

#### Stowe BO 1446(39) Alternatives Presentation Meeting Nebraska Valley Road (TH 43) – Bridge #48 over Miller Brook

June 8, 2020



#### Introductions

#### Carolyn Cota, P.E.

VTrans Design Project Manager

#### **Cory Burrall, P.E.**

VTrans Design Engineer

#### Laura Stone, P.E.

VTrans Scoping Engineer



### **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 and voice concerns











### **Meeting Overview**

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



#### **VTrans Project Development Process**





### **Project Overview**

- Existing Conditions
- Alternatives Considered
- Recommended Alternative



#### **Description of Terms Used**





#### Looking West over Bridge 48

- Roadway Classification Rural Local Road (Class 3 Town Highway)
- Bridge Type 45' Long Rolled Beam Bridge
- Ownership Town of Stowe
- Constructed in 1925, reconstructed in 1962 (Replacement of western abutment)

#### Looking East over Bridge 48

- Aerial Utilities
- Narrow Bridge (9'/1' typical)
  - Minimum Standard: 9'/2'
  - Corridor Width: 9'/3'
- 2 Intersections in close proximity

- The deck and superstructure are deteriorating at an accelerated rate
  - Deck: The underside of the deck has some heavy saturation, leakage, and staining. A large spall exposing corroded rebar has formed along with some additional delaminations.
  - Superstructure: The 6 rolled beams have negative camber. There are areas of rust scale build-up with minor section loss. It is anticipated that holes will develop in the webs over the next 10 years.
- The Eastern abutment has some minor to moderate distress. There is a pop-out below the fourth beam at the east abutment exposing the front portions of the two anchor bolts for the bearing.
- The existing bridge width is too narrow for the roadway classification and traffic volumes present.



#### **Condition Ratings**



- Deck Rating
- Superstructure Rating
- Substructure Rating
  6 (Satisfactory)
- 5 (Fair) 5 (Fair) 6 (Satisfacto

#### **Steel Beam Section Loss**

# **Existing Conditions - Bridge #48**

Rust scale build-up with minor section loss

#### Heavily Rusted Superstructure



#### Western Abutment

# **Existing Conditions - Bridge #48**

Replaced in 1962



#### Resources – Looking Upstream



- Northern Long-Eared Bat
- Statewide Significant Agricultural soils
- Historic Resources
  - Selden Adams House and related agricultural buildings on Nebraska Valley Road
  - 4(f) resource adjacent to the survey area: Mount Mansfield State Forest.
- 18 Archaeological sensitivity in southwest quadrant due to old schoolhouse



#### **Existing Conditions**



# **Design Criteria and Considerations**

- Average Daily Traffic
  - 440 vehicles per day
- Design Hourly Volume
  - 70 vehicles per hour
- % Trucks: 2.0%
- Design Speed of 35 mph



# **Alternatives Considered – Bridge #48**

- No Action
  - Additional maintenance required within 10 years
- Deck Replacement
  - Structural deficiencies would be addressed
  - Beam Painting Included
  - Widen to minimum standard (9'/2')
  - 30-year design life
- Superstructure Replacement
  - Structural deficiencies would be addressed as well as beam maintenance issues
  - Widen to minimum standard (9'/2')
  - 40-year design life
- Full Bridge Replacement with a Bridge
  - Widen to corridor width (9'/3')
  - 75-year design life
- Full Bridge Replacement with a Buried Structure
  - Widen to corridor width (9'/3')
- 21 75-year design life





### **Proposed Typical Section**









■ 10′/5′ typical, 75-year design life, **phasing** 



• 9'/3' typical, 75-year design life, temp bridge



TH-43 (NEBRASKA VALLEY ROAD) 16+00

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#### Alternative 4 Layout

# Full Replacement Buried Structure - Bridge #48

4+00

• 9'/3' typical, 75-year design life, temp bridge

13+00

ARCH

NEBRASKA



### **Proposed Profile - Bridge**





#### Proposed Profile – Buried Structure



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# **Recommended Alternative - Bridge #48**

- Full Bridge Replacement
  - Bridge or 3-sided buried structure (to be determined by the Town)
  - Maintain existing centerline of road
  - Widen Bridge slightly to meet minimum standard and match the corridor
    - 9'/3' typical
  - 75-year design life
  - Right-of-Way needed
  - Aerial utility relocation may be needed



