

# Regional Concerns Meeting

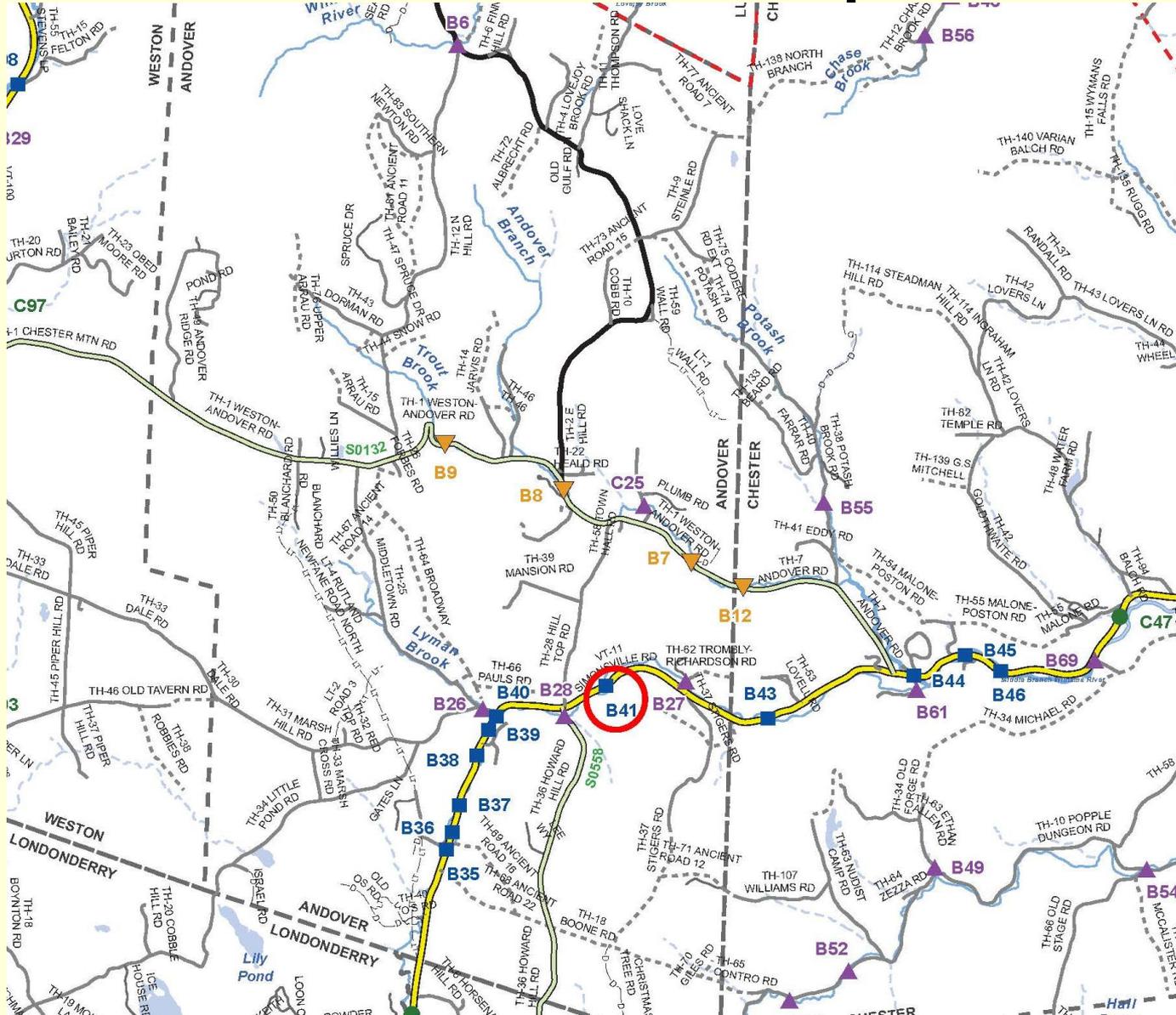
## Andover BHF 016-1(29)

Bridge 41 on VT 11 over Middle Branch of Williams River



Presented by  
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# Location Map



# Meeting Outline

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

# 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
- Accelerated Bridge Construction (ABC) with short-term closures used when appropriate
- Impacts to property and resources is minimized
- Results in project being delivered faster
- Goal of 25% of projects into Accelerated Bridge Program
- Goal of 2 year design phase for ABP (5 years conventional)
- Visit the website at [acceleratedbridge.vermont.gov](http://acceleratedbridge.vermont.gov)

# Project Initiation & Innovation Team

- Part of re-organization in January 2012
- Currently team of 5
- All projects will begin in the PIIT
- Very efficient process
- Look for innovative solutions whenever possible
- Involved until Project Scope is defined
- Hand off to Design Project Manager to continue Project Design phase -

