



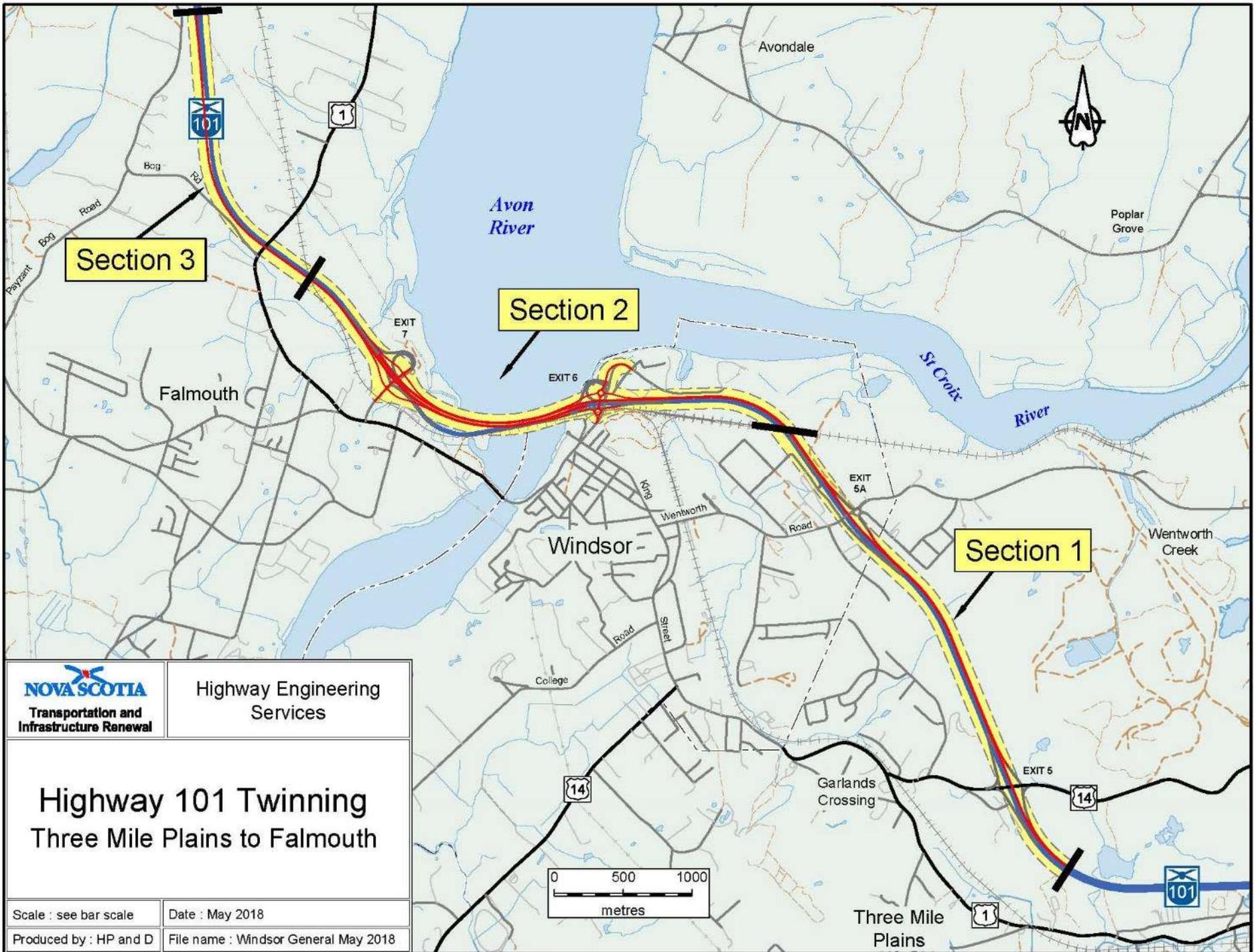
# Highway 101 Twinning and Avon River Aboiteau and Causeway

Project Update for Community Liaison Committee  
February 27, 2019



# Overview

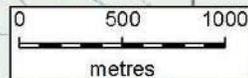
1. Update on Highway 101 Three Mile Plains to Falmouth Twinning Project
2. Update on the design of the Avon River Aboiteau and Causeway Upgrading
  - Brief Recap of Aboiteau Options
  - Public & Stakeholder Consultation Summary
  - Current Status and Next Steps
3. Questions / Discussion



