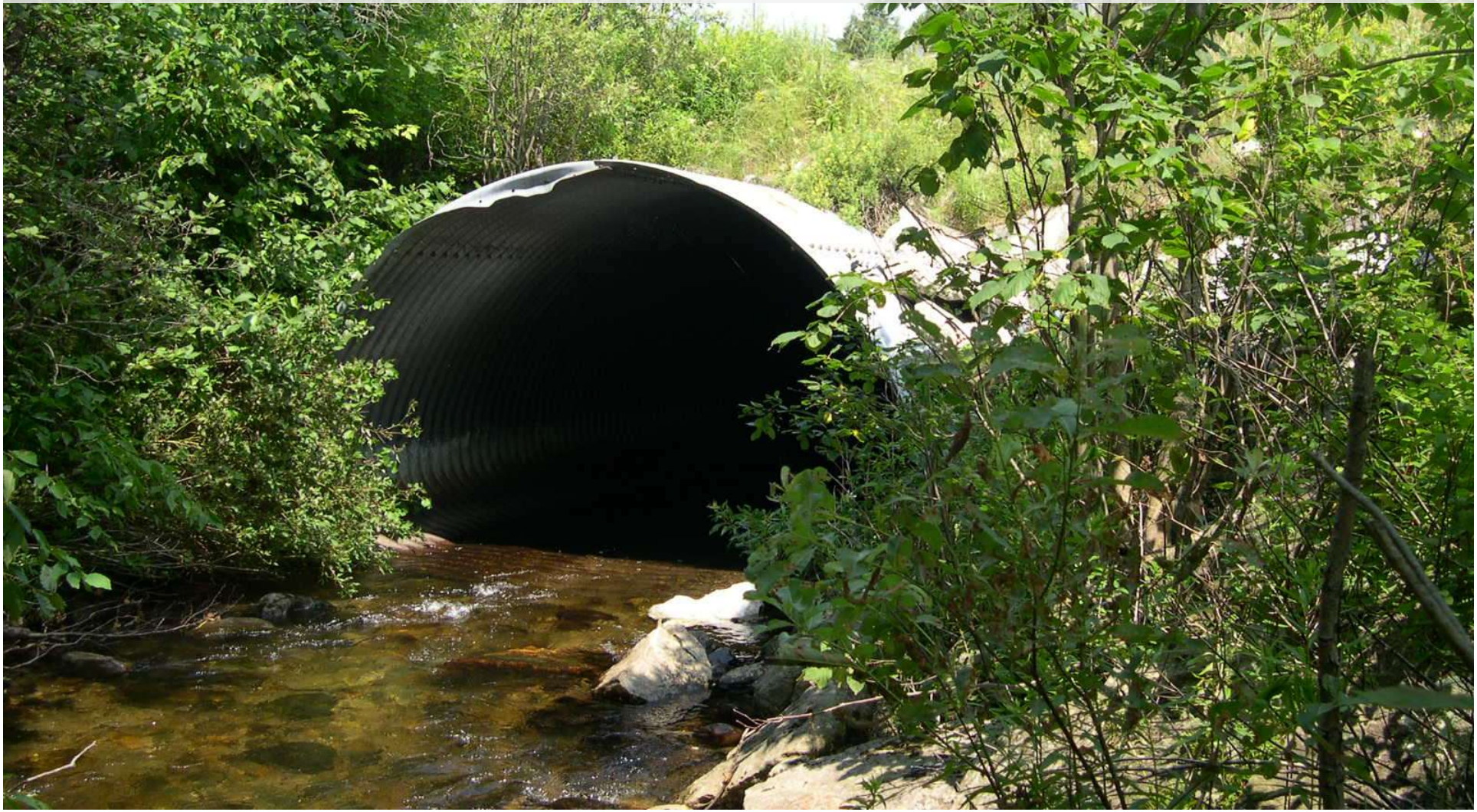
September 12, 2017

Mount Holly - BF 013-3(12)

Public Information Meeting

Vermont Route 155 – Bridge #7 over Mill River



Introductions

Cassidy Cote, E.I.
VTrans Scoping Engineer

Gary Sweeny, P.E.
VTrans Scoping Engineer

Rob Young, P.E.
VTrans Design Project Manager

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Purpose of Meeting

- Provide an understanding of our approach to the project
- Provide an overview of project constraints
- Discuss alternatives that were considered
- Discuss our recommended alternative
- Provide an opportunity to ask questions