# Phases of Development

Project  
Funded

Project  
Defined

Contract  
Award

Project Definition

Project Design

Construction

Identify resources &  
constraints

Evaluate alternatives

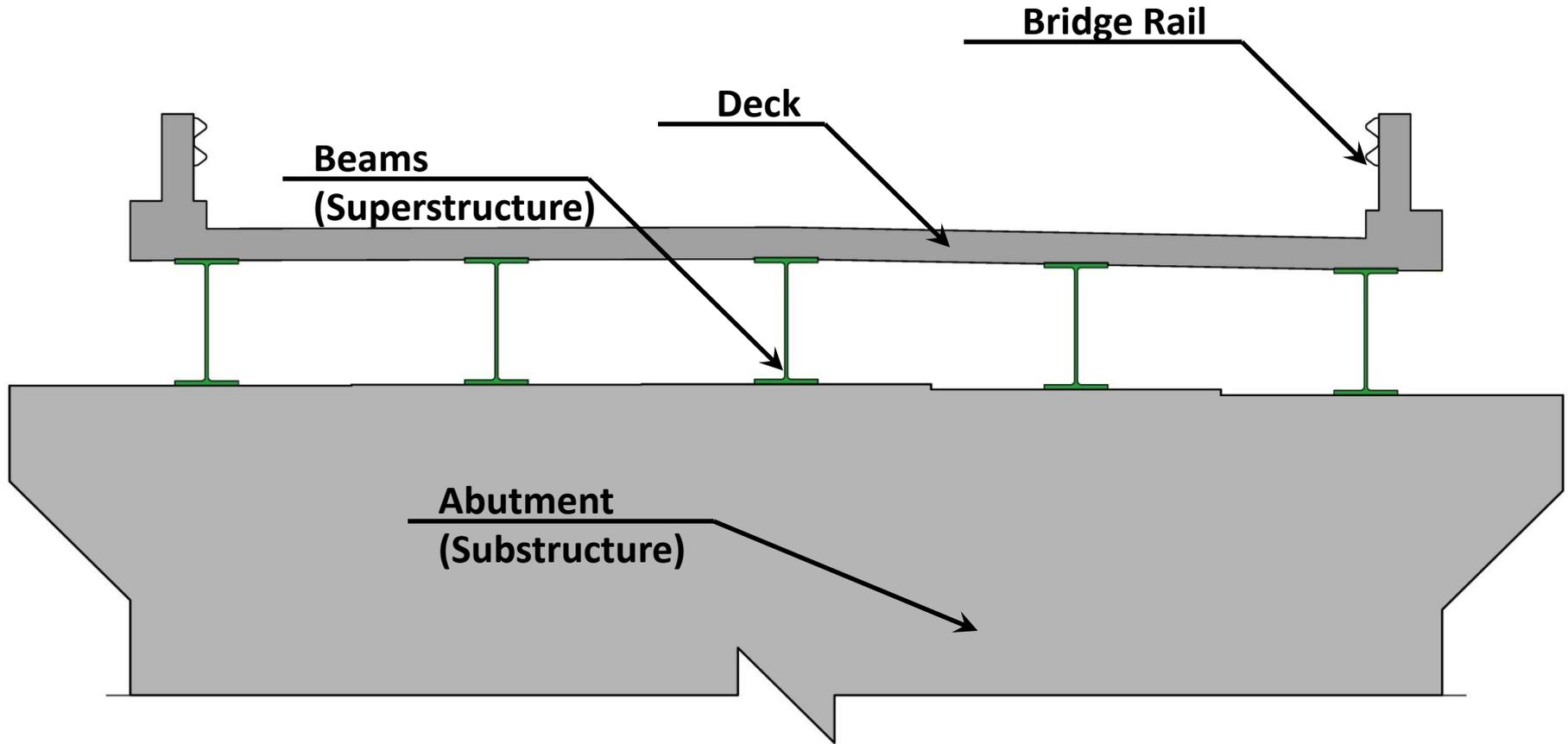
Public Participation

- Quantify areas of  
impact

- Environmental  
permits

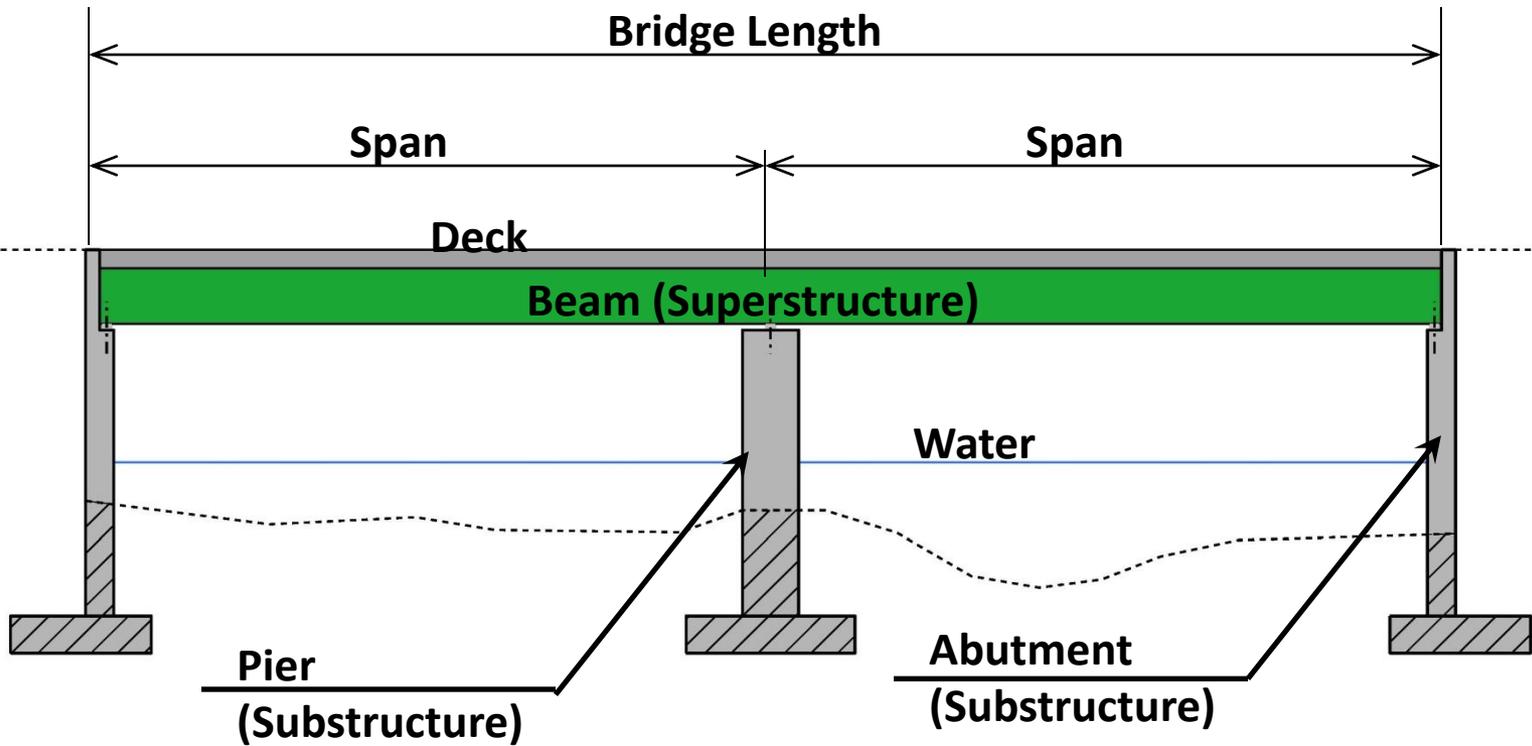
- Develop plans,  
estimate and  
specifications

# Description of Terms Used



**Cross Section of Bridge**

# More Terms Used



**Elevation View of Bridge**

# Project Background

- Existing bridge is a single span concrete T-beam bridge
- Widened with steel beams in 1963
- Span length = 44'
- Bridge width = 30' (curb-curb)
- Built in **1927 (86 years old) – widened in 1963**
- Posted speed limit = 50 mph
- Owned and maintained by the State (no local funds)
- VT 11 functional classification is Rural Minor Arterial
- **Priority 16** in the State Bridge Program-

# Project Background

- Traffic Data

<b>TRAFFIC DATA</b>	<b>2015</b>	<b>2035</b>
<b>AADT</b>	<b>2,700</b>	<b>2,900</b>
<b>DHV</b>	<b>320</b>	<b>340</b>
<b>ADTT</b>	<b>440</b>	<b>670</b>
<b>%T</b>	<b>13.7</b>	<b>19.2</b>

# EXISTING BRIDGE DEFICIENCIES

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

Bridge Deck Rating	4 Poor
Superstructure Rating	5 Fair
Substructure Rating	6 Satisfactory

## Deficiencies

- Structural Capacity/Condition of the Bridge Deck and T-beams
- Scour and undermining on the east abutment

