridge costs is that we all know that MaineDOT, unfortunately, will ***not*** be receiving sufficient funding to set aside and reserve that present cash amount so it can grow to meet those future costs. But if no present cash amount is actually being set aside to grow, then using a present value discount does not reflect real-world economic realities of what will be required to fund these costs in the future.

The hard truth is that ***all*** of these future costs, ***at full value***, will have to be met by future year to year budgets, as there will be no reserve fund, established now, growing to meet these costs.

In fact, the reality is even harsher: The above table provides the total estimated costs of initial construction plus anticipated future inspection, maintenance, and rehabilitation costs for replacement or rehabilitation without a present value discount, but it uses ***today's*** costs for all anticipated future costs. In other words, these totals make no provision for the inevitable impact of inflation. We all know that we will not be able to purchase something that costs a dollar (or a million dollars) today for the same amount 20 years from now - much less 75 or 100 years from now.

While current inflation rates are exceptionally low (1.1% for the year ending 2016-08), we are looking at life cycle costs over the next 75 to 100 years. Given that timeline, the average inflation rate over the past century (3.29%) is much more likely to reflect inflation rates over the next century. And, at that unremarkable inflation rate, costs double every 22 years.

Whatever the actual inflation rate is over the next 75 to 100 years, it only takes simple arithmetic to see that the increased costs resulting from inflation will be much, much higher when applied to a current cost total of 38.2 million dollars than it will be for a total of 17.3 million dollars. And ***all*** those costs, including inflation, will have to be met by future year to year budgets.

It's not difficult to discern which alternative will be very substantially more burdensome to Maine taxpayers.

Ms. Cheryl Martin
Assistant Division Administrator.
Federal Highway Administration, Maine Division
40 Western Avenue
Augusta, ME. 04330.

November 28, 2016

Copy to Mr. Joel Kittredge, MDOT

Dear Ms. Martin.

RE: Frank J. Wood Bridge, Androscoggin River

We understand it was stated by MDOT's historic preservation consultant, during the most recent Section 106 meeting, that the demolition of the Frank J. Wood Bridge and construction of a new bridge upstream would have no negative impact on the historic character and significance of our neighborhood on Summer Street, Topsham. We understand our neighborhood to be eligible as a National Register Historic district.

In case you are not familiar with the elements of Summer Street, it is a short street, consisting of 7 single family houses and 2 multifamily houses. All but one of the buildings were built in the 19th century, some as early as the 1830's. In addition, Summer Street is a part of the walking trail that goes along the river. It has, as well, a Prayer Wheel Garden and labyrinth which is dedicated to all spiritual traditions, and which is visited by many people, both local and tourists, each day. Residents have taken great care to preserve the character of the houses and the neighborhood. The neighborhood of is intimately connected to the existing bridge, as residents use it to walk and cycle into Brunswick, as well as view it daily from their windows.

Based on the seven Aspects of Integrity presented by the consultant, her statement of no negative impact is blatantly incorrect. In fact, it is so incorrect that her statement seems to be less of a finding, and more of a justification for the MDOT proposal. Three of the Aspects - Setting, Feeling, and Association - would all be very seriously impacted by the removal of the Wood Bridge and/or construction of a modern highway style bridge upstream, closer to our neighborhood. The consultant's "survey" of our neighborhood plainly did not provide her with any idea what the residents of Summer Street value and appreciate about the historic character of the existing bridge, and what it contributes to the neighborhood.

Looking out our windows at an open river framed by this historic truss bridge which has existed alongside our neighborhood for 85 years, bookended by 2 historic mills, is fundamentally different from looking out at the underside of a concrete slab on deep steel girders that hides the river and everything beyond it. The curved bridge proposed would cause vehicle headlights to sweep across our neighborhood and into our windows every night. The location of the proposed new bridge would bring the dirt and noise of the road much closer to our homes. Bringing the bridge closer to the concrete dam would amplify the noise even further.

In addition, the view presently includes the lower falls in which Native Americans fished for millennia. European settlement began nearby in 1628, with a trading post intended

to buy fish caught by Native Americans in the lower falls. Documentation exists too concerning European settlers who also fished in the falls beginning in the 1670's. The proposed plan would destroy the character of the falls. Piers for the proposed new concrete and steel bridge would be built in the falls themselves, destroying the natural character and view of this last and important falls on the Androscoggin. The view of this falls is a central part of the view from Summer Street. In addition, the alignment of the proposed new bridge over the lower falls is presently frequented by eagles, peregrine falcons, blue herons, kingfishers, and many others, who would be displaced by the proposed construction. In fact, during spring runoff, the area of the proposed alignment is used by hundreds of birds of all types.

There is simply no way a reasonable argument can be made that the loss of our historic bridge and its associations, the loss of our river view, and the impacts of a highway bridge veering into our neighborhood will not negatively affect the Setting, Feeling, and Association of this eligible National Register District. We respectfully request that our letter be included in the record of the proceedings of Section 106 and 4(f) hearings.

Sincerely

The residents of Summer Street whose names, and signatures appear below:

Name.	Address.	Signature
Kevin + Alison Duffy	17 Summer St.	
"	" " "	
PAUL SEAQUIST	29 SUMMER ST	
Martha L Dillard	29 Summer Street	
JEFFREY MUNSON	15 Summer ST	
Karen L Munson	15 Summer st	
Charles H. Carroll	24 Summer ST.	
Josephine L. Seymour	27 Summer St.	
MAYNARD D. McCORKLE	23 SUMMER ST	
Claudia S. McCorkle	23 Summer St	
William D. McCorkle	23 Summer St.	
Jill Brayman	25 Summer St.	

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

CERTIFIED MAIL

7016 1970 0000 1462 9294

1000

04330

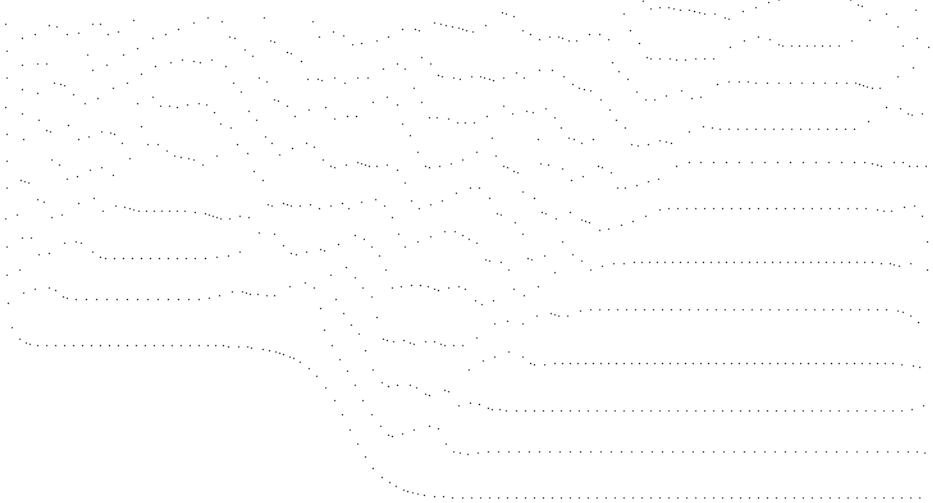
U.S. POSTAGE
PAID
BRUNSWICK, ME
04011
NOV 30, 18
AMOUNT
$6.00
R2303S10351F

04011

RETURN RECEIPT REQUESTED

Ms. Cheryl Martin
Asst. Division Administator
Federal Highway Administration, Maine Division
40 Western Ave
Augusta ME 04330

0433038325 0000



Kate Willis

From: Hopkin, Megan M <Megan.M.Hopkin@maine.gov>
Sent: Wednesday, December 07, 2016 8:13 AM
To: Kate Willis
Subject: FW: Frank J. Wood Bridge Project - Request for Comments on Section 106 Documents

---

From: Chase, Cassandra (FHWA) [mailto:Cassandra.Chase@dot.gov]
Sent: Wednesday, December 07, 2016 8:12 AM
To: Kittredge, Joel; Hopkin, Megan M; Chamberlain, Kristen
Cc: Martin, Cheryl (FHWA)
Subject: FW: Frank J. Wood Bridge Project - Request for Comments on Section 106 Documents

FYI.

From: MaryAnn Naber [mailto:mnaber@achp.gov]
Sent: Monday, December 05, 2016 4:53 PM
To: Chase, Cassandra (FHWA)
Subject: Re: Frank J. Wood Bridge Project - Request for Comments on Section 106 Documents

Hi, Cassie-

I realized when I saw your response to Mr. Graham's comments that I had never followed up our later discussion with written comments. I have concerns about both the preliminary assessment of effects and the manner in which alternatives were considered.

