Highway 101 Twinning and Avon River Aboiteau Replacement & Causeway Upgrading

CLC Meeting - Project Update

October 7, 2020

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Overview

1. Highway 101 Twinning Update (TIR)

2. Avon River Aboiteau and Causeway Design
    - Background, Current Approach, Next Steps (TIR)
    - Design Update (CBCL)

3. Questions / Discussion

Highway 101 Twinning
Three Mile Plains to Falmouth

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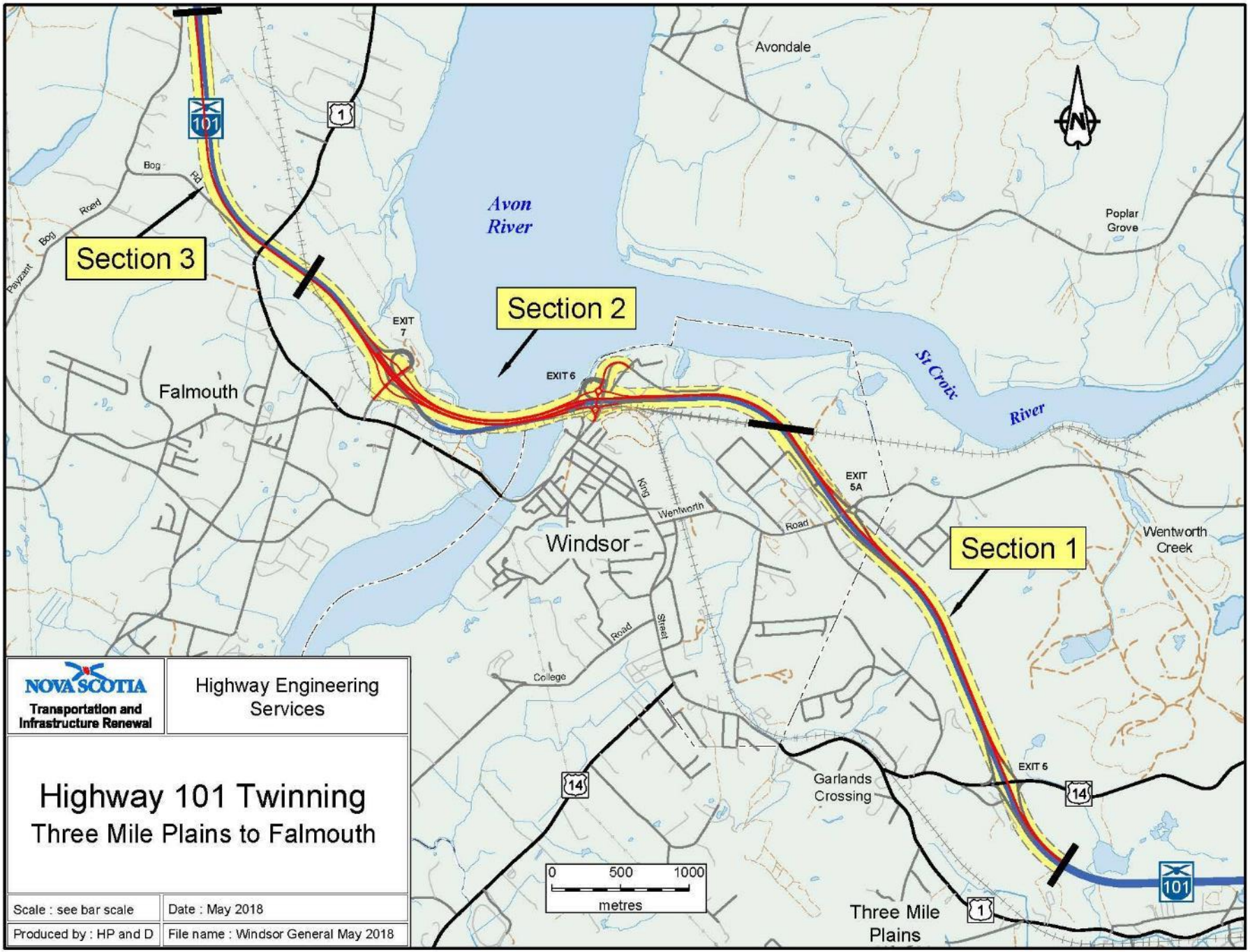
Avondale
Avon River
Poplar Grove
St Croix River
Section 3
Section 2
Section 1
EXIT 7
EXIT 6
EXIT 5A
EXIT 5
Falmouth
Windsor
Wentworth Creek
Garlands Crossing
Three Mile Plains
King Street
Wentworth Road
College Road
Bog Road
Payzant Bog
101
1
14
0 500 1000
metres
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Transportation and Infrastructure Renewal
Highway Engineering Services
Highway 101 Twinning
Three Mile Plains to Falmouth
Scale : see bar scale
Date : May 2018
Produced by : HP and D
File name : Windsor General May 2018

