Highway 101 Twinning and Avon River Aboiteau and Causeway

Project Update for Community Liaison Committee

February 27, 2019
Overview

1. Update on Highway 101 Three Mile Plains to Falmouth Twinning Project

2. Update on the design of the Avon River Aboiteau and Causeway Upgrading
   • Brief Recap of Aboiteau Options
   • Public & Stakeholder Consultation Summary
   • Current Status and Next Steps

3. Questions / Discussion
Highway 101 Twinning Update

Work Completed to Date:

• **Subgrade** for the new Highway 101 westbound lanes, from Trunk 14 (Exit 5) to the Windsor Railway Overpass – 3.4 km (Section 1)
  - Excavation and fill placement (earthworks)

• **Bridge Structures** at Exit 5 (Trunk 14) and Exit 5A (Wentworth Road) for new westbound lanes
  - Bridge abutments (foundations) up to beam seats
  - Bridge girders recently installed
Highway 101 Twinning Update

Work Scheduled for 2019:

• Complete 3.4 km section of westbound subgrade (Section 1)
• Complete Bridges at Exit 5 (Trunk 14) & Exit 5A (Wentworth Rd)
• Construction of 2.4 km of new subgrade for eastbound lanes from Falmouth Railway Overpass westerly to existing twinning (Section 3)
• Construction of new eastbound structures at Trunk 1 and Falmouth Railway overpasses
• Construct new overpass structure at Windsor Railway
• Construct transitions to existing highway and pave Section 1
• Potential removal of the Exit 5 and 5A eastbound structures
Highway 101 Twinning Update

**Project Timelines:**

- Overall a 5-year project with completion currently planned by Fall 2022 (currently entering year 2 of 5)

- Area between the Windsor Railway and Falmouth Railway crossings (Section 2) will be completed in years 3 to 5 (including the Avon River Aboiteau)

- Partial infilling for the widening of the causeway is expected begin this summer as it will require time for consolidation (settlement) due to soft sediments in the salt marsh
Existing Causeway

100 Year Level
50 Year Level

Salt Marsh

Lake Pesaquid

1:300

Railway Trail
Twinning for 50 Year Scenario plus 100 Year Dyke Footprint

Existing Causeway

100 Year Level
50 Year Level

Salt Marsh

1:300

Lake Pesaquid
Aboiteau Design Recap

- The existing aboiteau is at end of life and has no further opportunity for improvements to fish passage
- Extremely complex flood control structure that forms part of the overall dykeland system
- Many requirements and a wide range of interests
- Primary objective is flood control and public safety
- Improved fish passage is also important requirement and will be subject to assessment and scrutiny by DFO
General Concept

Existing Highway 101 & Aboiteau

Realigned Highway 101 with Bridges

New Aboiteau
Aboiteau Design Recap

Maintain Freshwater Lake (Options A & B)
• Operation primarily focused on restricting the tide from flowing upstream and maintaining a freshwater lake/reservoir

Partial Tidal Exchange (Option C)
• Controlled exchange of tidal water to maximize fish passage and still prevent upstream flooding

Hybrid Solution (Option D)
• Ultimate functionality that allows for a range of operational scenarios and added system redundancy
Public Engagement & Feedback

• The Project Team undertook an extensive public engagement process in September/October concluding with two Open House Information sessions on October 10th.

• The engagement process included members of the community and various stakeholders. Some of the groups or stakeholders we met with or heard from include:

  - First Nations
  - Highway 101 CLC
  - Town of Windsor
  - Municipality of West Hants
  - Regulators (NSE and DFO)
  - Businesses
  - Recreational Groups
  - Farmers
  - Land Owners
  - General Public
Consultation Feedback

Open House Summary:

- 300+ attendees over 2 sessions
- 184 feedback forms completed (over 60%)

<table>
<thead>
<tr>
<th>Feedback Question</th>
<th>Yes</th>
<th>No</th>
<th>No answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was the info helpful?</td>
<td>87%</td>
<td>6.5%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Were questions answered?</td>
<td>70.7%</td>
<td>12%</td>
<td>17.3%</td>
</tr>
<tr>
<td>Were staff knowledgeable?</td>
<td>84.8%</td>
<td>2.7%</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

- In addition we have received dozens of letters and e-mails from people or groups expressing their interests or concerns
- The most frequent comment made was support for Hybrid Option D, quite often as a step to save the lake for business, community, tourism and recreational purposes.
“What We Heard”: Public Engagement

• Many also saw Option D as a way to satisfy a range of interests in the community by allowing the lake to be maintained and fish passage to be improved and monitored.

