

# **ATTACHMENTS**

**for**

**8/22/18 MEMORANDUM**

**to**

## **SECTION 106 CONSULTING PARTIES**

**Frank J. Wood Bridge project WIN 22603.00**

**Brunswick-Topsham, ME**

- I. Minutes – 6/27/18 Consulting Parties meeting
- II. Section 106 Mitigation Q&A Document
- III. Minutes – 7/17/18 SHPO meeting
- IV. Section 106 Steps and Consultation Timeline
- V. Technical memorandum reviewing additional rehabilitation concept

# MEETING MINUTES

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## Section 106 Consulting Parties Meeting, Frank J. Wood Bridge

**DATE OF MEETING:** June 27, 2018

**ATTENDEES:** Cheryl Martin, FHWA  
Eva Birk, FHWA  
Sharon Vaughn-Fair, FHWA  
Silvio Morales, FHWA  
David Clarke, FHWA (on phone)  
David Gardner, MaineDOT  
Julie Senk, MaineDOT  
Kristen Chamberlain, MaineDOT  
Joel Kittredge, MaineDOT  
Bill Pulver, MaineDOT  
Toni Kemmerle, MaineDOT  
Ted Talbot, MaineDOT  
Christopher Closs, Maine Preservation  
Dan Myers, TYLin  
Darin Bryant, TYLin  
Kate Willis, Kleinfelder  
Amanda Taylor, Kleinfelder  
Bruce Van Note, DAC  
Doug Bennett, DAC, Topsham  
John Shattuck, Topsham  
Rich Roedner, Topsham  
Gary Smart, Topsham  
Theo Gardner-Puschak, Topsham Intern  
Steve Pelletier, Topsham  
Ann Carroll, Summer Street/Friends  
Charles Carroll, Summer Street/Friends  
Donna Neff, Brunswick  
Carolle Eyerman, Topsham Town Planner

# MEETING MINUTES

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Phinney Baxter White, Topsham/Friends  
Scott Hanson, Friends  
John Graham, Friends  
Arlene Morris, Friends  
Jane, Brunswick Planner  
Betty Hanks Leonard,  
Kathy Lamb, Topsham  
Steve Hinchman, Friends Counsel  
Linda Smith, Town of Brunswick  
Sarah Stokely, ACHP (on-phone)  
Nathan Holth, historicbridges.org (on phone)  
Kitty Henderson, Historic Bridge Foundation (on-phone)  
Betsy Merritt, NTHP (on-phone)

**RECORDED BY:** Amanda Taylor, Kleinfelder

**SUBJECT:** Frank J. Wood Bridge Section 106 Consulting Parties  
Mitigation Meeting

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Cheryl Martin opened the meeting at 2:00 pm. She introduced herself and began by stating that the comment period for the Frank J. Wood Bridge Project Environmental Assessment or EA closed on April 11, 2018. FHWA as the lead federal agency, along with MaineDOT, are moving ahead with Alternative 2, replacement on upstream alignment. She then reiterated that throughout the Section 106 process, FHWA has sought input from the consulting parties on the APE, identification of historic resources, and project effects. She then noted that the purpose of this meeting is to get views from consulting parties on mitigation for the adverse effects of Alternative 2. She then laid out ground rules for the meeting, including being respectful and allowing individuals time to finish speaking before responding. She noted that if anyone did not feel comfortable speaking, a comment box has been provided for anyone to write down suggestions. Feedback can also be submitted via the MaineDOT website or via e-mail until July 11, 2018. Ms. Martin explained the meeting's agenda, which included brief remarks from David Clarke, Federal Preservation Officer, FHWA, and Sarah Stokely, Advisory Council on Historic Preservation (ACHP). The meeting would then include 40 minutes to hear from consulting parties about the Section 106 process to express views, comments, and questions, and then there would be time for consulting parties to submit ideas about mitigation measures. The meeting would conclude with a discussion of next steps.

# MEETING MINUTES

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David Clarke introduced himself by stating that he has agency wide authority related to compliance with Section 106. He also clarified that project decisions are made at the local level, and in this instance, it is at the division level. He apologized that he was unable to travel to the meeting. He reiterated that FHWA does want to hear from consulting parties throughout the project and that he is a resource for FHWA compliance with this regulation.

Sarah Stokely introduced herself and stated that she has been following this project and talking with consulting parties from this project. Her role is to review FHWA Section 106 cases. She said that the ACHP will make a decision to be part of a specific project's Section 106 process when there is controversy or concerns about the case. She is available to the public as a resource on Section 106.

Ms. Martin opened the floor for anyone to comment on the project's Section 106 process.

John Graham, Friends of the Frank J. Wood Bridge, asked for clarification of Ms. Martin's opening statement that the EA has been concluded and that the project is moving forward.

Ms. Martin replied that this means that the final NEPA decision will happen late this summer.

Christopher Closs introduced himself as the Field Service Advisor from Maine Preservation, the state's private historic preservation organization. He stated that he thought the project's Section 106 process was unusual and irregularly conducted. He stated that his comments are related to due process, that the process has been abridged and that the Section 106 process has been accelerated and the selection of Alternative 2 premature. He believes the alternative was selected before effects are fully known and that it is premature to discuss mitigation. He stated that the investigation is incomplete and that FHWA has not responded completely to EA comments, that there was no public notice for this meeting, that MaineDOT hired a bridge consultant with no experience rehabbing bridges, that the rehabilitation option was not weighed fully, that in 2017 an engineer in Massachusetts studied a rehabilitation alternative that would cost \$17 million with a service life of 100 years if maintained. He stated that this alternative has not been evaluated or commented on. He stated that the bridge's construction as an interurban bridge has not been adequately addressed related to load capacity; that FHWA has refused to reopen environmental review after the bridge was determined individually eligible in November 2017; that the bridge, as an example of rolled steel members and its role in the interurban electric railroad, has not fully been investigated; that FHWA has refused to produce renderings of the bridge and that without them effects cannot be accurately determined. He noted that since 1999 Maine has lost 49 Warren truss bridges, 23 of them eligible for listing in the National Register, and he asked about where the updated bridge survey results are and the impact of this loss on the remaining bridges. He stated that there has been no discussion about the bridge's loss on local

# MEETING MINUTES

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heritage tourism and on the impact to the Maine Street Historic District, a National Register-listed district. Mr. Closs submitted a copy of his statement to FHWA.

Ann Carroll of Summer Street and the Friends spoke next. She asked why there is no impact on the Summer Street Historic District and if anyone had read their letters? The new bridge would have a devastating impact on Summer Street. It will completely block the view of Summer Street to the yellow mill and vice versa. Lights will constantly be shining on us and the noise will be louder as the new bridge will be higher. She noted that no one has shown drawings of entry points and that what has been produced shows a smooth bridge, which is not the case. How will it be no impact?

Steve Hinchman, legal counsel for the Friends, spoke next. He began by stating he has worked on shad, Essential Fish Habitat related to the Brunswick Dam with Fish and Wildlife, EPA, Marine Resources, and that the fish ladder does not successfully pass shad and partially works for other fish. Many things have been tried to get the fishway to work, but there is a fundamental design flaw. FERC relicensing for the dam is less than 15 years away and that a solution to the fishway will be required, but no one is sure what that will be. He asked if there is a fundamental problem with the new bridge that could impact fish passage and to what extent and that this needs to be considered now as part of NEPA, Clean Water Act, and Section 7. The issue has been recognized but not dealt with and has not been integrated into other planning processes. NEPA prohibits actions that affect future alterations and disclosures; if other alternatives have not been considered, how can mitigation be talked about if the fish passage hasn't been figured out? He stated that it is premature to talk about mitigation. He noted that he is looking for a fair, open, and complete process. He also asked for answers to the EA comments. He submitted a bulleted list on behalf of the Friends.

Charles Carroll, Summer Street and Friends, introduced himself by stating that he has dealt with Section 106 since 1966 when he worked in the executive office of the White House oversight of the Bureau of Public Roads (FHWA precursor) and the Secretary of Transportation and to sites where there was controversy over highway and bridge projects. He then quoted Section 106, particularly that views of the public are essential to inform decisions. He noted that serious consideration has not happened related to alternatives or the statements by the public. He quoted more 106 regulation, including gathering public knowledge of historic properties. He stated that Summer Street is a historic area, meets the requirements of a district, and that no one went to Summer Street to ask for historic information. He then noted that the bridge has been neglected for some time and that can be considered a "use" under Section 4(f). He stated that there has been an extreme intention to do Alternative 2 and that rehab was not seriously considered. He stated that there was a change from many years ago when rehab was considered and that he can only think there are undisclosed political involvement influencing the change to a new bridge. He thinks that consulting parties have been deprived of much information that must be confidential.

David Clarke asked if Maine's SHPO was at the meeting. Ms. Martin noted that he is not.

# MEETING MINUTES

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Scott Hanson, Friends, then spoke, stating that he was about to ask about SHPO attending the meeting. He stated that in the absence of SHPO it is impossible to consider mitigation.

Ms. Martin replied that SHPO was invited to the meeting and that all the info at the meeting will be shared with him. She noted that SHPO does not have to attend consulting parties meeting, but that they will be a signatory on the MOA.

Phinney Baxter White, Business Owner and Friends, stated that it is unfortunate that Kirk Mohney is not here at this important meeting. He stated that the main purpose of Section 106 is to minimize harm to historic properties not for 5-foot bike lanes. He noted that the bridge could have 4-foot shoulders. He then stated that to ensure that the new bridge will be preferred, those that favor the current bridge have been prevented from speaking. At the April 5, 2017 open house, the Friends should have been allowed to have a booth to present their ideas to the public. He noted that he tried to speak at the event, but that the microphones had been turned off. He stated that the bridge was determined individually eligible last year, but this is the first consulting parties meeting in a year and a half. He stated that because the preferred alternative was based on the bridge not being individually eligible that it should have been hashed out. Instead, the process has skipped to mitigation. He believes this is a flaw and that the preferred alternative should be retracted with determinations. He noted that a November 2015 meeting was a sales pitch to influence the public that the bridge was not worth putting money into and that even rehab would only extend its service life by 30 years. But that now MaineDOT is stating that a rehab would add 75 years. He noted that fracture critical has been used a lot lately and that the bridge opened as fracture critical and that it can still serve the public after rehab as fracture critical. He noted that the bridge is eligible for its interurban line, but that it could also be under Criterion C if its rolled beams are unique and the prime example of using that technology. He continued that the MaineDOT survey will include the bridge and Criterion C and that it is not yet complete. He questioned why the process is moving on when this survey is not complete. He wants everything totally evaluated about the bridge. He stated that he has no interest in mitigation, no plaques, but he does have interest about the name of the bridge. He thinks there is a huge credibility issue and that Section 106 has not been run correctly. He noted that the ACHP has guidelines about how this should be done and that they have been walked on and the rules have not been followed. He encouraged the ACHP to take FHWA to task.