Highway 101 Twinning

<u>Section 1:</u> Existing Twinning (Three Mile Plains) to Windsor Railway

- New westbound lanes complete & open to 2-lane, 2-way traffic
- Windsor Railway Overpass under construction, expected completion later this fall
- Eastbound lane upgrading & replacement of the Trunk 14 & Wentworth Road Overpass structures to begin this fall, expected completion late spring 2021
- Paving tentatively scheduled to be complete summer/fall 2021

Highway 101 Twinning

Section 2A: **Windsor Railway Crossing to Exit 6**

- Subgrade construction for new westbound lanes started late this summer, expected completion by end of 2020

- Extension of Trecothic Creek Box Culvert & improvements to the Municipal water infrastructure crossings

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Highway 101 Twinning

Section 2B: **Exit 6 to Exit 7**

- Construction of toe berm along causeway underway, wick drain installation & preload fill in progress, completion late this fall
- Exit 6 Interchange/Nesbitt Connector subgrade construction expected to begin this fall
- Subgrade between Avon River & Exit 7 is starting soon, with majority expected to be complete before year end
- Exit 7 Interchange structure & ramp subgrade expected to begin this fall, completion late 2021

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Highway 101 Twinning

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Highway 101 Twinning

<u>Section 3:</u> Exit 7 to Existing Twinning (Falmouth)

- New eastbound lane construction & paving (2.5 km) at western end is complete

- Construction of Wildlife Crossing structure complete on south side of Highway 101 with north side expected to be complete early this fall

- Eastbound lane subgrade construction for remaining 500 metres near Exit 7 expected to be complete early fall, including extensions of Elderkin Creek Box Culvert and improvements to Municipal water and wastewater infrastructure crossings

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Highway 101 Twinning

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Highway 101 Twinning

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Avon River Aboiteau and Causeway Upgrading – TIR Update

