

# **Bradford BF 0191(29) Bridge 1 on VT Route 25B over the Waits River Regional Concerns Meeting**



**Presented by  
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# Meeting Outline

- Purpose of the Meeting
- Structures Section Re-organization
- Existing bridge deficiencies
- Alternatives considered
- Summary and recommendation
- Next Steps

# Purpose of Meeting

- Present the alternatives that we have considered
- Explain the constraints to the project
- Help you understand our approach to the project
- Provide you with the chance to ask questions
- Provide you with the chance to voice concerns
- Build consensus for the recommended alternative-

# Accelerated Bridge Program

- Began in January 2012
- Bridges are deteriorating faster than we can fix them
- Short-term closures are key
- Impacts to property owners and resources is minimized
- Less impacts = less process = less money = faster delivery
- Accelerated Bridge Construction (ABC) is very efficient
- Accelerated Project Delivery is the result
- Shift from individual projects to programmatic approach
- Goal of 25% of projects into Accelerated Bridge Program
- Goal of 2 year design phase for ABP (5 years conventional)

# Project Initiation & Innovation Team

- Part of re-organization in January 2012
- All Structures projects will begin in the PIIT
- Very efficient process
- Look for innovative solutions whenever possible
- Involved until Project Scope is defined
- Hand off to PM to continue Project Design phase

# Phases of Development

Project  
Funded

Project  
Defined

Contract  
Award

Project Definition

Project Design

Construction

Identify resources &  
constraints

Evaluate alternatives

Public Participation

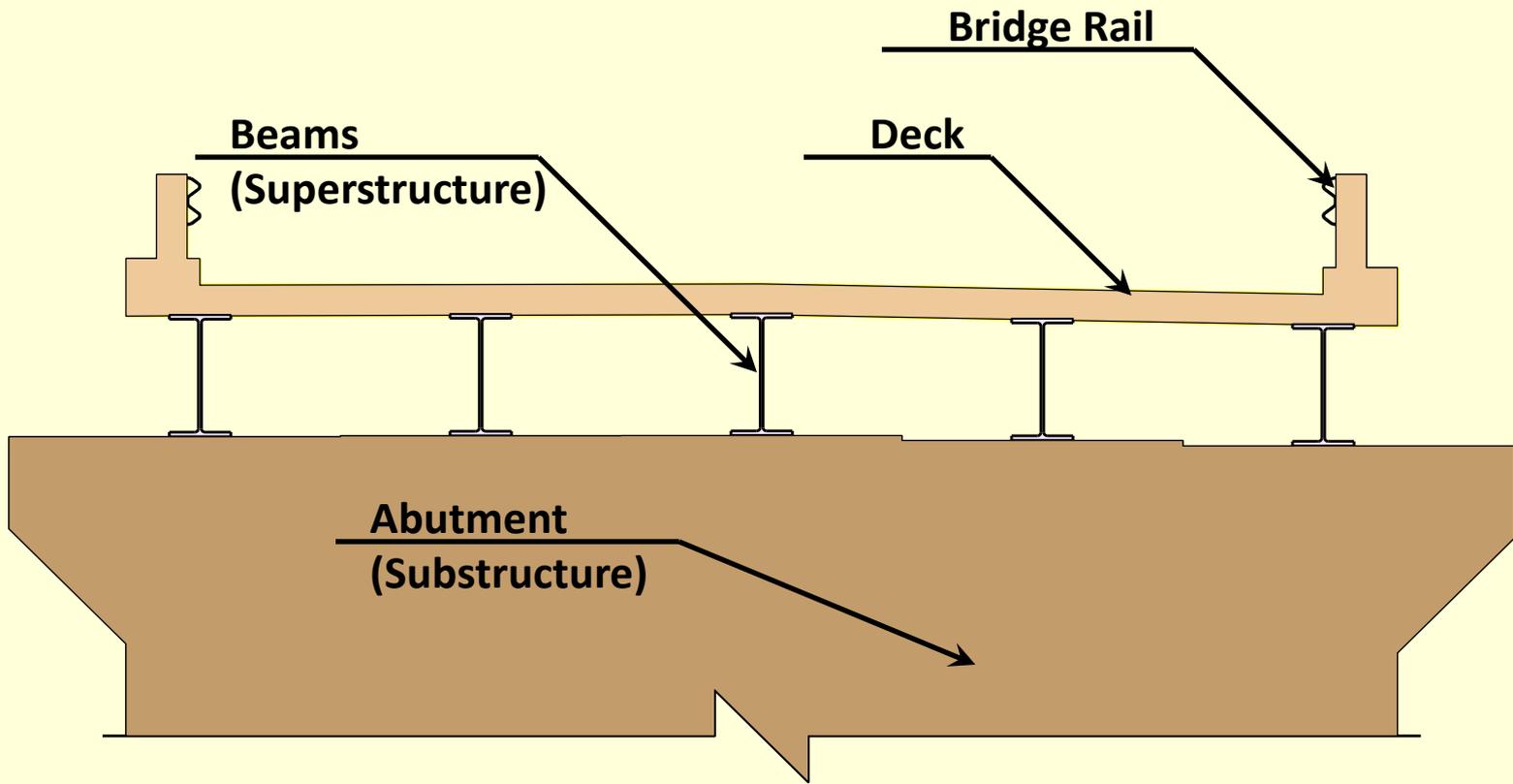
Build Consensus

- Quantify areas of impact

- Environmental permits

- Develop plans, estimate and specifications

# Description of Terms Used



# Project Background

- The structure is owned and maintained by the State
- Functionally labeled as a Rural Major Collector
- Posted Speed = 50 mph (Design Speed)
- Existing bridge is a three-span steel beam w/ concrete deck
- Span length = 159 feet
- Bridge Width = 20.5 feet (curb-curb)
- The bridge was built in 1933 (80 years old)

# Traffic Data

	<b>“Current Year” 2016</b>	<b>“Design Year” 2036</b>
<b>Average Annual Daily Traffic</b>	<b>1,400</b>	<b>1,500</b>
<b>Design Hourly Volume</b>	<b>180</b>	<b>190</b>
<b>Average Daily Truck Traffic</b>	<b>140</b>	<b>230</b>
<b>%Trucks</b>	<b>10.7</b>	<b>15.6</b>

# EXISTING BRIDGE DEFICIENCIES

## Inspection Rating Information (Based on a scale of 9)

<b>Bridge Deck Rating</b>	<b>4 Poor</b>
<b>Superstructure Rating</b>	<b>5 Fair</b>
<b>Substructure Rating</b>	<b>6 Satisfactory</b>

## Rating Definitions

- 9 Excellent**
- 8 Very Good**
- 7 Good**
- 6 Satisfactory**
- 5 Fair**
- 4 Poor**
- 3 Serious**
- 2 Critical**
- 1 Imminent Failure**