Betsy Merritt, NTHP, asked who spoke. Ms. Martin replied and responded that the bridge has been considered a historic resource from the beginning as it is a contributing resource to the Brunswick-Topsham Industrial Historic District. She also stated that the bridge's individual eligibility was reviewed as a result of a consulting party meeting and is a good example of where feedback was received and acted upon.

John Graham, Friends, stated that there was another rehabilitation option suggested by the professional engineer hired by the Friends that had been used on a bridge in Massachusetts with new independent steel girders ("Option 3"). Mr. Graham stated that

# MEETING MINUTES

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this alternative, which had been submitted to MaineDOT, is on par with the new bridge. This alternative would leave the bridge as is but add more steel and make the bridge not be fracture critical. It would also be lower cost. Mr. Graham indicated that the Friends could not pay for further engineering analysis for that option for the Frank J. Wood Bridge. He wanted to know if MaineDOT had any numbers on the alternative.

Bill Pulver, MaineDOT, responded that MaineDOT and TYLin have reviewed the report and that there was not enough analysis in the report for MaineDOT to determine the engineering or cost viability of the Option 3 concept. (\*Note: Further review of the study after the meeting did not find a reference or comment regarding a Massachusetts bridge or any other bridge that utilized the long-span steel girder concept similar to Option 3.)

Mr. Graham asked if MaineDOT would look at the alternative on their own.

Ms. Martin stated that FHWA and MaineDOT are not looking at any other alternatives and the project, through the EA and Section 106, has moved past the point of weighing alternatives.

Mr. Graham believes this answer is difficult to accept. Based on the Freedom of Access Act materials, including 60-80 hours of emails, he thinks MaineDOT has been unjust to the old bridge, as shown by the email asking to use the worst photos of the existing bridge and best views of a new bridge. He noted that even in the EA the old bridge and new bridge were scaled differently and that the old bridge was made to look narrower. He states that the decision was made three years ago. He also asked where the responses to the EA comments are and that it is premature to discuss mitigation. He also stated that the process budget of \$130,000 is over budget to \$600,000.

Ms. Martin stated that there were 15 minutes left in the comment period.

Kitty Henderson, Historic Bridge Foundation, echoed the previous comments. She reiterated that local residents are concerned that they haven't gotten answers to questions and that she has contacted the FHWA Maine Division about this. She stated that the discussion has not ended and that no answers have been given. She thinks that the answer to John Graham's report question is not an actualized answer. She reiterated, for the record, that it is premature to talk about mitigation.

Betsy Merritt, NTHP, also spoke to reiterate the previous concerns and comments, particularly those voiced by Maine Preservation about the legal flaws in the process.

Betty Hanks Leonard, Brunswick stated that she grew up here and that the mindset that new is good and old is bad is concerning along with replacing the bridge with a piece of concrete. She said to go to Grand Central Station, a cathedral, awe inspiring, that thanks to Jackie Kennedy, was saved. It would have been torn down. New York still bemoans the loss of Penn Station. She said there is an interest in modernizing that she is not interested in. She was born in Brunswick and has seen buildings, churches, public buildings torn down, but two mills have been saved. She asked why there has been no serious effort to save the bridge? She doesn't understand this mindset and asked for

# MEETING MINUTES

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second thoughts to be given to bridge advocates. She stated that she has an affinity for old things in the community.

Donna Neff, Brunswick, stated that she is heartbroken. She moved here four years ago, and has tirelessly worked to preserve her own house for the next generation. She got an award from the Brunswick Downtown Association for its preservation. She stated that it was for the love of the house and the neighborhood that they preserved it. She asked that the voices of the public who love old houses be considered and that the bridge should be considered for saving. She stated that a cement causeway would be wrong.

Doug Bennett, Consulting Party and DAC, stated that he has been to all the meetings for this project and talked to citizens and read all of the public comments. He's listened to all the people and sees their passion for historic preservation. He's read all 800 pages of comments to the EA and there is enormous passion for a new bridge to connect the two villages; that the people in the room did not reflect all the opinions in the public comments.

Ms. Martin asked if there are any more comments. With no others, she stated that the next portion of the meeting is to get ideas on mitigation measures for adverse effects on this project. She turned the meeting over to Eva Birk, FHWA.

Ms. Birk introduced herself stating that she is new to the FHWA-ME office, but happy to be back in Maine. She thanked everyone for attending the meeting and stated that FHWA appreciates their thoughts. She then stated that this part of the meeting is to discuss mitigation measures for Section 106 and to get ideas for these measures. She reminded everyone that comments could be submitted via notecards in the box, by email, or by the MaineDOT website. She discussed a PowerPoint slide with 4 steps in the Section 106 process. She stated that mitigation is meant to offset impacts to historic properties and that how much mitigation or what is appropriate depends on the project. She noted that consulting parties are needed here to help inform why something is significant. She explained that general guidelines for mitigation measures are to consider the resource's significance and that it should be something public in nature. She offered that documentation, panels, coffee table books are all things that can be shared with a large group of people. She further explained that mitigation should consider the needs of all parties, enhance knowledge of historic properties, and consider costs. Ms. Birk then invited Kate Willis, Kleinfelder, to provide a refresher of resources affected by the project.

Ms. Willis pointed the audience to their handouts and posters on the wall and explained the significance of the Cabot Mill, Pejepscot Mill, Frank J. Wood Bridge, and Brunswick-Topsham Industrial Historic District. She noted the significance, National Register criteria, and character-defining features of each resources and that effects have been concurred with by SHPO. She then explained that mitigation measures should relate to the resource's significance but apply to the entire project.

Ms. Birk then asked for suggestions on mitigation and noted that Ms. Willis and Julie Senk would record them.

# MEETING MINUTES

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Mr. Hanson stated that instead of resolving adverse effect, FHWA should minimize and avoid. He stated that the bridge should be rehabbed to avoid and minimize and then mitigation would not be needed.

Ms. Birk asked if Sarah Stokely or David Clarke had anything to add.

Ms. Stokely stated that from what she has heard from the consulting parties is that there are concerns about looking at other alternatives. She asked if the agencies feel like they need to go back and look at anything? In terms of moving forward, she noted that this is the opportunity to mention if there will be any further investigations.

Mr. Clarke added that mitigation should be looked at in terms of direct, indirect, and cumulative impacts.

Ms. Martin stated that FHWA and MaineDOT do not plan on going back and looking at any new alternatives. Alternatives for this project include the four previously studied.

Mr. Carroll asked why Summer Street is not being looked at.

Ms. Willis stated that the adverse effect determination is for the whole project. The Summer Street Historic District is eligible for Architecture and that it would not be adversely impacted by this project. This effect was concurred with by SHPO. The No Adverse Effect signifies that there is a change to the district, but that the change does not diminish the character-defining features related to National Register eligibility.

Mr. Carroll stated that the view between the district and the mills would be blocked by the bridge.

Ms. Willis related that no direct connection between the mills and the district was found.

Mr. Carroll replied that his own house was owned by an executive at the mill.

Ms. Willis asked Amanda Taylor, Kleinfelder, to further elaborate on the relationship between the mills and the district as she completed much of that research.

Ms. Taylor stated that Summer Street was evaluated for any industrial significance and that SHPO asked for evidence that the houses were built or used by the mills for the specific reason of housing workers or executives. Ms. Taylor stated that this connection was not found. While many workers or executives from Cabot and Pejepscot lived on Summer Street, this was likely due to the proximity to the mills and not that the mills deliberately built the houses.

Mr. Hanson stated that he found a high percentage of workers from the mills living on Summer Street in one US Census. He sent this information to Kirk Mohny.

Mr. Carroll stated that on the river side of Summer Street steel bolts exist which were related to the Pejepscot Paper Mill.

Ms. Birk asked if anyone has any mitigation ideas.

Mr. Bennett spoke to relate ideas from the DAC. He noted that the DAC began meeting in 2016 and were a committee operating in parallel with the Section 106 process. The

# MEETING MINUTES

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DAC was to inform on design aspects if a new bridge was selected. The DAC completed a report in August 2017. The report included ideas about what a new bridge would look like, what its ends would look like, and how it would connect to the existing park. The DAC thought a lot about the new bridge and its setting and how to memorialize, honor, the historic resources. He then listed the report's broad ideas for mitigation including: ecology of the river; indigenous peoples' role at the site; history of the varied economies of the use of the falls, mills and others; succession of crossings at this site, the Wheeler history notes many bridges; incorporate pieces of the bridge's infrastructure in the park; show what the river looked like before man made changes; and show freshets and floods at the site. Mr. Bennett then submitted the report to FHWA.

Ms. Carroll stated that she was a part of the DAC. She noted that the DAC was respectful to her even though she was the only member against a new bridge.

Ms. Neff asked if anyone knew where downtown Topsham was. She thought a new bridge would take over the Topsham historic district. She noted that a new bridge doesn't make sense.

Mr. Hanson asked if anyone knows how much money was spent by MaineDOT on the DAC. He noted that the DAC was supposed to be town run, but that MaineDOT and TYLin produced many items for it.

Mr. Closs stated that the absence of solutions for mitigation speaks for itself, and that this segment of the meeting is entirely inappropriate.

Ms. Merritt asked a question about slide 5, the Frank J. Wood Bridge slide. She noted that while the bridge is eligible under Criterion A, what is happening with the evaluation of Criterion C? She also noted that the period of significance for the bridge seemed narrow. Would eligibility under Criterion C change the period of significance?

Ms. Martin replied that there is no active study for Criterion C for the bridge.

Mr. Clarke added that the bridge was independently evaluated for Criterion A, but that not enough information was available for Criterion C. He said that the state is still completing its overall bridge survey.

Mr. Carroll asked what Criterion A and Criterion C are.

Ms. Willis explained that Criterion A has to do with events or broad patterns in history, while Criterion C has to do with the physical appearance of a resource or its architecture or engineering.

David Gardner, MaineDOT, added the MaineDOT is still working on an evaluation of the remaining truss bridges in Maine. The study is focusing on the bridges found not eligible in the 2000 bridge survey. He stated that MaineDOT is looking to complete the study by the end of summer.

Mr. White asked if the Frank J. Wood Bridge is included in the study.

# MEETING MINUTES

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Mr. Gardner replied that in terms of context the bridge is included, but that study is looking more closely at the bridges previously determined not eligible.

Mr. Graham asked if the study would evaluate the bridges lost?

Mr. Gardner replied that this would be included in the study's context.