The overview of eligibility upon which the assessment of effects was based is inadequate to consider the full range of effects to the historic resources identified. The statements of eligibility should include a more complete discussion of all the contributing elements and the relative aspects of integrity in order that project effects may be assessed by applying the criteria of adverse effect. Integrity is not limited to "essential" physical features. It should be noted that the criteria of effect is based on the potential that a project "may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." In addition, the regulations at 36 CFR 800.5 state, "Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register." Accordingly, it may be necessary to re-visit, update, and expand the original determinations of eligibility to ensure all contributing features of the properties are identified and may be taken into account. The overview of resource eligibility is not adequate to capture the full range of potential impacts to the historic properties, in particular with regard to indirect impacts such as those to setting, feeling, and association. Furthermore, these aspects of integrity seem to have been discounted if they were at all previously "compromised." For example, the presence of a parking lot is implied to have negated any aspect of the integrity of setting. However the relationship of the mills with the source of water power which gave rise to both and the water crossing between them are nevertheless significant features of the respective settings of each of those elements, and may yet be diminished by removal of the historic bridge.

I am also concerned with the order and weight given the various alternatives. Both Section 106 and Section 4(f) set a higher bar for selecting an alternative which would replace the Frank J. Wood Bridge. As a historic

property, the approaches which would preserve the bridge must be given additional weight in evaluating the available alternatives. Cost and the degree to which the alternative meets the identified purpose and need are but two of the factors that should evaluated in selecting the alternative. The rehabilitation alternatives that preserve the bridge to the greatest degree should first be considered fairly and eliminated before determining that replacement with a new bridge is the only prudent alternative. I am also concerned that the firm providing the initial evaluation seems to have a bias toward new construction and does not have the experience with rehabilitating historic bridges to make a full and fair assessment of the rehabilitation potential for the Wood Bridge. I recommend that you seek a second opinion from a firm with historic bridge experience to evaluate the rehabilitation alternatives from that perspective.

Thank you for the opportunity to provide comments on the preliminary effects assessment and draft alternatives matrix. I look forward to our next meeting and discussing the project in further detail.

MARYANN NABER
Senior Program Analyst, FHWA Liaison
Advisory Council on Historic Preservation

On Fri, Nov 4, 2016 at 8:56 AM -0400, "Chase, Cassandra (FHWA)" <Cassandra.Chase@dot.gov> wrote:

Good Morning,

Thank you all for attending the October 27th Section 106 Consulting Party Meeting for the Frank J. Wood Bridge Project. As mentioned at the meeting, we apologize for providing the materials just prior to the meeting. We were still working on compiling all of the information right up until the meeting, but we understand and recognize that this does not provide you with an adequate opportunity to review and come prepared to the meeting. In the future, we are committed to providing you with all documents to be discussed at future Section 106 consulting party meetings at least two weeks prior to the meeting.

Additionally, to ensure you are able to review and provide input on the draft alternatives matrix summary, the draft alternatives matrix, and the preliminary effect determinations, we are accepting and would appreciate any comments you have by COB on December 2, 2016. Please send your comments to both me (cassandra.chase@dot.gov) and Joel Kittredge (joel.c.kittredge@maine.gov). If you'd like to send your comments by mail, please either mail them to my attention at the Federal Highway Administration, Edmund S. Muskie Federal Building, 40 Western Avenue, Room 614, Augusta, Maine 04330; or Joel's attention at the Maine Department of Transportation, 16 SHS, Augusta, ME 04333-0016. We are currently working on addressing the comments received at last week's consulting party meeting. After we receive all of your comments by December 2nd, we will begin reviewing, addressing and considering those comments as well. You can expect to see another e-mail from me, in response to your comments particular to the Section 106 process, sometime in mid-December.

In addition to attaching the October 27th sign-in sheet, the draft alternatives matrix summary, draft alternatives matrix, and the preliminary effect determination presentation, I have attached a copy of the Cabot Mill Historic Survey, which indicates that the Cabot Mill is individually eligible for listing under the National Register of Historic Places. This was requested at the October 27th meeting. Also requested at the Section 106 consulting parties meeting was a link to view the architectural survey and eligibility package. This information can be found on MaineDOT's website at http://www.maine.gov/mdot/env/documents/Brunswick22603.00106Package8.2.16.pdf.

A public meeting, specific to the overall project, will be held in the near future and comments will also be received at that time on the project in its entirety. As always, feel free to contact me if you have any questions.

Cassie

Cassie Chase
Environmental Engineer
Federal Highway Administration – Maine Division
Office: 207-512-4921
Cell: 207-689-8007
Cassandra.chase@dot.gov

1/17/2017 3:55 PM

Ms. Martin,

I have enclosed a DVD of the Green Bridge in Topsham during high water on May 27, 2013.

There are two separate file/movies, 2 and 5 minutes of length. Hope they play on your computer fine.

It was a great sight !

Bill Morin

Bill Morin

Topsham

Frank J Wood Bridge Androscoggin River Brunswick Topsham Maine

Tuesday, January 17, 2017

From The Desk of William F. Morin:

6 Front Street Topsham, Maine 04086
207-729-1760
williammorin@midmaine.com

Cheryl Martin
Assistant Division Administrator

Federal Highway Administration – Maine Division
40 Western Ave
Augusta, ME 04330

Dear Ms. Martin:

I wish to express my comments regarding the proposed plans for replacement of the Frank J. Wood Bridge # 2016 between Topsham and Brunswick Maine. Maine DOT has proposed a new bridge to be constructed to replace the current one and the Section 106 review process is under way to make an appropriate determination regarding historical prominence of the Wood Bridge.

Designation of Frank J Wood Bridge for Historical Classification

The review process is to evaluate the effect of the undertaking by DOT to remove and replace the current bridge and also determine if any surrounding historical resources would be negatively affected. An undertaking such as this can potentially cause change, beneficially or adversely, to the quality of the historical, architectural, archeological, or cultural character of a resource that qualifies for listing on the NRHP. Each undertaking has an area of potential effect and it is to be determined by the HRO (Heritage Resource Specialist) and SHPO (State Historic Preservation Office) if the area is physically or visually affected by the proposed undertaking.

That portion of the process is currently being deliberated after a presentation by DOT and FHWA staff at the Topsham Town Office with Consulting Parties on October 27, 2016. The attendees were presented with a detailed **Matrix of Alternatives Investigated – Draft 10-26-2016** for consideration and is discussed as follows.

The following is a description of the various impacts based upon Section 106 of the National Historic Preservation Act as presented in the **Matrix of Alternatives Investigated – Draft 10-26-2016** and are summarized as follows.

Alternative No Build: No effect on the Brunswick-Topsham Industrial Historic District, Cabot Mill, Summer Street Historic District or the Pejepscot Paper Company Historic District.

Alternate 1 Replacement Bridge: Adverse Effect on the Brunswick – Topsham Industrial Historic District

Alternate 2 Replacement Bridge: Adverse Effect on the Brunswick – Topsham Industrial Historic District

Alternate 5 Replacement Bridge: Adverse Effect on the Brunswick – Topsham Industrial Historic District

Alternate 3 Rehabilitate Bridge: No Adverse Effect on the Brunswick – Topsham Industrial Historic District

Alternate 4 Rehabilitate Bridge: No Adverse Effect on the Brunswick – Topsham Industrial Historic District

Removal and replacement of the bridge will result in losing a structure that could well serve as a recognized historical asset in its own right and also would remove an historical corridor that connects all the other historical districts and have an adverse effect on the Brunswick-Topsham Industrial Historic District. I believe the loss of the Wood Bridge would somewhat diminish the sites of the surrounding area though not adversely affect them.

The replacement bridge would definitely not conform to the historical era of the Cabot Mill, Summer Street Historic District or the Pejepscot Paper Company Historic Districts and not add any significant qualification to the Industrial Historic District.

Replacement of the bridge would only have an adverse effect on the on the Brunswick-Topsham Industrial Historic District.

Environment of The Frank J. Wood Bridge Discussion

These districts, of the Brunswick – Topsham Industrial Historic District, the Cabot Mill, the Summer Street Historic District and the Pejepscot Paper Company Historic Districts, the Wood Bridge, the Falls and the surrounding area are an exceptional, historical and distinctive locale and I believe that all their components enhance the site and the loss of any member would be detrimental. The site is an iconic attraction and many people frequent this area for dining, entertainment, antique shopping, and visits to the many and various business offices, and medical services among others and to view the scenic falls which many visitors marvel at. The entire site attracts many hundreds of people day and night most everyday of the week and is definitely a destination for these many purposes.

Observing the entire sight, one sees the importance of the river which brought the industries over the last 200 years and the harnessing of the river to produce energy and the resultant commercial and residential development adjacent to the river. Over this river, there are a number of bridges that serve the communities. One is a footbridge that harkens back to the 1890s and has significant historical prominence, another a Warren Truss railroad bridge built around 1910 and another railroad trestle bridge built in the early 20th century. Also, two modern style vehicular bridges also are present, one North and one South of downtown Brunswick. The five bridges described exist within a mile or so of each other between Brunswick and Topsham with the Wood Bridge being in a central positon between these other bridges. This location is central to all other bridges and the central main streets in Brunswick and Topsham. The railroad bridges exist because of the Brunswick central rail lines that trail

along the Androscoggin River to Lewiston, Portland, and along the Maine coast and to Augusta.

There are certainly a large amount of bridges mentioned but they all have a useful purpose. The Wood Bridge is a local and not a thru corridor bridge and it predecessors have occupied the same locale for over two hundred years long before any of the previously mentioned bridges. At the site of the Wood Bridge, a crossing and the Falls were important to the indigenous inhabitants before settlement by the white man.