## Deficiencies

- The deck is in poor condition with severe deterioration
- The bridge and approaches are too narrow for the roadway classification and design speed
- The bridge railing is substandard
- The bridge is “scour critical” and the pier has scour issues
- The alignment (K value and Stopping Sight Distance) is substandard

# Looking east over Bridge



# Looking west over Bridge



# Bridge Fascia upstream



# West Abutment and water main



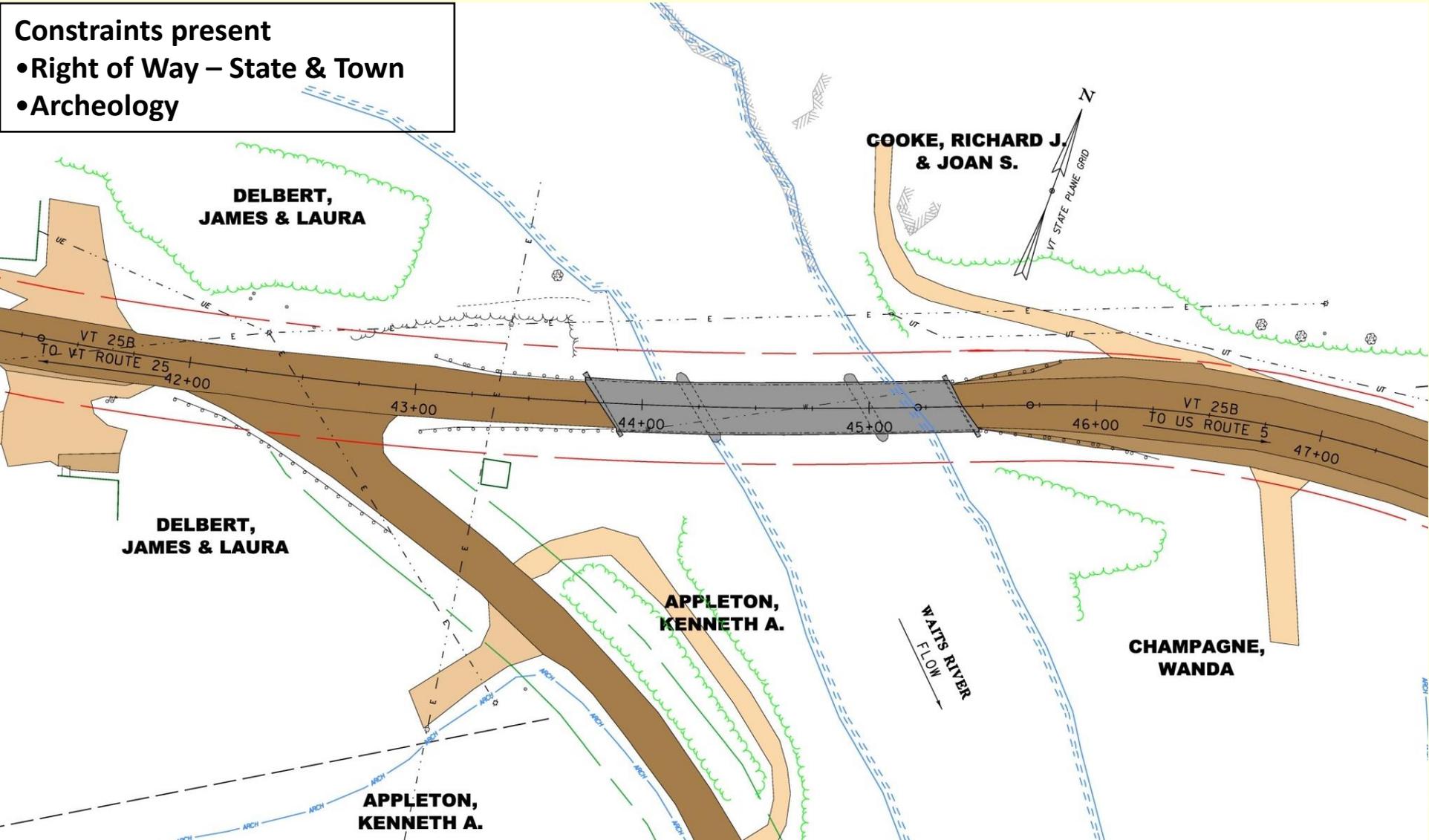
## Bottom of Deck showing delamination



# Layout Showing Constraints

Constraints present

- Right of Way – State & Town
- Archeology



# Alternatives Discussion

- Rehabilitation was ruled out due to the deteriorated condition of the existing bridge and since major work to widen the substructures to accommodate the increased width of the deck would be required.
- Rehabilitation was not detailed in the Scoping Report

Full bridge replacement is the only alternative considered in this study

Note: The method to maintain traffic during construction will be considered separately later in the presentation

# Replacement Alternatives

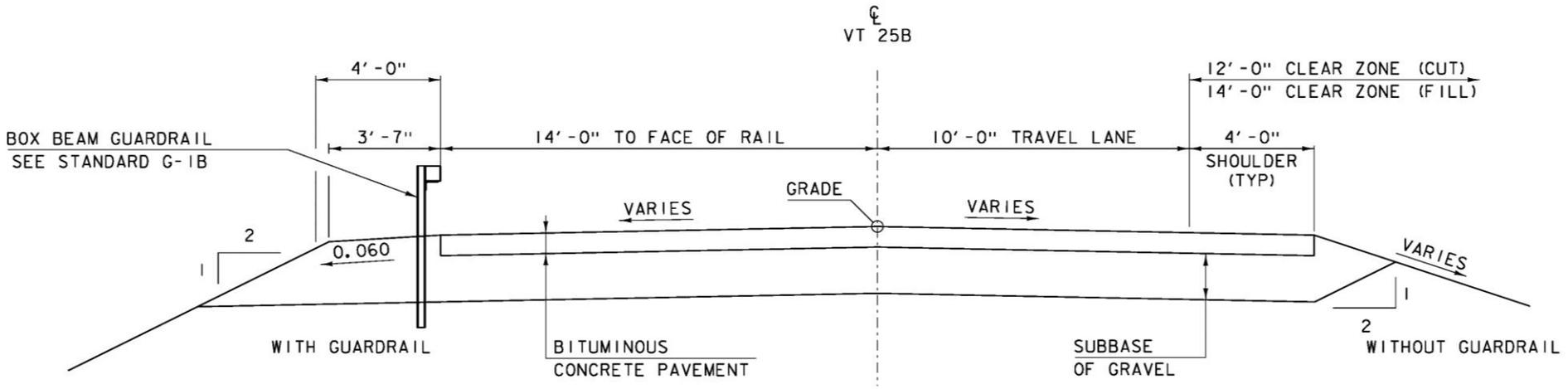
## Alternatives Considered

1. Single span, existing alignment, raise grade
2. Two span, existing alignment, no raise in grade
3. Single span, new alignment, raise grade
4. Two span, new alignment, no raise in grade