Mr. White stated that SHPO did not want to duplicate this effort and that SHPO is waiting on MaineDOT. He does not think this task should fall to MaineDOT. He also mentioned that it is bizarre that SHPO was not there.

Ms. Merritt added that Criterion C could be relevant to the nature and magnitude of adverse effects. The loss of the bridge could weigh on the design of the new bridge. She noted that the issue of Criterion C and the period of significance could also be sent to the Keeper of the National Register. The ACHP could refer it to the Keeper. She reiterated that she feels Criterion C should be resolved and that it could have implications for design of a new bridge and the magnitude of the adverse effects.

Ms. Stokely asked if there are any additional evaluations in the works for the bridge and if concerns had been raised about Criterion C.

Mr. Clarke noted that the previous eligibility filing discusses C, but that SHPO did not think enough information had been provided.

Mr. White again stated that mitigation is premature. He directed his question to Mr. Clarke and asked if Criterion C could be determined soon and that he should tell Ms. Martin to back off and retract the preferred alternative.

Mr. Clarke stated that National Register Criteria is one factor and that with the replacement of a bridge it is a complete loss. With the bridge already determined eligible under Criterion A, the loss of the bridge pushes to an adverse effect. He also acknowledged that the state is suggesting moving forward and that the NEPA decision is up to the FHWA Maine Division. He noted that this project did not rise to a level that would require national FHWA oversight.

Mr. Carroll asked Mr. Clarke to explain more about why the project did not meet the standards to move to Washington, D.C. oversight.

Mr. Clarke replied that NEPA decision making is authorized at the division level, unless a request is made to elevate to a FHWA headquarters project.

Ms. Martin further related that the division office can make a request to elevate the project as prior concurrence. The requests are made for projects that are nationally significant. She noted that this is a typical project for the division level.

Sharon Vaughn-Fair, FHWA legal counsel, explained that nationally significant projects impact how FHWA does business across the country. She gave an example that the hyperloop tunneling project proposed from Washington DC to Baltimore is a project of national significance. These projects require prior concurrence for headquarters to handle. These projects would have national policy implications.

# MEETING MINUTES

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Mr. White posited that the bridge could be significant nationally. He wondered if the bridge is the best example of rolled steel members in the nation. He also noted that LBJ drove over the bridge.

Mr. Clarke replied that MaineDOT is looking into trusses and the bridge's status should be considered. He stated that at the onset of this project, based on his involvement with similar projects around the country, he did not think this bridge is nationally significant.

Ms. Birk asked for any additional comments.

Ms. Martin then began discussing next steps in the Section 106 process. She noted that all comments will be considered. She reminded everyone that even if the bridge is determined eligible under Criterion C, the adverse effect remains. She noted that comments could be submitted via comment cards, email, and the MaineDOT website. She noted that a NEPA decision is slated for an August timeframe. She also noted that mitigation comments can come from any member of the public. She adjourned the meeting.

FHWA/ DOT  
 Frank J. Wood Bridge Mitigation

4/27/18

NAME

AFFILIATION

EVA BIRK

FHWA

DONNA NEFF

NWBNA

Cheryl Martin

FHWA

- Arlene Morris

Friend FJWB

Christopher W. Closs

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Topsham - Lower Village Development Committee

~~Elizabeth Harris Leonard~~

~~FHWA~~

GARY SMART

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KATHY LAUB

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Theo Gardner Puschak

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Rich Roedner

Topsham

Bruce Van Note

Topsham, DAC.

Steve Pelletier

" TDI, TCL

Steve Hutchinson

FFSWB

Scott Hanson

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~~Heide O'Connell~~

~~Town of Brunswick~~

## Section 106 Mitigation Comment Response Document

### Frank J Wood Bridge Project

### Brunswick-Topsham, ME (WIN 22603.00)

August 20, 2018

#### **Introduction:**

The Federal Highway Administration (FHWA) and the Maine Department of Transportation (MaineDOT) held a Section 106 consulting parties meeting on June 27, 2018 to discuss mitigation measures for anticipated adverse effects for the Frank J. Wood Bridge project. Responses to questions are provided below in the order they were raised. The Maine State Historic Preservation Office (SHPO) provided comment on mitigation measures in a later meeting on July 17, 2018. For a full record of Section 106 consultation activities see the attached “Section 106 Steps and Consultation for the Frank J. Wood Bridge Project”. For additional questions not captured here, please email [eva.birk@dot.gov](mailto:eva.birk@dot.gov).

#### **Question 1: Can FHWA/MaineDOT please respond to comments that the Section 106 process for this project was flawed?**

**Answer:** The timeline referenced above and attached details the Section 106 process to date and relevant regulatory requirements. It identifies multiple consulting parties and public comment periods as well as project components that were revised or revisited to respond to and incorporate consulting party input. Comments from consulting parties and the Maine SHPO were also made available to the public via MaineDOT’s project website.

The Maine SHPO has concurred on both eligibility and effects to historic properties. The preferred alternative will result in adverse effects to historic resources. Resolution of adverse effects through mitigation is the next step in the Section 106 process.

#### **Question 2: Have MaineDOT/FHWA considered the Friends of the Frank J. Wood (Friends) Engineering study, specifically the additional rehabilitation concept titled “Option 3”?**

**Answer:** The Friends’ rehabilitation option discussed at the June 27 consulting parties meeting (Option 3) proposes to replace the existing bridge deck with an independent steel girder system.<sup>1</sup> This option was presented at a conceptual level only. No engineering analysis or cost estimates were provided. As stated at the June 27<sup>th</sup> meeting, MaineDOT conducted an examination of the Friends’ bridge rehabilitation study conducted by JDB Consultants, and determined that the rehabilitation options already evaluated in the Environmental Assessment are appropriate.

In addition, MaineDOT commissioned review of the Friends’ study by the firm TYLIN International, who identified numerous technical concerns with the rehabilitation alternative presented by the

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<sup>1</sup> See: *Historic Frank J. Wood Bridge Study*. Prepared for: Friends of the Frank J. Wood Bridge. Prepared by: JDB Consulting Engineers, Inc. April 9, 2018. This analysis was submitted as comment to the Frank J Wood Bridge project Environmental Assessment.

Friends.<sup>2</sup> It is MaineDOT’s opinion that the additional option would not surface as a viable preferred alternative if further engineering analysis was performed.

In response to consulting party interest in expending further agency time and effort exploring constructability, design details and cost implications of the Friends’ additional rehabilitation concept, FHWA conducted an *additional* internal review of both the Friends’ report and TYLIN’s analysis in August 2018. This review found the following:

The Friends’ Option 3 was presented at a conceptual level only. No engineering analysis or cost estimates were provided. Therefore, only general comments could be made.

- As a general rule, for simply supported steel I-girders, AASHTO Table 2.5.2.6.3-1 specifies the minimum ratio of the depth of steel girder portion to the span length to be 0.033. Based on the existing span length of 310’, the girders would be around 10’ deep. However, to maintain the existing structure depth as described in the report, the girders would have to be around 5’ deep. This proposed depth to span ratio is significantly outside the range of standard engineering practice. Further development of this option would be needed to determine if the construction of this bridge type is possible. If construction of this type is possible, this option would look and act different from the existing bridge.
- This option also proposes the use of a “vertical slip connection” between the truss and the new girders. This is a complex detail and there is no information in the study to determine how the existing trusses are attached to the new superstructure. This is not a typical bolted connection so it would need further development and analysis to demonstrate its viability.
- In addition to improving the structural condition and load capacity, the Purpose and Need of this project includes pedestrian accommodations. The existing bridge has a sidewalk on the west side. Option 3 has no mention of a sidewalk or any other pedestrian accommodations.

Although FHWA appreciates the effort of consulting parties to present additional alternatives for consideration, after additional review of rehabilitation options including Option 3, FHWA continues to support MaineDOT’s assessment that these are not viable or prudent options to meet the purpose and need of the transportation project.

**Question 3: What is the significance of rolled steel beam technology found on the Frank J. Wood Bridge?**

**Answer:** At the project kick-off in February 2014, MaineDOT understood that the Frank J. Wood Bridge was eligible for the National Register of Historic Places (NRHP) as a contributing resource to the Brunswick – Topsham Industrial Historic District. It follows that assessment of project alternatives has always considered impacts to this NRHP eligible bridge. During the Section 106 consultation process, at the request of consulting parties, MaineDOT/FHWA reevaluated the *individual* eligibility of the Frank J Wood Bridge. It was ultimately determined that the bridge was individually eligible under Criteria A, but there was not enough information for FHWA to conclude

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<sup>2</sup> Memorandum. WIN 22603.00 Frank J. Wood Bridge: Comments on JDB Bridge Rehab Study. TYLIN International. June 4, 2018.

that the bridge was eligible under criteria C. It was originally determined not eligible under Criteria C in the 2003 Maine Historic Bridge Survey.

In the spring of 2018, MaineDOT began a reevaluation of MaineDOT's remaining truss bridges that were originally not determined eligible for NRHP listing during the 2003 Maine Historic Bridge Survey. This was a separate process from the Frank J. Wood Bridge Section 106 process. The truss survey reevaluation is ongoing, but MaineDOT research indicates that the use of rolled steel sections became widespread and common in late 1929 and onward. Therefore, the bridges constructed after 1929 are not considered significant for the use of rolled steel sections. This technology became common place within a year. The period of significance for the innovative use of rolled sections is comparatively miniscule to the period of significance for metal trusses in the context of bridge technology. The period of significance of an eligible metal truss bridge that is eligible for its use of rolled steel members in Maine is 1929. Therefore, there are no remaining significant examples.

The period of significance for the Frank J. Wood Bridge has been determined to be 1932-1937. This is documented in the Section 106 eligibility determination for this project and has been concurred upon by the Maine SHPO.

**Question 4: How did MaineDOT consider visual impacts of a new bridge? (For example, depth of beam and view from the Summer Street district.)**

**Answer:** MaineDOT and FHWA reviewed extensive public comments regarding visual impacts and aesthetic considerations. Visual elements of the bridge and aesthetic considerations will continue to be refined in final design.

In response to questions specific to visual impacts on the Summer Street District, MaineDOT developed two renderings, provided below, of both the existing and proposed bridge from Summer Street. The comparison between Alternative 2 (Sheet 2) and the existing bridge (Sheet 1) were generated based on variable components that relate beam depth to structure depth from a single vantage point (Sheet 3 "Summer Street Viewpoint"). The images are to scale and are based on existing information and preliminary engineering.

To provide as much detail as possible to consulting parties and to be responsive to questions asked at the last meeting, the following preliminary design details have been summarized, below.