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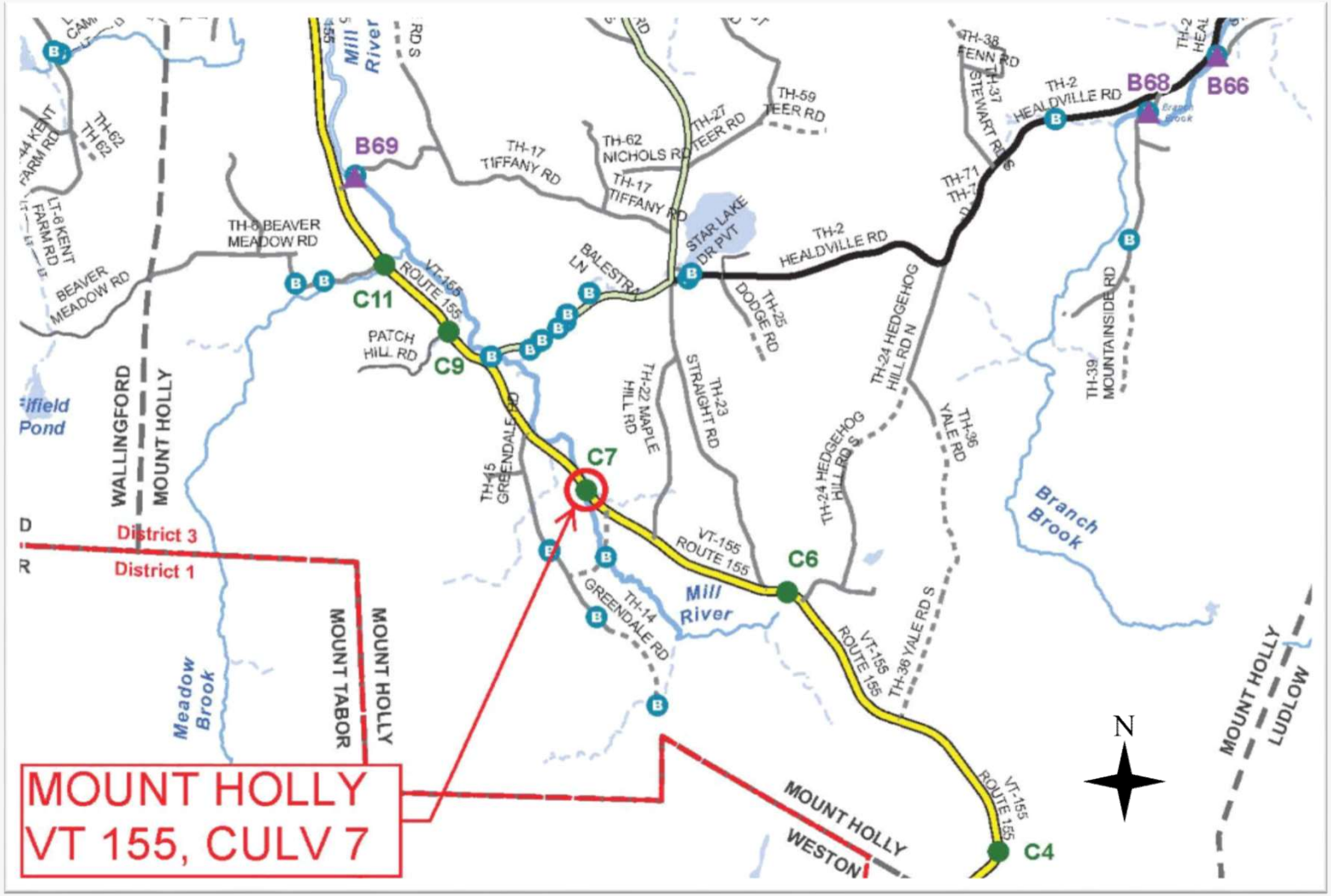
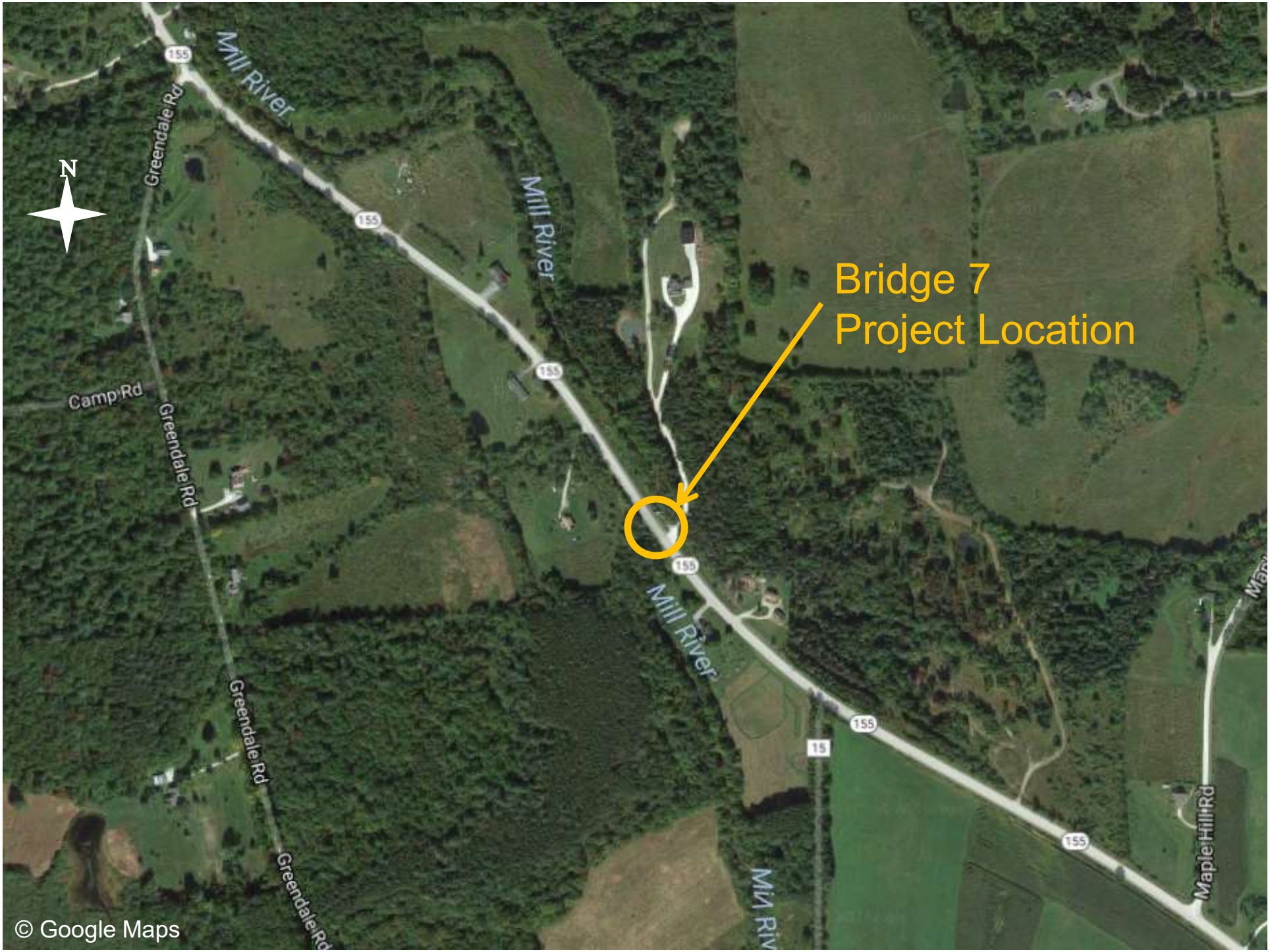
Location Map




N
Bridge 7
Project Location
Mill River
Greendale Rd
Camp Rd
155
15
Maple Hill Rd
© Google Maps

Meeting Overview

- VTrans Project Development Process
- Project Overview
  - Existing Conditions
  - Alternatives Considered
  - Selected Alternative
- Maintenance of Traffic
- Schedule
- Summary
- Questions

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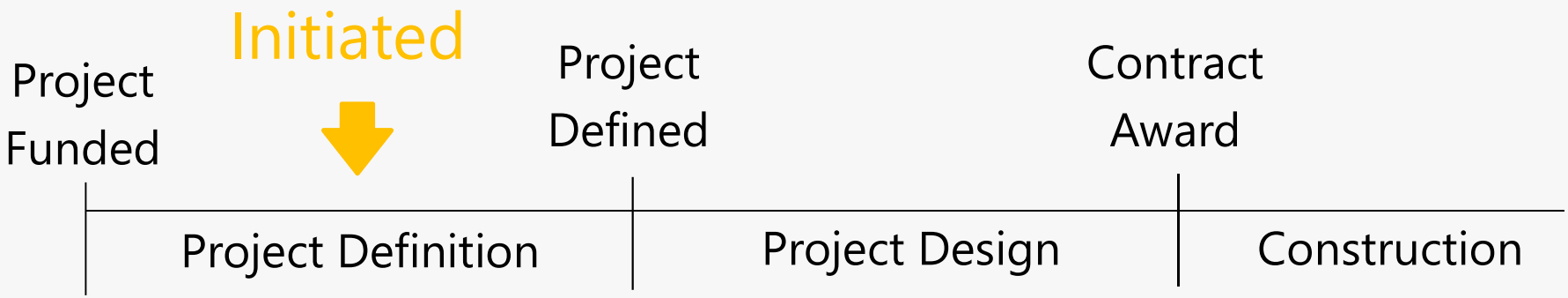
VTrans Project Development Process



- Identify resources & constraints
- Evaluate alternatives
- Public participation

- Quantify areas of impact
- Environmental permits
- Develop plans, estimate and specifications
- Right-of-Way Process