# Looking West



# Looking East



# Looking Upstream



# Looking Downstream

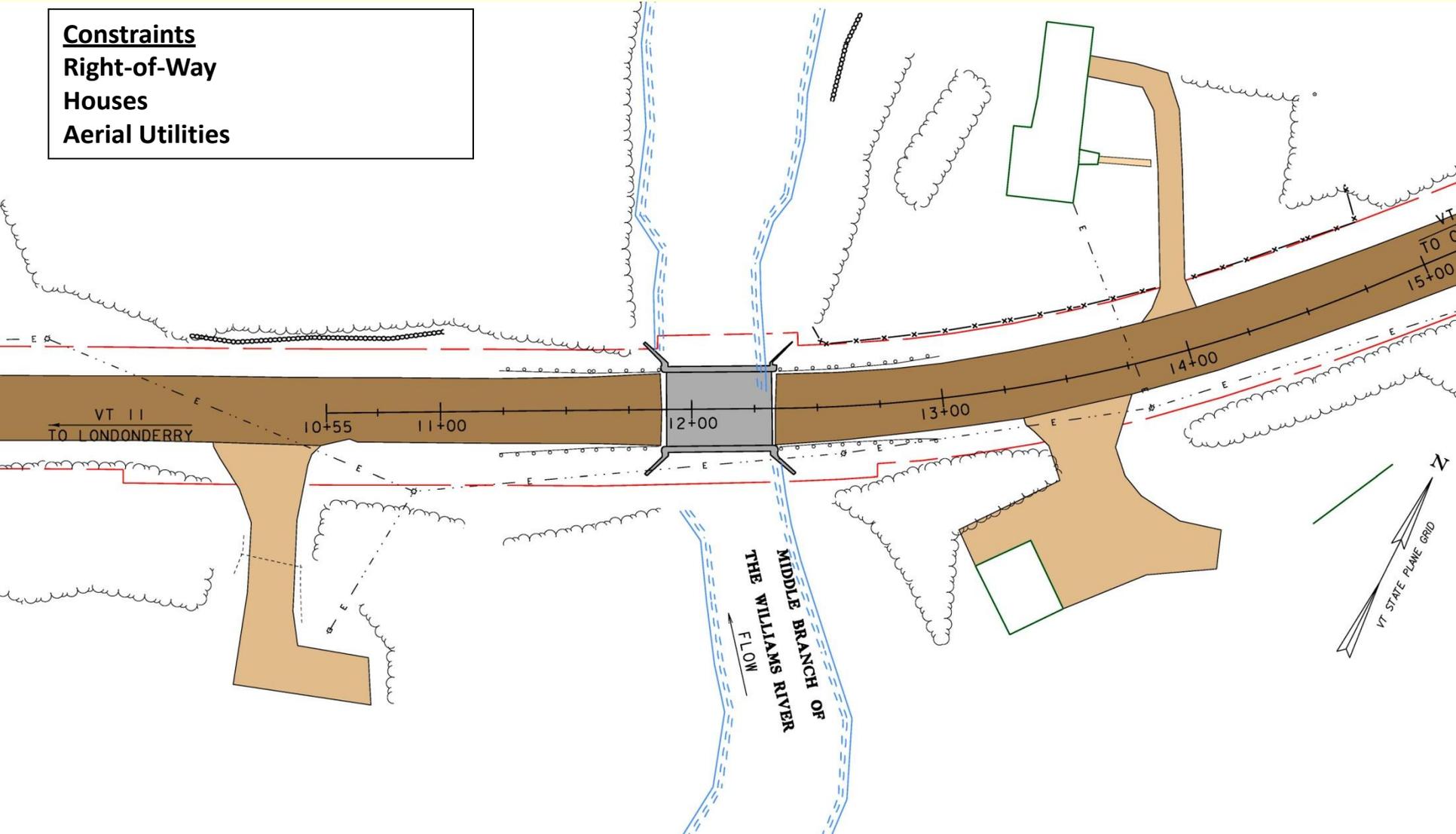


# Underside of Deck



# Layout Showing Constraints

- Constraints**
- Right-of-Way**
- Houses**
- Aerial Utilities**

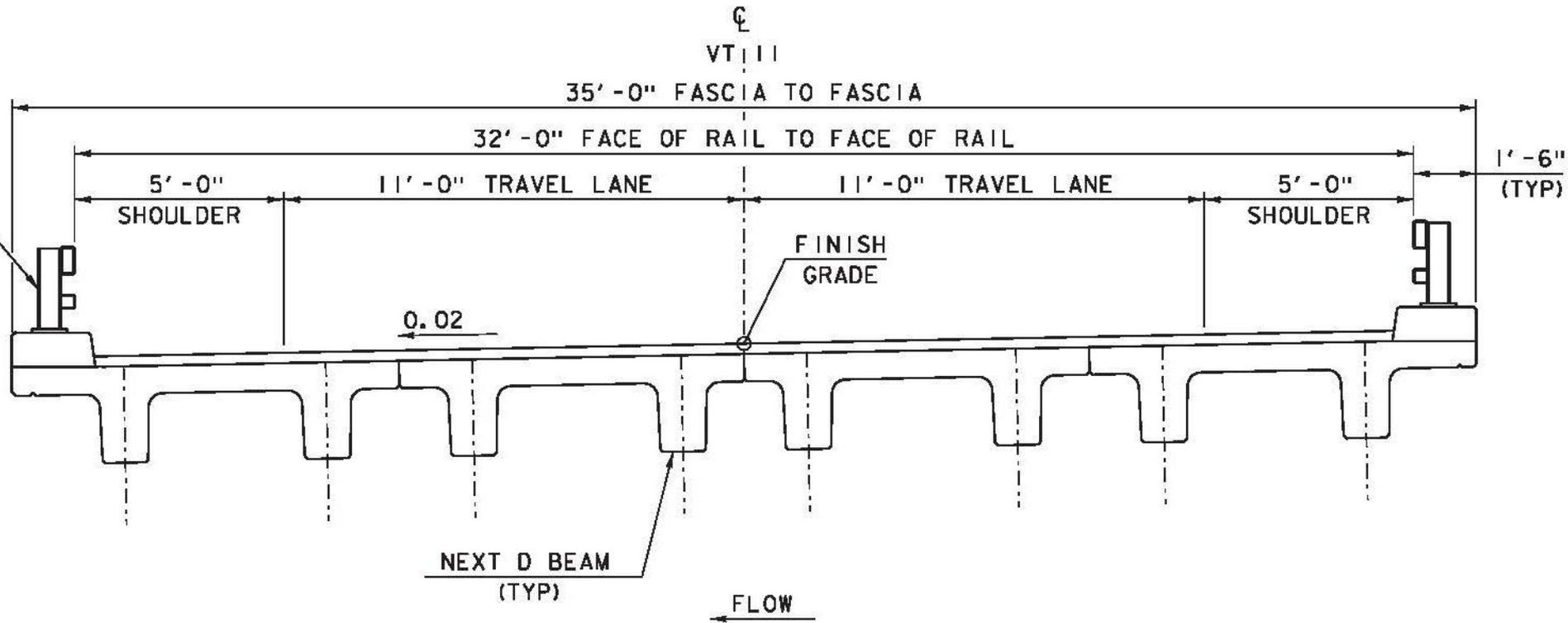


# Alternatives Considered

- Superstructure Replacement
- Full Bridge Replacement

Note that the method to maintain traffic will be addressed separately

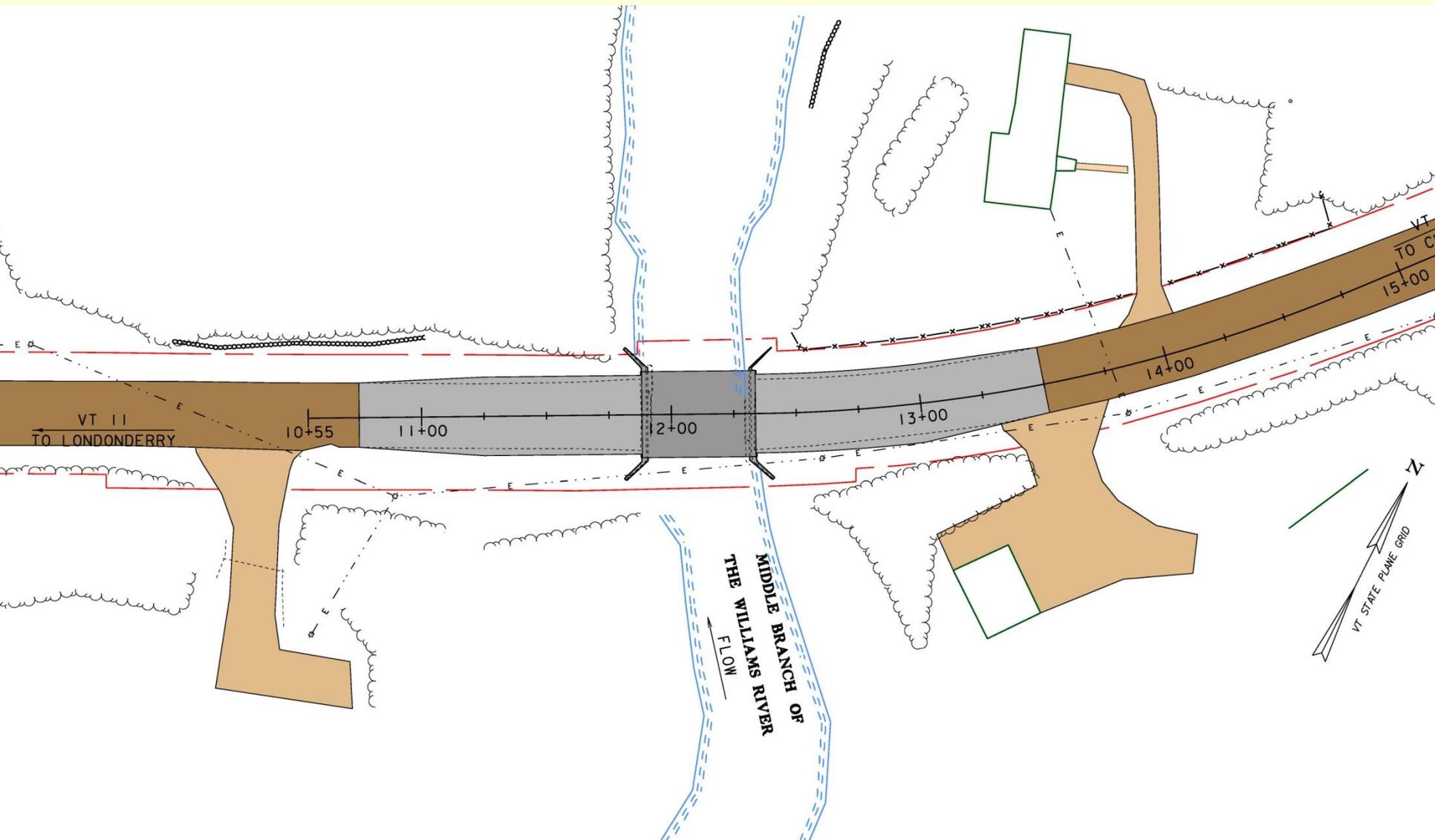
# Proposed Bridge Typical (Same for both options)



