



Permitting the Replacement of Loring Crossing Bridge over the East Branch of the Tioughnioga River

PRESENTED BY:
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Presentation Overview

NYSDEC permitting process and mitigation efforts for recent Cortland County Project

- Project background and context
- Structure location and type
- Identified regulated resources
 - Impacts to waterway bed and banks
 - Impacts to mussel populations
- Design and demolition alternatives
- On-site and off-site mussel mitigation






Project Overview

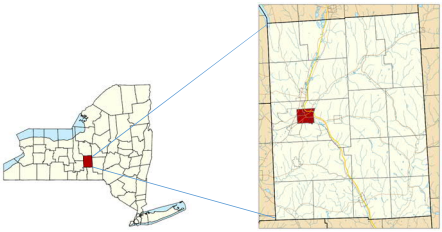

Replacement of Loring Crossing Bridge over the East Branch of the Tioughnioga River

- Replacement of an existing two-span bridge.
- Includes ±2000 ft of road reconstruction

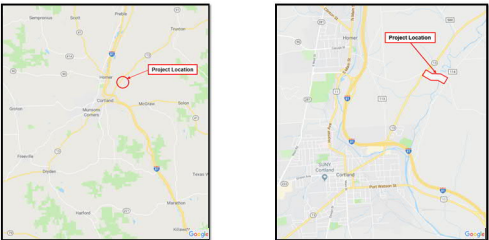

Sponsor: Cortland County
 Funding Source: BridgeNY
 Construction Contact Amount: \$2,987,897.90
 Construction Year: Currently under construction

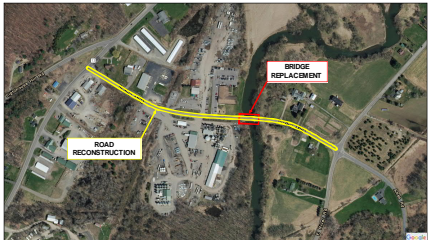

Project Location

Project Location





Project Location


Existing Bridge - Overview

- Built in 1937
- 166'-0" two-span concrete frame superstructure
- CIP concrete abutments and piers with timber piles
- 32'-0" width carries two traffic lanes and a sidewalk




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Existing Bridge - Deterioration



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Existing Bridge - Deterioration



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Existing Bridge - Deterioration



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Existing Bridge - Deterioration



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Existing Bridge - Deterioration



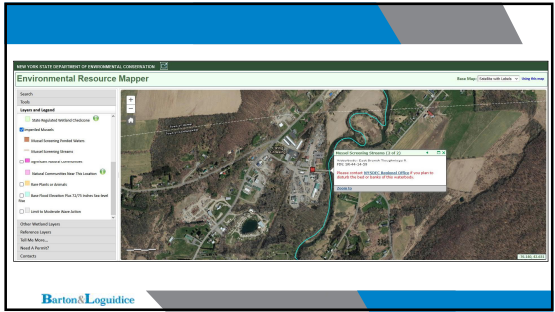
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The Mussel Context

- Large number of mollusk species proposed to be added to NYS ESA regulations
 - 2 Endangered, 6 Threatened, 13 Species of Special Concern
- Most sensitive projects: bridge replacements and rehabs, culvert work (including trails), water/wastewater intakes and outfalls
- T/E and S1/S2 populations identified across NYS
 - Includes all T&E species
 - Also includes some non-listed species
 - Very few Counties without imperiled mussels
- Does not allow for blanket Section 401 Water Quality Certification coverage from NYSDEC

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Imperiled Mussel Species

- Imperiled mussel species: the yellow lampmussel
- Identified during preliminary design
- Recognized by the NYSDEC as a S3 species

Result

- Presence of mussels will lead to a more involved permitting process
- Avoid waterway impacts if possible

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Pre-Application Meeting

Preliminary design determined that impacts to the waterway and mussels could not be avoided

- A NYSDEC permit would be required

Pre-application Meeting with NYSDEC – March 2020

- Discussed anticipated impacts
- Discussed demolition methods and span configuration
 - Additional guidance regarding specific demo methods and dewatering options was requested
- NYSDEC provided initial concerns and suggestions

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What's in the water?