The functional structures of this area have changed over the course of over three centuries. They have ranged from a 18th century garrison fort near the Falls to rehabilitated sites of business and residences contained in the districts. The Wood Bridge is actually a new comer to this environment except for the two newer vehicular bridges. It seems a untimely consideration for this relatively new structure not to be preserved. It is older but a new enough bridge to continue serving as it has for over 80 years.

Perspective Thoughts of The Frank J. Wood Bridge Discussion

In the 106 process, there are many and varied factors used to determine the historical representation of the subject property and I appreciate the difficulty in doing so. My interpretations are based on the previous Historical Classification and Environmental Discussion paragraphs.

First, I believe that the Wood Bridge has standing to be classified as an historical asset as defined under the Historical Act of 1966 as approved by President Johnson. The signed legislation has been the bedrock of historical preservation for 50 years. That Act was in response to many historical structures and sites being unprotected and subsequently destroyed. Here in Maine that movement especially began after the demolishment of the admired Portland railroad station in 1961 and other railroad stations. By 1966, the Act was in place and one early recipient was the Brooklyn Bridge which was listed in October 1966.

When President Johnson visited Maine during the summer of 1966, his motorcade drove over the Wood Bridge and stopped at the Topsham Dairy Joy for a frozen treat. I can't help but believe he found the Wood Bridge appealing and of course, he did the touristy thing and stopped in Topsham.

As an observer of this bridge for many years, I have seen it grow in appreciation by local citizens and more recently visitors and tourists. The same reaction is also present in the recently rehabilitated Foot Bridge between Topsham and Brunswick. Its historical significance has become well known and widespread with daily visitors almost constantly all day long in the warmer months and throughout the year. I see the same happening at the Wood Bridge as visitors wish to see the Falls and this bridge (a favorite of photographers) draws them to view

the scenery. These two bridges are now popular tourist attractions and the Wood Bridge deserves also to be recognized as an historical bridge.

Few public assets in small town America are as revered as much as a local bridge. Perhaps it is the largeness of the structure, its design, the public events that can be identified with it, its usefulness in everyday life, its appearance over a running body of water and sometimes the drama of a flood that increases the watchfulness of a bridge by local citizens.

The Wood Bridge has been an familiar icon of the mid coast region of Maine for many years. Destruction of this icon would be inconsistent with the structure itself. It is a well-built bridge that was designed to accommodate two lanes of traffic plus a central railroad track to accommodate railroad cars and heavy steam engines. Granted, the travel lanes then were narrower than our current travel lane standards but because of the original wider design to accommodate three lanes, the width of the Wood Bridge is very suitable to present day two lane traffic of vehicles.

A bridge of this truss design consists of many girders and beams and if a deficiency is found, it can be replaced by a new member. Such a bridge like this is similar to a large old house which may have lower support sills that need replacing. The rest of the structure can have "good bones" and rehabilitation can restore it to a safe and attractive structure.

The Wood Bridge was built by the Boston Bridge Company which was active at the turn of the19th century up to the time of the Wood Bridge construction. Most of their bridges were built in Massachusetts and with others constructed in all the other New England states starting in the 1880s to the 1930s. Only three Boston Bridge Company structures are accounted for in Maine and the Wood Bridge is by far the largest and most impressive. Bridges of this type and builder are getting scarce not unlike the covered bridges of yesteryear.

Discussion and Designation of District for Historical Classification

I obtained and quote the following from an issue of The National Register Bulletin and it describes the distinguishable appearance of an historic district very well.

"Significance"

"A district must be significant, as well as being an identifiable entity. It must be important for historical, architectural, archeological, engineering, or cultural values. .."

"A district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development."

"Concentration, Linkage, & Continuity of Features"

"A district derives its importance from being a unified entity, even though it is often composed of a wide variety of resources. The identity of a district results from **the interrelationship of its resources**, which can convey a visual sense of the overall historic environment or be an arrangement of historically or functionally related properties. For example, a district can reflect one principal activity, such as a mill or a ranch, or it can encompass several interrelated activities, such as an area that includes industrial, residential, or commercial buildings, sites, structures, or objects. A district can also be a grouping of archeological sites related primarily by their common components; these types of districts often will not visually represent a specific historic environment."

"Types of Features"

"A district can comprise both features that lack individual distinction and individually distinctive features that serve as focal points. It may even be considered eligible if all of the components lack individual distinction, provided that the grouping achieves significance as a whole within its historic context. In either case, **the majority of the components that add to the district's historic character, even if they are individually undistinguished, must possess integrity, as must the district as a whole.**

A district can contain buildings, structures, sites, objects, or open spaces that do not contribute to the significance of the district. The number of noncontributing properties a district can contain yet still convey its sense of time and place and historical development depends on how these properties affect the district's integrity. In archeological districts, the primary factor to be considered is the effect of any disturbances on the information potential of the district as a whole."

"Geographical Boundaries"

"A district must be a definable geographic area that can be distinguished from surrounding properties by changes such as density, scale, type, age, style of sites, buildings, structures, and objects, or by documented differences in patterns of historic development or associations. It is seldom defined, however, by the limits of current parcels of ownership, management, or planning boundaries. The boundaries must be based upon a shared relationship among the properties constituting the district." END OF ALL QUOTES

The following is a discussion and views regarding the historical classification with emphasis of the characteristics of the Wood Bridge. First, I must say that many of the features of historical properties as outlined in the previous quoted paragraphs are also clearly visible in the

structural assets of the Brunswick-Topsham Industrial Historic District, Cabot Mill, Summer Street Historic District or the Pejepscot Paper Company Historic District.

The characteristics are; Significance, Concentration and Linkage, Features, and Boundaries.

Significance:

It is certainly a site of significance as it is a magnificent and collective grouping of historical and manufacturing structures and supporting housing and public bridges that portray a past industrial and economic age that emerged here and in other river towns of New England. This district was the recipient of the enormous and perpetual renewable energy of the Androscoggin River that turned the waterwheels and electric turbines of the mills. The river flows from the upper reaches of the White Mountains and is actually a large mountain stream subject to the melting snows and spring rains which cause flooding at times. The historical districts are the result of that freely available abundant energy and businesses that combined to build mills, bridges, houses and employ an industrious workforce that we physically still see in these assets. The original industries are gone as well as the people of those generations, but the properties of the districts remain to represent that culture and for us to interpret their lives and occupation.

Concentration, Linkage, & Continuity of Features:

This area illustrates the industrial revolution that took place during the late 19th century to the 20th century. Paper and textile mills were a part of the expansion of industrial activity at this site and were enabled by abundant water power and much immigrant labor to thrive during this period. Much concentrated commercial and residential development occurred on both sides of the bridge at this time. Brunswick's Maine Street is now an historical district which is essentially adjacent to the Cabot Mill and the Brunswick-Topsham Industrial Historic District. It is virtually a unified area of historical designation. The Wood Bridge is a binding property in this location as it was and continues to be the only major vehicular and pedestrian corridor between the two towns connecting Brunswick's Maine Street and Topsham's Main Street. This bridge therefore certainly provides the continuity to relate all of the districts of concern and can accomplish this function for the foreseeable future.

Further, The Frank J Wood Bridge #2016 was previously inventoried as part of the Maine DOT Historic Bridge Survey. It was determined a contributing resource to a potentially eligible industrial district at the time. The eligible Brunswick – Topsham Industrial district is comprised of the NR eligible Summer Street Historic District, the NR eligible Cabot Mill, the Bridge and the National Register listed Pejepscot Paper Company. The Pejepscot Paper Company was listed in the National Register of Historic Places in 1974. It retains integrity to remain listed in the register. The important fact is that the bridge is an additional supporting asset for the potentially eligible industrial district.

Types of Features:

The districts of concern and the Wood Bridge are of varying degree of prominence or function, but they are in a state of collocation and arrangement and integrity which substantiates that this area of the Wood Bridge and the districts is a locality that provides one the ability to recognize that this a historical site that reveals the period of its development. This is true because the majority of the district was built in the 19th century and structures like this no longer are built.

Geographical Boundaries:

The districts of concern and the Wood Bridge occupy an area of the river and falls that would not be in any other area as they simply were built there to take advantage of water power to run the two mills. A bridge would be a part of it for transportation and communication between the two towns and the adjacent Summer Street Historic District dwellings were to provide residences for employees and management most likely in this case for the Pejepscot Paper Company. The four districts are exclusively related to each other as their function is wholly dependent upon the site of the river and falls and the boundaries of the districts are apparent by their relationship in the same surroundings.

Community Participation Comments:

I attended the meeting of October 27th, when interested parties gathered to discuss the eligibility of the Frank J. Wood Bridge for the National Register of Historic Places with DOT and FHWA staff at the Topsham Town Office. I must say honestly, that I was somewhat surprised at the presentation known as 106 review and immediately started some research about this process.

I have always been interested in the Wood Bridge plus the Foot Bridge and the Black Bridge in Topsham as I am a local born resident and all my life I have crossed all three bridges tens of thousands times and have admired them and valued their existence. Last winter DOT made a presentation in Topsham regarding the condition of the Wood Bridge and a proposal to replace it. It seemed as presented as the best alternative and I felt there was no other approach that was conceivable. In October after hearing about the meeting on the 27th I went to the meeting and got exposed to the 106 process and learned there are options to replacing historic bridges by advocating for preservation. My impression now is that there was a rush of judgment in early 2016 to condemn this bridge with little serious attention given to consider the alternative of preserving this bridge.

