

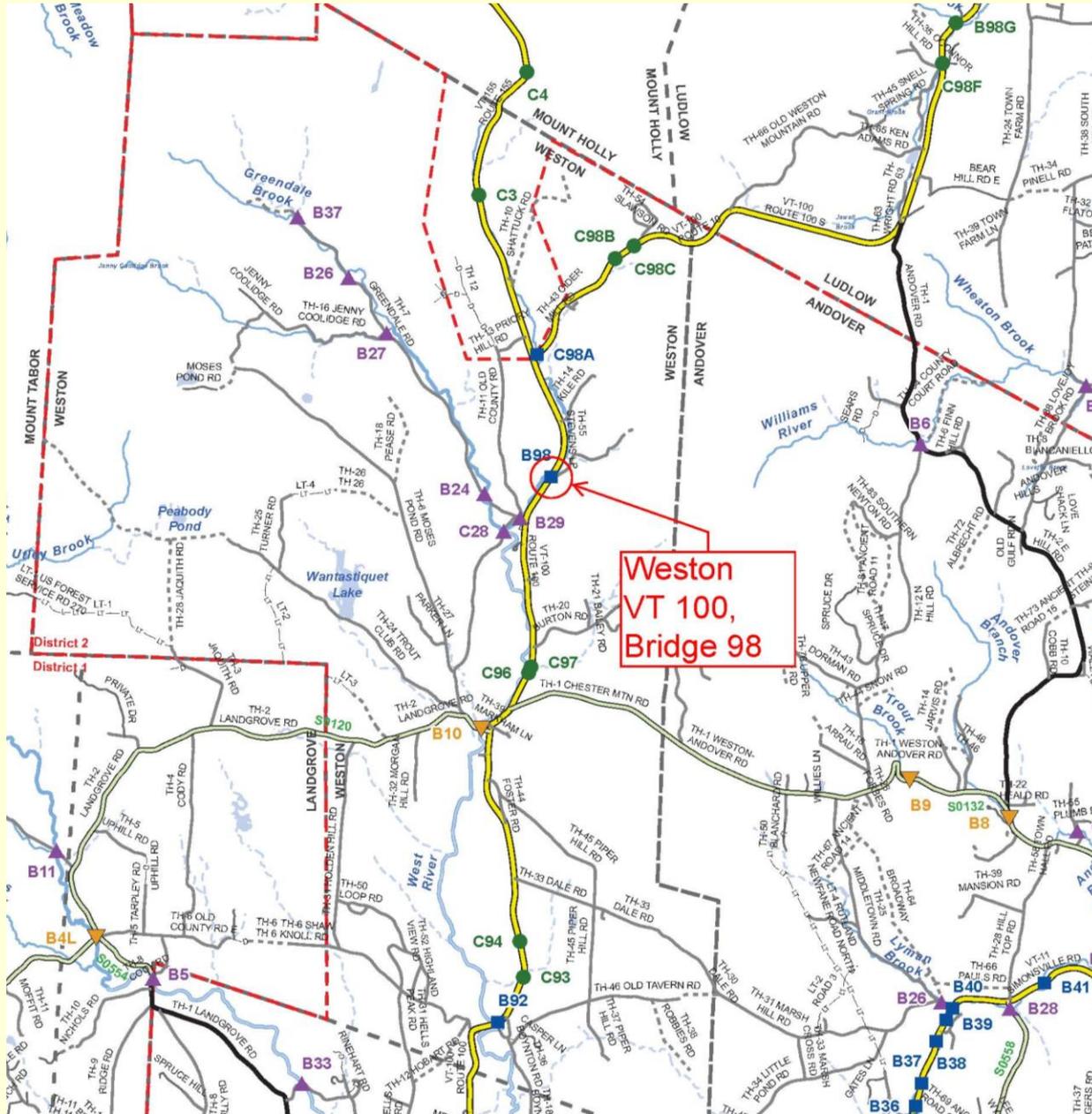
Weston BF 013-2(13) Bridge 98 on VT Route 100 over the West River Regional Concerns Meeting



**Presented by
Christopher P. Williams, P.E.
Senior Project Manager, Structures Section
Vermont Agency of Transportation
Chris.Williams@State.VT.US**