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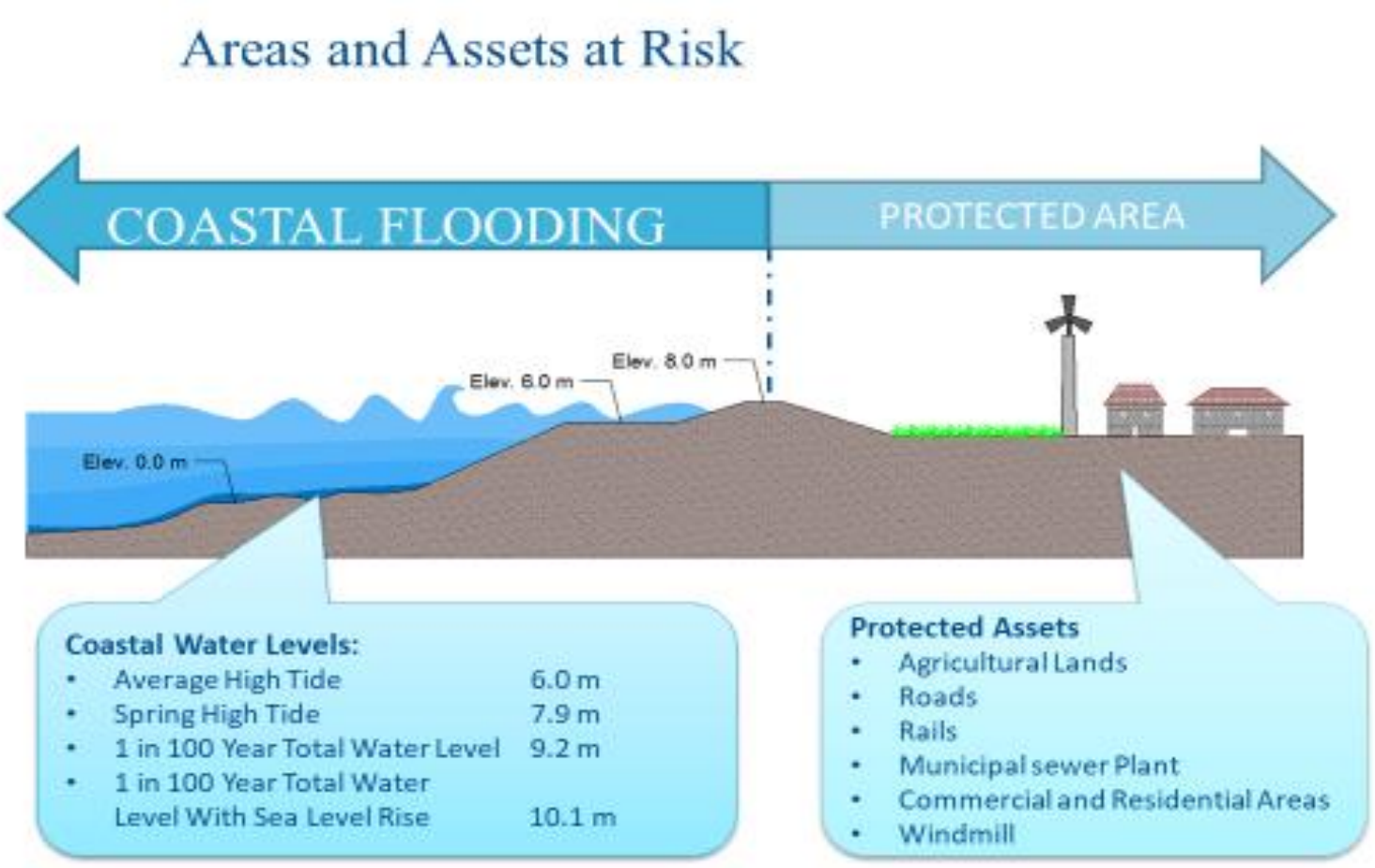
Background

- The existing aboiteau and causeway were originally constructed in 1968-70 to replace 26 km of historic dykes and 36 aboiteau structures upstream

- Since that time much of original dykeland infrastructure has been removed or naturally degraded

- The existing causeway and aboiteau are an integral part of the provincial dyke system providing critical flood protection for the communities of Windsor, Falmouth and more than 1,600 ha (4,000 acres) of agricultural lands (>2,100 ha including non-agricultural / community properties)