The Topsham Board of Selectmen, at their June 2, 2016 meeting, adopted a resolution in support of the replacement of the existing bridge and voted that a Joint Design Advisory Committee (with Brunswick) be appointed to work with MDOT to create the best plan to meet MDOT's transportation needs and the Town's design and function preferences for a new bridge.

There was local input from citizens at the meeting and the following are quoted minutes of that meeting of The Topsham Board of Selectmen on June 2, 2016. This was not an advertised

public hearing but rather a regularly scheduled board meeting. I enclose these minutes as there were many attending respondents who wanted to address the fact that an action quoted as follows was to be considered: "16-46 CONSIDERATION AND ANY APPROPRIATE ACTION ON MAINE DOT PROPOSAL FOR REPLACING THE FRANK WOOD BRIDGE."

I and others at that time was not aware of any approval decision to be acted upon in June 2016 as I thought the previous public meetings were informational and not subject to a consensus or a decision action.

The following are the approved minutes of that discussion in quotes. I include the minutes as evidence that citizens who attended this June 2016 meeting do have strong opinions for or against and some felt that it wasn't necessary that the town pass a resolution regarding the replacement of the Frank Wood Bridge and that some members of the Board at that meeting "were not aware of the 106 Process and statement was made that that process will determine what will finally happen." The major purpose of including these minutes is the public comments where 2 citizens did not approve of rehabilitation for financial reasons; 1 citizen recommended making a recommendation to Maine DOT to replace the bridge; and 8 citizens opted in their comments for rehabilitation and 1 citizen said there was no hurry to adopt a resolution for replacement of the Wood Bridge for a total of twelve respondents. The dialogue is considerably in favor of rehabilitation and these respondents were also logical and informed in presenting their justifications. Please note first paragraph.

"APPROVED 6-16-16
BOARD OF SELECTMEN MINUTES

Minutes of the Board of Selectmen

"16-46 CONSIDERATION AND ANY APPROPRIATE ACTION ON MAINE DOT PROPOSAL FOR REPLACING THE FRANK WOOD BRIDGE

Economic Development Director, John Shattuck, opened the discussion on this agenda item saying this is the 7th public meeting held on the Frank J. Woods Bridge. The Maine Department of Transportation has completed their study and both Topsham and Brunswick agree with MDOT that the bridge should be replaced.

Chairman Douglass asked how we arrived at naming Mr. Shattuck (our Economic and Development Director) as the Town's representation in the 106 Process. The Town Manager responded that the Town has a seat if we want one and it seemed easiest to have Mr. Shattuck represent the Town dealing with both historic and environmental purposes rather than several other department heads.

Although not a Public Hearing, the meeting was opened at this point to receive comments from members of the public. Several individuals spoke, including:

Scott Hanson - Mr. Hanson spoke on behalf of the group "Friends of the Frank J. Wood Bridge." He said the organization is registered with the State and has a facebook page also. Mr. Hanson spoke at length saying the group feels the MDOT decision to replace the bridge is premature and the 106 Process can demand that MDOT do further research. The group has 764 followers on facebook. The group prepared a booklet entitled "Frank J. Wood Bridge Improvement Project Considerations" and Mr. Hanson asked the Board to review the information it contained. (A copy is filed with these minutes.) The group questions the validity of the report done by T.Y.Lin. Mr. Hanson urged the Board to not take any action on this agenda item. Mr. Hanson said the Federal Highway Administration will fund the 106 Process.

Phiney White, Bridge Street - Mr. White displayed enlarged color photographs of three bridges in Massachusetts built in 1931 by Boston Bridge Works - same company that build the Frank J. Wood Bridge. They were rehabilitated in 2012. One was built in 1883 and rehabilitated in 2013.

He said rehabilitation of a bridge is not foreign to large firms. Mr. White said that T.Y. Lin's figures are not accurate. Wants to see the bridge rehabilitated.

Paul Loveless, 36 Williams Drive - Said he was here in Topsham during the last rehab. Said it will take more time and more money to rehab. Spending dollars to save this bridge is not a good idea. If one is stopped on the bridge when a big truck goes by, the bridge rocks back and forth. Bridge needs to be replaced.

Curt Neufeld, 14 Merrymeeting Drive - In favor of new bridge. Said bridges are being taken down because they need to be replaced. Bridge was built in 1932 for cars and trucks built in 1932 which are no comparison to cars and trucks of today. Agreed that the bridge is a hero, but should be replaced. Urged the Board not to throw good money after bad.

Don Russell, 80 Winter Street - Urged the Board to make a recommendation to MDOT relevant to replacing the bridge. You need to do that based on what you have heard. The one thing I did hear, I want to thank Scott for the work they did. In favor of proceeding with the 106 Process.

John Graham, Pleasant Street - In favor of restoring the bridge. Have walked across it many times. It is a historical structure and should be saved. The Town should have appointed the Historic District Commission to handle the 106 process, not a person in the town office.

Ann Carroll, Summer Street - Plea is emotional. It was insulting that no one in our neighborhood was notified of the meetings. It was like we didn't count. Urged the Board to take the human element into account. Thanked Don Russell for spending money to keep his property up. When you drive by Don's house you have a piece of history.

Jill Raymond, 25 Summer Street - I have never come to a meeting. I did not get a notice of these meetings. It is offensive that I heard nothing. Want to see a restoration project, not a new bridge. Does a village have a super highway?

Charles Carroll, Summer Street - This is a neighborhood built 200 years ago. Our house was built in 1825. This is a neighborhood 200 years old. People socialize on this bridge. We are closest to the bridge. Have lived there for 6,000 nights. I look at the bridge every single day. The folks that built the bridge gave it much thought. I don't feel that way about the design of the new bridge. It seems nonsensible for you as a Board to take a position. The better part of wisdom would be for you to say "No, we don't need to take a position."

Arlene Morris, 13 Main Street - Loves Topsham. Urged the Board not to vote one way or another. There is no hurry.

John Shattuck - Brief statement. When a public outreach is done, some people will be missed. However, the papers were plastered with announcements of these meetings. This is a process that has been on-going for over 14 months. The 106 Process will continue over the next 6 or 7 months.

Steve Stern, 13 Main Street - Said he has degrees in Civil and Structural Engineering from Maine and MIT. Is not unfamiliar with some of the issues being brought up. This bridge is safe. It has been deemed safe by the DOT. There are mistakes made in any profession. As an engineer, he can attest to some of the mistakes. TY Lin is the largest engineering firm in the world. They have about a $3 billion overrun on a bridge that is now rusting. Some of the smaller projects they get...they are not as screened as they possibly should be. We are trying to save this historic bridge. Save money and make everybody happy. All we are asking, is...it is obvious we don't have all the information. If you go ahead and endorse the DOT's recommendations...we intend to have meetings with Joyce Taylor, the Chief Engineer at DOT. She is a reasonable person. I think you have to be very careful, because you can look very bad if you make the wrong decision here tonight.

Josey Seamore, Summer Street - Want to see the bridge saved. It is an important part of my life, my children's lives and my grandchildren's.

Having heard comments from all who wanted to speak, the Board entered into a lengthy discussion with each Board member contributing. Chairman Douglass read the letter mentioned earlier from Curtis Pickard speaking in favor of the new bridge. Some on the Board were not aware of the 106 Process and statement was made that that process will determine what will finally happen. Statement was made that the State does not take proper care, maintenance wise, and if the bridge is rehabilitated, would they let its care lapse.

Following discussion, motion was made by Selectman Tufts, seconded by Selectman Thompson, and it was unanimously ;

VOTED : To approve the Maine DOT proposal for replacement of the Frank J. Wood Bridge and to adopt the resolution regarding the Topsham-Brunswick Bridge."

Final Comments and Discussion:

I trust that I was able to analyze and convey my assessment of the best outcome for the Wood Bridge to you. There is a lot a discussion and study in this matter and much is factual and of course many regulations and participants in this process. However, a decision must be made based upon all factual aspects and still consider subjective opinion.

I conclude that the impartial and fact based criteria used in determining historical prominence as applied to the Wood Bridge and surrounding districts support the endorsement of the Wood Bridge as a historical structure worthy of preservation. Subjectively, the Wood Bridge is also supported but by a more open type of reasoning from the general public. This source uses their opinions and preferences and general cultural connections to form a more independently and unrestricted conclusion. Thus, the decision is more apt to keep an asset than to replace it. I would say that is the prevailing reaction in this matter.

In closing, I hope I haven't been too verbose but I wanted to justify the historical prominence and to explain some historical and social aspect of the bridge and its relationship to other elements of this significantly historical area which is comprised of other historic districts. Also and very important, the inclusion of the meeting minutes shows an assortment of the rationales for preservation which is of course are immeasurable.

Thank you for your attention and time to review this letter as I and others appreciate your concerns. If I can be of any help or need for clarification, please do not hesitate to contact me.

Sincerely,

William F. Morin

Appendix E
Cabot Mill

NHPC USE ONLY

Survey Map No. ____
Survey Map Name ____

INVENTORY NO.