October 28, 2013

PROJECT LOCATION



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

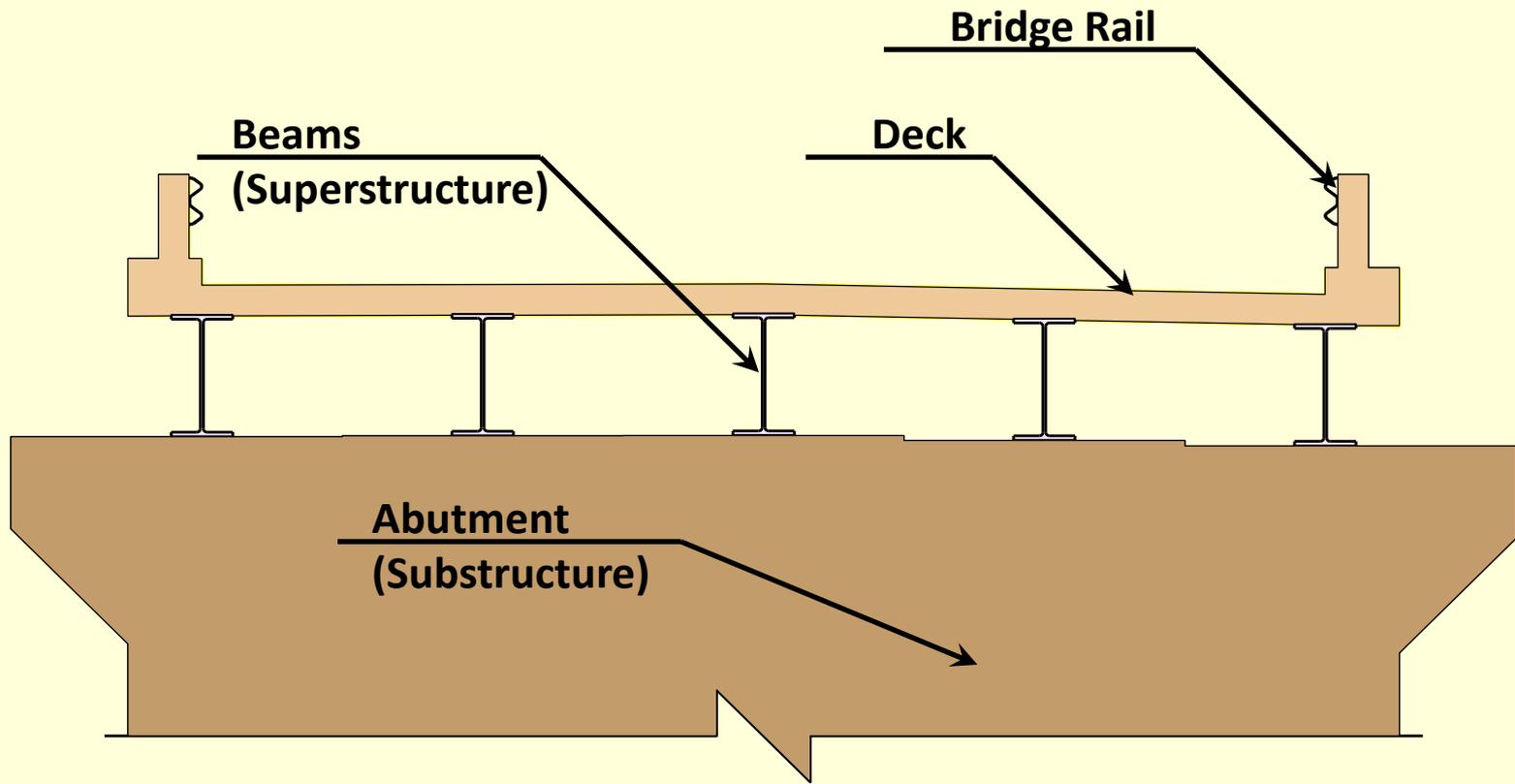
Build Consensus

- 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 Minor Arterial
- Posted Speed = 50 mph (Design Speed)
- Existing bridge is a single span steel beam w/ concrete deck
- Span length = 34 feet
- Bridge Width = 30.5 feet (curb-curb)
- The bridge was built in 1959 (54 years old)

Traffic Data

	“Current Year” 2016	“Design Year” 2036
Average Annual Daily Traffic	1,900	2,000
Design Hourly Volume	330	350
Average Daily Truck Traffic	150	250
%Trucks	8.9	14.2

EXISTING BRIDGE DEFICIENCIES

Inspection Rating Information (Based on a scale of 9)

Bridge Deck Rating	5 Fair
Superstructure Rating	7 Good
Substructure Rating	4 Poor