Function of Dyke System



Note: These water levels do not apply to this project

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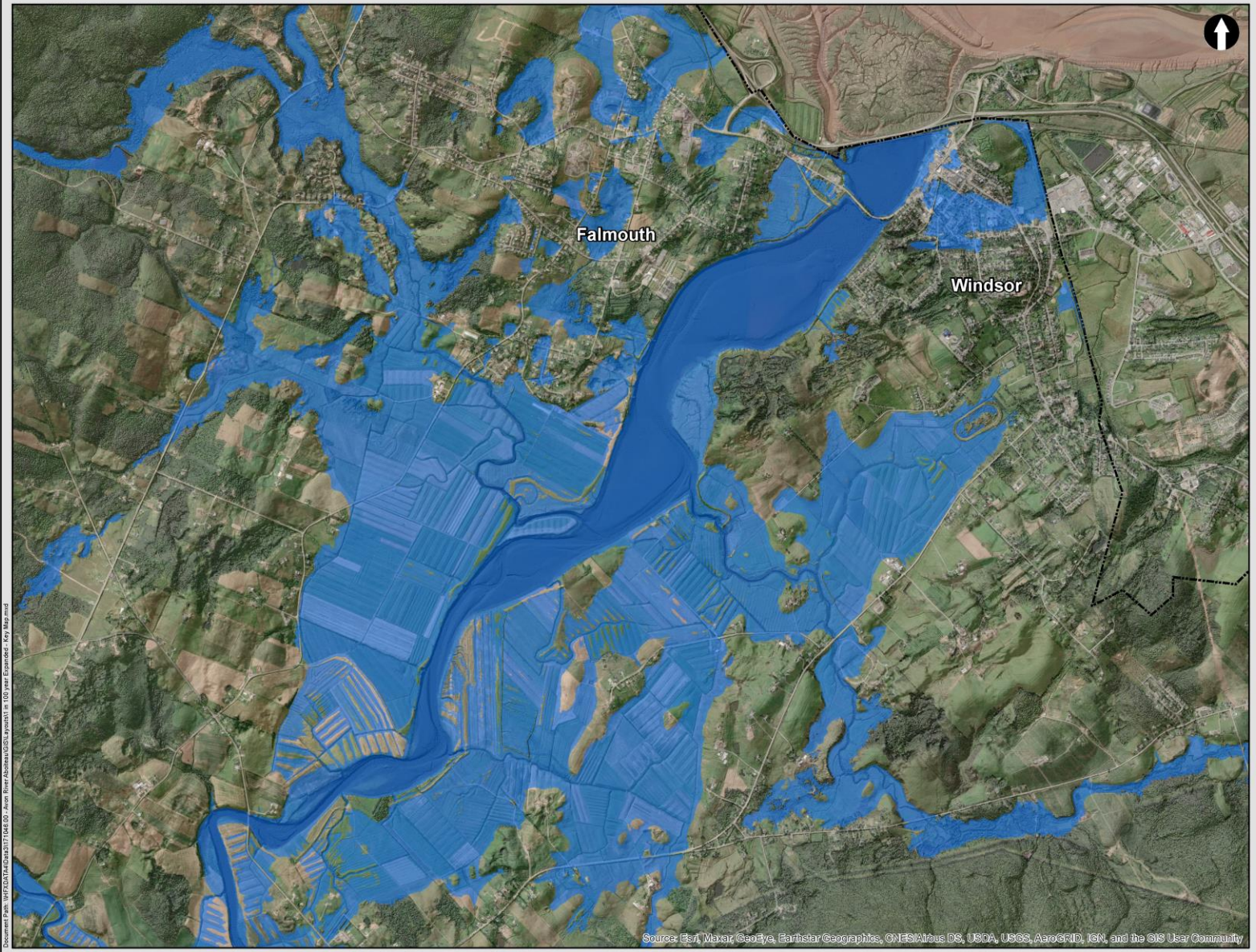
Existing Situation

- The existing aboiteau is at end of life and needs replacement to ensure continued flood protection that would not otherwise be possible with only bridges and free tidal flow
- The system is also vulnerable to storm surges and requires upgrades to adapt to climate change and sea-level rise
- The existing aboiteau was not originally designed to accommodate fish passage and has very limited flexibility
- Failure of the aboiteau gates or removal of the aboiteau would result in a significant flood risk to Windsor, Falmouth and surrounding areas



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Transportation and Infrastructure Renewal