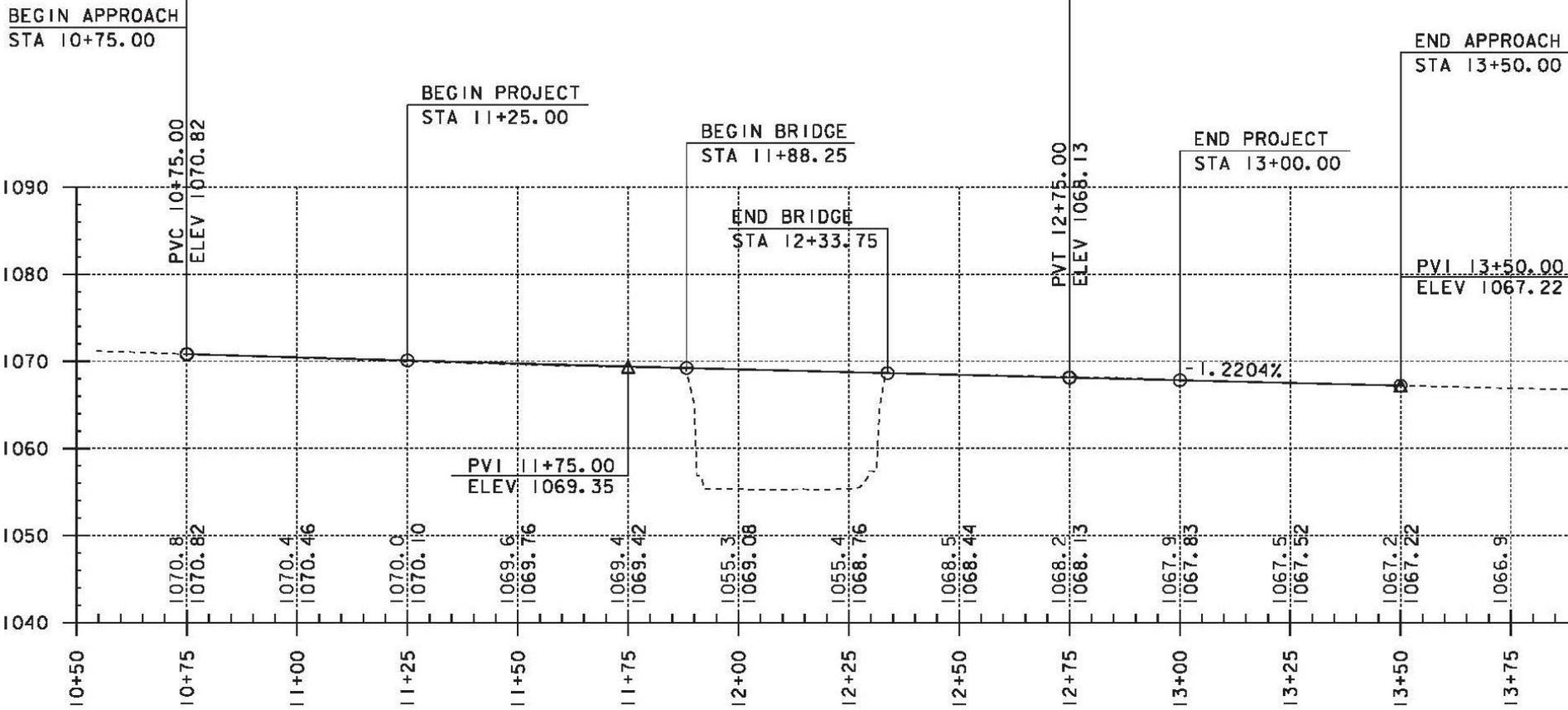
# Superstructure Replacement

- Use 11' lanes and 5' shoulders (32' rail-rail width)
- Keep existing abutments
- Address scour at east abutment
- Maintain existing centerline of road
- Horizontal curve would remain substandard
- Maintain vertical grade of road
- Structural deficiencies would be addressed
- No improvement to hydraulic capacity
- Predicted 40 year life expectancy-