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Project Overview

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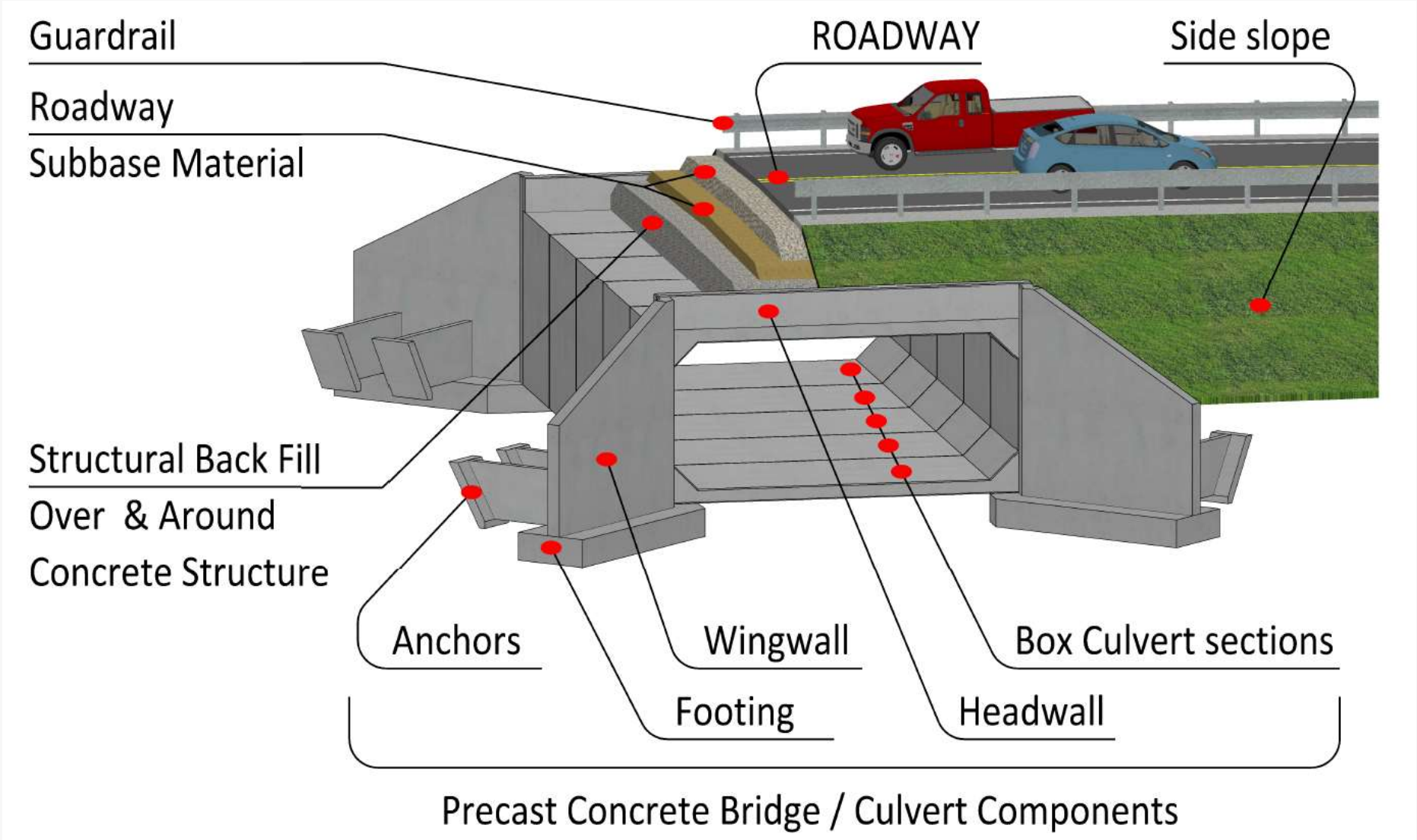
- Existing Conditions
- Alternatives Considered
- Selected Alternative

Looking Southeast Along VT-155

Description of Terms Used



Site Information

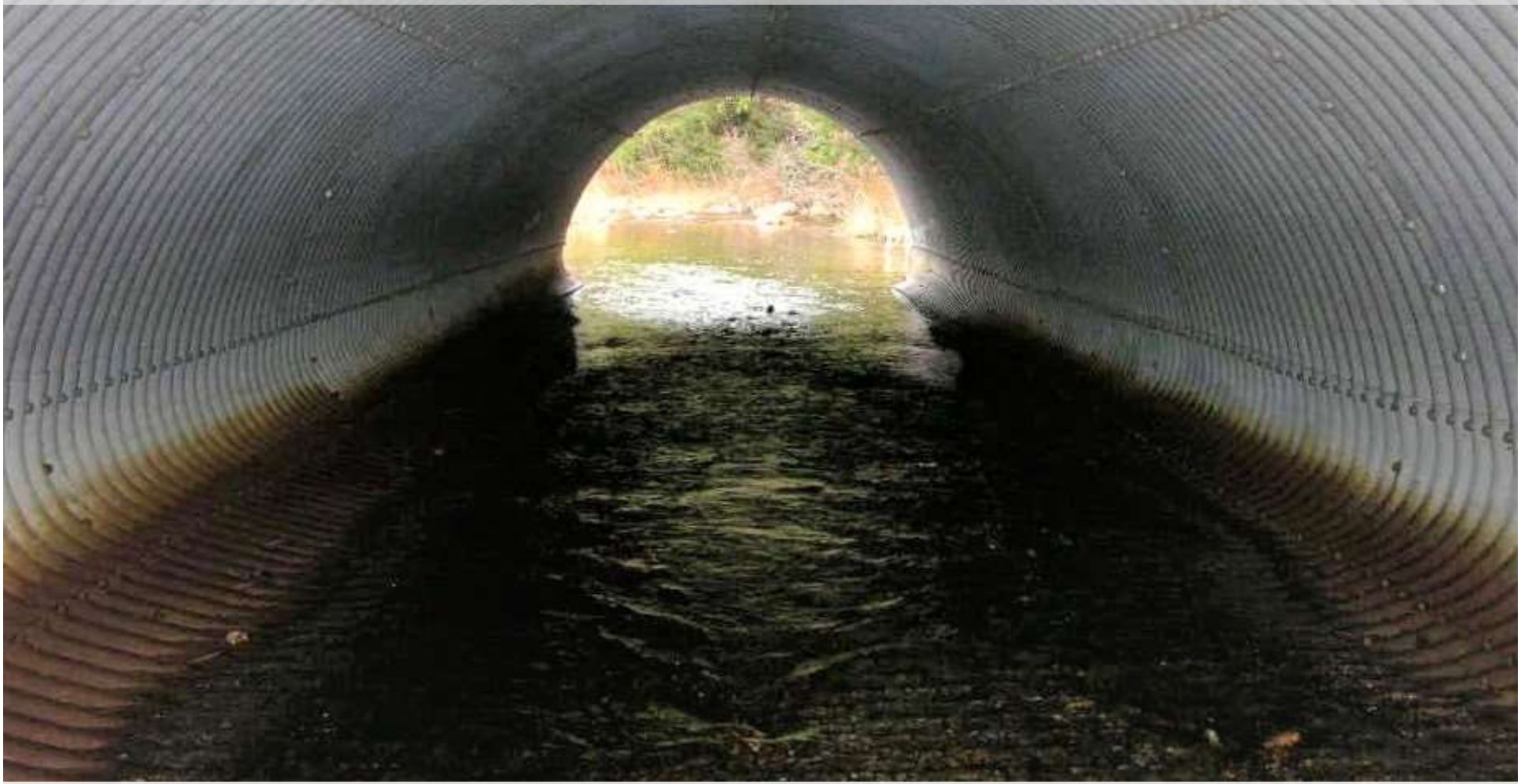
- Roadway Classification: Rural Major Collector
- Culvert Type: Corrugated Galvanized Multi-Plate Steel Pipe Arch
- Culvert Dimensions: 15′ – 4″ span, 9′ – 3″ depth, 104′ length
- Constructed in 1969
- Ownership: State of Vermont

Existing Conditions

- This culvert has a rating of 4, “Poor” and has bolt line cracking.
- The existing culvert does not meet state stream equilibrium standards for bankfull width.
- There are perforations throughout the invert of the pipe. The culvert has settled 1’ +/- from the mid-span to the outlet due to undermining.