MAINE HISTORIC PRESERVATION COMMISSION
Historic Building/Structure Survey Form

1. PROPERTY NAME (HISTORIC): Cabot Mill

2. PROPERTY NAME (OTHER): ____

3. STREET ADDRESS: Mill Street

4. TOWN: Brunswick 5. COUNTY: Cumberland

6. DATE RECORDED: 1/7/92 7. SURVEYOR: R. Reed

8. OWNER NAME: ____ ADDRESS: ____

9. PRIMARY USE (PRESENT):

SINGLE FAMILY	___	AGRICULTURE	___	COMMERCIAL/TRADE	✓	FUNERAR/	___
MULTI-FAMILY	___	GOVERNMENTAL	___	EDUCATION	___	HEALTH CARE	___
INDUSTRY	___	RELIGIOUS	___	HOTEL	___	LANDSCAPE	___
TRANSPORTATION	___	DEFENSE	___	SUMMER COTTAGE/CAMP	___	SOCIAL	___
RECREATION/CULTURE	___	UNKNOWN	___				

OTHER ____

10. CONDITION: GOOD ✓ FAIR ___ POOR ___ DESTROYED ___, DATE ____

ARCHITECTURAL DATA

11. PRIMARY STYLISTIC CATEGORY:

COLONIAL	___	STICK STYLE	___	COLONIAL REV.	___	FEDERAL	___
RENAISSANCE REV.	___	GREEK REVIVAL	___	SHINGLE STYLE	___	BUNGALOW	___
ROMANESQUE	___	19TH/20TH C. REV.	___	R. ROMANESQUE	✓	ITALIANATE	___
NEO-CLASSIC. REV.	___	SECOND EMPIRE	___	QUEEN ANNE	___	GOTHIC	___
HIGH VIC. GOTHIC	___	ARTS & CRAFTS	___	OTHER	___		

12. OTHER STYLISTIC CATEGORY:

COLONIAL	___	STICK STYLE	___	COLONIAL REV.	___	FEDERAL	___
RENAISSANCE REV.	___	GREEK REVIVAL	___	SHINGLE STYLE	___	BUNGALOW	___
ROMANESQUE	___	19TH/20TH C. REV.	___	R. ROMANESQUE	___	ITALIANATE	___
NEO-CLASSIC. REV.	___	SECOND EMPIRE	___	QUEEN ANNE	___	GOTHIC	___
HIGH VIC. GOTHIC	___	ARTS & CRAFTS	___	OTHER	___		

13. HEIGHT: 1 STORY ___ 1 1/2 STORY ___ 2 STORY ___ 2 1/2 STORY ___
3 STORY ___ 4 STORY ___ 5 STORY ✓ OVER 5 (___) ___

14. PRIMARY FACADE WIDTH (MAIN BLOCK; USE GROUND FLOOR):
1 BAY ___ 2 BAY ___ 3 BAY ___ 4 BAY ___ 5 BAY ___ MORE THAN 5 (___) ✓

15. APPENDAGES: SIDE ELL ✓ REAR ELL ✓ FRONT___ ADDED STORIES___ SHED___ DORMERS___ PORCH___ TOWER ✓
CUPOLA___ BAY WINDOW___

PHOTOGRAPH:

16. PORCH: ATTACHED ___ ENGAGED ___ ONE STORY ___ MORE THAN ONE STORY ___
FULL WIDTH ___ WRAPAROUND ___ SLEEPING PORCH ___ SECONDARY PORCH ___

17. PLAN: HALL AND PARLOR___ 1/2 CAPE___ CENTRAL HALL___ SIDE HALL___ BACK HALL___ IRREGULAR ___
OTHER _____

18. PRIMARY STRUCTURAL SYSTEM: TIMBER FRAME ___ BRACED FRAME ___ BRICK ✓ STONE ___
BALLOON FRAME ___ CONCRETE ___ STEEL ___ LOG ___
PLANK WALL ___ PLATFORM FRAME ___
FRAME CONSTRUCTION - TYPE UNKNOWN ___ OTHER _____

19. CHIMNEY PLACEMENT: INTERIOR ___ INTERIOR FRONT/REAR ___ CENTER ___ INTERIOR END ___
EXTERIOR ___ OTHER _____

20. ROOF CONFIGURATION: GABLE SIDE ___ GABLE FRONT ___ HIP ___ MANSARD ___
FLAT ✓ GAMBREL ___ PARAPET GABLE ___ SHED ___
CROSS GABLE ___ COMPOUND ___ OTHER _____

21. ROOF MATERIAL: WOOD ___ METAL ___ TILE ___ SLATE ___ ASPHALT ✓ ASBESTOS ___

22. EXTERIOR WALL MATERIALS: CLAPBOARD ___ BRICK ✓ FLUSH SHEATHING ___ WOOD SHINGLE ___
STONE ___ LOG ___ BOARD AND BATTEN ___ CONCRETE ___
PRESSED METAL ___ STUCCO ___ ASPHALT ___ ALUMINUM/VINYL ___
GRANITE ___ ASBESTOS ___ TERRA COTTA ___ OTHER _____

23. FOUNDATION MATERIAL: FIELDSTONE ___ BRICK ___ WOOD ___ CONCRETE ___ GRANITE ✓
ORNAMENTAL CONC. BLOCK ___ OTHER _____

24. OUTBUILDINGS/FEATURES: CARRIAGE HOUSE ___ FENCE OR WALL ___ CEMETERY ___
BARN (CONNECTED) ___ BARN (DETACHED) ___ FORMAL GARDEN ___
LANDSCAPE/PLANT MAT. ___ ARCHAEOLOGICAL SITE ___ GARAGE ___
OTHER _____

HISTORICAL DATA

25. DOCUMENTED DATE OF CONSTRUCTION: 1891-92 26. ESTIMATED DATE OF CONSTRUCTION: _____

27. DATE MAJOR ADDITIONS/ALTERATIONS: 1896, 1909, c. 1920

28. ARCHITECT: Dunning + Campbell 29. CONTRACTOR (NOTE IF SAME AS 28): E.S. Hackett & Son

30. ORIGINAL OWNER: The Cabot Manufacturing Company

31. SUBSEQUENT SIGNIFICANT OWNER: _____ DATES: _____

32. CULTURAL/ETHNIC AFFILIATION: ENGLISH ✓ FRENCH ACADIAN ___ NATIVE AMERICAN ___ SCOTTISH ___
FRENCH CANADIAN ___ EAST EUROPEAN ___ IRISH ___
OTHER _____

33. HISTORIC CONTEXT(S): COMMERCE ___ INDUSTRY ✓ TRANSPORTATION ___ AGRICULTURE ___
MILITARY ___ RELIGION ___ CIVIC AFFAIRS ___ RECREATION ___
HABITATION ___ EDUCATION ___ ART, LIT, SCIENCE ___ SOCIAL ___

34. COMMENTS/SOURCES: A stone woolen mill on this site, built in the 1830s and enlarged in the late 1860s, was acquired by the Cabot Manufacturing Company in 1857. In October, 1890, the Brunswick firm of Dunning + Campbell, architects and engineers, were hired to prepare plans for a new mill "on the Lockwood plan" (Brunswick Telegram 10/2/1890).

35. HISTORICAL DRAWINGS EXIST: YES ___ NO ✓ LOCATION: _____

ENVIRONMENTAL DATA

36. SITE INTEGRITY: ORIGINAL ✓ MOVED ___ DATE MOVED ___
37. SETTING: RURAL/UNDISTURBED ___ RURAL/BUILT UP ___ SMALL TOWN ✓ URBAN ___ SUBURBAN ___
38. QUADRANGLE MAP USED: _____ QUADRANGLE #: _____
39. UTM NORTHING: _____ 40. UTM EASTING: _____
41. FACADE DIRECTION (CIRCLE ONE): N (S) E W NE NW SE SW

MHPC USE ONLY

DATE ENTERED IN INVENTORY: _____ PHOTO FILE #: _____
NR STATUS: L ___ HD ___ E ✓ NE ___ ND ___ REVIEWER KM CM 7/12/2010
DATA SOURCE: HPF ___ CLG ___ R&C ___ STAFF ✓ STATE SURVEY ___ OTHER ___ LEVEL OF SURVEY: R ___ I ✓

FORM HPSL7WFK.FRM

Inventory No.

MAINE HISTORIC PRESERVATION COMMISSION
Historic Building/Structure Form

Continuation Sheet

No. 34, continued:

Construction of the main section of the mill occupied much of 1891 and 1892 as the old mill was kept in operation until each section was displaced by portions of the new mill. One wing from the old mill, dating from 1865-66 was retained and is still standing.

Additions continued to be made over the next three decades. For a description of the completed first section ofthe mill see, Lewiston Evening Journal December 7, 1891. Information of the first mill can be found in Wheeler's History of Brunswick. The 1865 addition is documented in the Brunswick Telegraph December 15, 1865, p.2. The following Industrial Journal items also provide documentation: March 18, 1892, p.3; Sept. 2, 1892, p.4; Oct. 28, 1892, p.1; April 11, 1893, p.1; Jan. 25, 1895, p.5; Dec. 4, 1896, p.8; Sept., 1909, p.31.