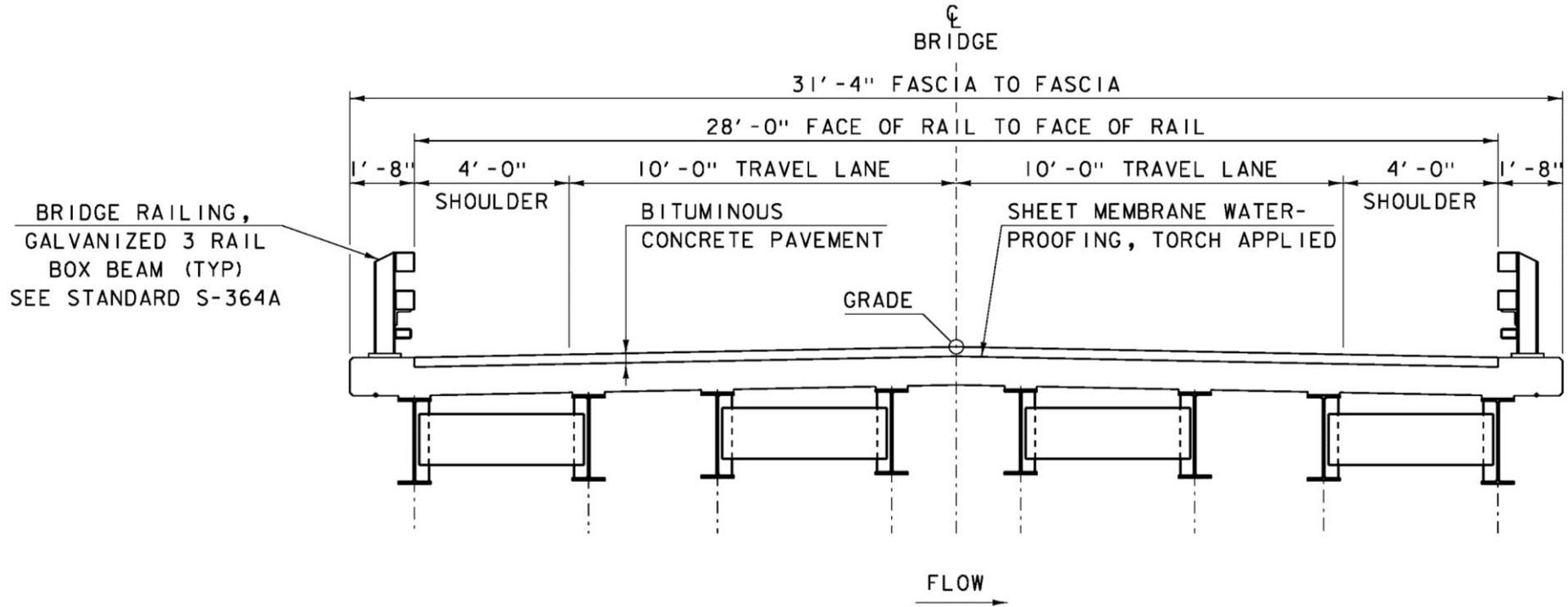
## Common details for replacement alternatives

- 28' width between face of rail
- Not all substandard features will be addressed
- Long term (80 year) solution