Existing Conditions - Interior

Inspector's comments urge action. The invert has failed allowing for undermining and resulting in a 1' +/- settlement of the downstream end of the structure.

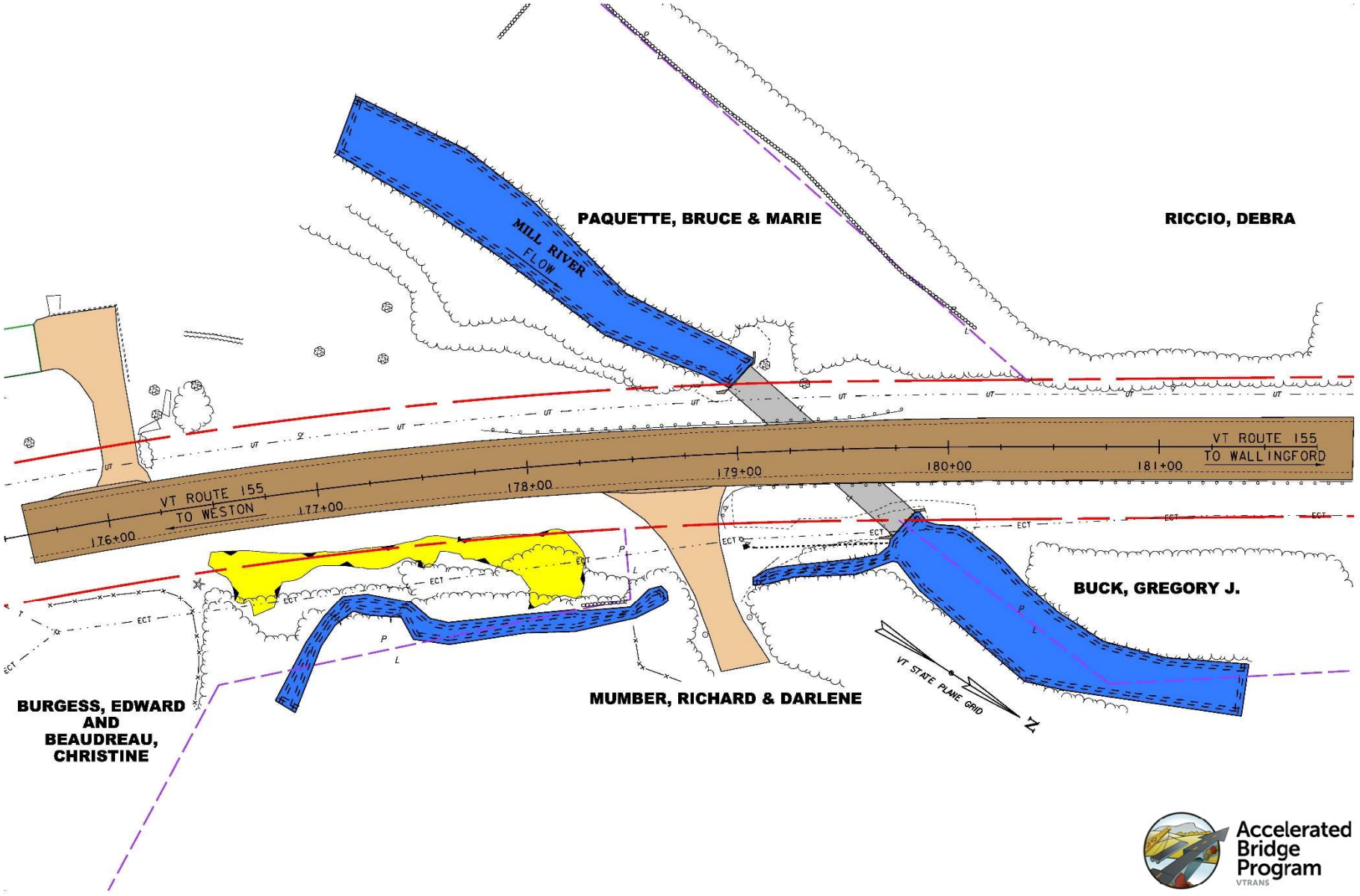


Typical Corrosion Deterioration

Resource Constraints

- Inlet and outlet are outside of state right of way
- Stream Equilibrium – Bankfull width
- Northern Long Eared Bat – Federally threatened and Vermont State endangered species
    - No time-of-year restrictions anticipated
    - Formal commitments provided during NEPA review
- Wetland – Located to the south of Spruce Lane (pvt.)
    - Class II with a 50’ regulatory buffer
    - Formal commitments provided during permitting phase
- Utilities – Aerial, Underground and Municipal
    - Municipal: Mt. Holly Fire Department dry hydrant

Resource Site Plan



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Design Criteria and Considerations