# Layout – Superstructure Replacement



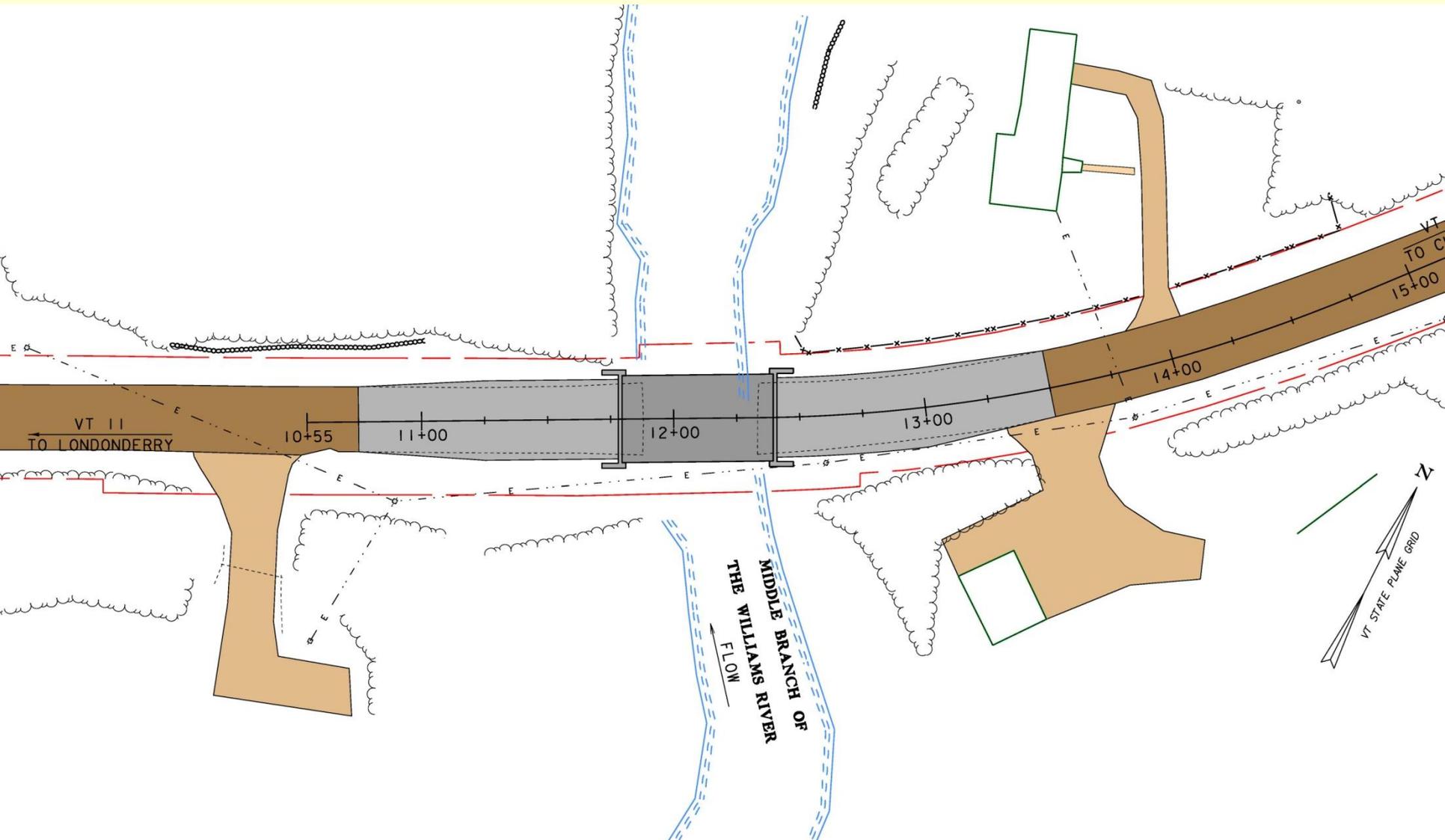
# Profile – Superstructure Replacement



# Full Bridge Replacement

- Use 11' lanes and 5' shoulders (32' rail-rail width)
- Increase span to approximately 60 feet
- Maintain existing centerline of road
- Horizontal curve would remain substandard
- Maintain vertical grade of road
- Improvement to hydraulic capacity
- Predicted 80 year life expectancy-

# Layout – Full Replacement



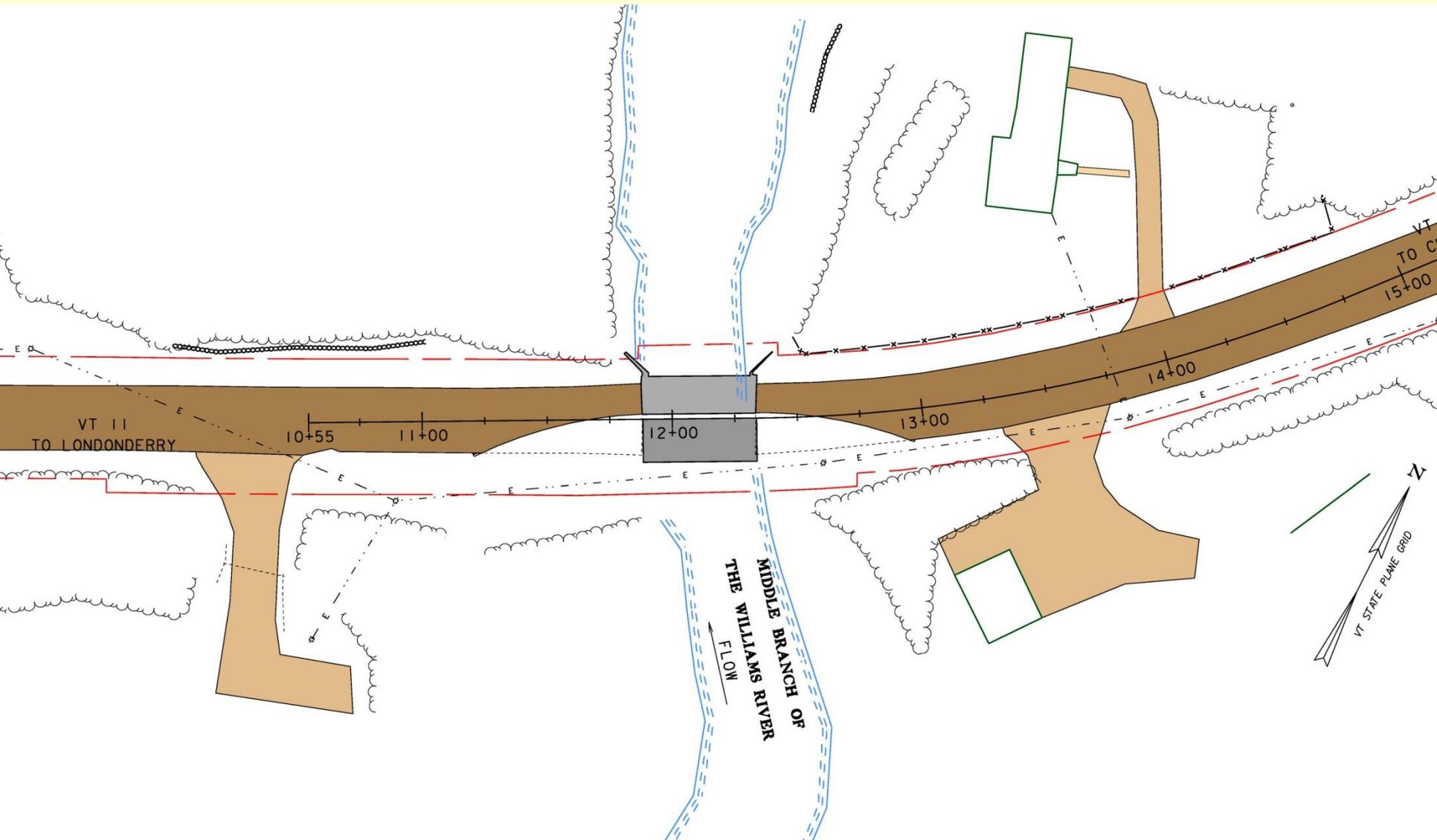
# Methods to Maintain Traffic

- Phased Construction
- Temporary Bridge
- Accelerated Bridge Construction with Off-site Detour