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Department of Agriculture

Avon River Aboiteau Hydrotechnical Assessment

Floodline with main gates left fully open

Estimated Flood Extents During Extreme Storm Event

1 in 100 year Rainfall
1 in 2 year Storm Surge

Main Gates Left Fully Open

Aboiteau Structure in Existing Configuration

Scale: 1:25,000

Date: 15/09/2020
CBCL Project #: 171046.00

CBCL

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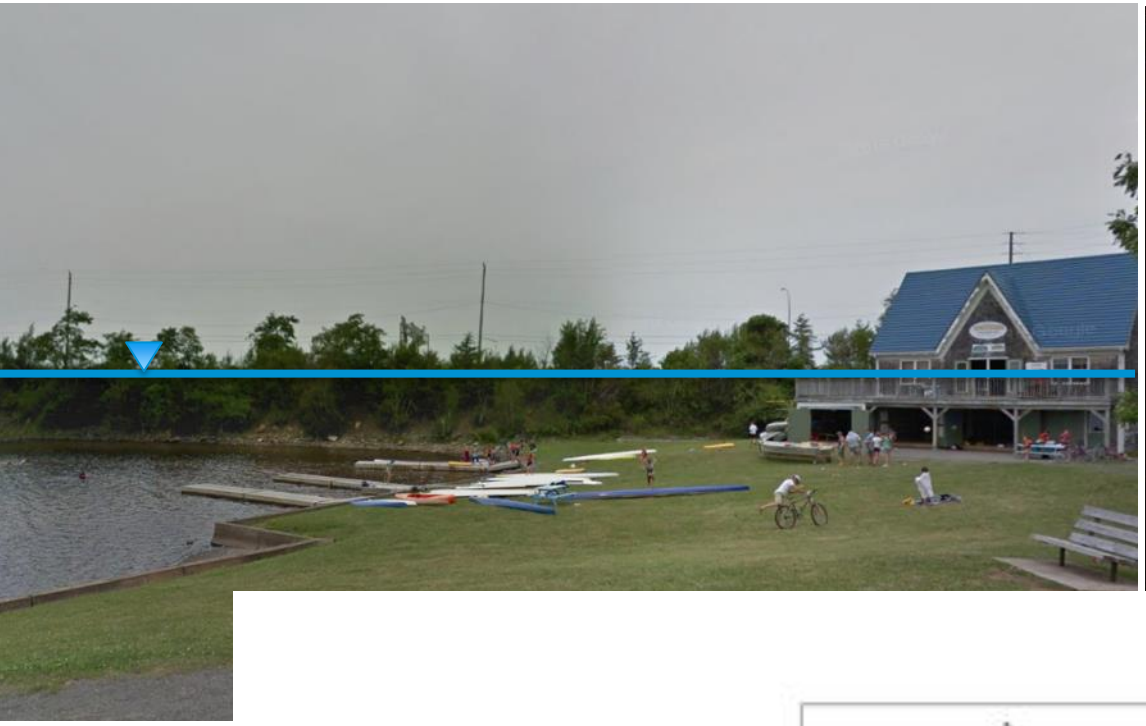
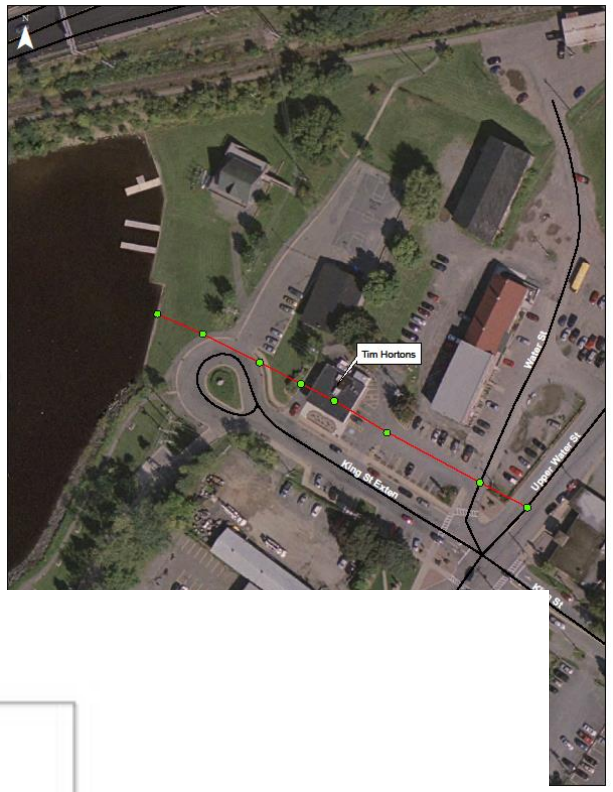
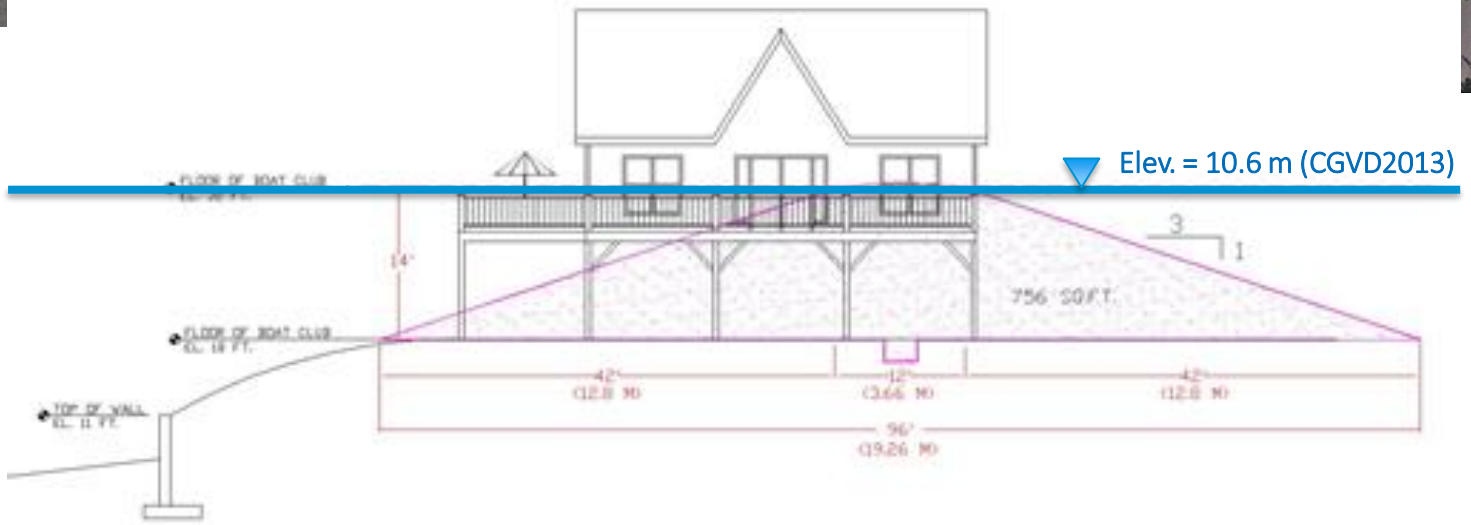