- Substandard Features
  - Horizontal Alignment
  - Bankfull Width

AADT	580
DHV	65
% Trucks	3.1%
Design Speed	50 mph

Projected Traffic Volumes for 2038

Looking Northwest Along VT-155

Alternatives Considered

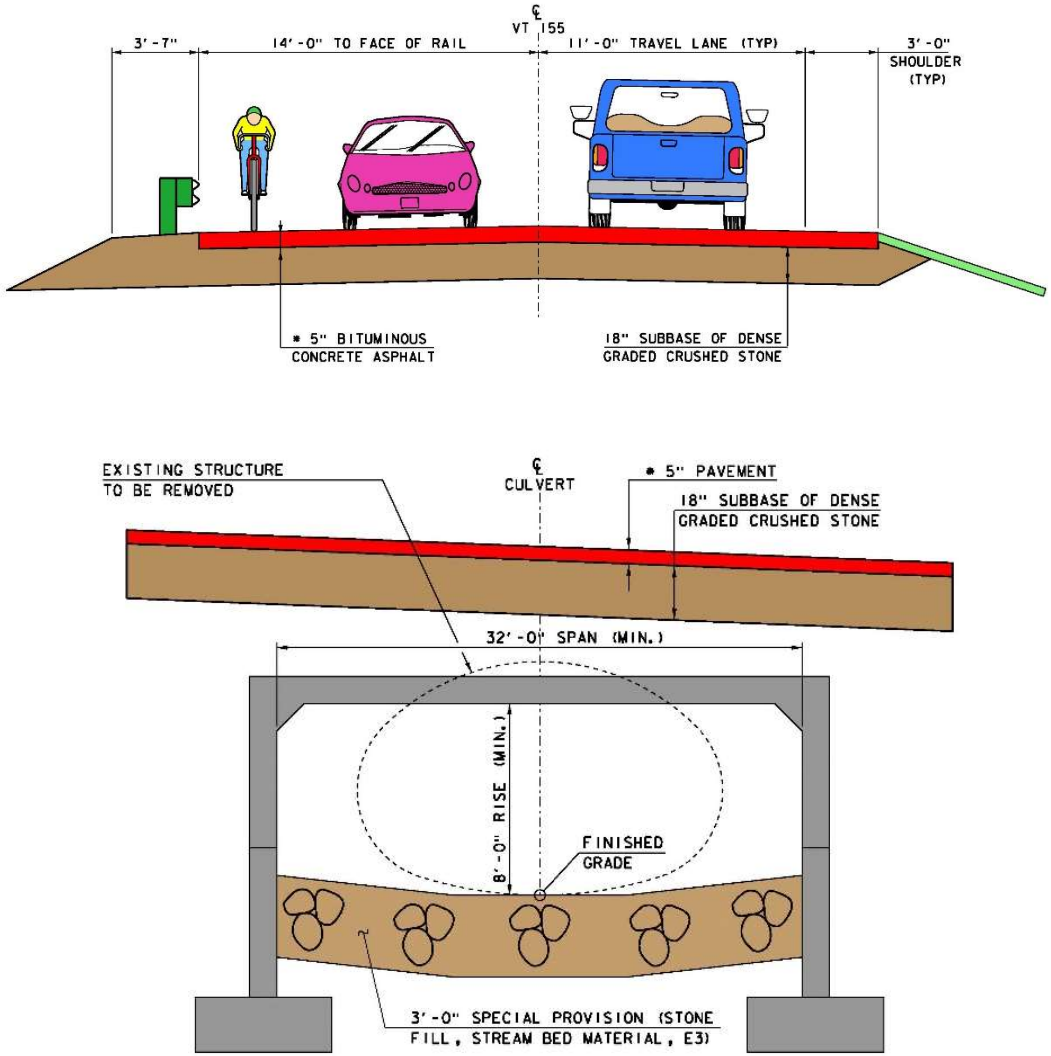
- **No Action**
  - Not recommended due to limited service life of under 10 years
- **Rehabilitation**
  - Any rehabilitation option leaves unresolved issues
  - The presence of a flood insurance study further justifies replacement
- **Structure Replacement – Trenchless Methods**
  - Not economical for structures that have only 6′ of cover
- **Open Cut Replacement – Buried Structure with Natural Streambed**
  - Precast concrete three-sided rigid frame, metal or concrete open bottom arch
  - More favorable conditions for aquatic life
- **Structure Replacement – New Bridge**
  - New 70-foot span bridge with a 20° skew and 8.5′ clear height
  - More favorable conditions for aquatic life and wildlife connectivity
  - Anticipated relocation of Spruce Lane (private drive)
  - Increased maintenance and project cost compared to that of a buried structure

Recommended Alternative

Open Cut Culvert Replacement – Buried Structure with Natural Streambed

- Replace culvert with a steel or concrete three-sided rigid frame or open bottom arch
  - *Projected service life of a steel structure on pedestals: 75 years*
  - *Projected service life of a concrete structure on pedestals: 100 years*
- May either be supported on piles or spread footings
- Enhanced aquatic organism passage
- Minimal impact to adjacent properties, including Spruce Lane (pvt.)
- Less maintenance compared to that of a Bridge

Proposed Typical Section



PROPOSED TYPICAL SECTION

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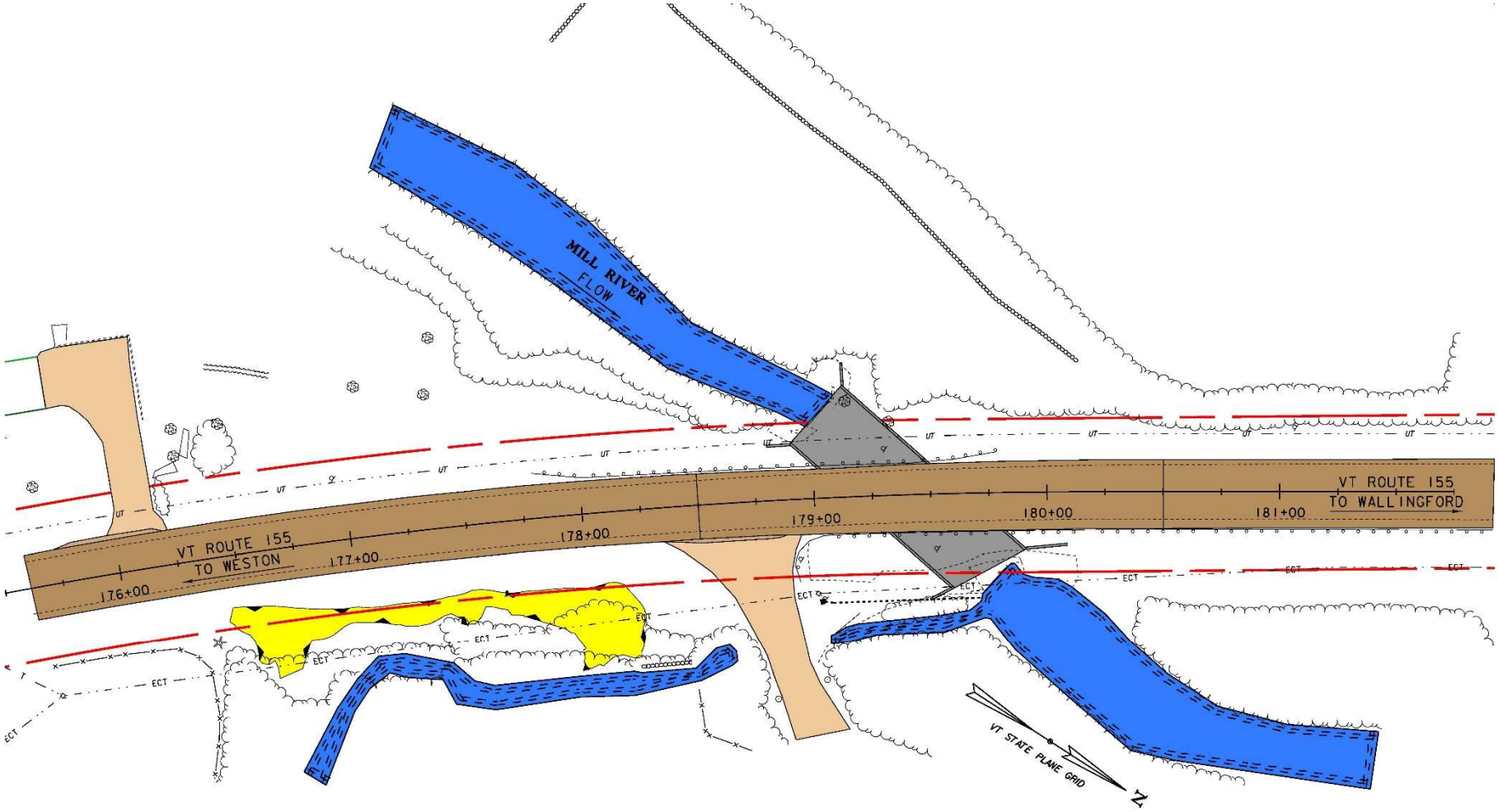
Proposed Layout