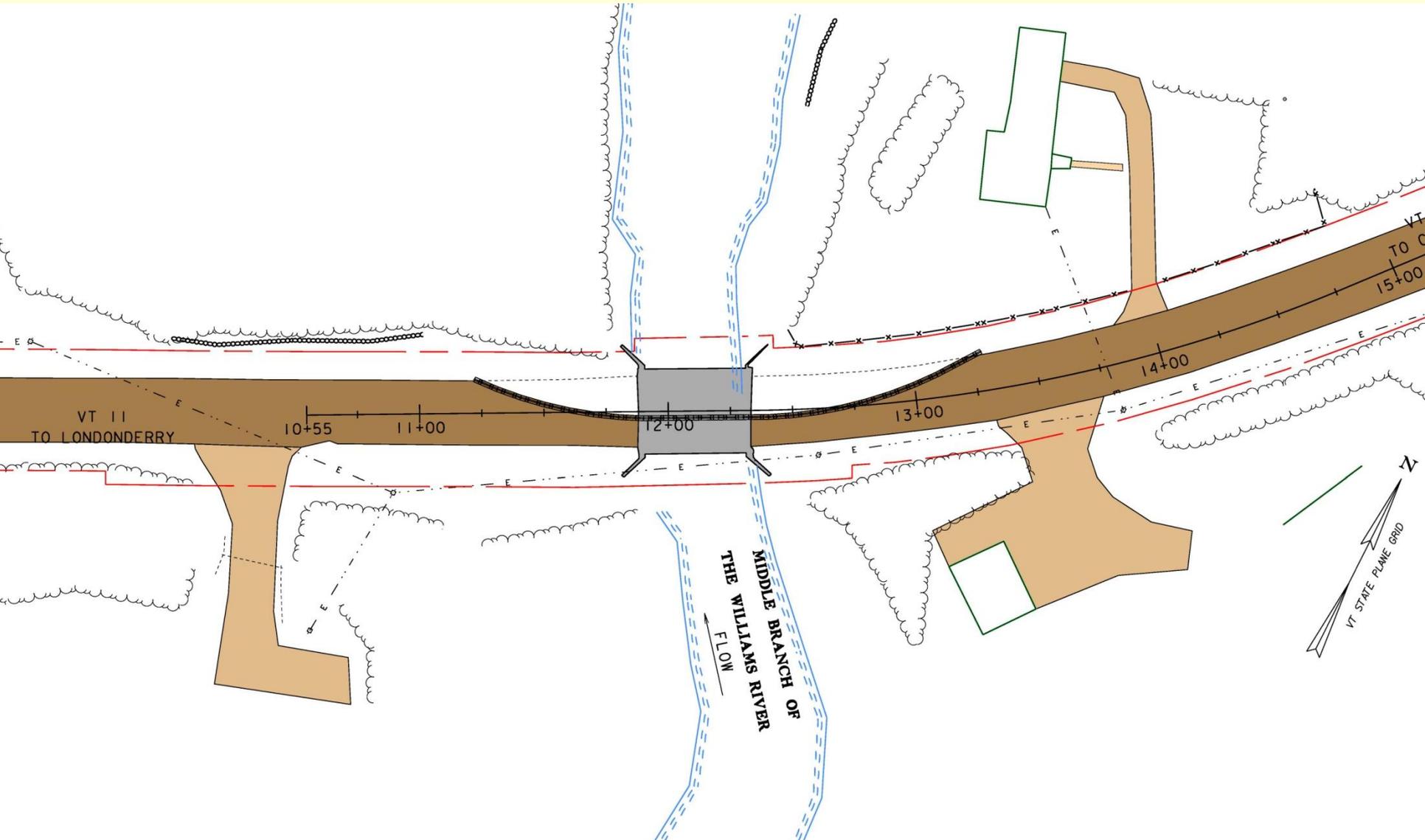
# Phased Construction Option

- 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
- Only considered for superstructure replacement option-