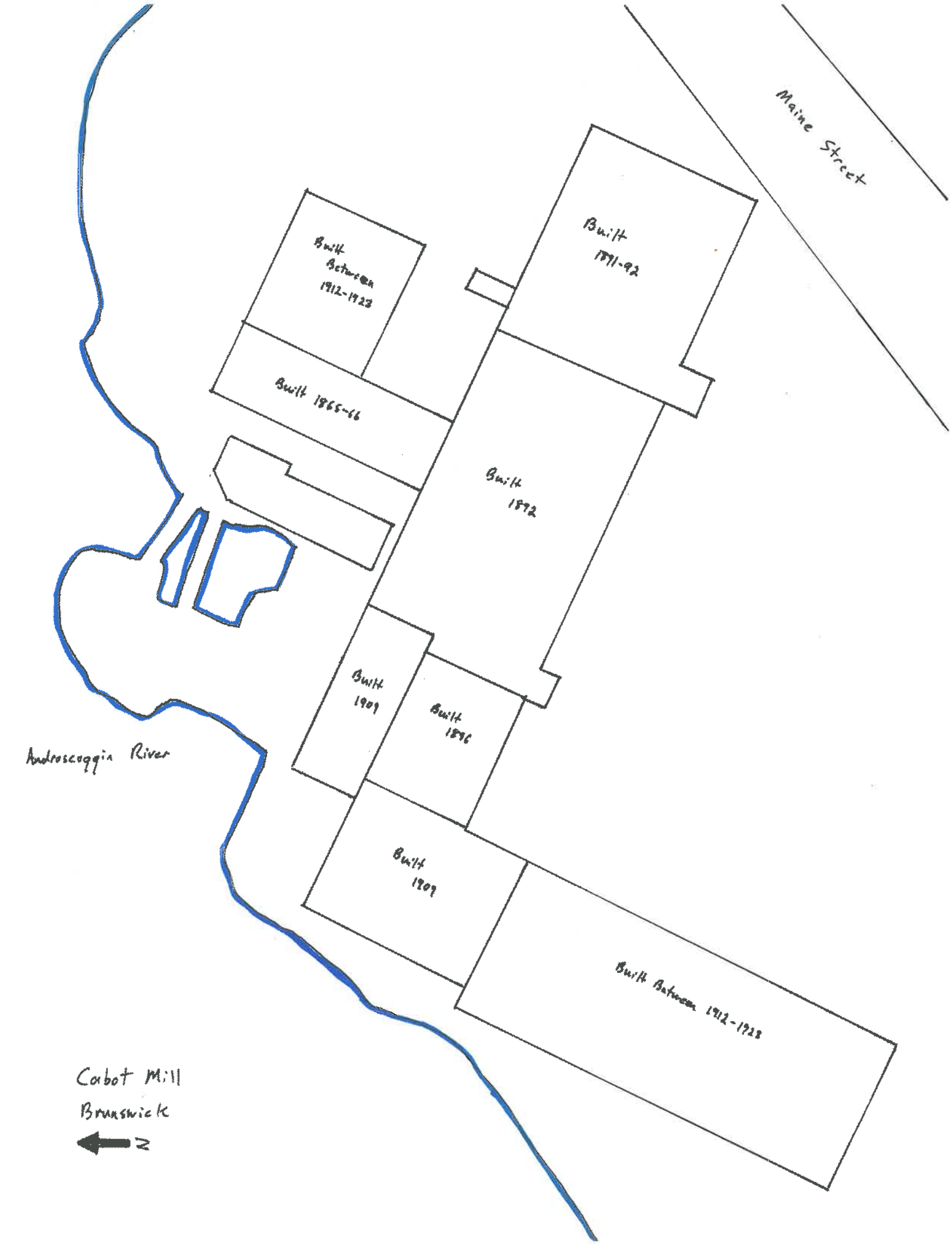
South Wing of Cabot Mill, c.1920

Inventory No.

MAINE HISTORIC PRESERVATION COMMISSION
Historic Building/Structure Form

Continuation Sheet

Cabot Mill from Topsham, looking south.


Maine Street
Built Between 1912-1923
Built 1865-66
Built 1891-92
Built 1892
Built 1909
Built 1896
Built 1909
Built Between 1912-1923
Androscoggin River
Cabot Mill
Brunswick
N

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

ANGUS S. KING, JR.
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

March 22, 2000

Chantelle Goldthwaite
ATC Associates, Inc.
1 Richmond Square Tech Center
Providence, RI 02906

Project: MHPC #524 - Rooftop Telecommunications Array, 14 Main Street (4PB-218-A)
Location: Prospect, Maine

Dear Ms. Goldthwaite:

In response to your recent request, I have reviewed the information received March 16, 2000 to initiate consultation on the above referenced project. We are reviewing this project pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended.

Based upon the description of this project (addition of telecommunication array on top of subject building), I find that the proposed project will have no adverse effect to historic properties (potentially eligible industrial complex).

Please call Dana R. Vaillancourt of my staff if we can be of further assistance in this matter.

Sincerely,

Earle G. Shettleworth, Jr.
State Historic Preservation Officer

EGS/drv

PHONE: (207) 287-2132

FAX: (207) 287-2335

ATC ASSOCIATES INC.

1 Richmond Square Te enter
Providence, Rhode Isla 2906
www.atc-e com
401. 3955
Fax 401. 0894

March 15, 2000

MAR 16 2000 -3

Mr. Earle G. Shettleworth, Jr.
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

RE: Section 106 Determination
Proposed Telecommunication Facility
Omnipoint Site Number 4PB-0218A
14 Main Street
Brunswick, ME

Dear Mr. Shettleworth,

In accordance with FCC regulations in 47 CFR 1.1307(a)(4), ATC requests that the MHPC make a Section 106 determination for the proposed wireless telecommunication facility at the above-referenced location.

Enclosed for your review is a site information sheet, location map and preliminary design drawings. Should you have any questions or comments concerning our request, contact the undersigned at 401/274-3955. Please reference Omnipoint site number 4PB-0218A in your correspondence.

Very truly yours,

ATC Associates, Inc.