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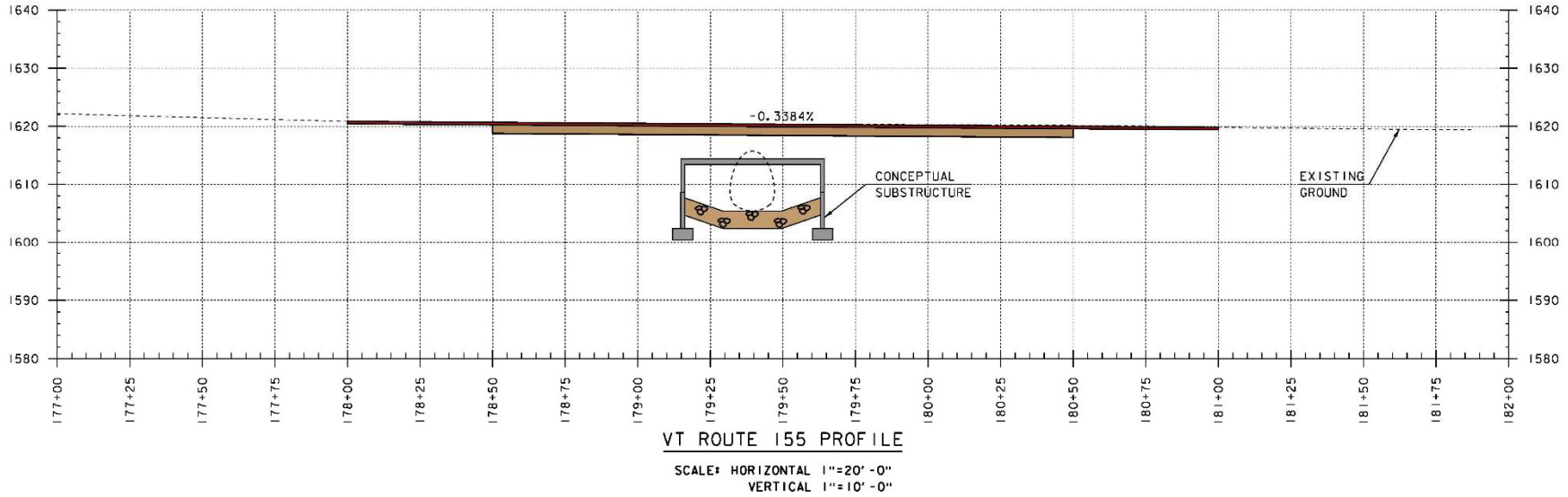
Proposed Profile



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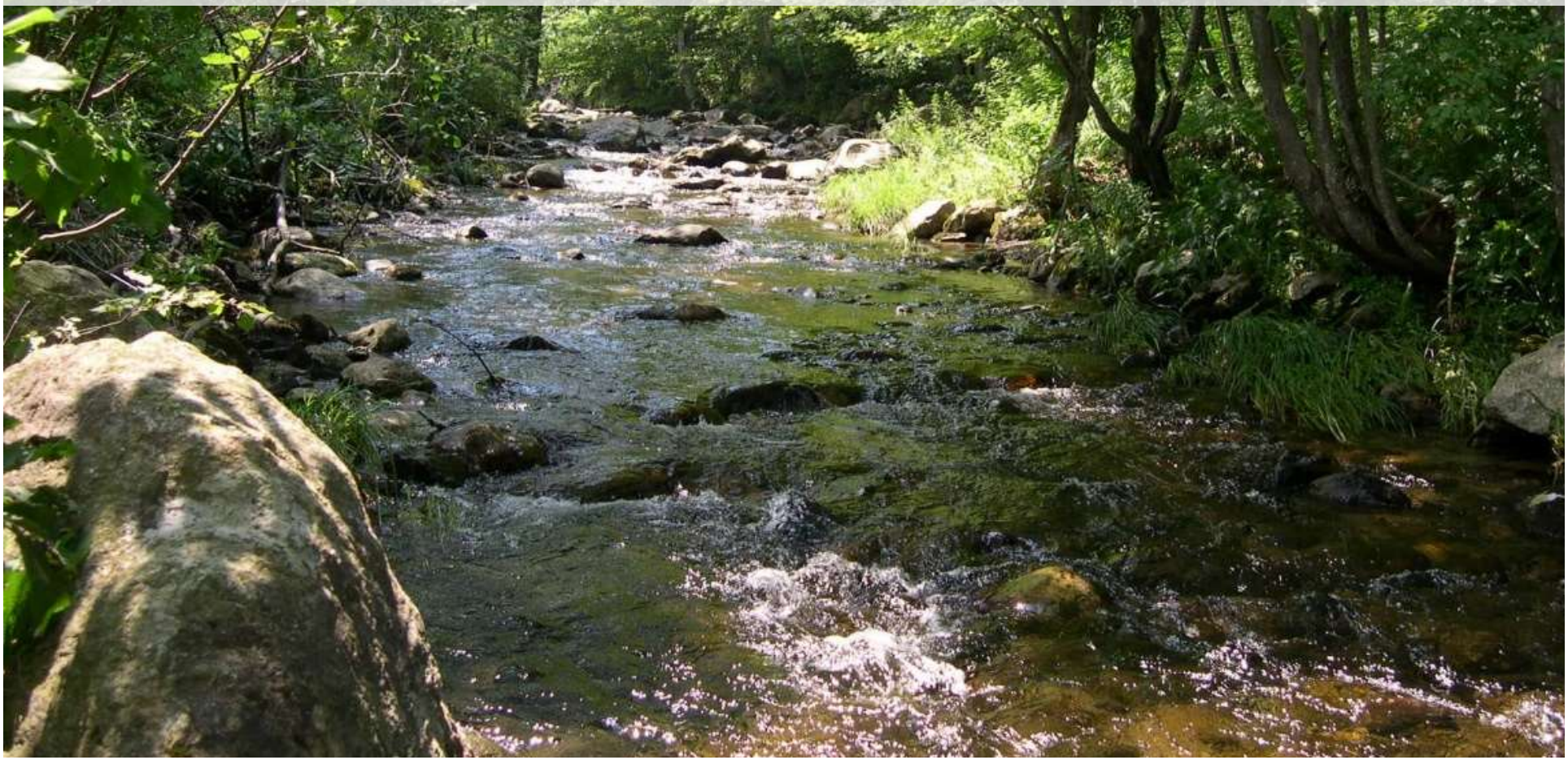
What Will the New Bridge Look Like?