Tim Hortons
King St Extn
Upper Water St


Elev. = 10.6 m (CGVD2013)
3
1
14'
756 SQ.F.T.
42'
(12.8 M)
12'
(3.66 M)
42'
(12.8 M)
56'
(19.26 M)

Project Objectives:

PUBLIC SAFETY

- Continued protection of communities and agricultural land from the effects of flooding and sea level rise / climate change
- Expand corridor over Avon River for Highway 101 Twinning and improved highway safety

REGULATORY REQUIREMENTS

- Improve Fish Passage (EA Condition & *Fisheries Act*)
- Consideration of potential negative impacts to asserted or established Mi'kmaq Aboriginal or treaty rights
- Minimize Environmental Impacts (i.e. Impact to Salt Marsh)

MINIMIZE SOCIETAL IMPACTS

- On community, businesses, farming, recreation, etc.

Current Approach

New Aboiteau and Upgraded Causeway

- The Province decided in the early planning stages that the most feasible option to ensure continued flood protection was to replace the aboiteau and upgrade the causeway

- Replacement of the aboiteau in conjunction with the highway twinning limits conflicts/risks between infrastructure and provides better overall value (systems approach)

- An Environmental Assessment (EA) was approved for the Highway 101 Twinning project in June 2017, which included the proposal for new aboiteau and upgraded causeway

Current Approach

New Aboiteau and Upgraded Causeway

- EA Terms and Conditions required that the aboiteau must provide improved fish passage

- As a condition of the EA, a ‘Communique’ was provided in 2017 describing the Department’s rationale for an aboiteau and upgraded causeway over other crossing options (bridges)

- A bridge alone does not address the primary objective of the project - flood protection for upstream infrastructure and public safety