**NOVA SCOTIA**  
 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 Update

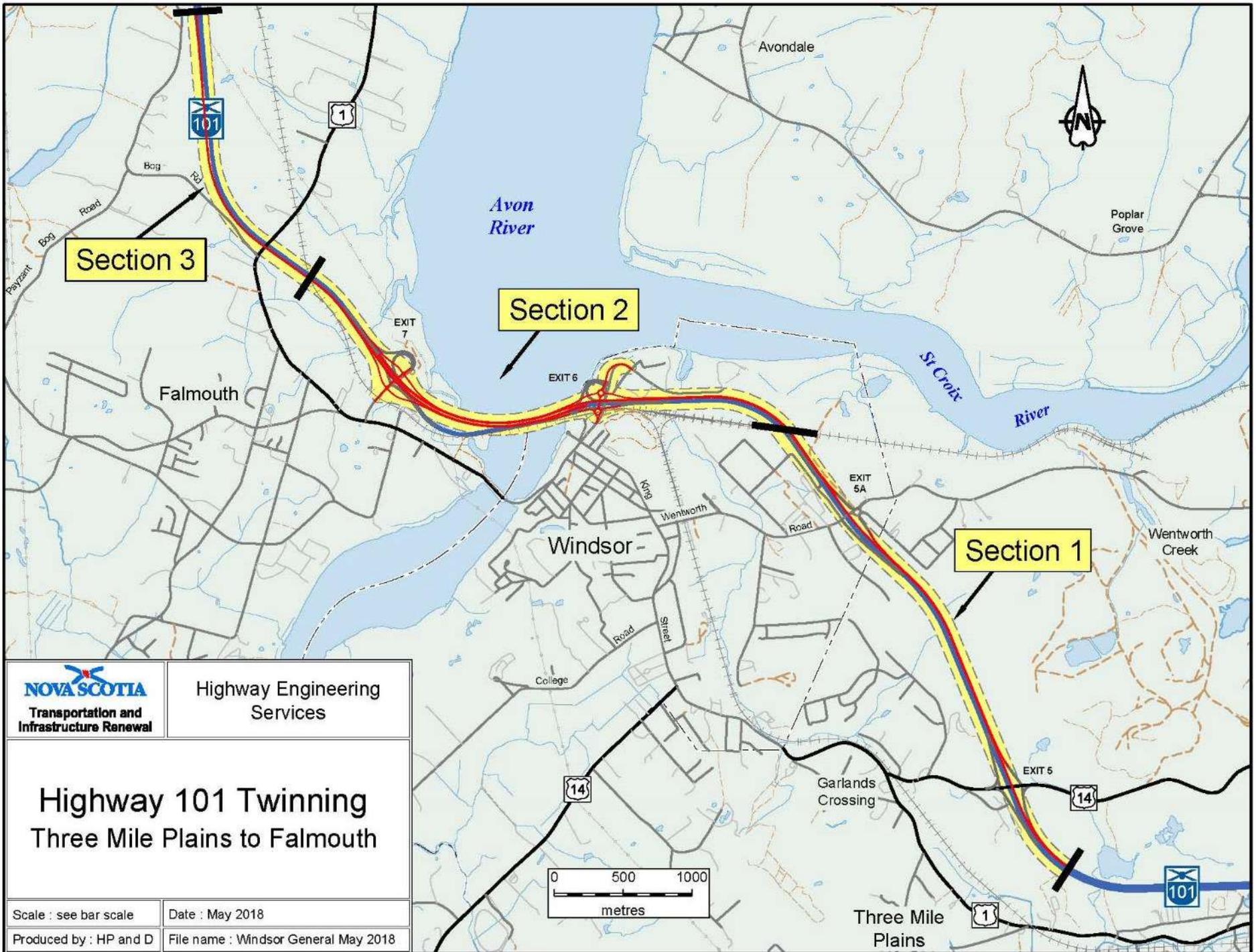
## Work Completed to Date:

- **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



**NOVA SCOTIA**  
 Transportation and  
 Infrastructure Renewal

Highway Engineering  
 Services

# Highway 101 Twinning Three Mile Plains to Falmouth

Scale : see bar scale

Date : May 2018

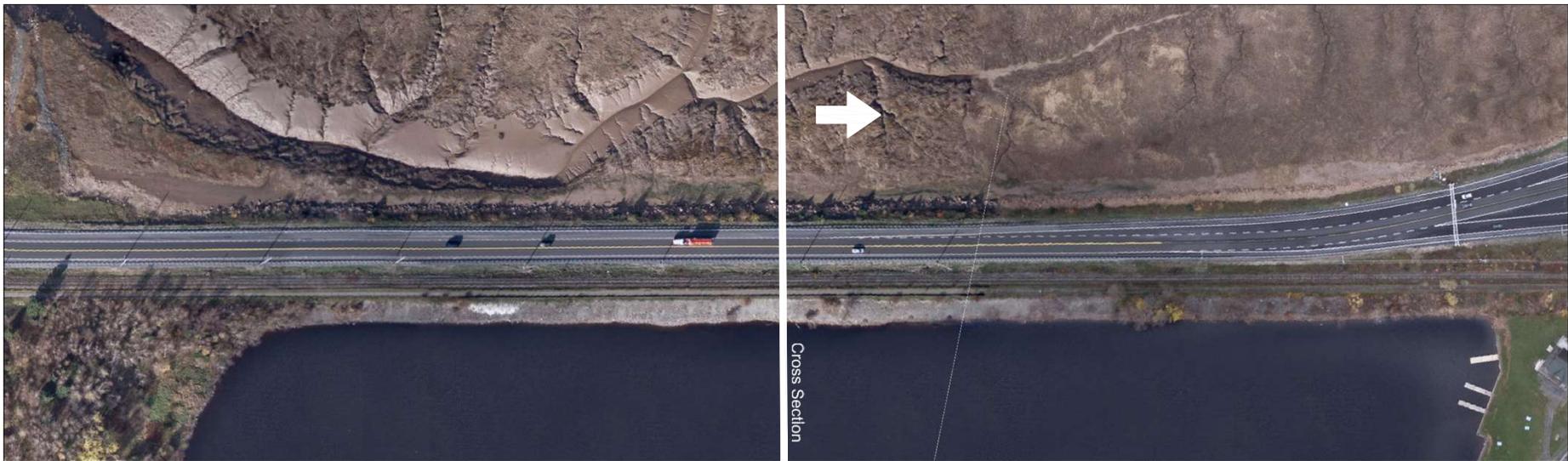
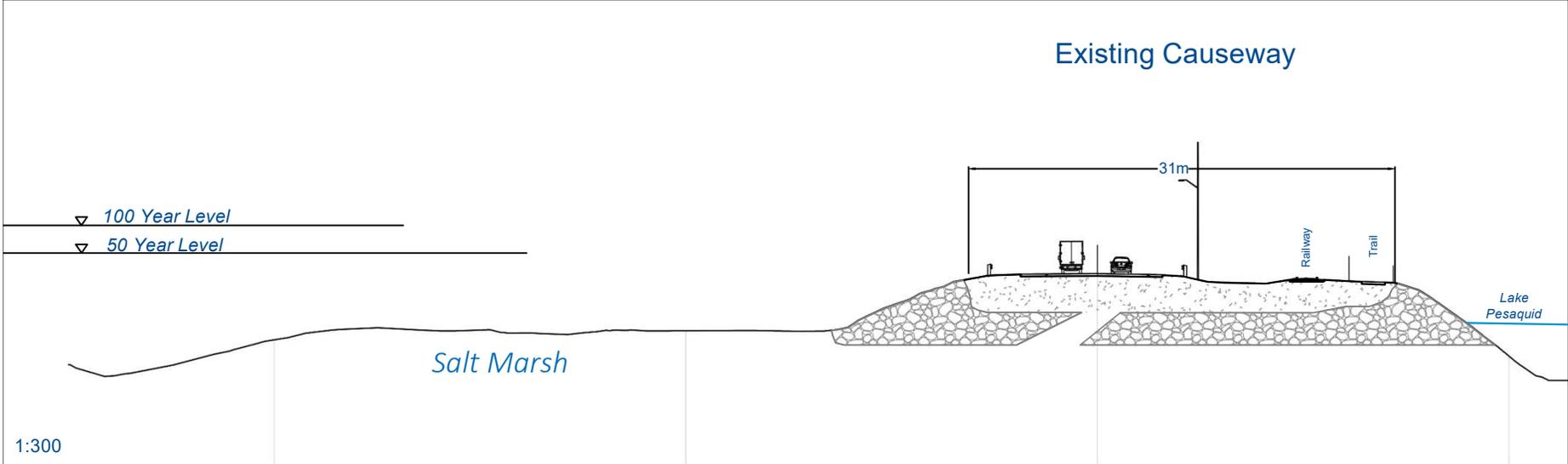
Produced by : HP and D