# Phase 1 – Build half of new deck



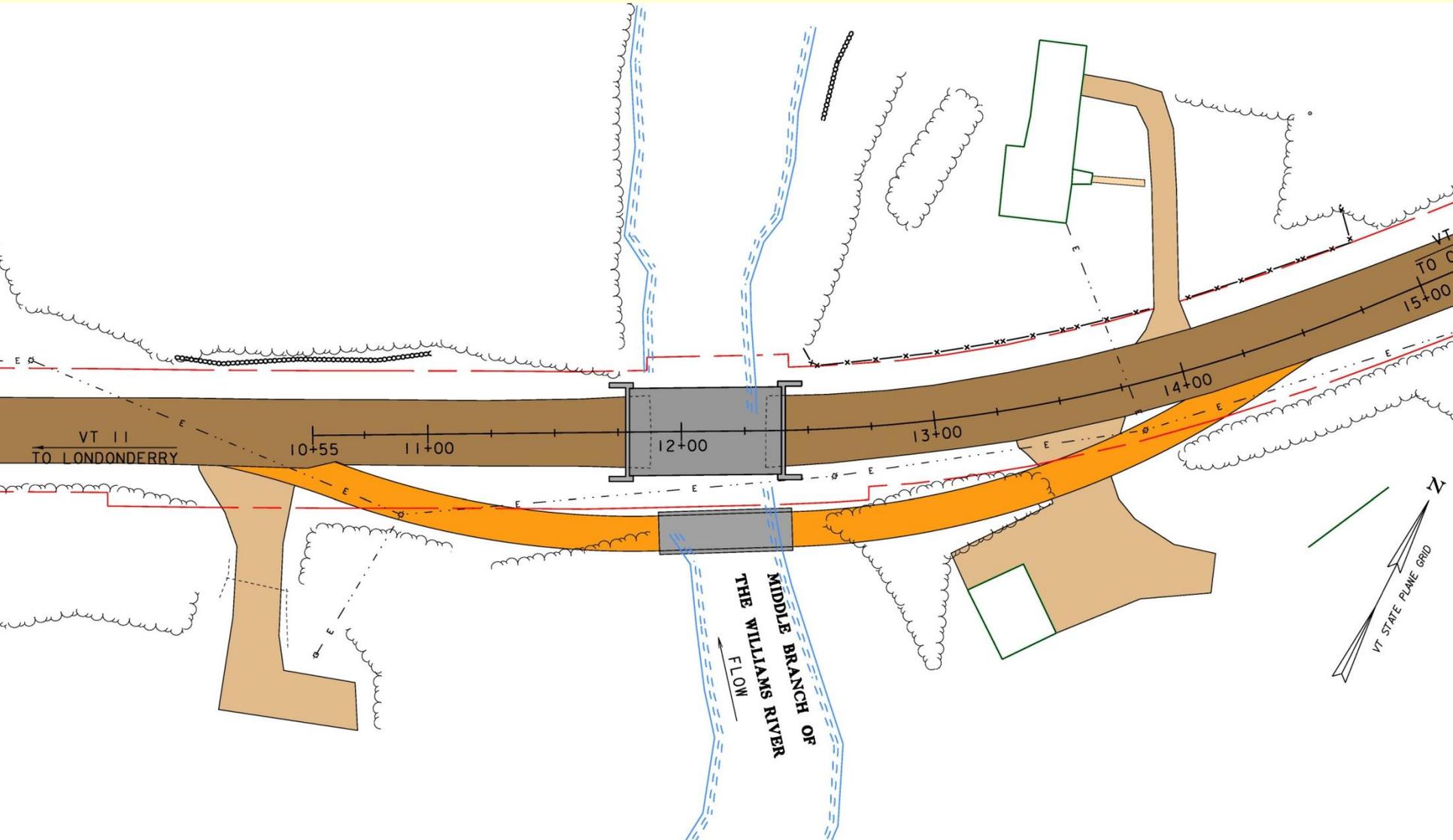
# Phase 2 - Build remainder of new deck



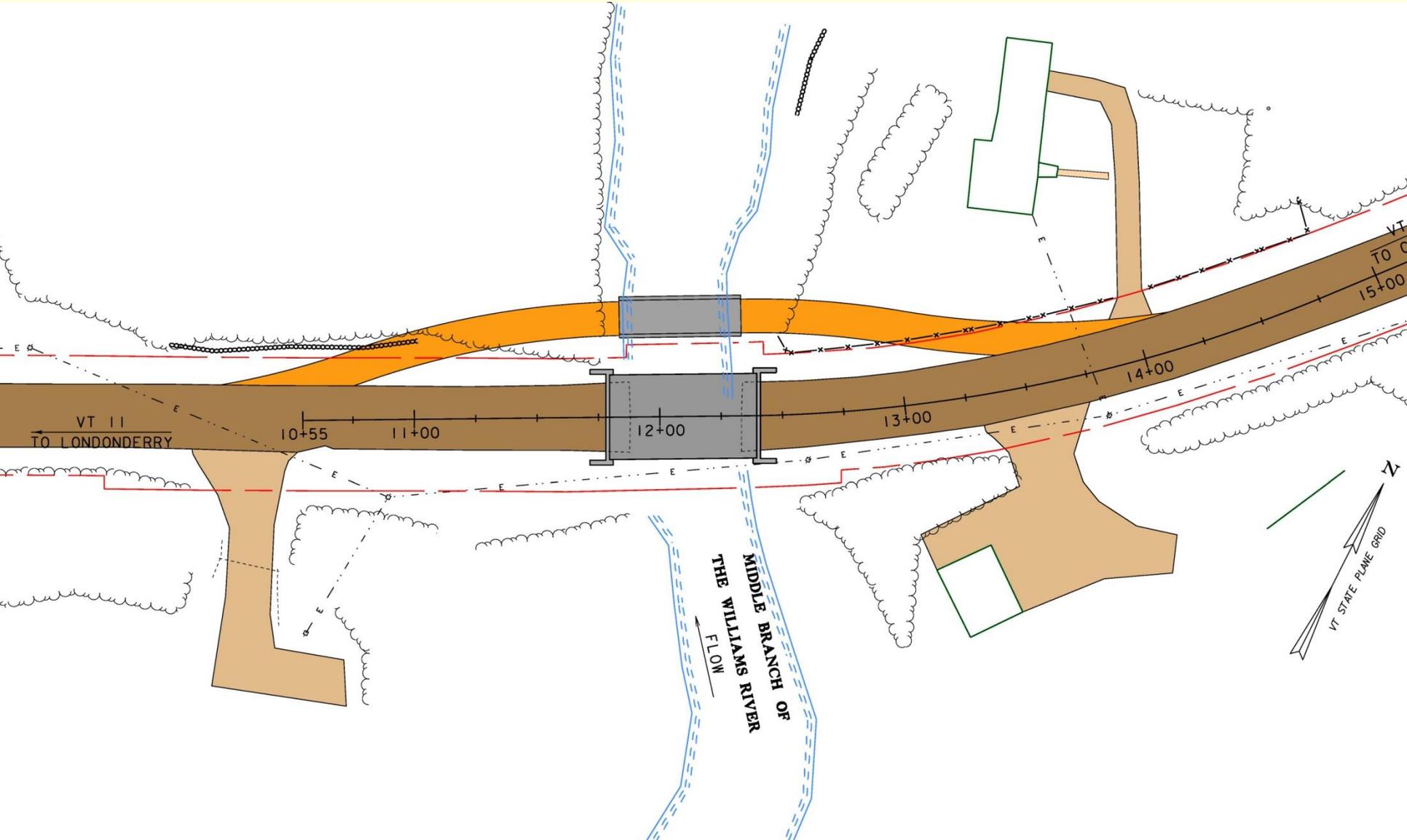
# One-Way Temporary Bridge Option

- 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
- Only considered for full replacement option-

# One-Way Temporary Bridge w/ Lights Upstream



# One-Way Temporary Bridge w/ Lights Downstream



# ABC with Bridge Closure Option

- Bridge 41 to be closed during new construction
  - 28 days (maximum) for full replacement
  - 10 days (maximum) for superstructure replacement
- Allow 24/7 construction during bridge closure
- Contract incentives/dis-incentives to encourage contractor
- 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 -