Current Approach

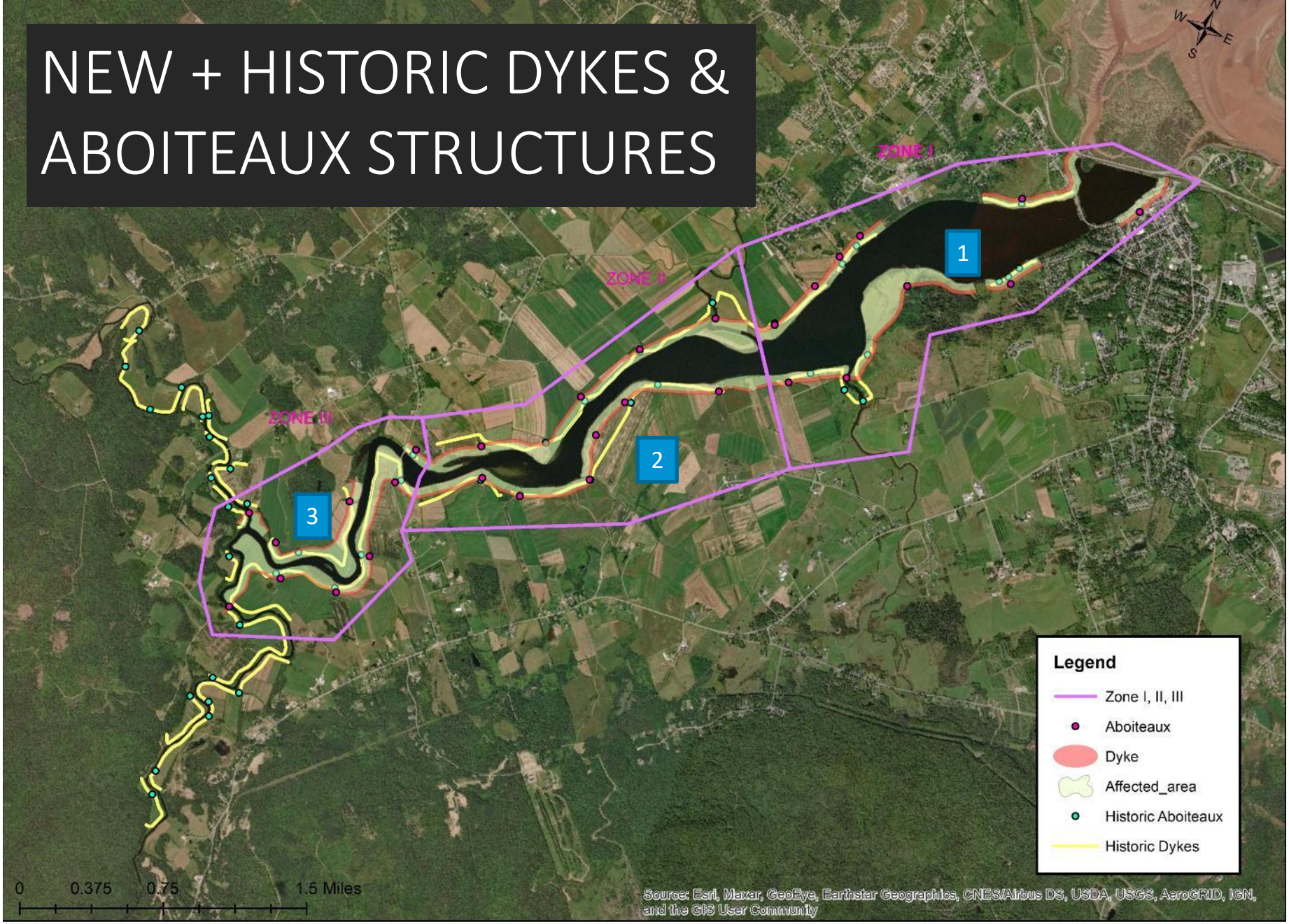
New Aboiteau and Upgraded Causeway

- Bridge options were highly complex due to site conditions and would require an extensive new dyke system along the Avon River (with multiple aboiteaux) to maintain equivalent level of flood protection resulting in substantial impacts

- Greatly expanded infrastructure footprint would require extensive land impacts (including along Windsor waterfront)

- The assessment of other crossing options concluded that a single new enhanced aboiteau with improved fish passage provided the best form of flood protection, had significantly less impacts and was a much more cost-effective solution

NEW + HISTORIC DYKES & ABOITEAUX STRUCTURES



Current Approach

New Aboiteau and Upgraded Causeway

- CBCL Limited was hired in 2018 to complete overall design process for the Avon River Aboiteau and Causeway Upgrading which is scheduled to be finalized in early 2021

- A primary focus of the design over the past 2+ years has been to maximize fish passage for as many species as possible within the limitations associated with providing flood protection

- Consultation with the Mi'kmaq, public and various groups/stakeholders has been ongoing throughout the project development

Aboiteau Design – Current Approach

- **Flexible** design, offering wide range of operating scenarios
- **Adaptable** to changing/future requirements
- Two (2) **Dedicated Fishways**
- **Improved** Gate Functionality in Operations and Back-up
- **Initial operation** - Freshwater Lake scenario
- **Monitoring** of fish passage will be required, including a robust monitoring plan to show improvements in fish passage

Next Steps

- Environmental Permitting (Phase 2 submissions October 2020)
  - DFO *Fisheries Act* Authorization Application
  - NSE Wetland Alteration Proposal
- Consultation will shift to DFO during application review
- Completion of Final Design Plans & Specifications (early 2021)
- Aboiteau and Bridge Construction scheduled to begin in 2021
- Overall Project Completion – Fall 2022

Photo from van Proosdij (2018)

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Avon River Aboiteau and Causeway Upgrading – CBCL Update