File name : Windsor General May 2018

# Highway 101 Twinning Update

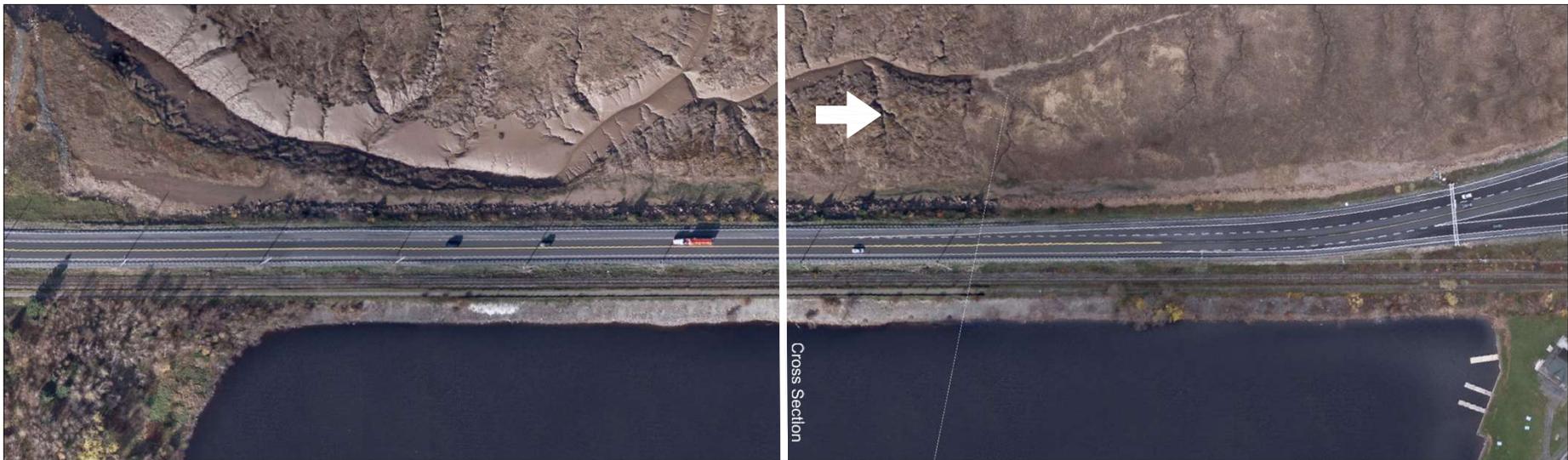
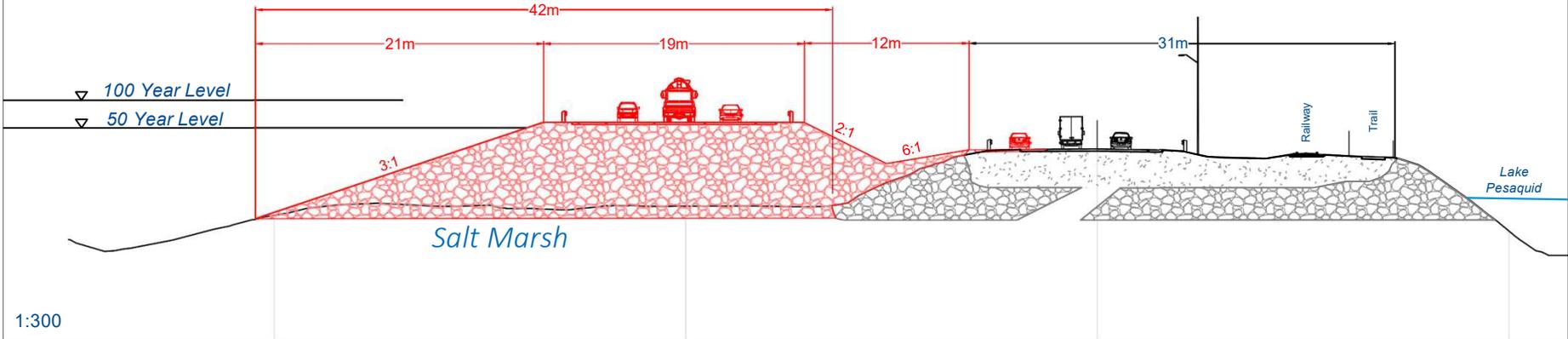
## Project Timelines:

- 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



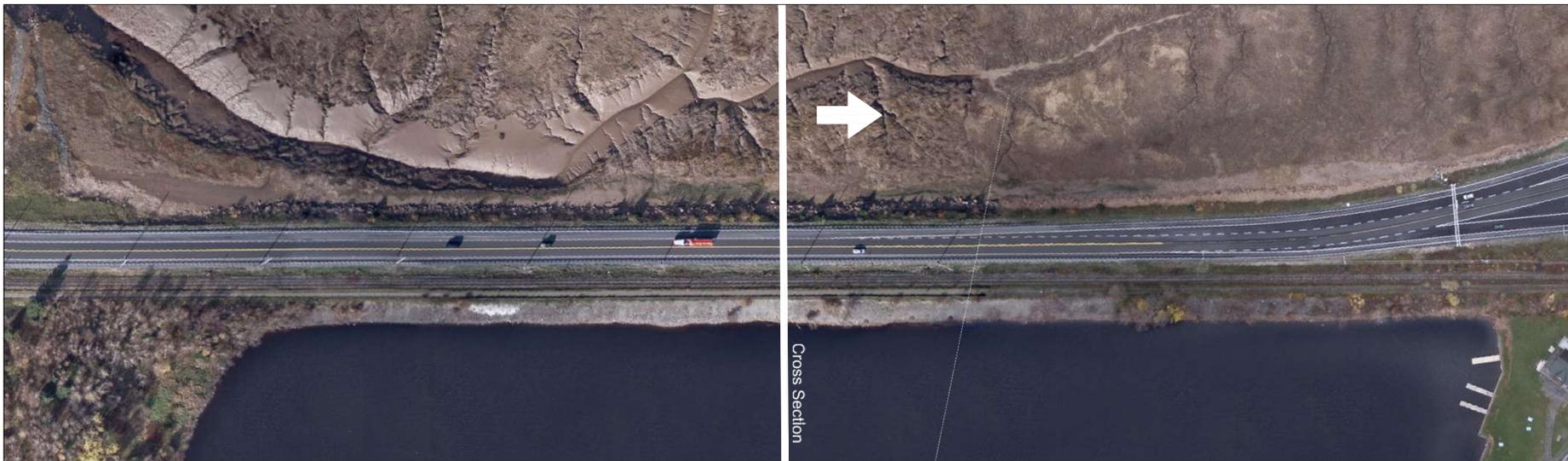
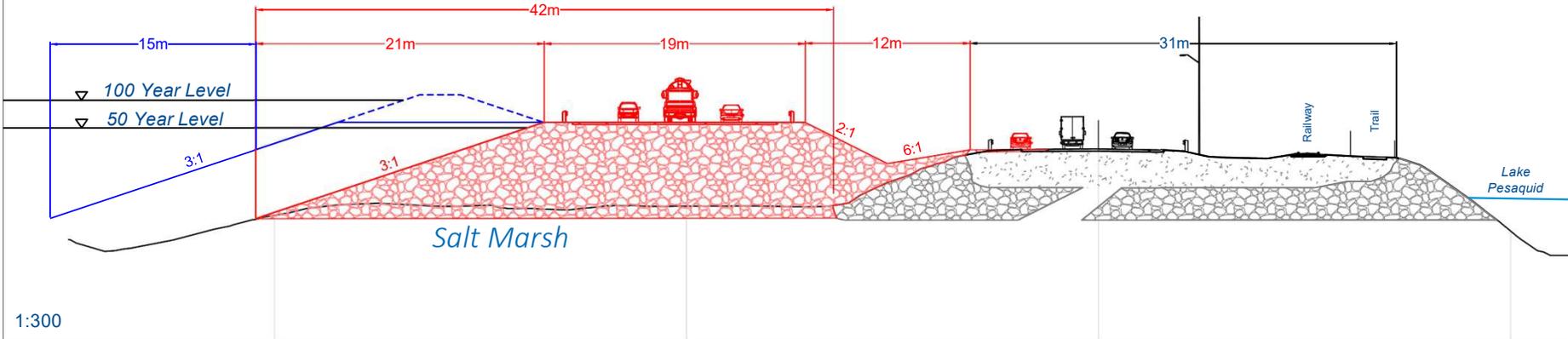
### Twinning for 50 Year Scenario