Preliminary Design Details for the Preferred Alternative 2 Height/Span Length

*The preferred Alternative 2 bridge is comprised of four variable length spans. The first span, at the Brunswick end is the longest, the next two spans are the same length and the last span, at the Topsham end, is the shortest. Generally, structural efficiency is gained through a positive relationship between span length and girder depth. As the span length increases, the girder depth should also increase to maintain structural efficiency. Because of this relationship, the girder depths vary with the span lengths, deeper girders are used for the longer spans and more shallow sections are used for the shorter span lengths. Additional structural efficiency is gained by using "haunched" girders, which have a shallower depth at the mid-span and then curve down to become a deeper section over the piers where load demand is highest.*

*Preliminary design has resulted in initial approximate sizing for these girders. These sizes will be refined during the final design phase to optimize economy and aesthetics. The “bridge structure depth” is made up of the depth of the steel beam girders plus the thickness of the concrete and asphalt deck, sidewalk, and the 3’-6” high combination concrete / metal railing. Due to the variability in the girder depth, the bridge structure depth varies from the Brunswick end to the Topsham end of the bridge. At the Brunswick end, the bridge structure depth for the first span varied from approximately 15’-8” in the center of the span to approximately 17’-8” at the pier. At the Topsham end, the bridge structure depth for the last span is approximately 11’-0” at the center of the span and 12’-8” at the pier.*

*When looking at the existing bridge from the side there are two visual components to the bridge depth. The first is the “bridge structure depth” referenced in the question, which is made up of the depth from the bottom chord to the top of the sidewalk railing. The second is the overall depth of the bridge including both the “bridge structure depth” and the truss elements above the railing.*

*Regarding the existing “bridge structure depth”, when looking at the side of the bridge this is seen as mostly solid. It includes the depth of the truss bottom cord, height of the sidewalk bracket, the thickness of the sidewalk concrete, and height of the metal pedestrian railing. The structure depth varies with span length but the difference is less pronounced than for the proposed bridge. The structure depth, for the existing bridge, is approximately 9’-6” for the shortest span and 10’-6” for the other two spans.*

*The second visual component of the existing bridge is the portion of the truss above the sidewalk railing. When looking at the side of the bridge, the view above the pedestrian railing is partially to mostly obstructed by the truss elements depending on the view perspective. The total maximum height from bottom chord to highest point on the truss is about 36’-6” for the span closest to Topsham, and about 54’-0” for the other two spans.*

*In summary, the “bridge structure depth” that completely obscures the view when looking at the side of the bridge goes from an existing depth of between 9’-6” and 10’-6” to a proposed Alternative 2 depth varying between 11’-0” and 17’-8”. The total structure depth (contributing to both completely and partially to mostly obscured views) reduces from between 36’-6” and 54’-0” for the existing bridge to between 11’-0” and 17’-8” for proposed Alternative 2.*

The public can continue to comment and provide input on visual features of the project during final design after the NEPA decision is complete. Because NEPA asks agencies to consider multiple alternatives, MaineDOT/FHWA cannot commit to final design details before issuing a NEPA decision.<sup>3</sup> As is the case with other projects that have a high level of public interest, MaineDOT regularly receives public comment on final design elements (e.g., bridge height, curb materials, lamp posts, lighting style, etc.) throughout the NEPA process. To address historic preservation concerns and because MaineDOT cannot make any final design commitments at this early stage, a Memorandum of Agreement (MOA) containing mitigation measures to resolve adverse effects often includes a clause to continue consultation with the SHPO through final design.

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<sup>3</sup> 40 CFR 1500-1508

**Question 5: What is the status of MaineDOT’s historic truss bridge survey?**

**Answer:** In the spring of 2018, MaineDOT began a reevaluation of the remaining truss bridges that were originally not determined eligible during the 2003 Maine Historic Bridge Survey. All MaineDOT metal truss bridges (extant or replaced) that were part of the original Historic Bridge Survey will be considered in this survey.

The evaluation is ongoing and will be finalized only after input from and consultation with the Maine SHPO. It is anticipated that the reevaluation will be final in fall 2018. The Section 106 process underway for the Frank J. Wood Bridge is independent of the truss survey effort.

**Question 6: Has MaineDOT/FHWA considered the impacts of the project on local heritage tourism?**

**Answer:** MaineDOT and FHWA recognize that Brunswick and Topsham have cultural resources and history that are an important part of the local economy and tourism industry. MaineDOT has requested and received comments from residents, business owners, Town governments, and Section 106 consulting parties to understand the direct and indirect impacts of the project on cultural resources.

**Question 7: How did FHWA determine effects to the Summer Street Historic District under Section 106? How did MaineDOT/FHWA determine there would be No Adverse Effects to Summer Street?**

**Answer:** MaineDOT and FHWA provided a Determination of Effect, dated February 6, 2017 stating that Alternative 2 would have no adverse effect on the Summer Street Historic District. This Determination of Effect was published via the MaineDOT website and distributed to consulting parties. During the subsequent comment period, the SHPO and the public requested additional information regarding the Summer Street Historic District. MaineDOT completed additional research and provided supplemental information regarding the Summer Street Historic District on March 17, 2018. Based on this information, in a memo dated March 29, 2017, the SHPO concurred with MaineDOT’s findings that the conceptual design of Alternative 2 will have no adverse effect on the Summer Street Historic District.

**Question 8: Did MaineDOT/FHWA consider potential impacts to the upstream fishway?**

**Answer:** MaineDOT and FHWA acknowledge comment letters received from the public, Brookfield, and the National Marine Fisheries Service (NMFS) regarding potential impacts to the function of the fish ladder upstream of the existing bridge.

At present, Atlantic salmon passing upstream or downstream through the action area are subjected to vibrations associated with traffic crossing the existing Frank J. Wood Bridge. The preferred alternative would feature construction enhancements designed to reduce vibration in the form of rubberized pot bearings which would eliminate the current construction of steel on steel contact. Based on an assumed comparable traffic load across a new bridge it can be expected that the level of vibrations in the action area would be lower for a new structure than the current condition. Thus, an

Endangered Species Act (ESA) determination of “not likely to adversely affect” was reached for impacts to upstream fish passage from bridge vibrations associated with future cross-bridge traffic for the preferred alternative.

Although it is understood that the presence of shadows can affect fish behavior, there is no published literature on shadow effects as related to successful passage via an upstream fishway. MaineDOT’s design consultant evaluated the scope of static and dynamic shadowing from the existing Frank J. Wood Bridge as well as the proposed alignment of the preferred alternative. Under the existing conditions, anadromous fish species ascending the fishway are exposed to some level of dynamic and static shadowing. MaineDOT’s design consultant estimated the duration of shadowing from the existing structure at approximately 1 hour per day of static shadow (resulting from the bridge superstructure) and a few minutes per day of dynamic shadowing (resulting from passing traffic). Dependent on the model month, the shadows from the existing structure are present between the hours of approximately 0700 to 0945. MaineDOT’s design consultant predicted shadowing from the preferred alternative would increase the duration of static shadowing to 2.25 hours per day and of dynamic shadowing to 1.5-2 hours per day. The timing of shadowing predicted for the preferred alternative was between 0645 and 0945.

Man-made underwater noise has the potential to cause behavioral disturbances, hearing impairment or threshold shifts, physical injury, or mortality to fish species. Given the proximity of the preferred alternative of the new bridge structure to the existing upstream fishway in Brunswick, parties participating in the consultation process expressed concern over the potential impacts associated with the transference of traffic noise to the vicinity of the upstream fishway (i.e., underwater noise and vibrations).

Vibrations associated with traffic crossing the preferred alternative are expected to be at a more constant, low level (i.e., a “continuous” source) as opposed to a sudden and more intense burst associated with blasting or pile driving (i.e., an “impulsive” source). The bridge design consultant provided the following information about the potential for vibration from the new bridge:

- Vibration from traffic crossing the superstructure will need to travel through pot bearings, which the new superstructure will sit on. Each pot bearing has a rubberized elastomer designed to significantly dampen the transfer of vibrations from superstructure to substructure. This is a substantial upgrade from the existing structure which is constructed with a steel on steel design which offers little to no vibration dampening.
- Any vibration energy that does transfer through the rubberized pot bearing will then need to travel through concrete, water, the walls of the fish ladder, and then water again before it can be detected by any fish within the fishway. Each change in medium will result in a continued dampening of the vibrations.
- In addition, the flowing water (river and fish ladder) is quite turbulent with its own ‘white noise’ and will help to further dampen vibrations related to the bridge structure.

MaineDOT/FHWA initiated Essential Fish Habitat Consultation with the NMFS in 2018. NMFS Habitat Conservation Division concluded that the project will have minimal adverse effects to Essential Fish Habitat. NMFS provided Conservation Recommendations related to the timing of noise producing activities during construction and a recommendation for compensatory mitigation.

MaineDOT/FHWA have completed Section 7 ESA consultation with NMFS. Consultation considered the effects of the action on the fishway upstream of the bridge. In a Biological Opinion dated March 30, 2018, NMFS concluded that Alternative 2 (the preferred alternative) is likely to adversely affect, but not likely to adversely modify or destroy critical habitat designated for the Gulf of Maine distinct population segment (DPS) of Atlantic sturgeon.<sup>4</sup> The project may affect, but is not likely to adversely affect, the Gulf of Maine DPS of Atlantic sturgeon, endangered shortnose sturgeon, endangered Gulf of Maine DPS of Atlantic salmon, or critical habitat designated for the Gulf of Maine DPS of Atlantic salmon.

The Biological Opinion included the following conservation recommendation<sup>5</sup>:

FHWA should work with MaineDOT and Brookfield Renewable to develop and fund a plan to monitor the impacts of the proposed Frank J. Wood Bridge replacement and removal on fish passage in the Brunswick Dam fishway.

MaineDOT coordinated with Brookfield Renewable Energy Partners (Brookfield) throughout project development. MaineDOT acknowledges that the existing facilities will require Federal Energy Regulatory Commission (FERC) re-licensing in 2029. MaineDOT has used best available information to understand and characterize the potential impacts to Brookfield and the Fishway and will continue to coordinate and cooperate with Brookfield during final design upon completion of NEPA.

NMFS Protected Resource Division also commented by separate letter that Alternative 2 would limit options for future improvements to the fishway. MaineDOT and FHWA acknowledge that at some point in the future relicensing proceedings could result in the modification of the structures at the Brunswick fishway. However, the nature and type of modifications that are reasonably likely to occur have not been defined.<sup>6</sup>

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<sup>4</sup> National Marine Fisheries Service. Biological Opinion for Maine Department of Transportation Replacement of Frank J Wood Bridge. March 30, 2018

<sup>5</sup> Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

<sup>6</sup> NEPA requires agencies to contemplate indirect and cumulative impacts of an action, including the effects of "reasonably foreseeable" actions. Reasonably foreseeable actions are those actions likely to occur or probable, rather than those that are merely possible. See *Dubois v U.S. Dept. of Agriculture*, 102 F.3d 1273, 1286 (1<sup>st</sup> Cir 1996), where the court concluded that when attempting to define indirect impacts, "the agency need not speculate about all conceivable impacts but it must evaluate the reasonably foreseeable effects of the proposed action." Also, *Sierra Club v. Marsh*, 976 F.2d 763, 767 (1<sup>st</sup> Cir. 1992), where the court reviewed whether an indirect impact was "sufficiently likely to occur, that a person of ordinary prudence would take it into account in making a decision".