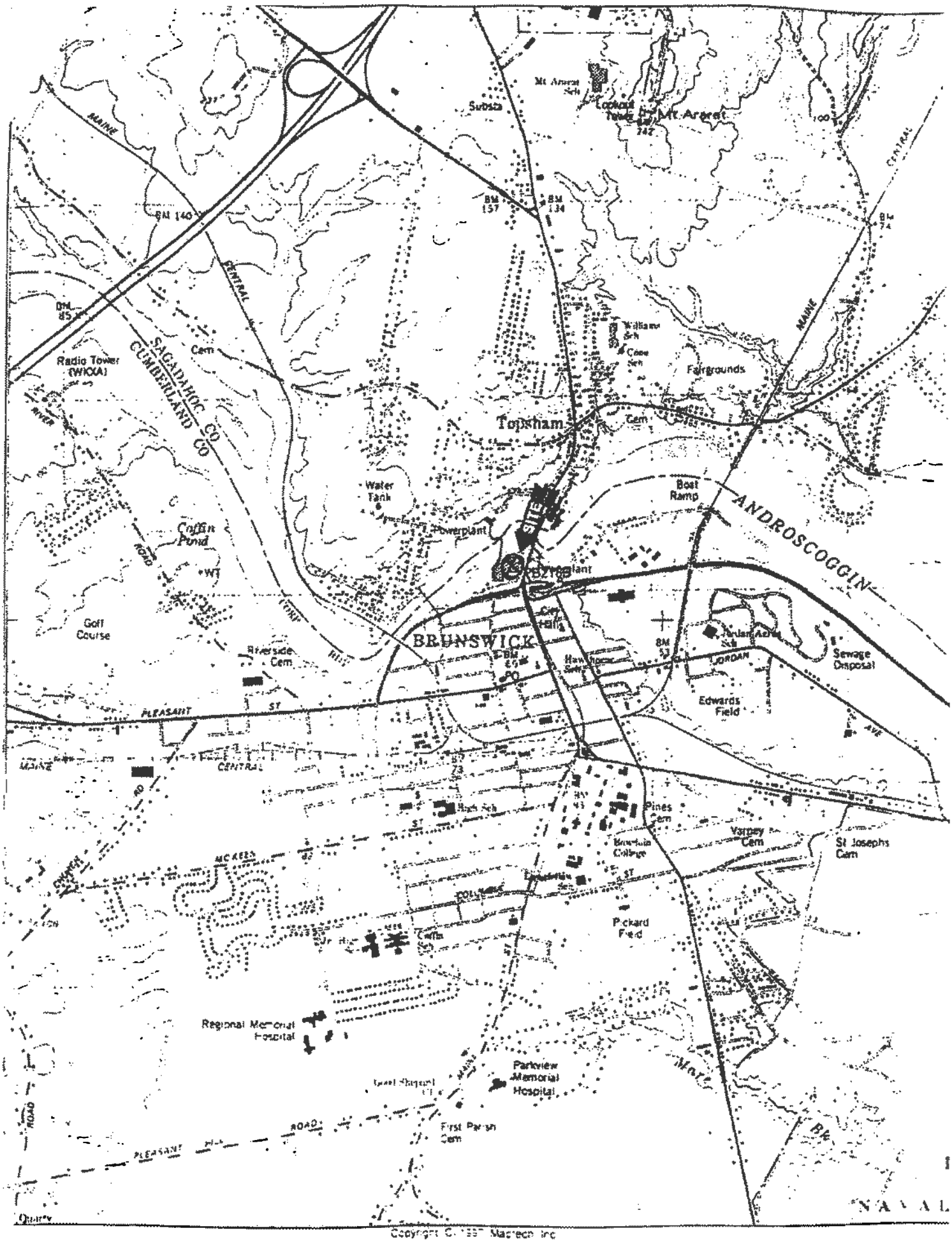
Chantelle Goldthwaite

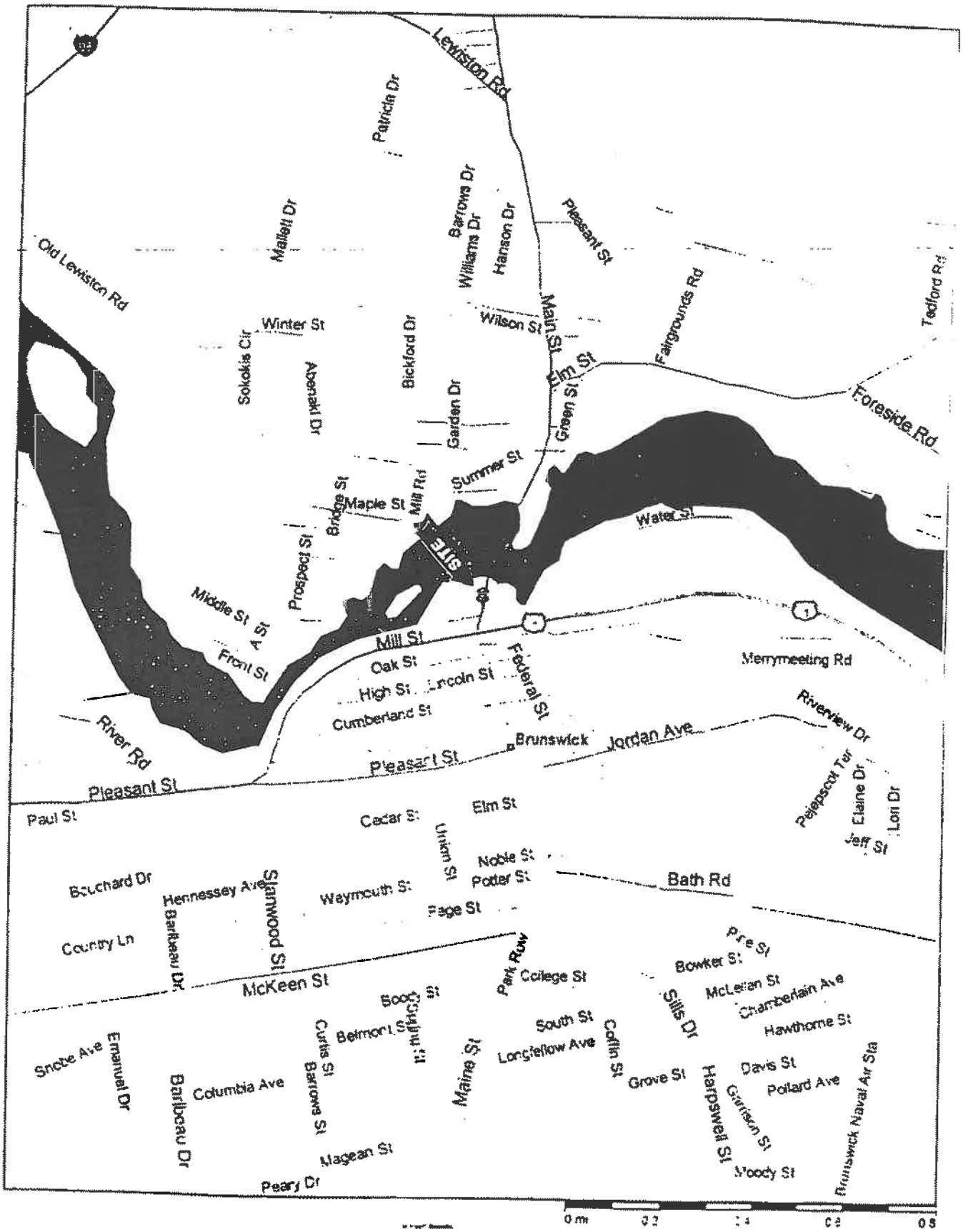
Enclosures

Wireless Telecommunication Facility Information Sheet

Site Reference: 4PB-0218A

- Site Location: 14 Main Street Brunswick, ME
- Antenna Location: ☐ New tower ☐ Existing tower ☒ Roof top ☐ Steeple ☐ Smoke Stack ☐ Water tank ☐ Existing utility pole ☐ Other: ____
- Overall Structure Height: 130 feet above ground level.
- Antenna Mounting Height: 140 feet above ground level.
- Antennas Type: ☒ Panels ☐ Canister ☐ Whips/omnis Total of 9 antennas
- Antenna Dimensions: ☒ 60"H x 8"W x 3"D ☐ 60"H x 16" dia. ☐ Other: ____
- Antenna Configuration: ☒ Three Sector ☐ Dual Sector ☐ Omni-directional
- Antennas Mounts: ☐ Triangular Frame ☒ Ballast Frame ☐ Pipe Mount ☐ Facade
- Stealth Treatment: ☒ None ☐ Paint to match ☐ Special: ____
- Radio Cabinet Location: ☐ Existing ground level ☒ Roof top ☐ Existing building floor ____ ☐ Existing equipment shelter ☐ New equipment shelter
- Radio Cabinet: 2 total, approximately 70" high x 51" wide x 28" deep.
- Site Access Road: ☒ No new site access required. ☐ New gravel access road ____ feet long.
- Utilities (from existing demarc) : ☒ Inside building or structure ☐ Underground ☐ Overhead
- Additional Information Attached: ☒ Street Level Map ☒ Design Plans ☐ Photos
- Comments: none.





Streets98

Appendix F
MHPC Concurrence
June 2016

STATE OF MAINE

MEMORANDUM

June 16, 2016

To: Megan M. Hopkin, ENV/Maine Department of Transportation

From: Kirk F. Mohney, State Historic Preservation Officer KFM

Subject: 22603; bridge improvements/replacement, Brunswick; MHPC #1595-15

In response to your recent request, I have reviewed the information received May 31, 2016 to continue consultation on the above referenced undertaking pursuant to the Maine Programmatic Agreement and Section 106 of the National Historic Preservation Act of 1966, as amended.

Identification of Historic Properties

The Commission agrees with the MDOT's conclusion that the Brunswick-Topsham Industrial Historic District is located within the proposed undertaking's area of potential effect. This district is eligible for listing in the National Register of Historic Places under Criteria A and C, and is comprised of the Pejepscot Paper Mill, the Cabot Mill and the Frank J. Wood Bridge. The MDOT also concludes that the dam located upstream of these three resources is a contributing feature of the district, and although we do not disagree, we would also include any extant hydroelectric generating facilities constructed during the period of significance that retain integrity. Finally, we believe that the district's period of significance should extend to 1966 as the Pejepscot Paper Mill was still in use as an industrial facility.

As to the inclusion of the houses along Summer Street in Topsham in this industrial district, it is the Commission's opinion that unless documentation can be found that establishes a direct link between their construction and/or occupants to the operation of the mills, this area should not be included. However, these properties may be eligible for listing in the Register as a separate residential historic district, the extent of which has not been determined.

If you have any questions regarding our comments, please do not hesitate to contact me.

Appendix G
Photographs

Frank J Wood Bridge, February 2016

Pejepscot Paper Company, February 2016

Cabot Mill (rear), February 2016

Cabot Mill (front), February 2016

15 Summer Street, February 2016

17 Summer Street, February 2016

19 Summer Street, February 2016

21 Summer Street, February 2016

21 Summer Street, February 2016

23 Summer Street, February 2016

Appendix H
Email from C.Anderson to N.Baker

From: Carl Anderson <carl.anderson@tylin.com>
Sent: Thursday, January 19, 2017 1:01 PM
To: Norman Baker
Cc: Kevin Ducharme
Subject: Potential impact of high beam vehicle lighting on Summer Street Topsham. (Revised)
Attachments: CFR 571_108 UPPER BEAM PHOTOMETRY.pdf; HEADLAMP - (HIGH_LOW BEAM - WIKIPEDIA).pdf

Norman,

I have completed an analysis on the probable impact that vehicle headlight illumination might have on the area in question on Summer Street in the Town of Topsham. The worst case scenario, based on the following conditions: (vehicle traveling from Brunswick into Topsham on proposed new bridge alignment; no traffic traveling from Topsham to Brunswick on bridge; clear sightline from vehicle headlight (36 inches above roadway surface) to Summer Street area; no bridge rail or solid barrier at edge of bridge; maximum allowable high beam photometric intensity of 75,000 candela (cd) per CFR 571.108) the maximum probable impact would be to increase the existing ambient illumination on a vertical surface by 0.117 foot-candle (fc) at the point of maximum photometric intensity of the high beam. (See attachments)

The use of low beam setting of headlights is unlikely to have any measurable impact on the area in question due to the photometric performance at the low beam setting which displaces the peak beam candlepower in a downward to the right position from the drivers prospective. (See attachments)

As a result of this analysis and the fact that there will in many cases be two way traffic on the bridge and the bridge will be illuminated in compliance with AASHTO standards
The need for the use of high beam on the bridge will be unnecessary and detrimental to oncoming drivers therefore minimizing further potential impacts to the area in question.