### Existing Causeway



Twinning for 50 Year Scenario plus  
100 Year Dyke Footprint

Existing Causeway



# Aboiteau Design Recap

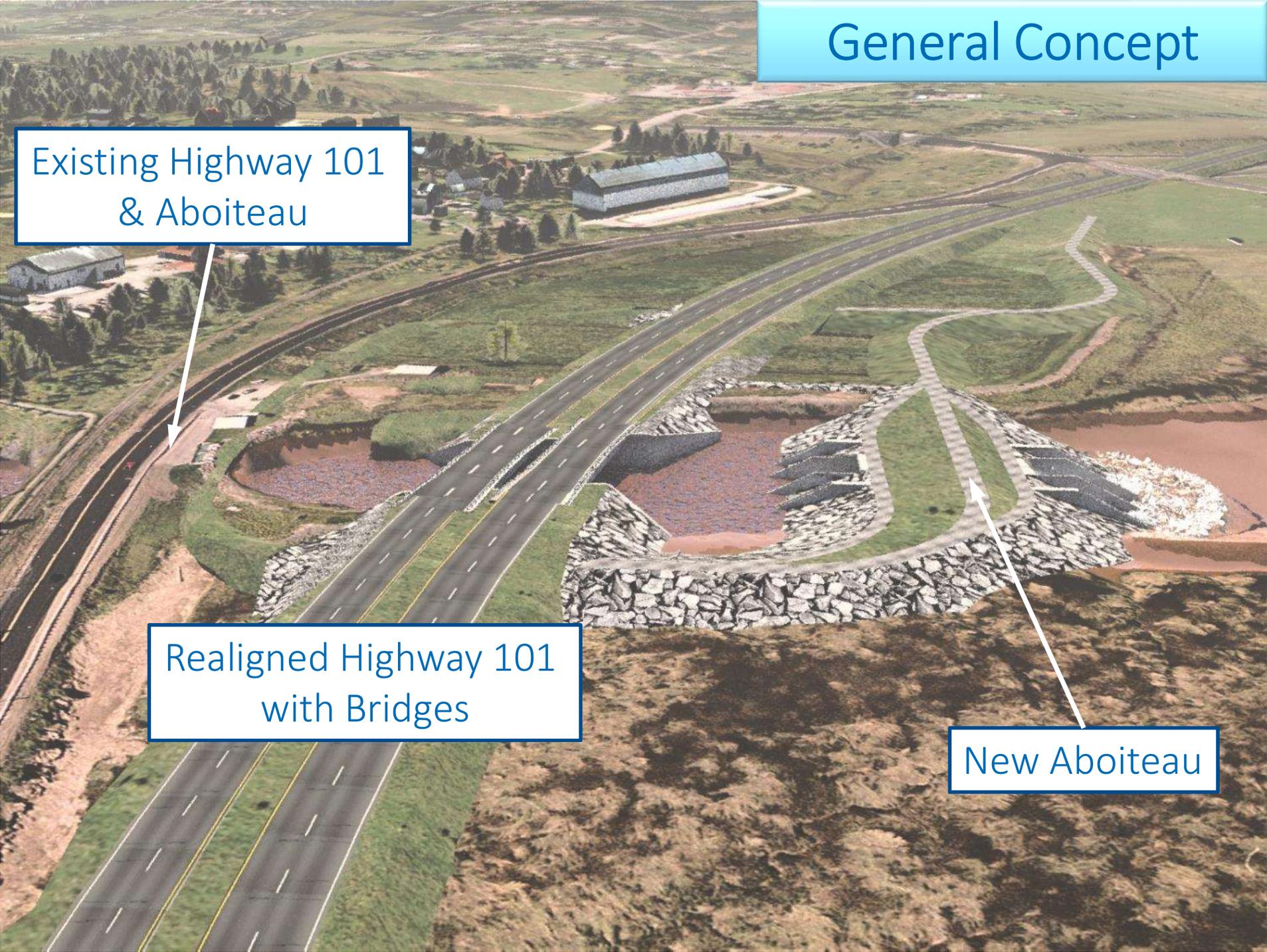
- The existing aboiteau is at end of life and has no further opportunity for improvements to fish passage
- Extremely complex flood control structure that forms part of the overall dykeland system
- Many requirements and a wide range of interests
- Primary objective is flood control and public safety
- 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 10<sup>th</sup>.
- 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*

*Businesses*

*Highway 101 CLC*

*Recreational Groups*

*Town of Windsor*

*Farmers*

*Municipality of West Hants*

*Land Owners*

*Regulators (NSE and DFO)*

*General Public*

# Consultation Feedback

## Open House Summary:

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

Feedback Question	Yes	No	No answer
Was the info helpful?	87%	6.5%	6.5%
Were questions answered?	70.7%	12%	17.3%
Were staff knowledgeable?	84.8%	2.7%	12.5%

- 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:
  - Protecting recreation & social events;
  - Keeping saltwater & mud out of the lake;
  - Protecting business & tourism opportunities on the lake;
  - Protecting agriculture;
  - Floodwater protection;
  - Protection of an available freshwater resource;
  - Fire protection;
  - Food security; and
  - 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)