• Several people acknowledged it would be a significant challenge to satisfy all interests and suggested a balanced approach.

• To a lesser extent, Option C was also often mentioned, primarily by those who want to see tidal flow (full or partial) and/or prioritization of fish passage.
“What We Heard”: Public Engagement

• Beyond the feedback on the options, protection of the lake, and fish passage, some of the common issues raised were:
  o Protecting recreation & social events;
  o Keeping saltwater & mud out of the lake;
  o Protecting business & tourism opportunities on the lake;
  o Protecting agriculture;
  o Floodwater protection;
  o Protection of an available freshwater resource;
  o Fire protection;
  o Food security; and
  o Impact to property values.
Aboriginal Consultation

• The Government has a duty to consider the potential negative impacts to asserted or established Aboriginal or treaty rights.

• The Province is currently in active consultation with the Mi’kmaq as part of a formal process undertaken for these types of major projects, and input from these consultations will be considered in the project approach.

• The proposed fish passage design will be subject to scrutiny by DFO who must also consider impacts to the Mi’kmaq. Ongoing monitoring is expected to be a condition of the DFO approval for any operational scenario to ensure fish passage is sufficient (or further changes could be required).
Hybrid Option D

The Project Team feels that Hybrid Option D is the best solution for the new aboiteau and will be proceeding to the detailed design phase while continuing to further analyze potential operational scenarios.

**Key Items to Note:**

- Proceeding to the detailed design phase does not limit potential operating scenarios.
- The goal is to initially operate in a manner that maintains the lake while maximizing opportunity for fish passage.
- Ongoing monitoring will be required to assess fish passage.
- Option D will still have the ability to operate with partial tidal exchange (Option C) if required to do so.
Hybrid Option D

Either Gate can be closed as needed

Tide gate

Flap Gate + Active Gate

Flap Gate + Active Gate

Freshwater Fishway

Tidal Fishway

Open

Constant water level

1.8m

6m

1.5m

6m
Hybrid Option D

**Key Benefits:**

- Balanced solution that can accommodate a wide range of interests and concerns
- Additional functionality provides a flexible and adaptable solution to help achieve the goals or requirements of both today and in the future
- Most robust option with greater redundancy for flood protection and public safety, but also for fish passage
- The aboiteau is not limited to a single mode of operation
- Allows for ongoing monitoring and testing to confirm analysis conducted during the design phase
Aboiteau Timelines

Phase 1:
- Pre-Design & Analysis

Phase 2:
- Design Option Development
- Detailed Design
- Construction Documents

Phase 3:
- Construction

Jan. 2018: 12 months
Jan. 2019: 8-10 months
Oct. 2019: 3 years
Oct. 2022

Duration:
- 12 months
- 8-10 months
- 3 years
Archaeology

• An Archaeological Resource Impact Assessment (ARIA) was originally completed in 2007 for this twinning project.

• NSTIR was required to prepare an archaeological contingency plan in partnership with CCH as part EA approval conditions (avoidance in some high potential areas).

• Some concerns had been raised about insufficient archaeology, particularly in the vicinity of the new aboiteau and causeway realignment (historic Avon River banks).

• We are in the process of engaging a consultant to complete additional archaeological assessment including subsurface investigation (shovel testing) in the area of the new dykes, aboiteau structure and causeway realignment.
Additional ARIA and Shovel Testing on the Avon River Banks
Geotechnical Investigation

• Expected to begin this winter/spring
• Provides subsurface (below ground) information to support the detailed design
• Particularly critical for the design of the aboiteau foundations and design of the causeway widening ‘embankment’
• Involves drilling boreholes to obtain soil/rock properties, groundwater information and subsurface characteristics
• Investigations will take place in the following locations:
  • On Land (outside salt marsh)
  • In Salt Marsh
  • In River Channel
Conclusion / Next Steps

• Option D is the preferred solution that is proceeding to Design Development (Phase 2)
• Archaeological Investigation planned for this spring
• Geotechnical Investigation planned to begin this winter/spring
• Partial infilling for the causeway widening planned to begin this spring/summer to accommodate geotech investigation on the marsh, provide access to the aboiteau location while also allowing for the consolidation (settlement) process to begin
• Preparation of Provincial and Federal regulatory applications for the causeway infilling this winter/spring
• Regulatory applications for the aboiteau structure will not occur until later in 2019 following completion of design
Questions / Discussion