It is FHWA's assessment that any potential impacts from the project to Brookfield and the fishway in 2029 (change in fishway placement, etc.) at the time of FERC relicensing are speculative.

**Question 9: How did MaineDOT/FHWA consideration of alternatives, specifically rehabilitation alternatives, incorporate statements and comments by the public?**

**Answer:** Rehabilitation alternatives were extensively analyzed and given full consideration within the Environmental Assessment (EA) and Section 4(f) documentation for this project. MaineDOT and FHWA identified a reasonable range of alternatives. As discussed in response to Question #2, above, alternatives were refined in response to initial comments from the Section 106 consulting parties, and additional avoidance alternatives were considered. Over the last 2 years, MaineDOT and FHWA have provided information at public meetings and through the MaineDOT website, accepted comments from the public and Section 106 consulting parties, and considered all available information. FHWA and MaineDOT do not intend to investigate additional alternatives.

**Question 10: Questions regarding SHPO attendance at June 27, 2018 consulting parties meeting.**

**Answer:** The Maine SHPO was not present at the June 27, 2018 consulting parties meeting. MaineDOT and FHWA met with the SHPO on July 17, 2018, provided draft meeting minutes on the June 27, 2018 meeting, and obtained input on potential mitigation measures. The agenda and minutes from this meeting are attached.

**Question 11: What is the difference between the 30-year rehabilitation alternative and the 75-year rehabilitation alternative?**

**Answer:** A 30-year rehabilitation alternative was initially presented in April 2016 and was used to see if the life cycle costs could be comparable to or compete with a replacement alternative. The 30-year rehabilitation looked at the remaining service lives of the major bridge elements and then tried to come up with a rehabilitation option that gained as much additional life from the bridge at a minimal cost. Accounting for future costs out to 30 years, this preliminary analysis would avoid painting the bridge in the future, a major component to the life cycle cost of the rehabilitation. The preliminary analysis of the 30-year rehabilitation included replacing the bridge deck, repairing the damaged and deteriorated steel bridge members, and painting the entire truss but did not estimate a temporary bridge and was analyzed prior to the August 2016 bridge inspection. MaineDOT evaluated a rehabilitation alternative with a 75-year life due to input at the first Section 106 consulting party meeting on July 11, 2016. The rehabilitation alternative with a 75-year life was added and presented to the Section 106 consulting parties at the August 18, 2016 meeting. This alternative does include temporary bridge costs and service life costs such as painting, maintenance and inspections. The 75-year rehabilitation alternative was also posted on the Frank J. Wood bridge project web page in November 2016 and presented at the April 5, 2017 public open house meeting.

**Question 12: When will MaineDOT/FHWA respond to Environmental Assessment (EA) comments?**

**Answer:** Typically, the responses to EA comments are provided with the documentation for the Environmental Impact Statement (EIS) Need Decision. Responses to substantive comments will be prepared, included in the EIS Need Decision, and posted to the Frank J. Wood web page. It is expected that this documentation will be available in Fall 2018.

**Question 13: What is the relationship between MaineDOT and the Topsham-Brunswick Design Advisory Committee (DAC)? How much money was spent by MaineDOT supporting the Topsham-Brunswick Design Advisory Committee?**

**Answer:** The Design Advisory Committee (DAC) was initiated by the Towns of Brunswick and Topsham. At the DAC's request, MaineDOT provided information and technical assistance to the group, including answering questions on feasibility of potential design features considered by the DAC. The DAC understands that the alternative decision is not final, and that more detailed design discussions and decisions will commence with initiation of final design once NEPA is complete.

MaineDOT produced many renderings while working with the DAC that are to scale and show the preferred alternative from various viewpoints. Public engagement is an integral part of the NEPA process, and FHWA guidance encourages engagement with a wide variety of stakeholders at each stage of the project development process. Renderings provided to the DAC are not meant to indicate MaineDOT/FHWA preference. As is the case with other DOT projects that collect input from a community advisory group, the Topsham-Brunswick report represents charrette exercises and preferences of town residents and local officials only, not the action agency. These meetings were open to the public, and hosted by the town(s). Information discussed at these meetings is available through the town of Topsham's website here:

<https://app.box.com/s/cybcsmfp7y7g9yy4teas6eq48hqgw5n5/folder/35935583469>

MaineDOT does not have specific cost estimates for staff assistance and technical support (renderings, power point presentations, etc.) provided to the local advisory committee. The agency regularly supports design advisory committees when requested by local municipalities. MaineDOT typically provides as much support as requested.

**Question 14: What if the Frank J. Wood Bridge is Individually Eligible under Criterion C? Could this influence design of a new bridge or the magnitude of adverse effects?**

**Answer:** Based on consideration of new information, on December 11, 2017, FHWA determined that the Frank J. Wood Bridge is eligible for listing in the NRHP as an individual resource. The bridge remains a contributing resource to the NRHP eligible Brunswick-Topsham Historic District. During the consulting parties meeting held on June 27, 2018, FHWA's Chief Preservation Officer, David Clarke, stated that the finding of effect for the proposed bridge project would not change as a result of the Frank J. Wood Bridge being determined an individually eligible resource, since the project still results in adverse effects to historic properties. Section 106 Consulting parties were given an opportunity to comment on additional information regarding Individual Eligibility of the bridge and

effects on January 16, 2018. In an email dated July 31, 2018, the SHPO stated: “As the Commission has previously concluded, alternatives that involve the replacement of the Frank J. Wood Bridge will have an adverse effect upon historic properties. That conclusion will not change if the bridge were to be found to have significance under multiple National Register criteria.”

**Question 15: What is the impact to Brunswick Historic District from reconstruction of Route 1?**

**Answer:** Reconstruction of the Route 1/Maine Street intersection in Brunswick is not part of the proposed action and is not within the Area of Potential Effect for the Frank J. Wood Bridge project.

**Question 16: What options are available to those who disagree with Section 106 determinations of eligibility or effects?**

**Answer:**

*Regarding Eligibility under Section 106*

MaineDOT employs contractors and consultants meeting the requirements of the Secretary of the Interior’s Professional Qualifications Standards (48 CFR 190: 44738-44739) to evaluate the eligibility of any historic properties for inclusion in the NRHP on behalf of FHWA. Determinations of eligibility are reviewed by the SHPO. The SHPO may request additional information, concur, or not concur with MaineDOT/FHWA’s determination.

Should any Section 106 consulting party and or the public disagree with an eligibility determination where the SHPO has concurred with the federal agency’s determination, they can contact the federal agency and it is up to the federal agency to determine if they will seek a formal determination from the Keeper of the National Register (Keeper). The Section 106 consulting party and or the public can also appeal an eligibility determination to the Advisory Council on Historic Preservation (ACHP), but the ACHP has no recourse except to recommend to the federal agency to seek a determination from the Keeper.

*Regarding Effects under Section 106*

If a Section 106 consulting party disagrees with an effect finding that has concurrence from the SHPO, they may appeal directly to the ACHP. The ACHP will determine to what extent they review the federal agency’s effect finding determination.

In this case, FHWA determined there would be an adverse effect on the project and the Maine SHPO concurred. Any Section 106 consulting party and or the public can challenge that determination to the ACHP.

**Question 17: How did MaineDOT/FHWA develop estimates for future cost of bridge maintenance and inspections?**

**Answer:** MaineDOT and FHWA provided the following response to questions regarding the estimation of annual inspection and maintenance costs. The response, including cost estimates, were posted to the MaineDOT website on June 7, 2017:

“Alternatives 1 and 2 (replacement) estimate an annual inspection cost and annual routine maintenance cost. These costs are broken down into annual costs even though inspections would be conducted every two years. The biannual inspection of a new bridge typically requires an inspection team spending a couple of hours looking at major items that may have changed in the two-year span between inspections. The inspection would be followed by the preparation of a report detailing any findings. Routine maintenance for a new bridge would include annual washing of the drains, curb lines, and joints as well as washing of any debris that might have built up on the structure.

Alternatives 3 and 4 (rehabilitation) also estimate an annual inspection cost and annual routine maintenance cost. The annual inspection of an older, fracture critical bridge requires an inspection team gaining hands-on inspection of all fracture critical members. This hands-on inspection can only be done with the use of expensive equipment (under bridge crane, bucket truck, etc.) and temporary traffic control. This work would generally take one to two weeks of on-site work preceded with several days of preparation work and followed by one to two weeks of report preparation. Routine maintenance for an older structure would include all the maintenance mentioned above for a new structure and repairs to failed steel members. This is difficult to quantify but very likely anticipated because of the age of the bridge. Even after rehabilitation, this bridge would remain fracture critical.”

**Question 18: The bridge was designed to accommodate an interurban trolley; doesn't that make it eligible to handle heavier loads?**

**Answer:** While the bridge may have been designed to carry heavier loads to accommodate the interurban trolley at the time of construction, the load rating is based on current condition of the bridge and recent inspection results.

**Question 19: Can MaineDOT/FHWA please respond to complaints that their agencies were biased towards bridge replacement?**

**Answer:** MaineDOT initiated a bridge improvement project for the Frank J. Wood Bridge in February 2014. The scope of the project was to assess feasibility of a range of alternatives to address the current bridge condition, from rehabilitation to full replacement. Baseline information regarding project constraints and existing conditions relative to right-of-way, traffic, utilities, environment, maintenance, and community needs was collected at that time. A preliminary public meeting was held on February 5, 2015 to obtain feedback and understand concerns. MaineDOT anticipated that the improvement analysis could show that cost effective repairs could be made to the bridge to extend the service life for several years. MaineDOT proceeded with the engineering feasibility study over the following year.

In March 2016, MaineDOT reviewed the preliminary results of the feasibility study. In April 2016, MaineDOT presented the public with a range of alternatives considered and the results of the feasibility study. The purpose of the meeting was to inform the public that an in-depth engineering examination of the repair needs of the bridge and associated costs revealed that a rehabilitation alternative would not be as cost effective as a bridge replacement. While replacement was the preliminary recommendation due to the cost findings, it was recognized at that time that many additional environmental analyses would have to occur, including the Section 106 review process before final decisions were made.