# Off Site Detour Option

## Mileage Summary

A-B Thru = 14 miles

A-B Detour = 28 miles

Added Miles = 14 miles

End-End Dist. = 42 miles

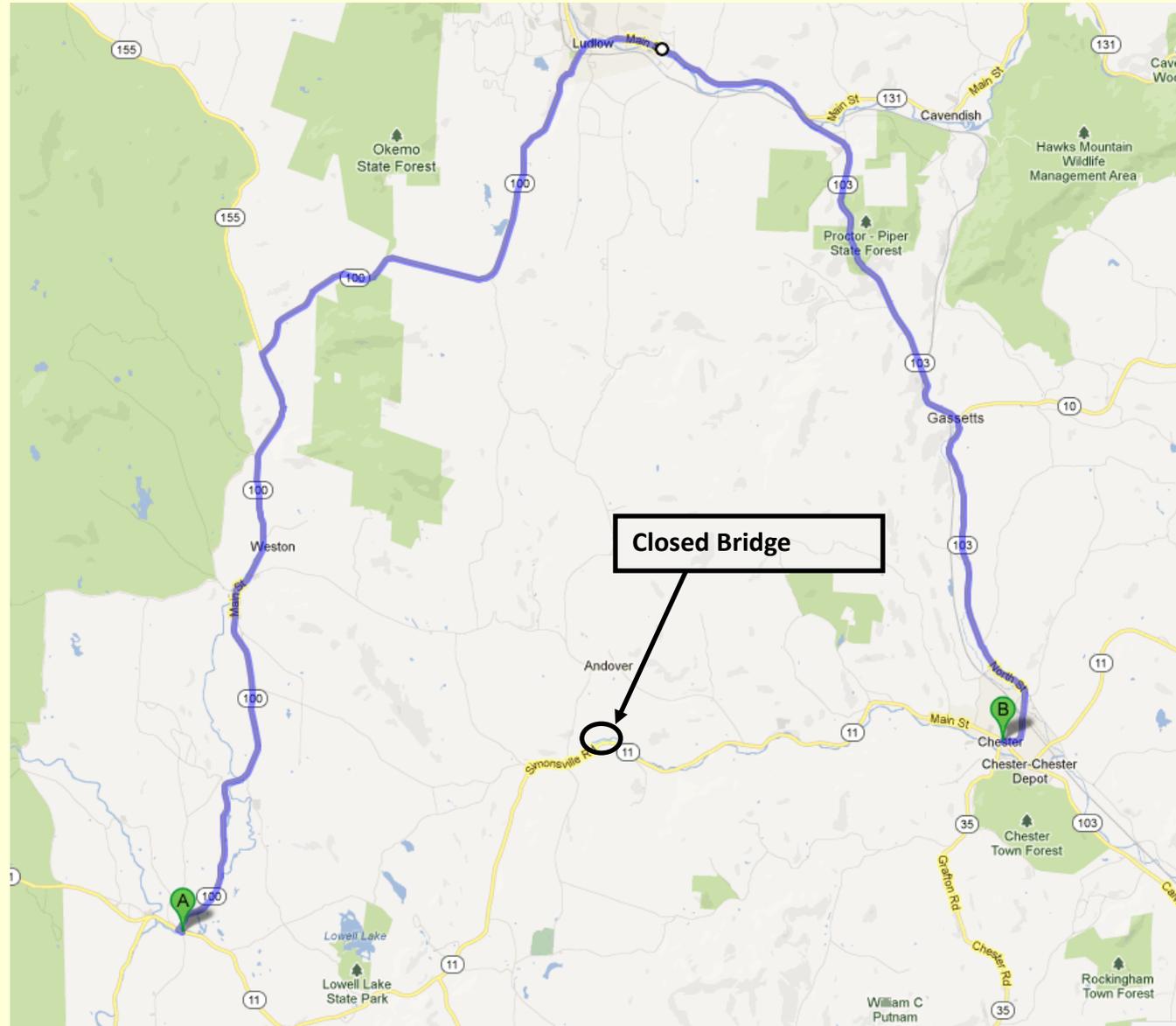
## Major Factors

Traffic Volume = 2,700

Added Miles = 14 miles

Duration = See Matrix

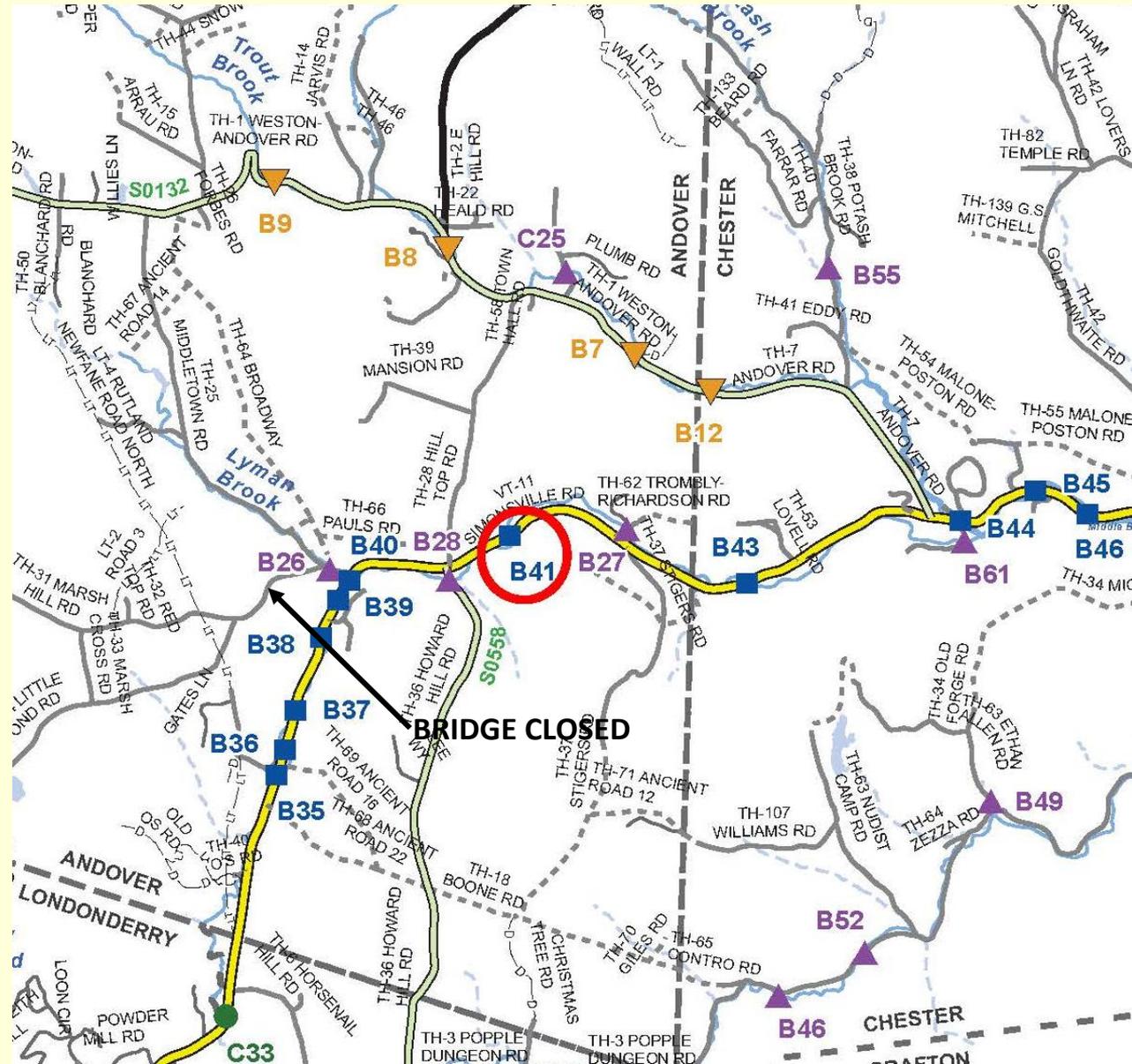
Note that there are local roads that could be used during a bridge closure but they would not be designated detour routes



# Local Bypass Routes

A local bypass route is not a detour route but is the most likely route that local traffic will use during the bridge closure.

The Agency compensates Towns for increased traffic on the local bypass route in a fair and consistent manner



# Local Bypass Details

- Local bypass route would not be considered detour route
- State would not add signing on local roads
- Could be used for emergency response as appropriate
- When and where appropriate, we can compensate Town to mitigate impacts due to increased traffic for:
  - Providing police presence to deter speeding
  - Providing DMV presence to enforce weight limits
  - Dust control
  - Road maintenance costs -

# Alternatives Matrix

	Super Replacement w/ Detour	Super Replacement w/ Phased		Complete Replacement w/ Detour	Complete Replacement w/ Temp Bridge
Maintenance of Traffic	\$47,250	\$61,000		\$68,750	\$168,750
Construction w/ CE + Contingencies	\$636,902	\$723,499		\$1,515,942	\$1,708,598
Preliminary Engineering	\$171,474	\$194,788		\$233,222	\$262,861
Right of Way	\$0	\$0		\$0	\$118,288
<b>Total Cost</b>	<b>\$808,376</b>	<b>\$918,288</b>		<b>\$1,749,164</b>	<b>\$2,089,747</b>
	Base	14% over Base		Base	19% over Base
<b>Design Life</b>	<b>40 years</b>	<b>40 years</b>		<b>80 years</b>	<b>80 years</b>
Project Development Duration	2 years	2 years		2 years	>4 years
Construction Duration	3 months	8 months		4 months	18 months
Mobility Impacts	10 days	4 months		4 weeks	7 months

# Conclusion and Recommendation

Superstructure replacement while maintaining traffic using a short-term closure and off-site detour.

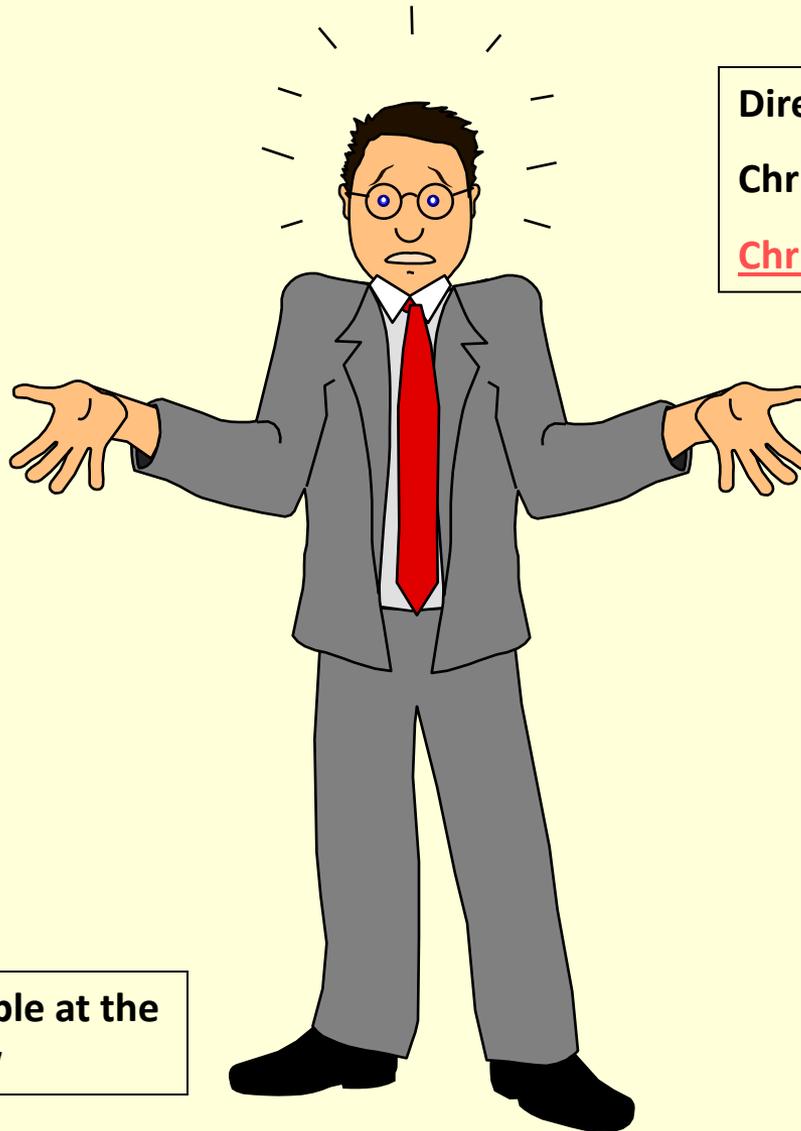
The primary reasons for this recommendation are:

- Addresses structural deficiencies
- Takes advantage of remaining life in substructures
- Minimizes property owner impacts
- Minimizes community impacts
- Reasonably Long term (40 year) solution
- Phased construction can not be justified due to decreased safety and increased community impacts
- Temporary bridge can not be justified due to increased impacts and longer project delivery time-

## **A Look Ahead to the Next Steps**

- Evaluate and consider comments received at this meeting
- Proceed based on recommended alternative unless adequate justification for reconsidering alternatives
- Develop Conceptual plans and distribute for comment
- Reach Project Defined milestone and begin Design phase

# Questions



Direct any questions to:

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This presentation is available at the  
web address shown below

<https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/12b140>