Rating Definitions

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

Deficiencies

- The bridge is structurally deficient with major deterioration of the abutments
- The bridge is too narrow for the roadway classification and design speed
- The bridge railing is substandard
- The bridge does not meet the hydraulic standards

Looking North over Bridge



05.15.2013

Looking South over Bridge



05.15.2013

South Abutment



South Abutment & Bottom of Deck

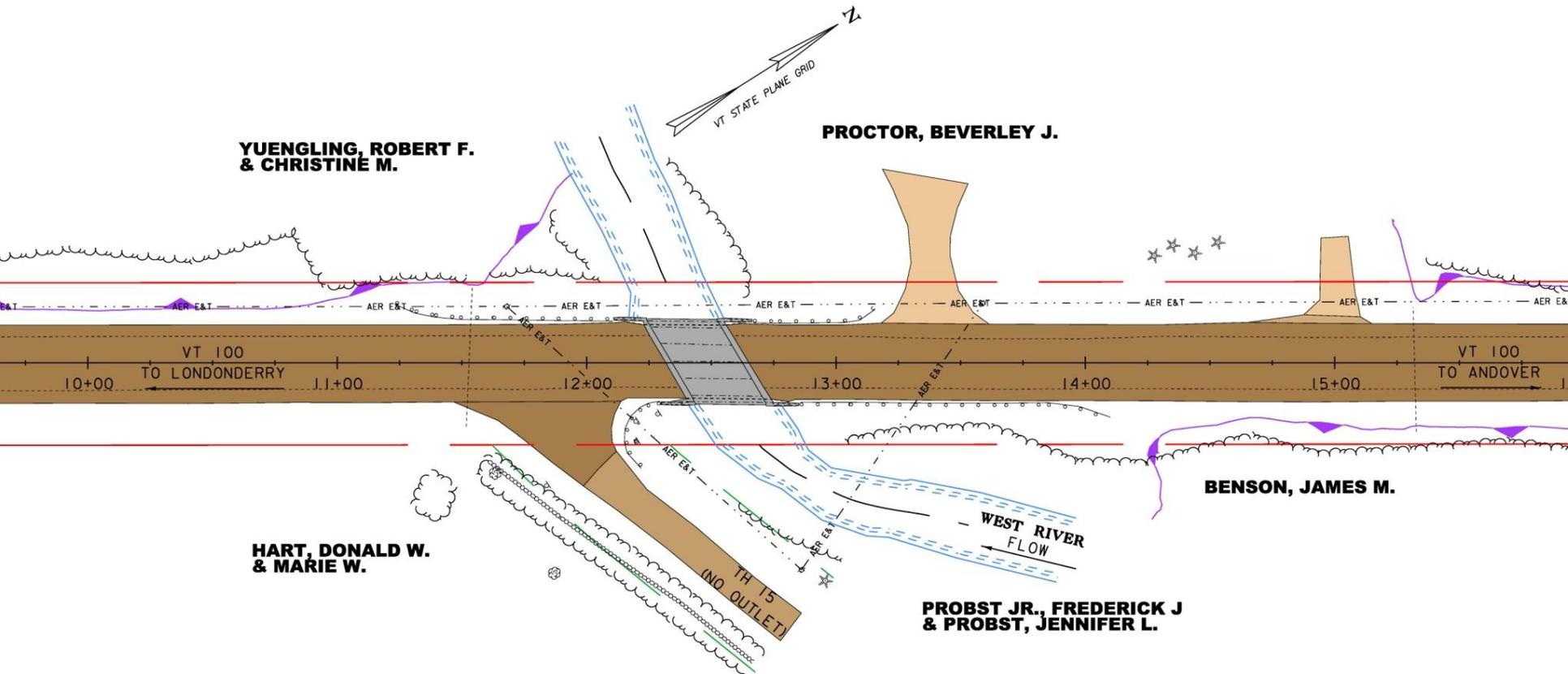


05.15.2013

Layout Showing Constraints

Constraints present

- Right of Way – State & Town
- Class II Wetlands
- Overhead Utilities
- Drive in NW quadrant



Alternatives Discussion

- Rehabilitation was ruled out due to the deteriorated condition of the existing abutments and was not detailed in the Scoping Report
- Placing a new superstructure on a severely deteriorated abutment does not make sense