In response to public comment, during the following two calendar years, MaineDOT and FHWA refined the alternatives, added alternatives not previously considered, and evaluated all alternatives with consideration of potential impacts including impacts to historic resources.



*7'-0" Bottom chord  
to top of sidewalk*

*10'-6" Bottom chord  
to top of bridge railing*

*54'-0" Bottom chord  
to top of truss*

*Existing Truss from Summer Street*

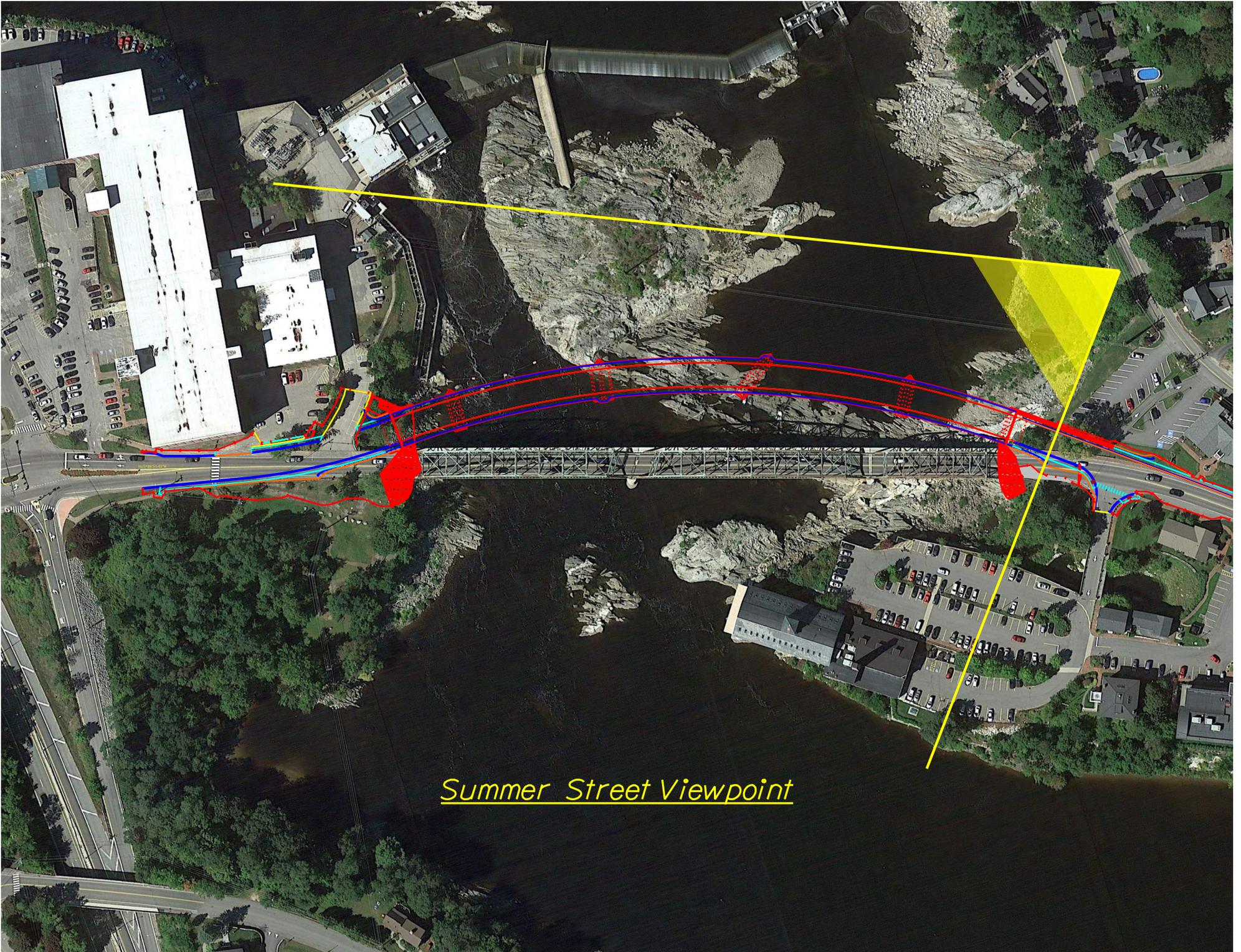
8-14-18



*11'-4" Bottom of girder  
to top of sidewalk*

*15'-10" Bottom of girder  
to top of bridge railing*

*Proposed Bridge from Summer Street*



Summer Street Viewpoint

**SHPO Update Meeting Notes**  
**7/17/18**

**Frank J. Wood Bridge, Brunswick-Topsham, ME (WIN 22603.00)**

Attendees

Kirk Mohny, MHPC (SHPO)

Cheryl Martin, Eva Birk, FHWA

Kristen Chamberlain, Julie Senk, MaineDOT

Introduction by Eva Birk.

**Meeting purpose:** to update SHPO on project including Section 106 process and the June 27, 2018 meeting with consulting parties; obtain SHPO input on potential mitigation measures for the project.

1. Public comment period on Environmental Assessment/Draft Section 4(f) Evaluation closed on April 11. Since then, MaineDOT and FHWA have been reviewing the comments. After reviewing all substantive comments, MaineDOT and FHWA are moving ahead with Alternative #2 – Replacement Bridge on the Upstream Alignment. The June 27, 2018 meeting with consulting parties was then scheduled to continue the Section 106 process, specifically for a discussion of how to mitigate adverse effects from Alternative 2. NEPA anticipated late summer.
2. MaineDOT provided SHPO with the following materials from the June 27 meeting: sign-in sheet, written comments provided by consulting parties, and draft meeting minutes. The comment period on mitigation extended from the meeting through July 11. FHWA explained that the consulting parties generally felt that discussion of mitigation at the meeting was premature and that the Section 106 process had not been completed correctly. FHWA explained that responses to the questions and comments raised at the meeting will be provided to the consulting parties along with meeting minutes.

SHPO asked how many people commented on mitigation during the meeting. Martin answered “very few.” Doug Bennett, a member of the Design Advisory Committee (DAC) did submit a report and letter that offered a great number of mitigation recommendations from the DAC Committee. SHPO received a copy of DAC report. SHPO asked if specific design recommendations have been considered already and whether it reflects the public expectations for Alternative 2. FHWA responded that details like those presented by residents and town officials in the report are Final Design details that cannot be determined before NEPA is complete. Renderings were provided to DAC by MaineDOT per their request to inform discussion only. SHPO states that some DAC recommendations are

reflected in these renderings and was concerned that if the perception is that the DAC items have already been committed to previously, that they may not be considered 106 mitigation. MaineDOT and FHWA reiterated that no commitments have been made, the DAC report has not been adopted and does not represent finalized design details. SHPO again reiterates concern that images in this third-party report could be perceived as Maine DOT's preference for how the final bridge will look.

SHPO confirmed receipt and review of meeting notes and did not have any further questions. He has no specific comments and will be interested in seeing our comments to meeting questions when they are released in 2 to 3 weeks. Birk says they will release a full package which will include explanation that DAC report renderings are not meant to indicate Maine DOT preference – this report was produced to represent preferences/ideas from Town residents and local officials only.

3. FHWA stated that they do not intend to pursue individual eligibility of FJW Bridge under Criterion C. FHWA Federal Preservation Officer stated at 6/27 meeting that it is an academic point and that it will not affect decision to continue with Alternative 2. MaineDOT stated that the survey of remaining trusses is underway, and that while research completed for the survey may provide information and context for FJW, that the Section 106 process for the Frank J. Wood Bridge would not depend on the content or outcome of the truss survey. Mitigation could cover Criterion C even if it is not revisited formally.
4. FHWA and MaineDOT acknowledged the potential for legal action by consulting parties under Section 106 and/or NEPA.
5. SHPO asked if Brunswick has made an official stance on the project. Martin stated that Brunswick did just send something to Bill Pulver but she didn't have it with her.
6. Birk brought up issue of Summer Street.
7. FHWA and MaineDOT noted that another consulting parties meeting is most likely going to occur. Martin stressed that she would like to hear more on mitigation from the consulting parties.

SHPO asked if MaineDOT/FHWA will have any ideas for mitigation by the next meeting. FHWA/DOT stated that a draft Memorandum of Agreement (MOA) will be prepared for that purpose so that we can hear from all 106 parties, along with the public.

8. SHPO asked if Brunswick Design Review Committee or the Topsham Historic Preservation Commission has been involved at all. Appears that there is some overlap between these groups and the DAC and the Section 106 Consulting parties.

SHPO spoke about Certified Local Governments and their local level oversight. SHPO thinks we should get the Historical Societies involved and offer the option to review and comment. This is important for mitigation (could be incorporated in MOA?) Carol Eyerman could be contact.

9. Martin mentioned mitigation ideas pulled from the comments of the EA (attached). Birk reiterated these. Also mentioned mitigation ideas in DAC report cover letter. They also brought up “placemaking.” Measures should create something that everyone can enjoy and have easy access to.
10. Birk described how FHWA handles mitigation measures in an MOA – the process involved. SHPO asked is ACHP will be involved; FHWA confirmed that ACHP is involved.

FHWA, MaineDOT, and SHPO discussed appropriate mitigation for resource with statewide significance:

- HABS-HAER documentation/recordation
- National Register nomination for industrial history – mills, housing, also across from suspension bridge.
- Aesthetic/design accommodations (driven by level of community interest)
- Summer Street National Register nomination
- Booklet on history of crossing.
- Retention of part of a bridge or retention of materials for use elsewhere (SHPO commented that salvaging not generally advocated by MHPC).
- Builders’ plaque

Martin asked about tribal consultation. SHPO stated historic district period of significance did not extend to prehistory, but could incorporate local history.