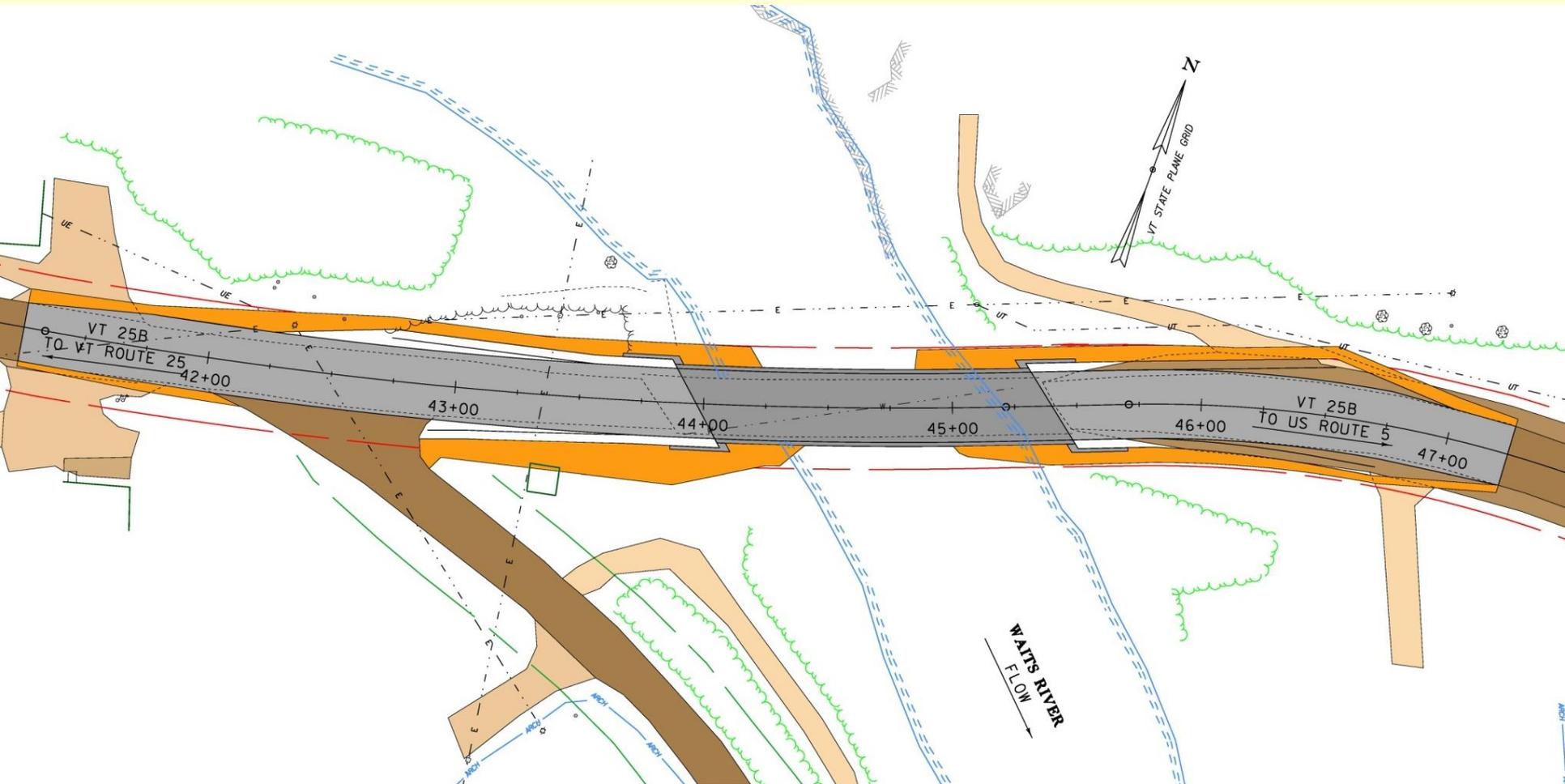
# Roadway Typical



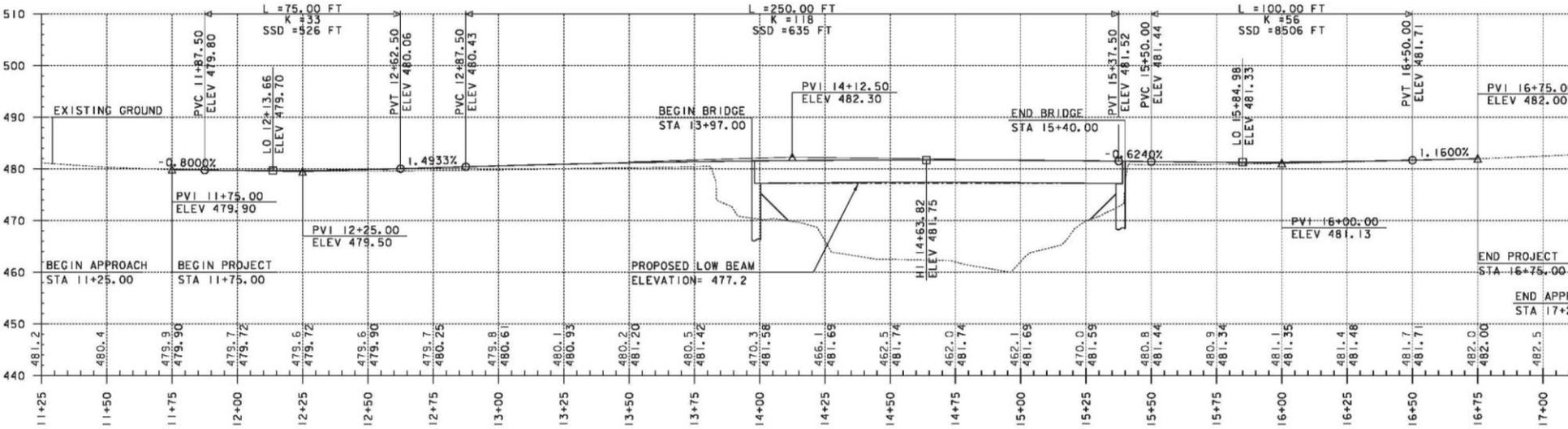
# Bridge Typical



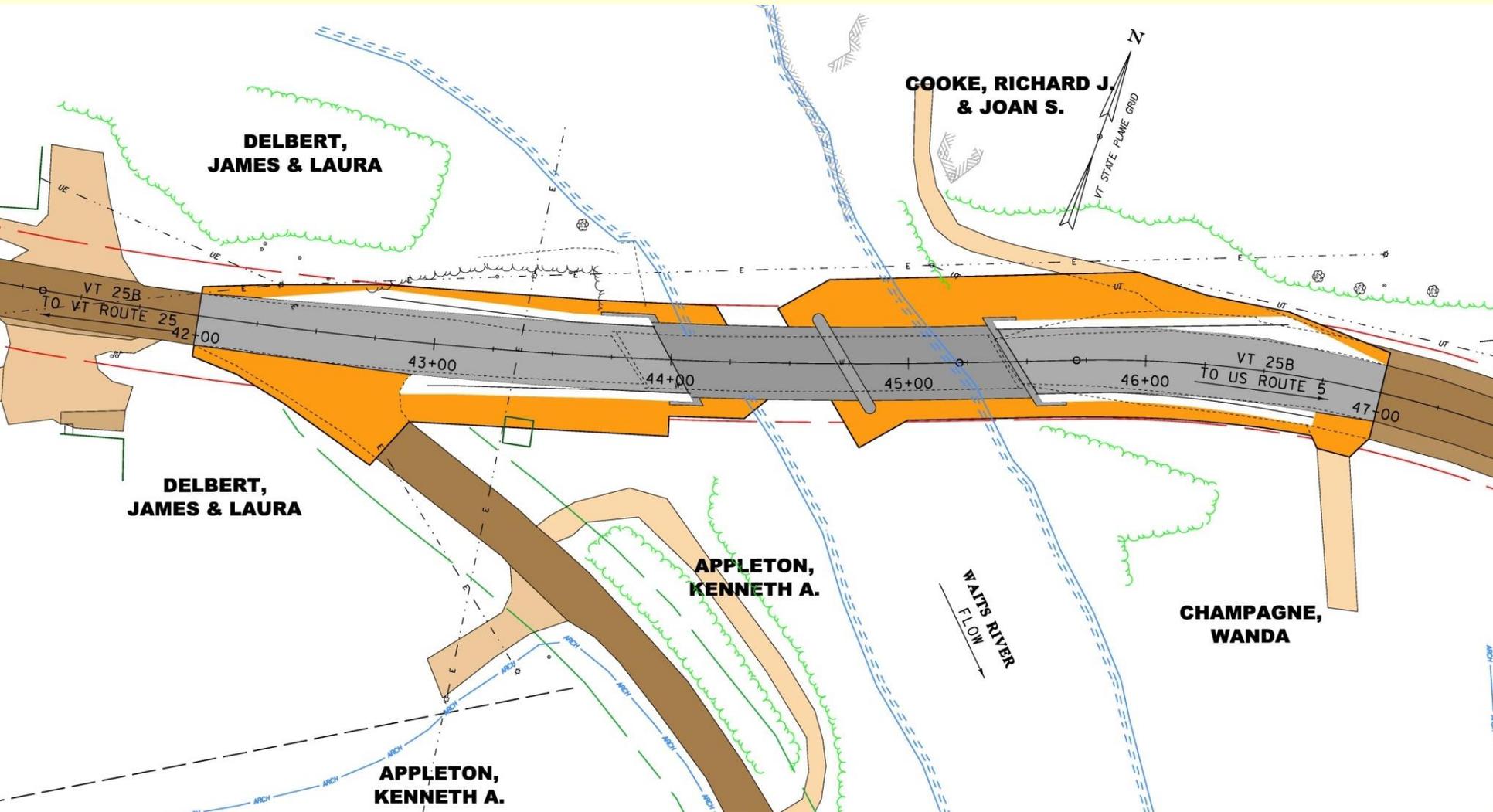
# Layout – Alternative 1



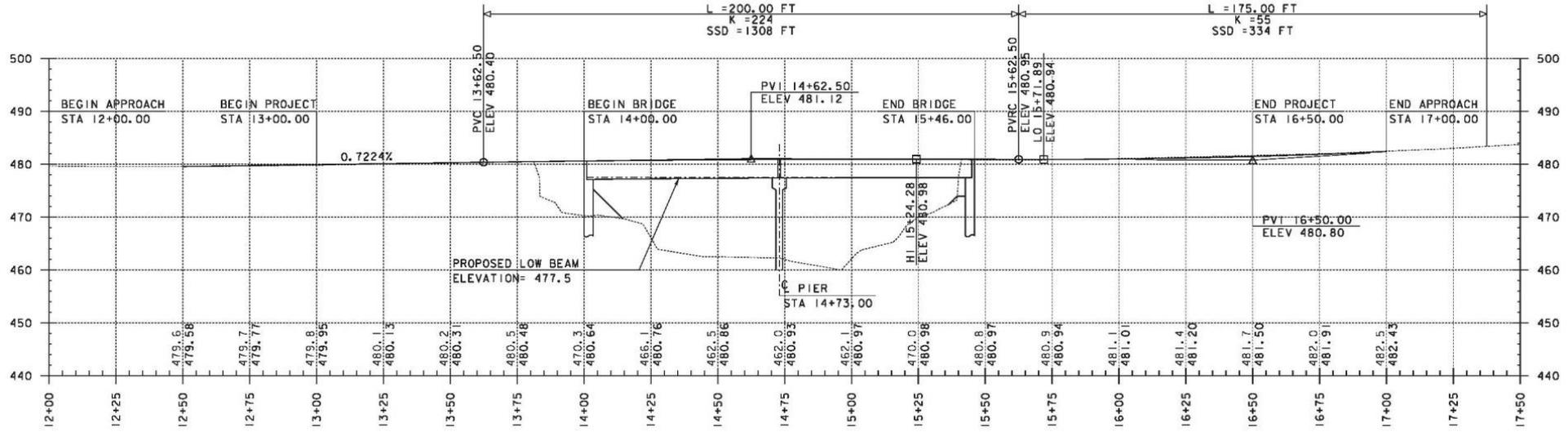