Illuminance (E) = I/D Sq. E = 75,000/800 x 800 = 0.117 fc.
Where: E = Illuminance in footcandles (fc)
I = Intensity in candelas (cd) toward point
D = Distance in feet

See also attachments: CFR 571.108 Upper beam photometry & Headlamp (High Low Beam)

Carl L. Anderson, PE
Senior Electrical Engineer

TY LIN INTERNATIONAL
12 Northbrook Drive
Falmouth, ME 04105
207.781.4721 main
207.781.4753 fax
carl.anderson@tylin.com
Visit us online at www.tylin.com
Twitter | Facebook | LinkedIn | YouTube

TABLE XVIII: HEADLAMP UPPER BEAM PHOTOMETRY REQUIREMENTS

TEST POINT (degrees)		UPPER BEAM #1 (UB1)		UPPER BEAM #2 (UB2)		UPPER BEAM #3 (UB3)	
		MAXIMUM PHOTOMETRIC INTENSITY (cd)	MINIMUM PHOTOMETRIC INTENSITY (cd)	MAXIMUM PHOTOMETRIC INTENSITY (cd)	MINIMUM PHOTOMETRIC INTENSITY (cd)	MAXIMUM PHOTOMETRIC INTENSITY (cd)	MINIMUM PHOTOMETRIC INTENSITY (cd)
2U	V	-	1,500	-	1,500	-	1,000
1U	3L &3R	-	5,000	-	5,000	-	2,000
H	V	70,000	40,000	75,000	40,000	75,000	20,000
H	3L & 3R	-	15,000	-	15,000	-	10,000
H	6L & 6R	-	5,000	-	5,000	-	3,250
H	9L & 9R	-	3,000	-	3,000	-	1,500
H	12L & 12R	-	1,500	-	1,500	-	750
1.5D	V	-	5,000	-	5,000	-	5,000
1.5D	9L & 9R	-	2,000	-	2,000	-	1,500
2.5D	V	-	2,500	-	2,500	-	2,500
2.5D	12L & 12R	-	1,000	-	1,000	-	750
4D	V	5,000	-	12,000	-	5,000	-

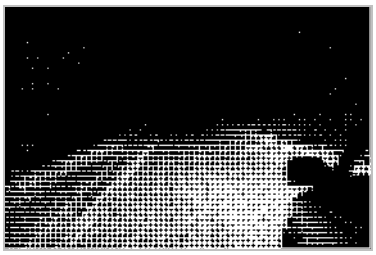
		UPPER BEAM #4 (UB4)		UPPER BEAM #5 (UB5)		UPPER BEAM #6 (UB6)	
2U	V	-	750	-	750	-	1,500
1U	3L &3R	-	3,000	-	2,000	-	5,000
H	V	60,000	18,000	15,000	7,000	70,000	40,000
H	3L & 3R	-	12,000	-	3,000	-	15,000
H	6L & 6R	-	3,000	-	2,000	-	5,000
H	9L & 9R	-	2,000	-	1,000	-	3,000
H	12L & 12R	-	750	-	750	-	1,500
1.5D	V	-	3,000	-	2,000	-	5,000
1.5D	9L & 9R	-	1,250	-	750	-	1,000
2.5D	V	-	1,500	-	1,000	-	-
2.5D	12L & 12R	-	600	-	400	-	-
4D	V	5,000	-	2,500	-	5,000	-

Regulations and requirements

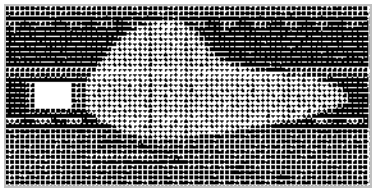
Modern headlamps are electrically operated, positioned in pairs, one or two on each side of the front of a vehicle. A headlamp system is required to produce a low and a high beam, which may be achieved either by an individual lamp for each function or by a single multifunction lamp. High beams (called "main beams" or "full beams" or "driving beams" in some countries) cast most of their light straight ahead, maximizing seeing distance, but producing too much glare for safe use when other vehicles are present on the road. Because there is no special control of upward light, high beams also cause backdazzle from fog, rain and snow due to the retroreflection of the water droplets. Low beams (called "dipped beams" or "passing beams" in some countries) have stricter control of upward light, and direct most of their light downward and either rightward (in right-traffic countries) or leftward (in left-traffic countries), to provide safe forward visibility without excessive glare or backdazzle.

Low beam

Low beam (dipped beam, passing beam, meeting beam) headlamps provide a distribution of light designed to provide adequate forward and lateral illumination, with limits on light directed towards the eyes of other road users to control glare. This beam is intended for use whenever other vehicles are present ahead, whether oncoming or being overtaken.



ECE dipped/low beam

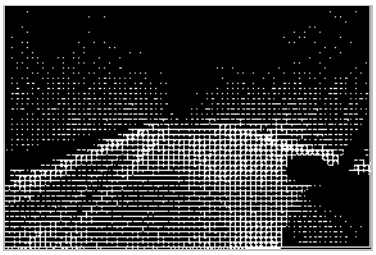


Asymmetrical low beam illumination of road surface – right-traffic beam shown

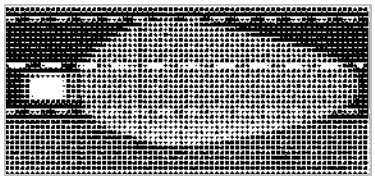
The international ECE Regulations for filament headlamps[19] and for high-intensity discharge headlamps[20] specify a beam with a sharp, asymmetric cutoff preventing significant amounts of light from being cast into the eyes of drivers of preceding or oncoming cars. Control of glare is less strict in the North American SAE beam standard contained in FMVSS / CMVSS 108.[21]

High beam

High beam (main beam, driving beam, full beam) headlamps provide a bright, centre-weighted distribution of light with no particular control of light directed towards other road users' eyes. As such, they are only suitable for use when alone on the road, as the glare they produce will dazzle other drivers.



ECE high/main beam



Symmetrical high beam illumination of road surface

International ECE Regulations permit higher-intensity high-beam headlamps than are allowed under North American regulations.[22]

Compatibility with traffic directionality

Most low-beam headlamps are specifically designed for use on only one side of the road. Headlamps for use in left-traffic countries have low-beam headlamps that "dip to the left"; the light is distributed with a downward/leftward bias to show the driver the road and signs ahead without blinding oncoming traffic. Headlamps for right-traffic countries have low beams that "dip to the right", with most of their light directed downward/rightward.

Appendix I
Email from P.Adams to S.Landry

Kate Willis

Subject: FW: FJW DOE DISCUSSION FOLLOW-UP

From: Adams, Patrick
Sent: Wednesday, November 02, 2016 4:09 PM
To: Landry, Stephen
Subject: Re: FJW

- We know that you increase risk to pedestrians whenever you increase the number of potential conflict points. Fewer crossing points would reduce the number of opportunities for Ped/car conflict.

- Drivers are more likely to anticipate pedestrian crossings at at intersections since this is how we've been trained. Midblock crossings inherently have increased risk because drivers don't traditionally expect there to be pedestrians crossing at that location. Locals will anticipate, but others my not even be aware that there is a crossing point at that location.

- The need for sidewalks is driven by pedestrian activity that is built upon the generators in the area. In this case, the generators are found on both sides of the road and the reasonably anticipated need/use would be for pedestrian activity on both sides.

- In 2012, NHTSA data indicates that as a pedestrian you are 3.5 times more likely to be struck crossing the street at a non-intersection (midblock) compared to at the intersection itself.

- Construction of two sidewalks promotes walk ability and significantly improves access and mobility for those with mobile concerns, impairments, and disabilities.

- The more pedestrian crossings you provide, the greater the impact a and impediments to traffic flow and movement.

- SRTS guidelines promote the inclusion of sidewalks on both sides of a roadway to improve safety.

- NACTO Guidelines support this recommendation.

- As a pedestrian, you are more than twice as likely to be struck by a vehicle in an area without a sidewalk for you to travel on than an area where you could utilize a sidewalk.

- Pedbikesafe.org states that "Sidewalks, provided on both sides of a street, are generally the preferred pedestrian facility. They provide that greatest degree of comfort for pedestrians and the presence of sidewalks has been associated with increased safety for pedestrians."

- Pedbikesafe.org also recommends that sidewalks on both sides of the road should should be required on all suburban highways, major arterials, urban collectors, minor arterials, local streets, and on all commercial urban streets. Sidewalks on both sides are "preferred" on urban local streets and on all streets in industrial areas.

Patrick Adams
Bicycle and Pedestrian Programs Manager

(207) 592-0873

Sent from my iPhone - So please excuse all my typos