### **Maintenance of Traffic Options Considered**

- Phased Construction
- Temporary Bridge



#### **Phased Construction**

- 2 Phases with one-lane alternating traffic with Traffic Signal
- 30 New Bridge would be 8-feet wider than minimum standard



#### Phase 1 Layout **AGENCY OF TRANSPORTATION** 58.7 AED MILLER BROOK É ANE) TH-47 BUSH SUGAR 1+00 (NEBRASKA ROADI 55 TH-43 (NEBRASKA VALLEY ROAD) 16+00 13+00 15+00 14+00 5 ; B \$ \$ ₿ ø GRID VT STATE PLANE ( ø ø ARCH FALLS TH-45 BROOK U. 11







#### **Temporary Bridge**

- One Lane Temporary Bridge with Traffic Signal
- Downstream temporary bridge would impact archaeologically sensitive area
- 33 Both upstream and downstream would require ROW acquisition

#### **Downstream Temporary Bridge Layout**



#### Temporary Bridge Option - Bridge #48

- Downstream temp bridge would have impacts to potentially archaeologically sensitive area
- Aerial utility relocation may not be needed
- **one Lane Temporary Bridge with Traffic Signal**

#### **Upstream Temporary Bridge Layout**



- Upstream temporary bridge will require relocation of aerial utilities
- <sup>35</sup> One Lane Temporary Bridge with Traffic Signal

### **Recommended Scope**

- Full Bridge Replacement ON Alignment with Traffic Maintained on Temporary Bridge
  - Conventional Bridge or Buried Structure (Determined by the Town)
  - Upstream or Downstream Temporary Bridge (Determined by the Town)
  - Maintain existing centerline of road
  - Widen Bridge slightly to meet minimum standard and match the corridor
    - 9'/3' typical
  - 75-year design life
  - Construction Summer 2023
  - Right-of-Way needed
  - Utility relocation may be needed
    - Participating Project cost



### **Alternatives Matrix**

Stowe BO 1446(39)	Do Nothing	Alt 1	Alt 2	Alt 3a	Alt 3b	Alt 4
		Deck Replacement	Superstructure Replacement	Full Bridge Replacement (Bridge)		Full Bridge Replacement (Buried Structure)
		Temporary Bridge	Temporary Bridge	Phased Construction (30' Bridge Width	Temporary Bridge (24' Bridge Width)	Temporary Bridge
Total Project Costs	\$0	1,273,363	1,142,767	1,651,098	1,418,803	1,614,105
Annualized Costs	\$0	31,834	28,569	22,015	18,917	21,521
Town Share	\$0	63,668	57,138	165,110	141,880	161,411
Town %		5%	5%	10%	10%	10%
Project Development Duration	N/A	2 years	2 years	2 years	2 years	2 years
Construction Duration	N/A	8 months	8 months	8 months	8 months	8 months
Closure Duration (If Applicable)	N/A	N/A	N/A	N/A	N/A	N/A
Typical Section - Roadway (feet)	22'	22'	22'	30'	24'	24'
Typical Section - Bridge (feet)	0.3-10.2-10.2-0.3	2-9-9-2	2-9-9-2	5-10-10-5	3-9-9-3	3-9-9-3
Geometric Design Criteria	Substandard Width	Meets Standard	Meets Standard	Meets Standard	Meets Standard	Meets Standard
Traffic Safety	No Change	Improved	Improved	Improved	Improved	Improved
Alignment Change	No	No	No	No	No	No
Bicycle Access	No Change	Improved	Improved	Improved	Improved	Improved
Pedestrian Access	No Change	Improved	Improved	Improved	Improved	Improved
Utility	No Change	No Change	No Change	Aerial Relocation	Aerial Relocation	Aerial Relocation
ROW Acquisition	No	Yes	Yes	Yes	Yes	Yes
Road Closure	No	No	No	No	No	No
Design Life (Years)	<10 years	30	40	75	75	75

#### Next Steps – Bridge #48

This is a list of a few important activities expected in the near future and is not a complete list of activities.

# Wait for Town response to recommendation on proposed project

- Develop Conceptual plans and distribute for comment
- Process local agreements
- Right-of-Way process
- Updates on project plans and estimates at each submittal



#### For more information:

https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/12J658



#### Stowe BO 1446(39) Questions and Comments Nebraska Valley Road (TH 43) – Bridge #48 over Miller Brook

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