11. Next steps: provide meeting notes from 6/27 meeting and this meeting to consulting parties with response to comments and questions; draft MOA for review by MaineDOT/FHWA/SHPO/consulting parties; schedule consulting parties meeting to review draft MOA.

| <b>Section 106 Steps and Consultation for the Frank J Wood Bridge Project</b> |   |
|---|---|
| <i>Draft - Includes Activities to Date</i>                                    |   |
| <b>Date</b>   | <b>Action</b>   |
| 9/23/14   | Preliminary engineering funding for Frank J Wood bridge improvement project authorized by FHWA  |
| <b>Steps 1-2: Initiate Section 106 Process, Identify Historic Properties</b>  |   |
| October 2015  | <p><b>(36 CFR 800.2(c)(1-4))</b> Consulting parties (often called “by-right” consulting parties) were established:</p> <ul style="list-style-type: none"> <li>• “By-right” consulting parties notified: Maine State Historic Preservation Officer, The Penobscot Nation, Passamaquoddy Tribe, the Aroostook Band of Micmacs, the Houlton Band of Maliseet Indians, Town Representatives of Brunswick and Topsham, Advisory Council on Historic Preservation, and MaineDOT.</li> </ul> |
| October 2015  | <b>(36 CFR 800.4 (a)(1))</b> Area of Potential Affect (APE) established.  |
| 11/3/2015   | <b>(36 CFR 800.4 (a)(4))</b> Email sent to Tribes (standard protocol) requesting comments regarding historic and cultural properties. Area of Potential Effect sent to Maine Historic Preservation Commission Archaeological staff for review and comments.   |
| 11/5/2015   | <b>(36 CFR 800.4 (a)(3))</b> Letters sent to the Town of Brunswick and Topsham requesting information/knowledge of or concerns with historic properties.  |
| 12/11/15  | <b>(36 CFR 800.4 (a)(3))</b> MaineDOT received email response from Town of Topsham with information regarding contributing buildings and structures within the historic district.   |
| 11/12/15  | <b>(36 CFR 800.4 (a)(3))</b> MaineDOT received email response from Town of Brunswick with information regarding the Brunswick Commercial Historic District.   |
| 11/19/15  | <b>36 CFR 800.4 (a)(4)</b> Response received from Penobscot Nation.   |
| 12/8/15   | <b>36 CFR 800.4 (a)(4))</b> Response received from Passamaquoddy Tribe.   |

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| 1/15/16          | <b>(36 CFR 800.4 (a)(2) and (b) and (c))</b> Architectural survey within APE begins to document properties eligible and listed for the National Register of Historic Places.   |
| 5/29/16          | <b>(36 CFR 800.4 (a)(2) and (b))</b> Architectural survey approved by Maine Historic Preservation Commission.  |
| 5/31/16          | <b>(36 CFR 800.4 (c))</b> MaineDOT requests State Historic Preservation Officer (SHPO) concurrence regarding National Register eligibility for properties within the APE.  |
| 6/16/16          | <b>(36 CFR 800.4 (c))</b> MaineDOT receives concurrence on properties that are eligible for the National Register of Historic Places from the SHPO.  |
| <b>June 2016</b> | <b>(36 CFR 800.2(c)(5) and 800.3 (f))</b> In addition, the Federal agency may invite other entities with a “demonstrated interest in the undertaking” to participate as consulting parties. Examples include local historic preservation officials, historic preservation groups, community organizations, individual property owners, and other stakeholders.)  |
| 7/11/16          | <p><b>(36 CFR 800.2 (a)(4))</b> Section 106 Consulting Party meeting #1 held in Topsham. The Section 106 process and identification of National Register eligible and listed properties was discussed. MaineDOT’s architectural survey, determination of eligibility, and the SHPO concurrence on eligibility were provided to the consulting parties.</p> <p><u>Consulting party Points of Interest offered:</u></p> <ul style="list-style-type: none"> <li>• Bridge is on the cover of the local phone book and the Bowdoin College Catalog</li> <li>• Individuals selected the Topsham/Brunswick community because of its historic character included the bridge</li> <li>• Business decisions currently pending outcome of bridge project</li> <li>• Existing bridge is unique, it matters, and provides important connection between two villages</li> <li>• Bridge is part of a continuous stretch of historic elements approaching Brunswick Downtown from Bowdoin College through downtown Brunswick, over the bridge and up to Topsham Village; it contributes overall magnitude to driving/walking/biking experience; is the connecting link that holds it all together</li> </ul> |

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|                | <ul style="list-style-type: none"> <li>• Placement of a new bridge could alter the falls significant to early settlement of the Brunswick/Topsham area and an important visual element</li> <li>• Bicycle/pedestrian accommodations required</li> </ul> <p><u>Section 106 points offered:</u></p> <ul style="list-style-type: none"> <li>• APE should be expanded to include the approaches on the Brunswick side to allow consideration of cumulative effects</li> <li>• MaineDOT responded to numerous technical questions regarding feasibility of different rehabilitation options</li> </ul>  |
| <p>8/18/16</p> | <p><b>(36 CFR 800.2 (a)(4))</b> Section 106 Consulting Party meeting # 2 held in Brunswick. John Buxton &amp; Bill Doukas (MaineDOT) talk about the inspection. APE boundaries were discussed and MaineDOT’s architectural survey, determination of eligibility, and the SHPO concurrence on eligibility were provided to the consulting parties.</p> <ul style="list-style-type: none"> <li>• Justification of the APE was provided specifically why the Topsham Historic District and the Brunswick Historic district were not included.</li> <li>• Route 1 severs Brunswick from the Cabot Mill, resulting in a lack of cohesion between resources.</li> <li>• Loss of historic structures between the intersection of Route 24 and parts of Bowdoin Mill Island results in a loss of cohesion; therefore, the APE remains as is, concurred with by SHPO</li> <li>• Consulting parties inquired about the individual eligibility of the Cabot Mill complex. An attendee indicated he/she was aware that it had been determined individually eligible as part of another project with a federal action. Consulting parties requested that the concurrence from that project be included into the record of this project.</li> <li>• <i>The concurrences were included as appendices to the Determination of Effect.</i></li> </ul> |

| <b>Step 3: Assess Effects to Historic Properties</b> |   |
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| 10/27/16   | <p><b>(36 CFR 800.2 (a)(4) and 800.5 (a) and 800.6 (a))</b> Section 106 Consulting Party meeting #3 held in Topsham. Effects discussion, FJW’s individual eligibility. Matrix of alternatives, summary of alternatives, bridge inspection report,</p> <ul style="list-style-type: none"> <li>• Requested comments from consulting parties by Dec 6, 2016.</li> <li>• Individual eligibility of the Frank J Wood Bridge considering the 15 years passage of time since the MaineDOT historic bridge inventory had been completing.</li> <li>• A question as to whether or not the natural falls of the Androscoggin River in this location were eligible for listing on the National Register as an individual resource.</li> <li>• The parties commented that mill workers were known to live in the houses of Summer Street and questioned what impact that would have on the Summer Street historic district.</li> <li>• Comments were made about the potential effect to historic properties resulting from headlights for a changed alignment.               <ul style="list-style-type: none"> <li>- Questions were asked regarding how the bridge plays a role in the setting of Summer Street HD, Cabot Mill, and the Pejepscot Paper Company.</li> </ul> </li> <li>• Questions were asked regarding how materials used in a rehabilitation may or may not affect a historic property.</li> <li>• Comments were made about the view to the bridge from businesses within the Cabot Mill and Bowdoin Mill (PPC).</li> <li>• Comments regarding the use of a detour for rehabilitation.</li> </ul> |
| 12/6/17  | <p><b>(36 CFR 800)</b> MaineDOT received, reviewed, and considered --- comments from Section 106 Consulting Parties and the public between November 3, 2016 and March 6, 2017.</p>  |
| 2/6/17   | <p><b>(36 CFR 800.6 (a))</b> Public Notice published providing the public an opportunity to view information regarding the various alternatives and their effects on National Register eligible and listed properties posted on MaineDOT’s web site. Interested parties were provided the opportunity to submit comments by March 6, 2017.</p> <p>MaineDOT submitted a request to the SHPO for concurrence on the various alternatives and their effects on National Register eligible and listed properties.</p>   |

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| 3/6/17                         | <p>MaineDOT received a concurrence memo from the SHPO regarding the various alternatives and their effects on National Register eligible and listed properties. The SHPO did request additional information regarding the Summer Street Historic District. This request was also received during from the public during the public comment period.</p> <p>MaineDOT received, reviewed and considered 31 comments from Section 106 Consulting Parties and the public between November 3, 2016 and March 6, 2017.</p> |
| 3/8/17                         | MaineDOT began additional research on the Summer Street Historic District as requested.   |
| March 2017                     | MaineDOT and FHWA posted of a public open house meeting to be held on April 5, 2017. All materials were posted on the MaineDOT website the comment period was officially open until April 19, 2017.   |
| 3/17/17                        | MaineDOT submitted a request to the SHPO for concurrence on the additional information requested on the Summer Street Historic District.  |
| 3/29/17                        | MaineDOT received a concurrence memo from the SHPO regarding additional information on the Summer Street Historic District.   |
| 4/5/17                         | <b>(36 CFR 800.6 (a)(4))</b> Public meeting - open house format. 99 members of the public officially signed in. This meeting included historic resources, but expanded to include design, natural resources, and bicycle/pedestrian concerns.   |
| 4/19/17                        | Public comment period closed.   |
| 4/20/17                        | MaineDOT and FHWA began reviewing and considering all comments received   |
| 4/30/17                        | All public and Section 106 consulting party comments received were posted to the MaineDOT website.  |
| 6/27/17                        | MaineDOT and FHWA announce preferred Alternative.   |
| June 2017-<br>December<br>2017 | Continued correspondence between the consulting parties, State Historic Preservation Office and FHWA. The consultation led to a reevaluation of the FJW individual eligibility.   |

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| 10/25/17  | MaineDOT sent determination of National Register individual eligibility (determined not eligible) to the SHPO for review and concurrence.   |
| 11/16/17  | The SHPO sends memo not concurring with MaineDOT's determination. SHPO states the bridge is eligible based on the additional research provided.   |
| 12/11/17  | FHWA preservation Officer determines the Frank J. Wood Bridge is individually eligible for the National Register.   |
| 12/13/17  | MaineDOT sends memo to SHPO stating that the FHWA has determined the Frank J. Wood Bridge is individually eligible for the National Register.   |
| 1/16/18   | MaineDOT sends addendum effect memo to SHPO and Section 106 Consulting Parties for comment.   |
| 2/16/18   | Friends of Frank J Wood officially comment under the adverse effect comment period. Memo sent to FHWA.  |
| 2/27/18   | EA circulated for public comment  |
| 3/28/18   | EA public meeting   |
| 4/11/18   | EA Public Comment Period closes. MaineDOT and FHWA begin review of comments.  |
| 5/30/18   | Public comments received posted on the MaineDOT project website.  |
| <b>Step 4: Resolve/Mitigate Adverse Effects</b> |   |
| 6/11/18   | FHWA provides update to consulting parties: After reviewing all substantive comments, MaineDOT and FHWA are moving ahead with Alternative #2 – Replacement Bridge on the Upstream Alignment, and continuing next steps in the Section 106 process. Invites consulting parties to meeting to discuss mitigation for adverse effects. |
| 6/27/18   | Section 106 Consulting Party meeting #4 held in Topsham to receive comments on potential mitigation for adverse effects. Comments on mitigation accepted until July 11, 2018.   |
| 7/17/18   | MaineDOT and FHWA meet with SHPO; provide minutes and update on June 27, 2018 consulting party meeting and obtain input on potential mitigation measures.   |

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| 8/22/18 | FHWA provides meeting minutes and information in response to comments and questions raised at the consulting parties meeting. |
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**To:** Joel Kittredge (MaineDOT)                      **From:** Darin Bryant (TYLI)  
**Date:** June 4, 2018  
**CC:** Daniel Myers (TYLI)  
Rick Hebert (TYLI)

**Re:** WIN 22603.00 Frank J. Wood Bridge: Comments on JDB Bridge Rehab Study

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## MEMORANDUM

T.Y. Lin International (TYLI) developed the Preliminary Design Report (PDR) for WIN 22603.00, Frank J. Wood Bridge. The Friends of the Frank J. Wood Bridge had JDB Consulting Engineers, from Massachusetts, develop an additional study evaluating rehabilitation options for the bridge. That report, entitled “Historic Frank J. Wood Bridge Study,” dated April 9, 2018, was submitted as a public comment during the Environmental Assessment process for WIN 22603.00.