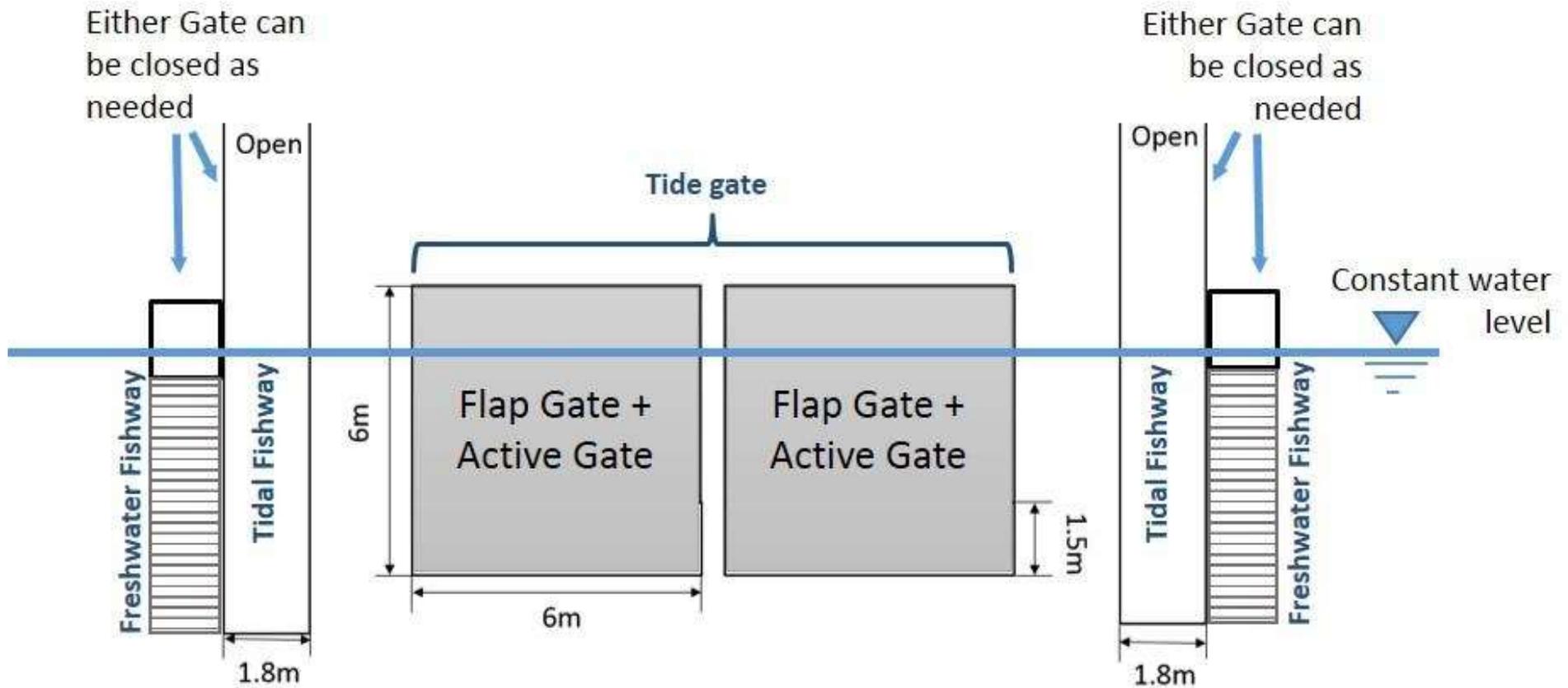
# Hybrid Option D

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

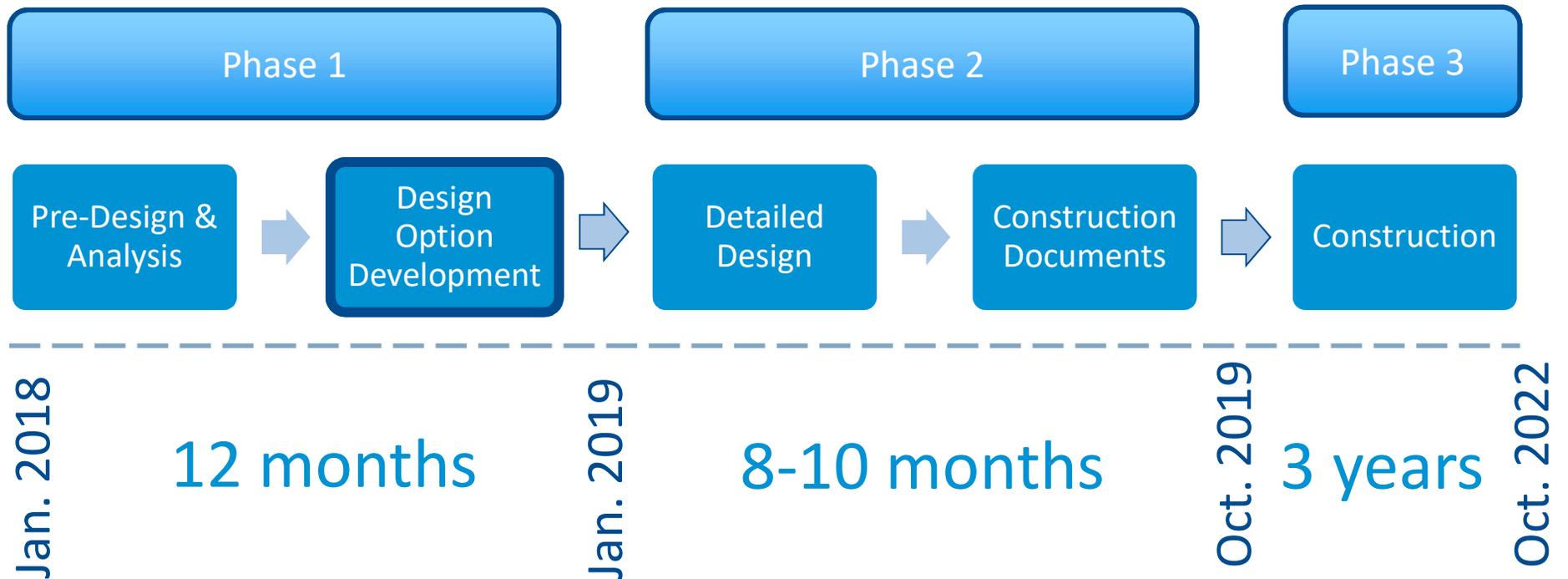


# Hybrid Option D

## 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



# Archaeology

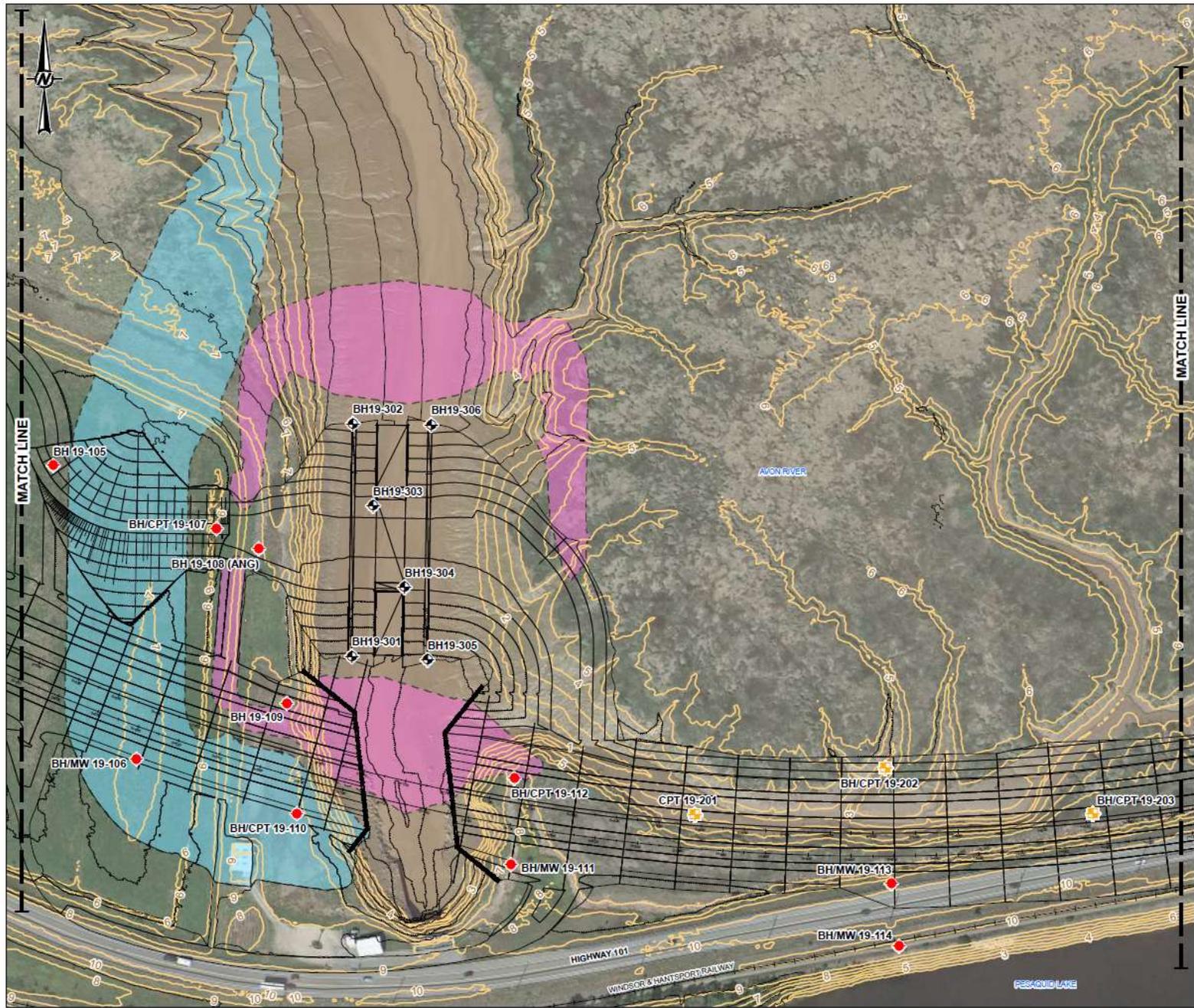
- An Archaeological Resource Impact Assessment (ARIA) was originally completed in 2007 for this twinning project
- NSTIR was required to prepare an archaeological contingency plan in partnership with CCH as part EA approval conditions (avoidance in some high potential areas)
- Some concerns had been 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