Proposed Example

- Reinforced Concrete Frame
- Natural Stream Bottom

Maintenance of Traffic Options Considered

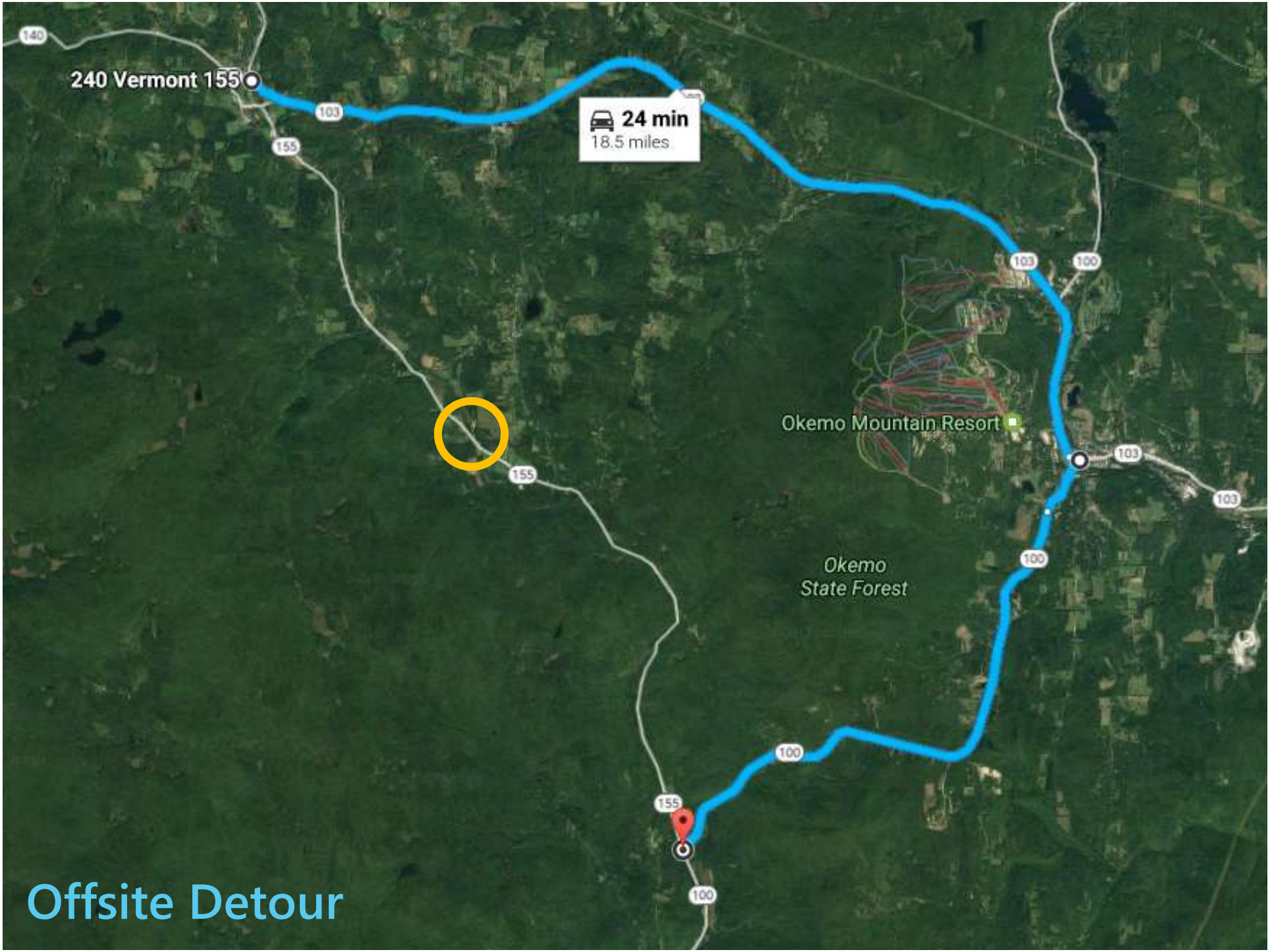
- Road Closure with Offsite Detour
- Phased Construction
- Temporary Bridge



Road Closure – Detour Route

- 28 day closure

▪ Through distance:	10.4 miles	14 minutes
▪ Detour distance:	18.5 miles	24 minutes
▪ Added distance:	8.1 miles	10 minutes
▪ End to end distance:	28.9 miles	38 minutes