Per MaineDOT request, this memorandum summarizes TYLI’s assessment of the similarities and differences between the information in the JDB study and the PDR.

The JDB study discusses the existing condition of the bridge and then presents 3 rehabilitation options for consideration. This memorandum will walk through the JDB study sequentially and discuss key points.

- The JDB study scope was limited to discussing options for rehabilitation of the existing truss. No comparison of rehabilitation to replacement options was included in the study. In addition, these rehabilitation options do not fully address the purpose and need that was established for this project. No discussion or mention is made of improving pedestrian accommodation.
- Page 3 of the study includes a “Description of Bridge” section. The information in this section appears correct, except:
  - The northerly and southerly trusses are both of equal length (total 803 ft long) and not 805 ft and 803 ft respectively as reported.
  - The most recent bridge repair (conducted in April/May 2017) is not referenced.
  - The most recent inspection report (September 2017) also noted distortion of bottom chord batten plates and floor beam flange angles due to pack rust.
  - Findings of the most recent 2017 bridge inspection dropped the FHWA sufficiency rating from the reported 25.4 to 24.7.

- Page 4 of the study documents “Past Information Used in Investigative Evaluation” referenced for the April 2018 report. The resources cited do not include the most recent “Routine and Fracture Critical Bridge Inspection” conducted in September 2017.
- Page 4 “Vehicle Load Rating, Criteria and Results” includes an incorrect reference to the spans. Truss spans 1 and 2 are similar to each other; span 3 is different.
- Page 5 “Rehabilitation Options” states that the floor system needs to be replaced in any rehabilitation. This agrees with the PDR.
- Page 5 “Option 1” generally agrees with the PDR rehabilitation alternative. The PDR alternative similarly proposes floor system replacement, repairs to the truss, and painting the truss. The JDB study proposes using an exodermic deck and 2” concrete overfill for the wearing surface—this is different than the PDR alternatives, but does not change price or conclusions significantly.

“Option 1” as well as “Option 3” mention “removal of all pack and surface rust”. As was discussed in the PDR, pack rust is very difficult to be removed, and would likely require full disassembly of the members to do so effectively. The difficulties with removing pack rust, proposed method for removing pack rust, and cost for pack rust removal are not discussed further or quantified in the “Option 1 Cost Estimate” in the JDB study. These costs will be significant.

“Option 1” suggests the ultrasonic testing of all welds in fracture critical members and suggests post-tensioning could be used as a repair option if internal inclusions or flaws are detected, but the cost of the ultrasonic testing and the estimated number and cost of the repairs do not appear to be included in the “Option 1 Cost Estimate” on Page 7 of the JDB study. A similar comment applies to the “support pins” and to the addition of “welded top flange stud connectors”.

“Option 1” states “The bridge would need to remain closed until all construction was completed.” Full closure was also recommended in the PDR. The PDR evaluated off-site detour options and the user costs associated with a road closure and off-site detour, found them to be excessive, and therefore recommended a \$4,000,000 temporary bridge on-site to maintain traffic during construction. Maintenance of traffic options and user costs associated with a road closure and detour or the cost for a temporary bridge to maintain traffic on-site is not included in the JDB study. This is a significant discrepancy between the JDB study and the PDR.
- Page 7 “Option 1: Cost Estimate and Quantities” presents a table of bridge repair items and associated costs. This estimate was not developed based on MaineDOT construction cost history. However, the overall estimate appears to be generally similar to the PDR rehabilitation alternative.

One pay item has a major discrepancy: paint. MaineDOT’s bid histories for truss field painting show a typical price of around \$1.20 per pound. This price includes all components of field painting work, including Containment and Pollution Control, Surface Preparation of Existing Structural Steel, Field Painting, and Disposal of Special Waste Material. This cost is based on numerous truss bridge painting projects in Maine—considering an extensive history of similar bridges. Including the floor system, the Frank J. Wood bridge has around 2,700,000 pounds of steel. The JDB estimate shows only

\$200,000 for painting the truss. This cost appears significantly too low. If the new floor system is already shop-painted, the remaining truss field painting should still cost approximately \$2,000,000.

With the added \$1,800,000 for paint and an added \$4,000,000 for the temporary bridge, the updated JDB study estimate would show a total project cost of \$19,300,000, which is very similar to the rehabilitation estimates included in the PDR.

Additional costs mentioned above, including testing, post tensioning, support pin work, and top flange stud connectors do not appear to be included, and neither are costs for items like field offices, material testing, and other smaller miscellaneous items. Taken in total, these additional costs would likely add significantly more to this total cost.

- Pages 6 & 7 mention service life-cycle costs. There is not enough information in the study to understand how this was calculated. Was a discount rate applied to future costs? There is no discussion of methodology or what was included in this number. Only wearing surface replacements and structural steel painting seem to be included currently—many other probable costs are missing. There are several additional expenses that would be needed over 100 years, including inspection costs, maintenance costs, substructure rehabilitation costs, steel repair costs, and a deck replacement. The provided life cycle cost is not well substantiated and appears to be significantly underestimated.

“Service Life-Cycle Cost” suggests a “chemically bonded/neutralizing paint film” would be used for future maintenance paintings. Such systems are not included in the NEPCOAT approved paint systems typically used for bridge projects by MaineDOT and other regional DOTs. The suggested system should be identified. Additional verification and approval by MaineDOT may be required.

- Page 8 “Option 2” was briefly discussed and dismissed due to weight and lack of benefit.
- Pages 8 & 9 “Option 3” presents a unique concept for rehabilitating the existing truss by replacing the floor system with an effectively independent girder system. This option is only presented at a conceptual level—no analysis or cost estimates are presented.

Given the lack of substantive detail on this option, only general comments can be made. The most basic comment is that this option is a rough concept only, and that it has some very unusual hurdles that may prove very difficult to overcome once the design is developed further.

The existing structure depth is approximately 6’-0” from profile grade line to the bottom of the bottom chord. To maintain the existing structure depth of the truss, the girders would have to be extraordinarily shallow for the given span lengths. The girders would likely be somewhere around 5’-0” deep (even if reducing the vertical clearance somewhat), which would yield a span-to-depth ratio of around 60. This is far outside the range of normal engineering practice, where bridges typically have a span-to-depth ratio between 20 and 30. Controlling deflections and vibrations would become a severe issue at that depth and span length.

This obvious design issue is not mentioned in the report. If a design could be developed to adequately address all design requirements, the amount of steel required would be many times as much as for a conventional continuous girder design with a reasonable girder depth. TYLI ran preliminary numbers on this approach to assess its viability.

With 8 girders and the 310' simple span, extraordinary flange sizes would be needed to control live load deflections—in the range of 6" thick and 3'-0" wide. Even with these very large plate sizes, dead load deflection would be 4 to 5 feet. The steel weight just for these inserted beams would be at least 3 times the steel weight for a full replacement bridge. There would also be many difficult detailing issues with such unusually proportioned beams.

Beyond those issues, constructing such a design would be unusually difficult and expensive, considering the needed temporary supports during construction and a unique handling and placement system that would be capable of working within the confines of the existing truss.

“Option 3” also considers the use of a unique “non-fracture critical vertical slip connection” between the interior girder structure and the truss bottom chord that would transfer wind loads from the truss to the steel girder system. Additional information as to the feasibility of this approach as well as project cost implications should be considered in the report by JDB. Unusual concepts like this frequently prove to have significant design issues and added costs when they are fully investigated.

“Option 3” does not address how the sidewalk would be supported without the current floor system in place. The sidewalk brackets are currently cantilevered extensions of the floor beams. With the floor beams removed, the support for the sidewalks have not been identified.. Is the “non-fracture critical vertical slip connection” supposed to provide this support by attaching to the girders? This is a risky approach—if the slip connection ever fails, major failures of the bridge would be likely.

“Option 3” would leave the truss in place. The report indicates that it will no longer be a fracture-critical structure, but this is not correct. The loads on the truss will be much lower and the safety factor will be greater, but the structure will still be fracture critical. The sidewalk would still be supported by the truss, and the truss would continue to span over the roadway, thus a failure of the truss would still have the potential to cause catastrophic damage to the new bridge.

“Option 3” is only a rough concept in this report. The option is not developed well enough to grasp all the technical challenges that would need to be overcome, nor is it clear if it is viable from a cost perspective. The comment that costs would be similar to “Option 1” is not supported in the report.

- Pages 9 & 10 “Bridge Betterment Recommendations” lists Options 1 and 3 as both recommended. “Option 1” is roughly similar to the PDR rehabilitation alternatives, though as discussed above there are issues with the cost estimate. “Option 3” is only a rough concept in this report, and a recommendation for further consideration does not appear to be justified by adequate supporting design and cost estimate investigations. All of these options are not compared with replacement alternatives such as those put forward in the PDR.
- Pages 11 & 12 “Other Considerations” discusses miscellaneous design notes. The original train loading of the Frank J. Wood Bridge was mentioned, with the implication that the heavy design loading would make it less susceptible to fatigue loading. This is an inaccurate implication. Fatigue susceptibility is primarily related to specific detail geometry and to cumulative cycles of loads that are well below design capacity.

In addition, gusset plate sizes were compared to gusset plate sizes on other bridges. This is not legitimate analysis. Without knowing the loads applied to the specific gusset plates, absolutely no assessment can be made about the gusset plates' adequacy. Implying that a gusset plate's thickness means anything, without knowing the loading and geometry, is inappropriate.

The final paragraph in this section says, "The longevity and resistance of the Frank J. Wood Bridge design is proven based on its past accommodation as both a train and highway crossing and the overall performance it has exhibited over the last 87 years." Future performance of a structure cannot be imputed from past performance without fully considering deterioration, fatigue, and changes in loading and usage.