# Profile - Alternative 1



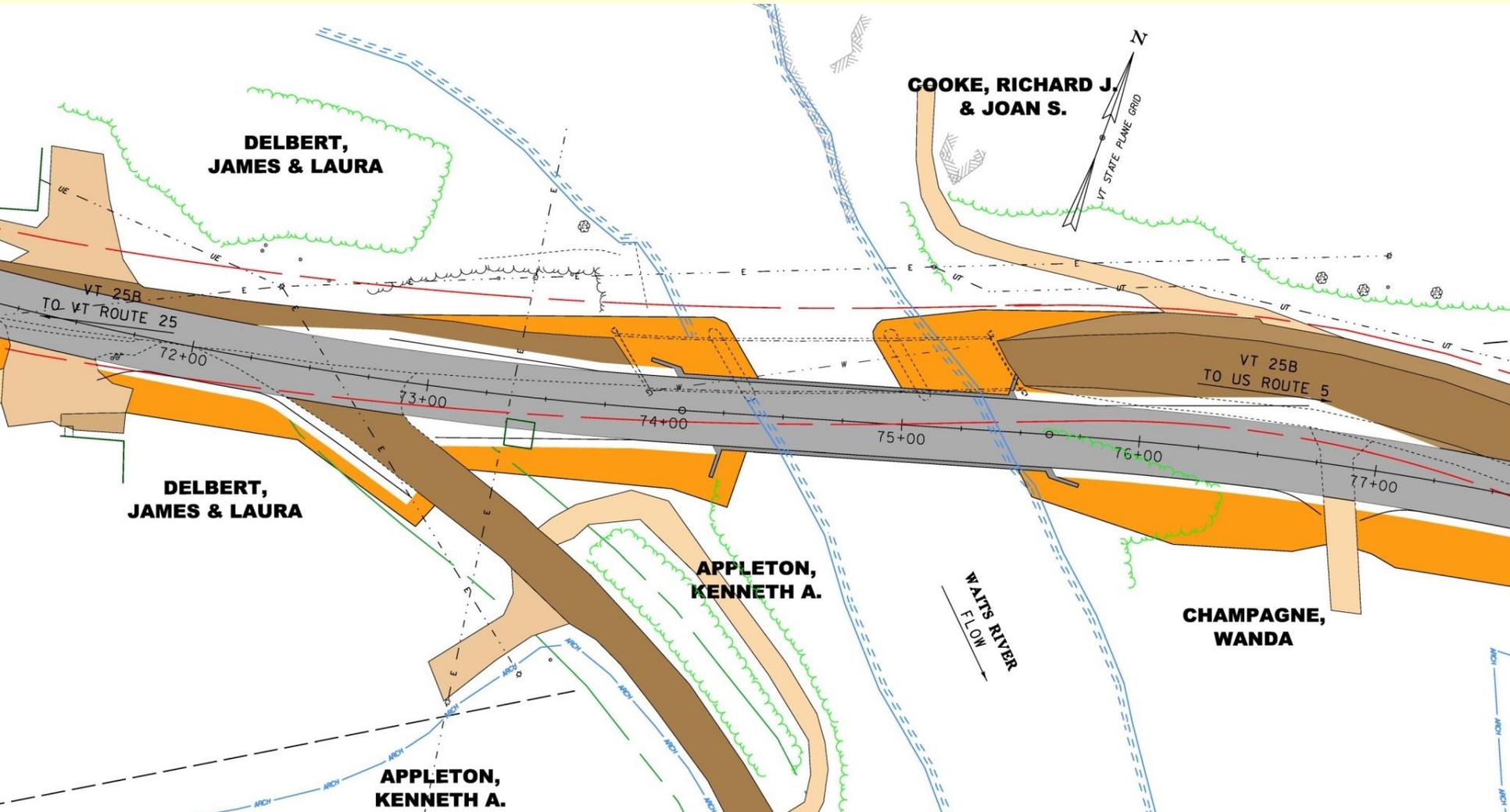
# Layout – Alternative 2



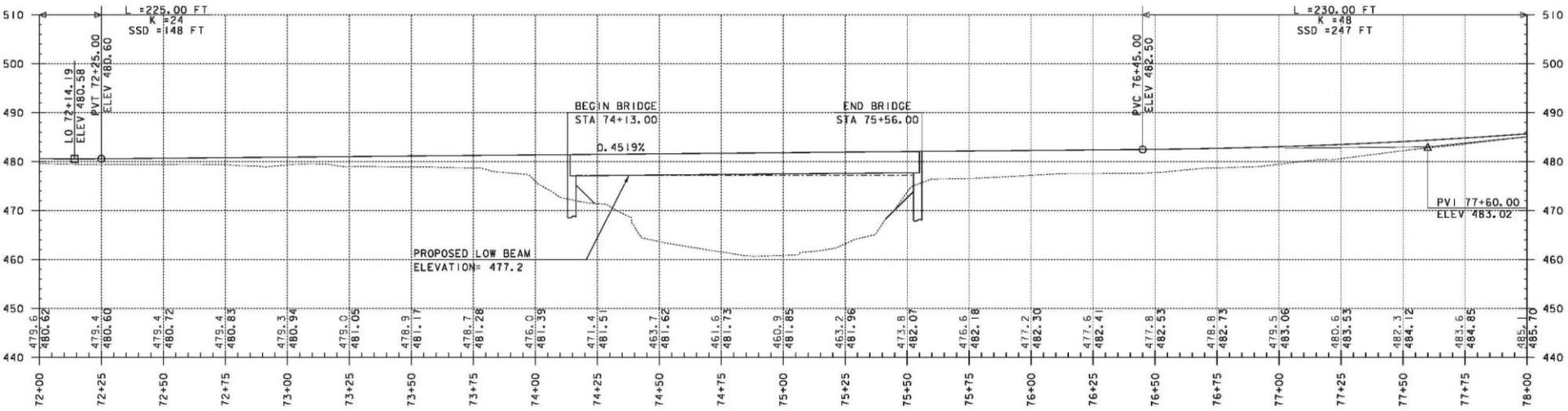
# Profile - Alternative 2



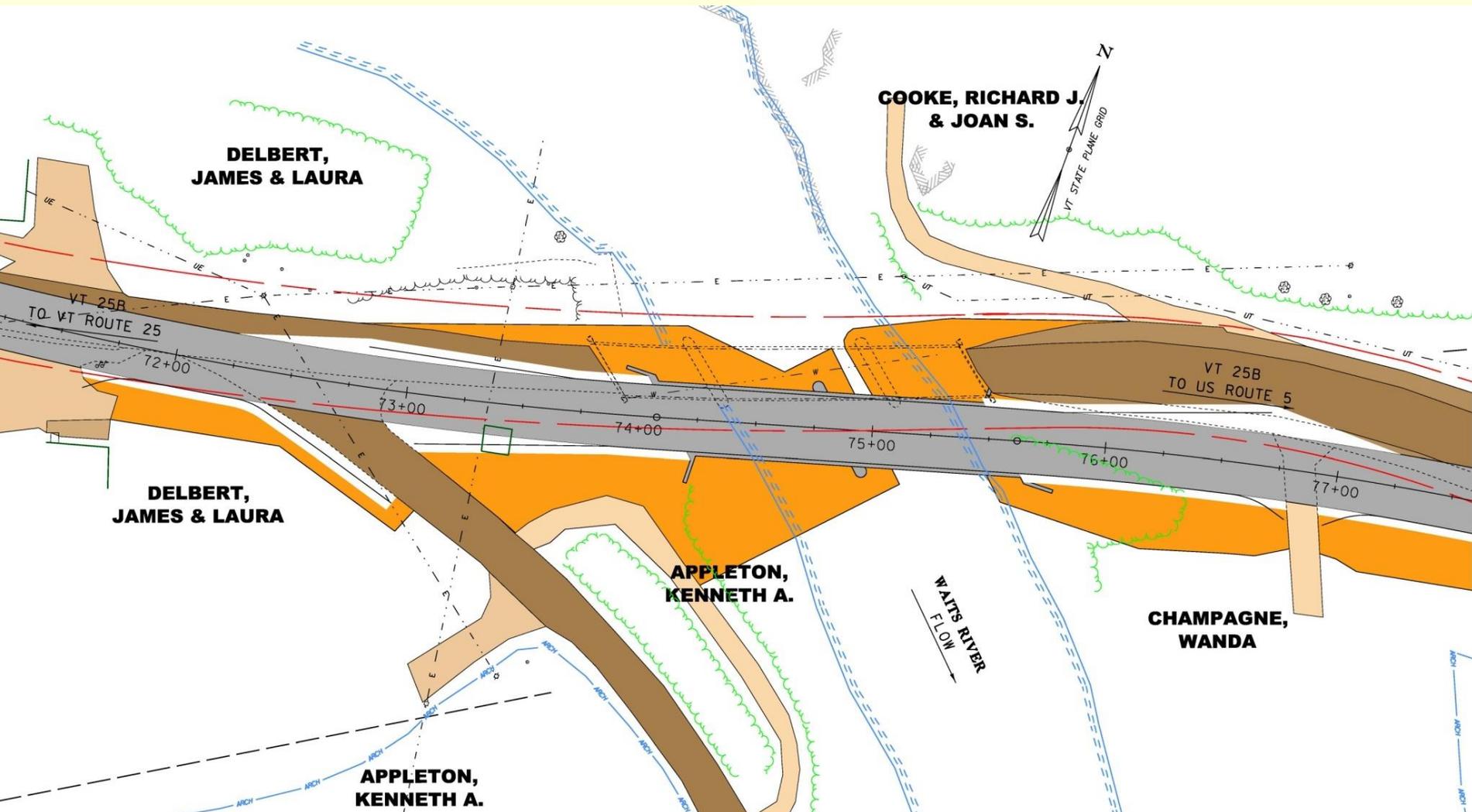