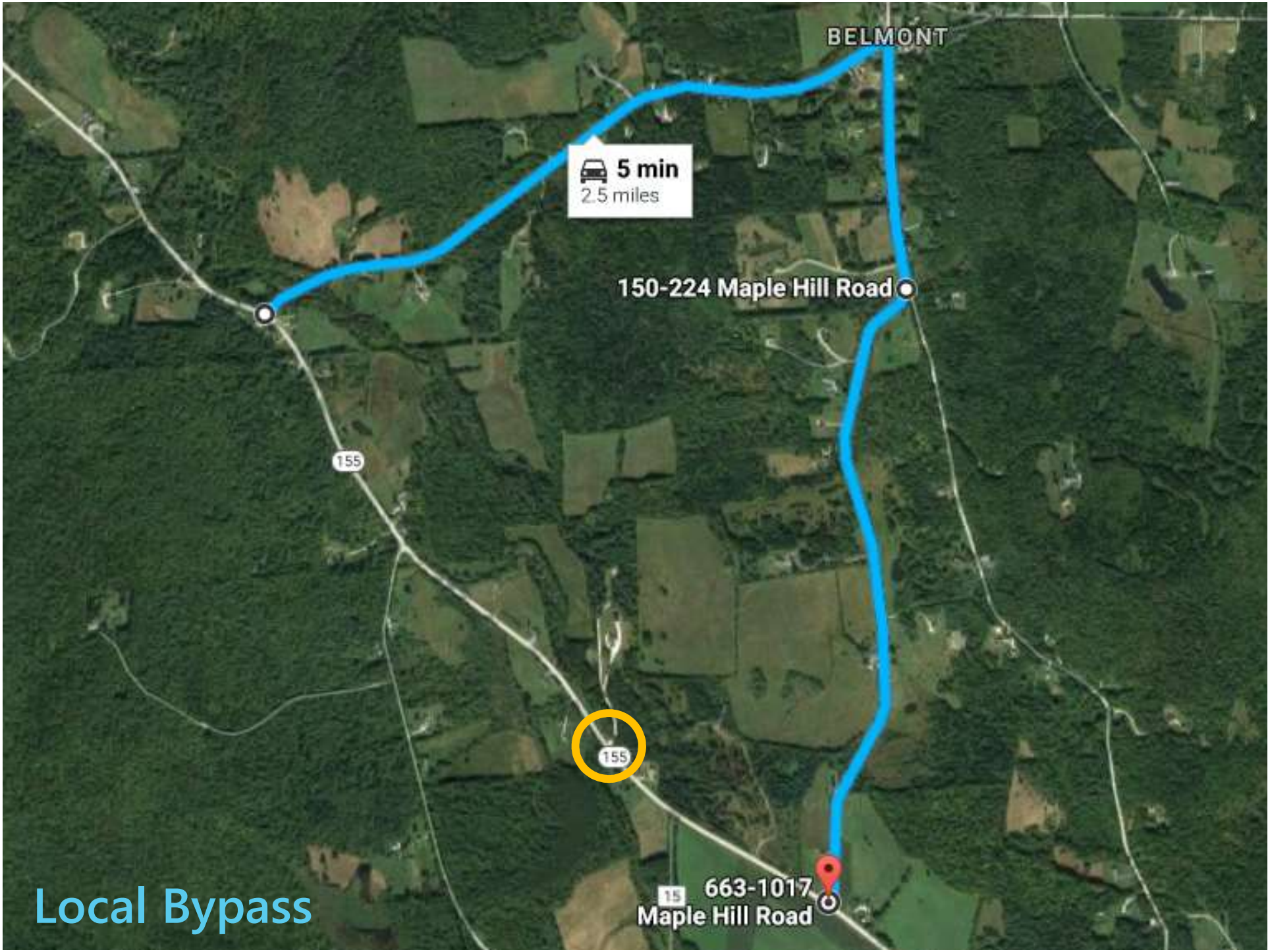


Offsite Detour

Road Closure – Local Bypass

- 28 day closure

Through distance:	1.3 miles	2 minutes
Detour distance:	2.5 miles	5 minutes
Added distance:	1.2 miles	3 minutes
End to end distance:	3.8 miles	7 minutes


BELMONT
5 min
2.5 miles
150-224 Maple Hill Road
155
155
663-1017
Maple Hill Road
Local Bypass

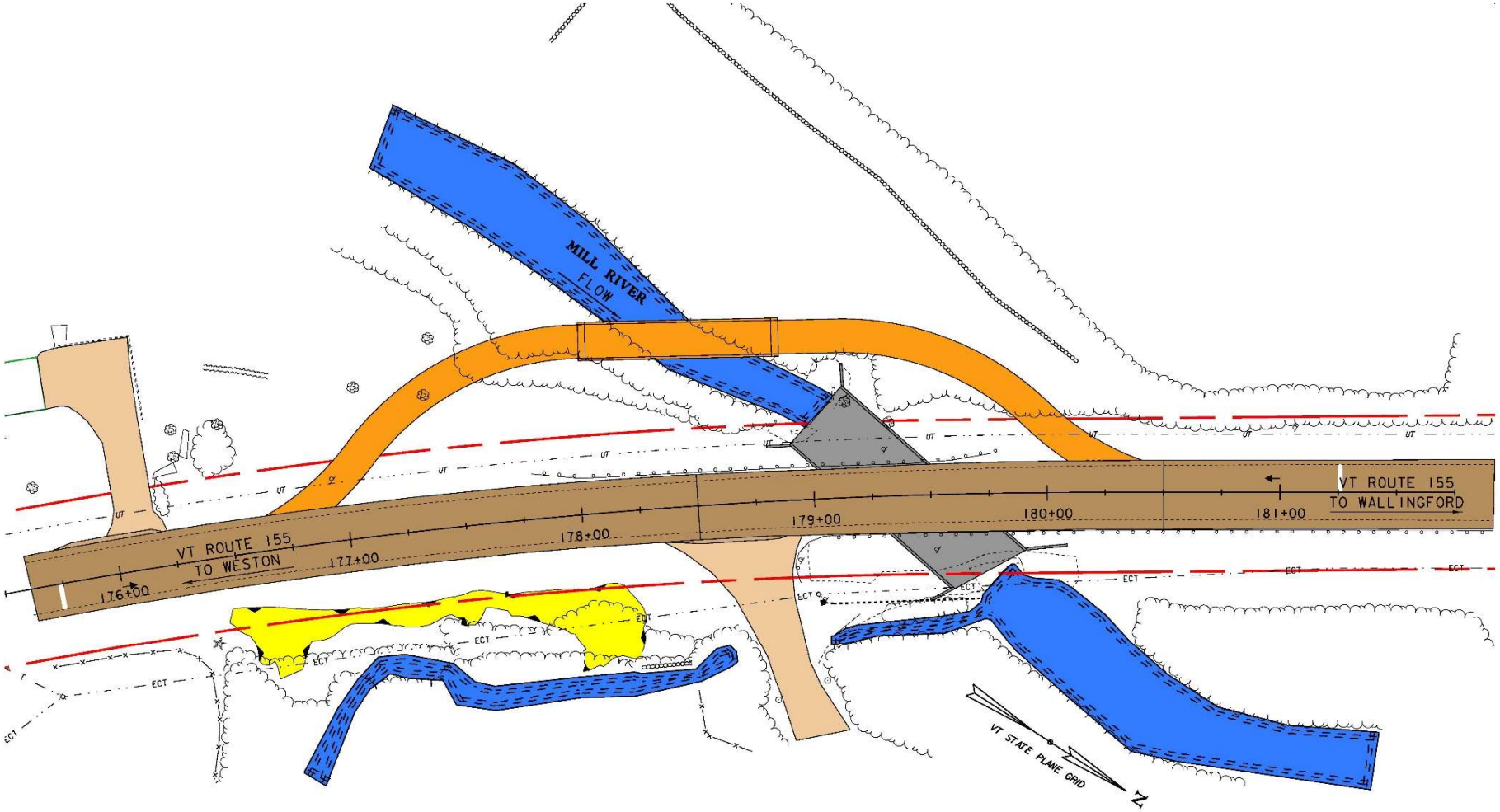
Phased Construction

- Boring samples have encountered bedrock approximately 50′ – 63′ below the ground surface.
- Phasing would require a fairly deep braced excavation immediately adjacent to a live traffic lane, impacting public safety, increasing project cost and extending the construction timeline.
- Not considered further given low traffic volumes and reasonable detour.

Temporary Bridge

- One lane temporary bridge
- Additional right-of-way acquisition necessary
- Increased project cost and extended project timeline
- Longest construction duration and longest duration disturbing traffic flow

Temporary Bridge Layout - Upstream



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Recommended Maintenance of Traffic

28 Day Road Closure with Offsite Detour

Project Summary

Replace culvert with a three sided frame or open bottom arch with natural streambed

- Structure may be composed of steel or concrete
- 32′ wide x 8′ high inside dimensions
- Meets hydraulic and stream equilibrium standards
- Enhanced aquatic organism passage and wildlife connectivity
- Resilient structure design
- Traffic maintained on offsite detour during 4 week closure
- Temporary utility relocation necessary
- Permanent right-of-way acquisition needed

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Alternatives Matrix

Mount Holly BF 013-3(12) Accelerated Bridge Program	No Action	Alternative 1 Full Replacement with Concrete Buried Structure		Alternative 2 Full Replacement with Steel Buried Structure	
		a. Detour	b. Temporary Bridge	a. Detour	b. Temporary Bridge
Total Project Costs (including Engineering and Contingencies)	$0	$1,544,000	$1,596,000	$1,206,000	$1,303,000
Project Development Duration	N/A	3 years			
Closure Duration	N/A	4 weeks	N/A	4 weeks	N/A
Construction Duration	N/A	12 weeks	7 months	12 weeks	7 months
Design Life	< 10 years	100 years		75 years	
Annualized Project Cost	$0	$15,440	$15,960	$16,080	$17,373

Preliminary Project Schedule

- Target Construction Season
  - Summer 2020

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For more information:

- https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/12c594

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Questions and Comments

VT 155 – Bridge 7 over Mill River

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