- Chemung River Basin in Susquehanna River Watershed
- Survey limits: 100m upstream and 200m downstream
- 47 mussels identified representing 8 species
 - 11 green floaters (NYS threatened species)
 - 5 yellow lampmussel (Proposed NYS species of special concern)
 - 1 eastern pearlshell (Proposed NYS threatened species)

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Demolition Methods


1. Support and remove in place
 - Scaffolding
2. Drop structure and remove from below
 - Drop into the active waterway
 - Drop onto a platform
 - Drop into the dewatered streambed



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Demolition Methods

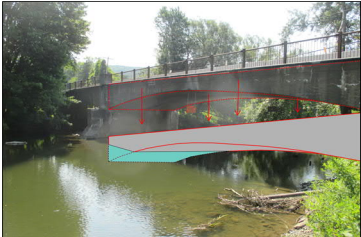
1A. - Support in place with scaffolding and remove in place



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Demolition Methods

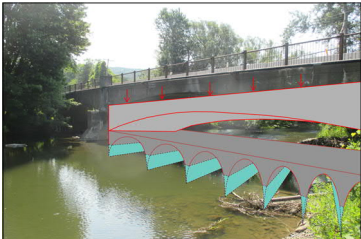
2A. - Drop structure into the active waterway and remove from below



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Demolition Methods

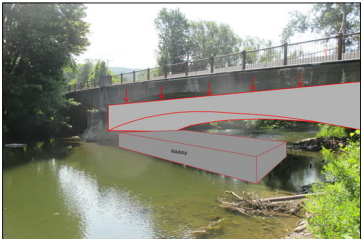
2B. - Drop structure onto a work platform and remove from below



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Demolition Methods

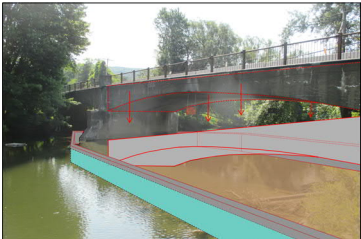
2C. - Drop structure onto a barge and remove from below



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Demolition Methods

2D. - Drop structure onto dewatered streambed and remove from below

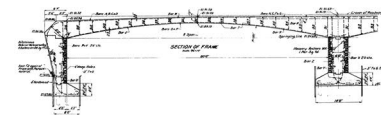


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Span Configuration

Key questions:

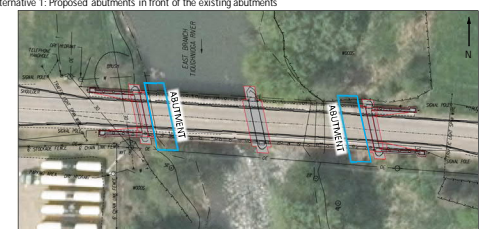
- Could we build in front of the existing abutments without creating hydraulic issues?
- If we could use 2 spans, what was the best placement for the pier?
- Did we need to eliminate the pier to help with hydraulics?
- If we got rid of the pier, what was the longest span we could get to work with hydraulics?
- Did we need to build new abutments in the same location as the existing?
- Did we need to build behind the existing abutments?
- Could we build in front of the existing abutments without creating hydraulic issues?



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Span Configuration

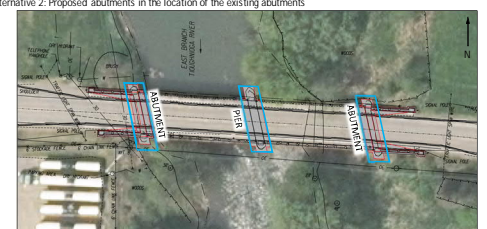
Alternative 1: Proposed abutments in front of the existing abutments



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Span Configuration


Alternative 2: Proposed abutments in the location of the existing abutments



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Span Configuration


Alternative 3: Proposed abutments behind the existing abutments



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Span Configuration

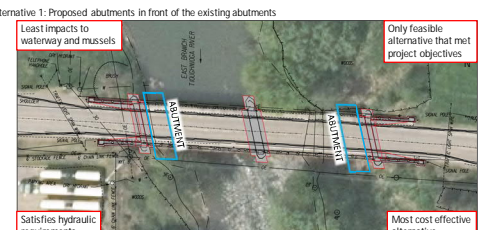
Alternative 4: One proposed abutment in front of existing abutment, and one behind



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Span Configuration

Alternative 1: Proposed abutments in front of the existing abutments



Least impacts to waterway and mussels

Only feasible alternative that met project objectives

Satisfies hydraulic requirements

Most cost effective alternative

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Span Reduction

Clear span reduced from 160ft to 130ft

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Overflow Channel

- Eastern span acts as an overflow channel
- Half of eastern span is a floodplain bench
- Proposed to eliminate bench
- NYSDEC required a portion of the bench to be retained to allow for wildlife passage

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Tree Clearing

- Tree clearing and grubbing needed to install stone bank protection
- NYSDEC viewed tree removal as a negative impact to mussel populations
- Live stake plantings were added to the stone bank protection to satisfy the NYSDEC.