# Layout – Alternative 3



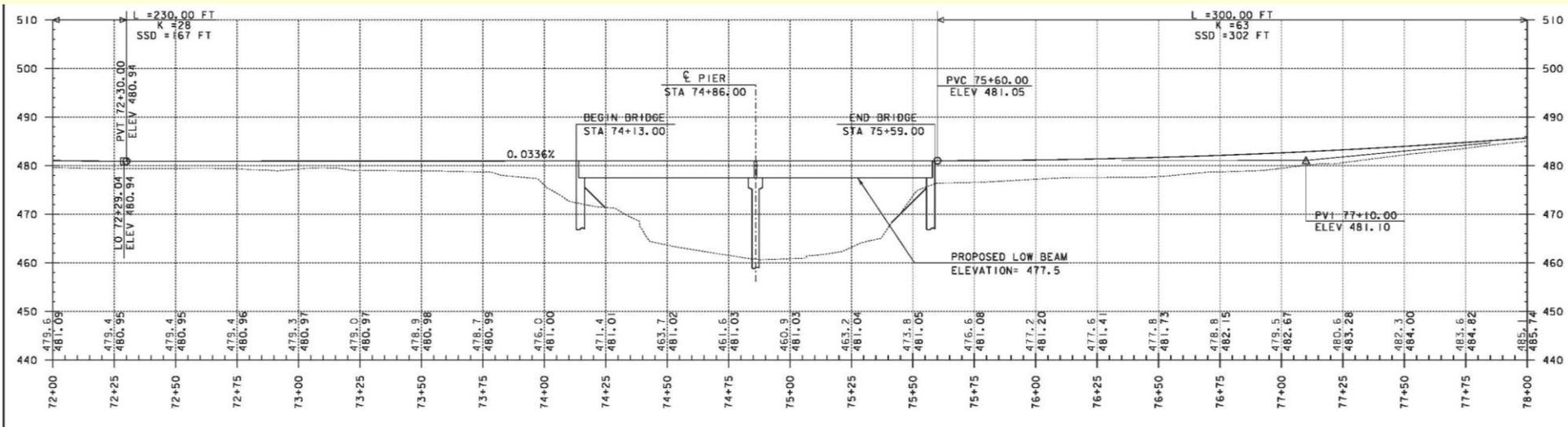
# Profile - Alternative 3



# Layout – Alternative 4



# Profile - Alternative 4



# Methods to Maintain Traffic

Three general methods available:

- Phased Construction
- Temporary Bridge
- Short-term bridge closure w/ off-site detour & ABC

# Phased Construction Option

- Build half new bridge while traffic is on half of old bridge
- Switch traffic on new bridge portion
- Build remainder of new bridge
- One-Way alternating traffic with lights
- Queue lengths and queue times can be inconvenient
- Access to side drives/buildings needs to be considered
- Relatively long construction duration
- Workers & motorists in close proximity – safety concerns
- Can usually be done without ROW acquisition
- This option ruled out due to concerns stated above and short detour distance-

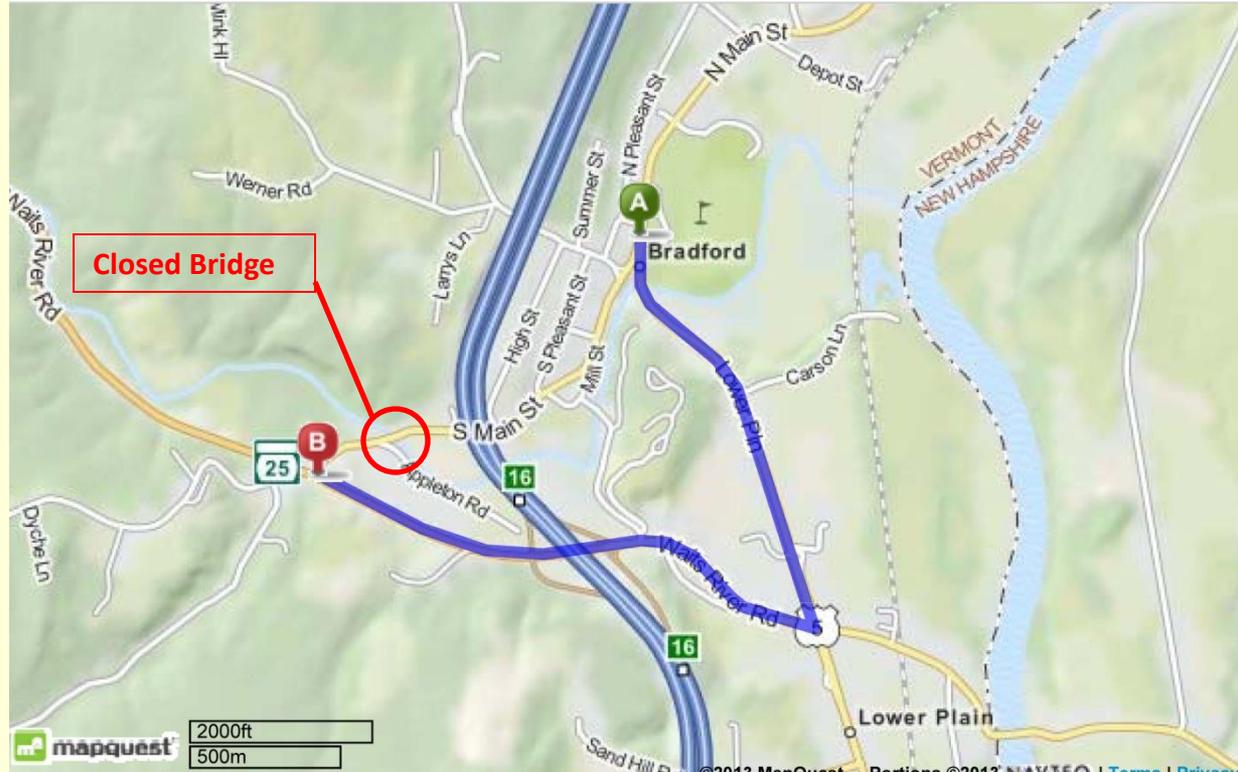
# Temporary Bridge Option

- Construct temporary bridge to maintain traffic
- One-Way alternating traffic with lights
- Queue lengths and queue times can be inconvenient
- Access to side drives/buildings needs to be considered
- Very long construction duration
- Right-Of-Way acquisition is necessary
- Environmental impacts are increased
- Property owner impacts are increased
- Project Delivery time increased
- Project Costs increased
- This option ruled out due to concerns stated above and short detour distance-

# Accelerated Bridge Construction with Bridge Closure Option

- Bridge 1 to be closed for 8 weeks or 16 weeks depending on alternative selected
- Allow 24/7 construction during bridge closure
- Contract incentives/dis-incentives to encourage contractor
- Contractor will receive more \$ if closure is less than stated in the contract
- Community would have input on time of closure (between June 1 and September 1)
- Detour would be on State highways
- Public Outreach to provide advance notice for planning
- Local bypass routes would not be considered detour route -

# Detour Route



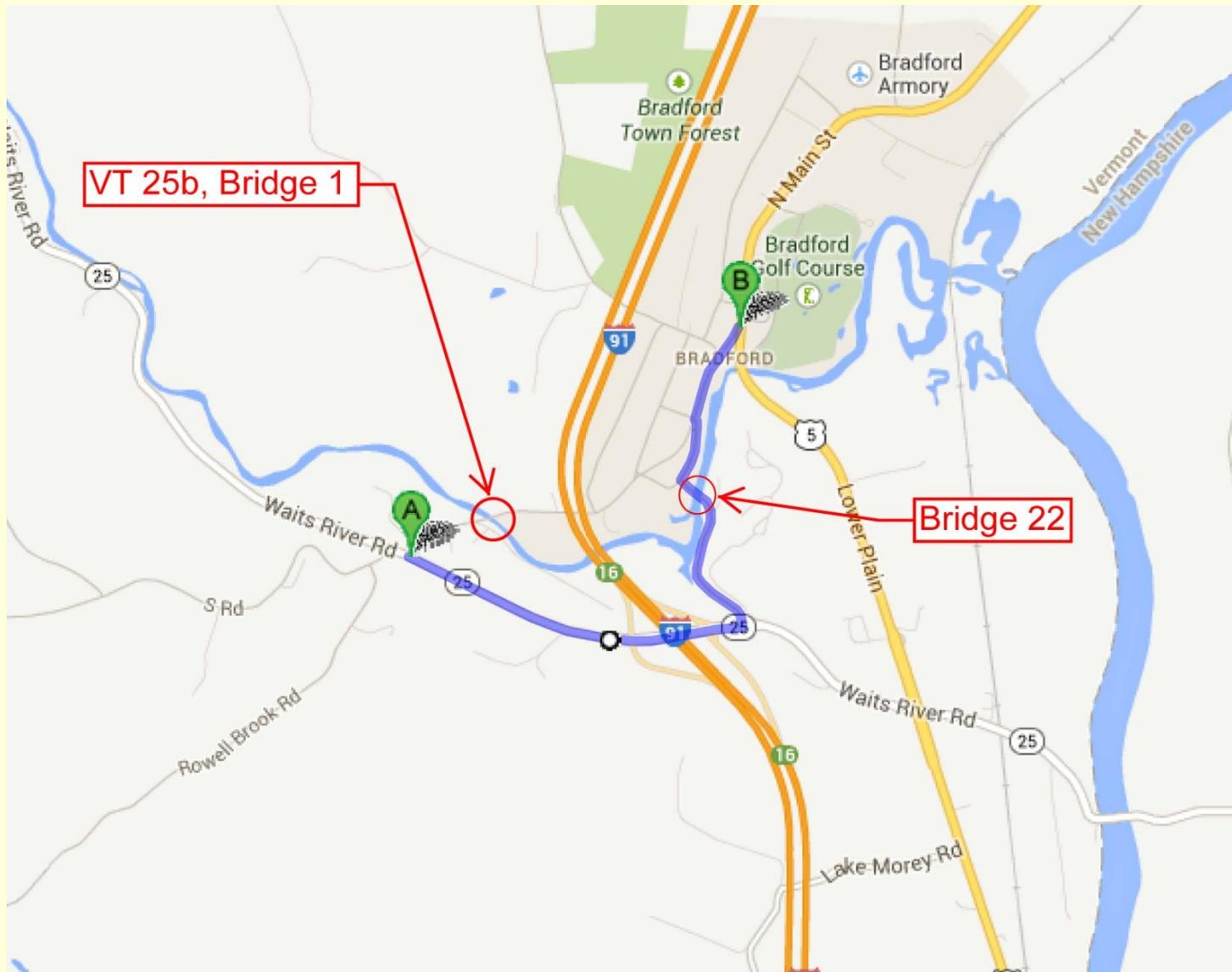
A to B on Thru Route: 1.0 Miles  
A to B on Detour Route: 2.0 Miles  
Added Miles: 1.0 Miles  
End to End Distance: 3.0 Miles

**Major Factors**  
Added Miles: 1.0  
Traffic Volume: 1,400 vpd  
Duration: 8 weeks (or 16 weeks)

# Local Bypass Details

- No local routes would be appropriate for the detour route
- Local bypass route would not be considered the detour route
- State would not add signing on any local roads
- Route could be used for emergency response as appropriate
- We are in the process of developing a way to fairly and consistently compensate Towns for impacts due to increased traffic on bypass routes
- Compensation amount would mitigate for:
  - Providing police presence to deter speeding
  - Providing enforcement to enforce weight limits
  - Dust control
  - Roadway Maintenance

# Local Bypass Map



# Alternatives Matrix

	Alternative 1 1 span ON	Alternative 2 2 span ON	Alternative 3 1 span OFF	Alternative 4 2 span OFF
Construction w/ CE + Contingencies	\$2,132,000	\$2,251,000	\$2,426,000	\$2,495,000
Preliminary Engineering	\$533,000	\$518,000	\$679,000	\$699,000
Right of Way	\$215,000	\$0	\$243,000	\$200,000
<b>Total Project Cost</b>	<b>\$2,880,000</b>	<b>\$2,769,000</b>	<b>\$3,348,000</b>	<b>\$3,394,000</b>
Design Life	80 Years	80 Years	80 Years	80 Years
Project Development Duration	4 years	4 years	4 years	4 years
Construction Duration	6 months	6 months	6 months	6 months
Closure Duration	8 weeks	16 weeks	8 weeks	16 weeks

# Conclusion and Recommendation

## Alternative Selection

### Alternative 1 - Full Bridge Replacement on existing alignment

- Most design standards are met
- Shorter bridge closure period
- Avoids pier in stream
- Cost effective
- Long term (80 year) fix

## Traffic Maintenance Method

### Bridge closure w/ off-site detour & ABC

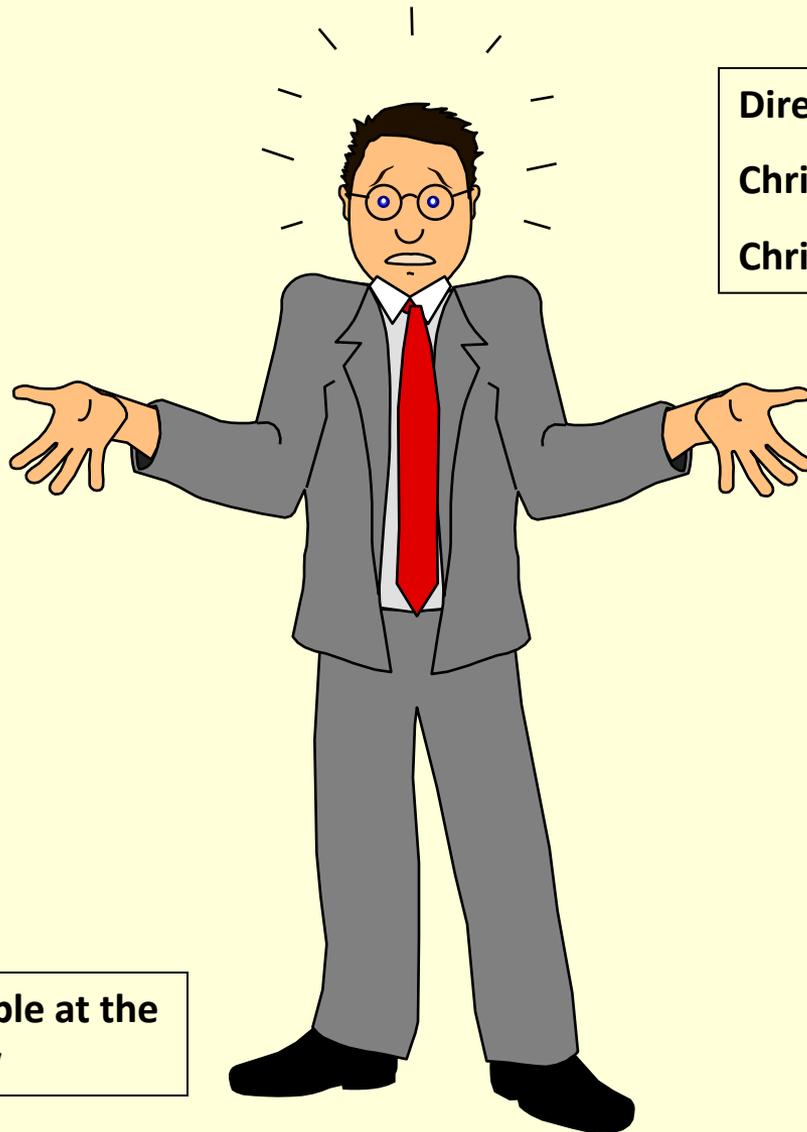
- Short detour route
- Safest alternative
- Minimal property owner and environmental impacts

## Next Steps

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

- Meet to discuss comments from this public meeting
- Decide how to proceed and document
- Develop Conceptual Plans
- Develop Preliminary Plans
- Environmental permitting
- Utility relocation

# Questions



**Direct any questions to:  
Christopher P. Williams, P.E.  
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**This presentation is available at the  
web address shown below**

**<https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/13C054>**