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Pulling a Muscle

- NYSDEC comes around to idea of Part 182 Permit need
- Draft Part 182 Mitigation Plan to address mussel take — Oct 2020
 - fashioned after a NYSDOT project
- Feb 2021 – NYSDEC indicates that other project's mitigation is not appropriate – back to the drawing board

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New Heights

Mitigation Proposal

- Salvage and relocation of mussels in impact area
- Post-relocation monitoring
 - 30-60 days
 - 1-year
- Completion of 2 off-site qualitative mussel surveys
 - NYSDEC to select locations

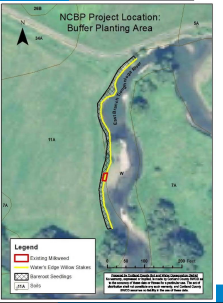
NYSDEC's Assessment

- Not enough
- NYSDEC wanted more to satisfy "take" under Part 182
- Look at off-site options
- Net Conservation Benefit

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Off-site Habitat Mitigation


- Riparian Buffer Mitigation Site
 - 550 linear feet, 15-20 feet in width
- Buffer plantings – Cortland County Soil & Water Conservation District
 - 59% shrubs – bare root seedlings and unrooted live stakes
 - 41% trees – bare root seedlings
- 3-year monitoring period



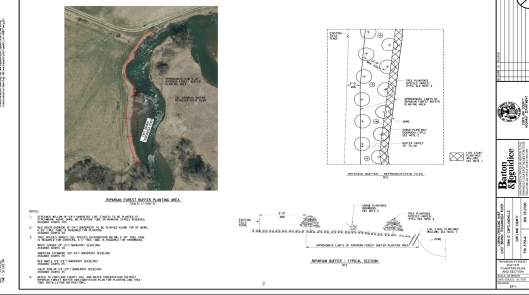
Legend:
 Existing Milewide
 15-20 ft Buffer Mitigation Stakes
 Riparian Seedlings
 (Tree, Shrub)

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Existing Condition



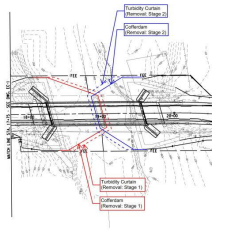
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Additional On-site Mitigation


- Erosion and sediment control measures
- Live stake installations at bridge corners
- Removal of the center pier – 6-12" below stream bed elevation
- Completion of work in dewatered work areas



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Salvage and Relocation

- 10 m upstream – 50 m downstream
- 46 live mussels salvaged representing 7 species
 - 14 green floaters
 - 8 yellow lampmussel
 - 1 eastern pearlshell
- Recipient site 300 m upstream



Garlicky Mussels – Crusty Bread

Parade.com <https://www.parade.com/2021/08/18/food-ideas-for-a-mussel-restaurant/>

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Relocation Area



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Save the Tylenol®

Current Progress

- Construction
- Post-relocation mussel survey



Source: iStockphoto.com/Artemio from the Equinox Agency

Reaffirmations

- Stay out of the water
 - Identify mussel needs early
 - Environmental Resource Mapper
- If Imperiled Mussels reported, start coordination early
 - NYSDEC Freshwater Mussel Survey Guidelines – April 2021
 - https://www.dec.ny.gov/docs/wildlife_pdf/musselsurveyguide.pdf

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Retention Check

1. Which of the following made finding a feasible demolition method so challenging?
 - a. The bridge is on the Historic Register
 - b. Needed to minimize negative impacts to waterway and mussels
 - c. The bridge is monolithic
 - d. Both b. and c.
2. Why couldn't the proposed substructure be built in the same location as the existing substructures?
 - a. NYSDEC required the existing substructures remain as bait habitat
 - b. The waterway was going to be widened to include those areas
 - c. Installation of new piles was not feasible among the existing timber piles

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Retention Check

3. Beyond impacts to the waterway and mussels from demolition and construction, what were two of the NYSDEC's additional concerns with the proposed alternative?
4. The incidental take of protected wildlife is covered under what NYSDEC permit (or regulatory part)?
5. What clade of aquatic organisms are gearing up to be the "Indiana bat" of the next decade?

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