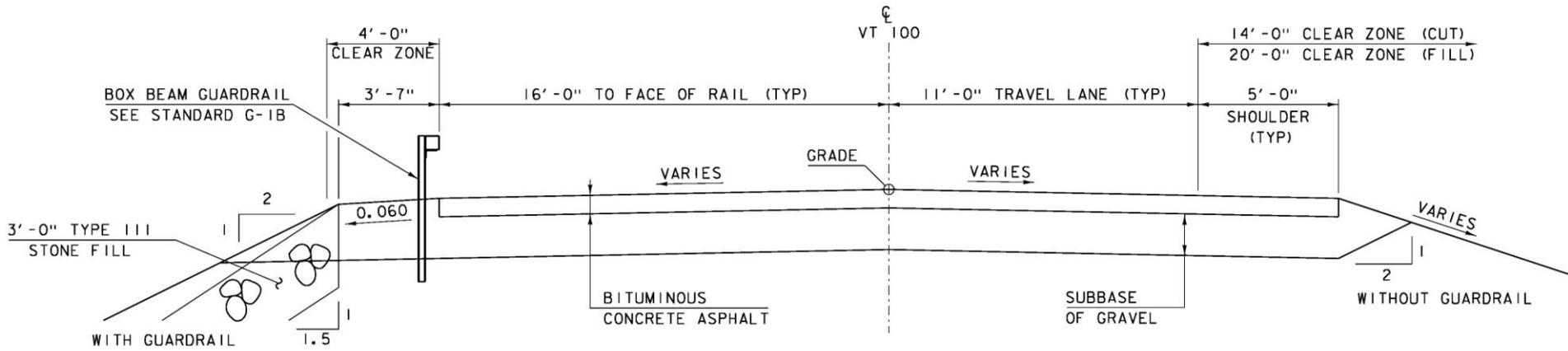
Full bridge replacement is the only alternative considered in this study

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

Replacement Details

- Complete Bridge replacement warranted
- Span = 59'
- 32' width between face of rail
- Maintain existing centerline of road
- Raise the vertical grade of road to improve hydraulics
- Long term (80 year) solution

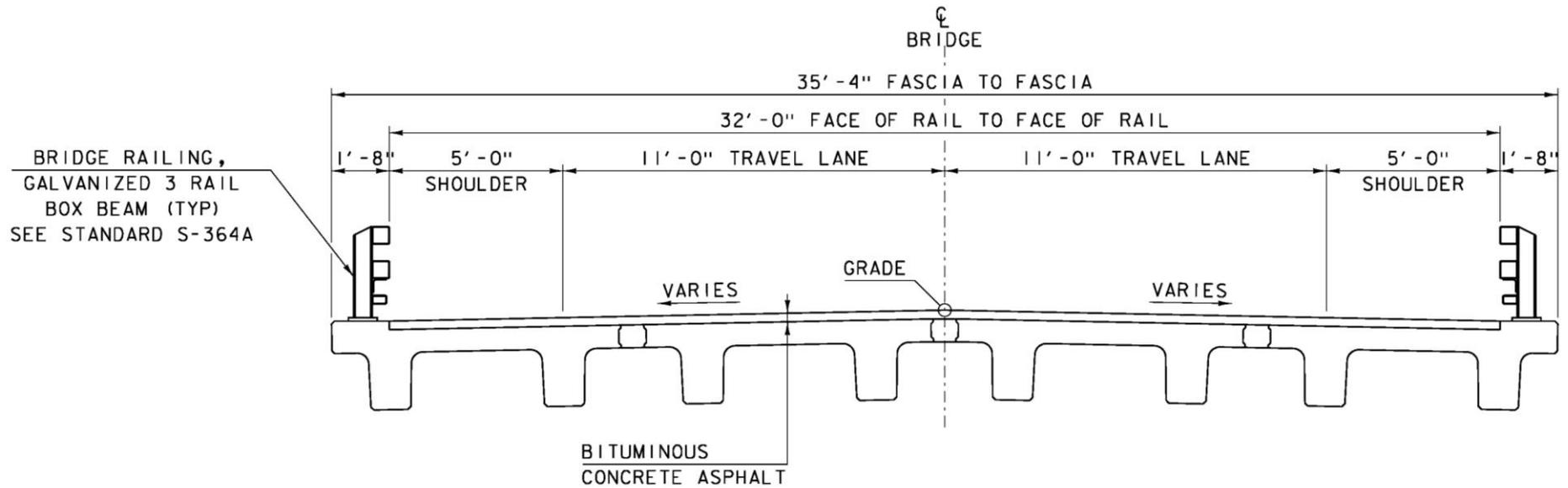
Roadway Typical



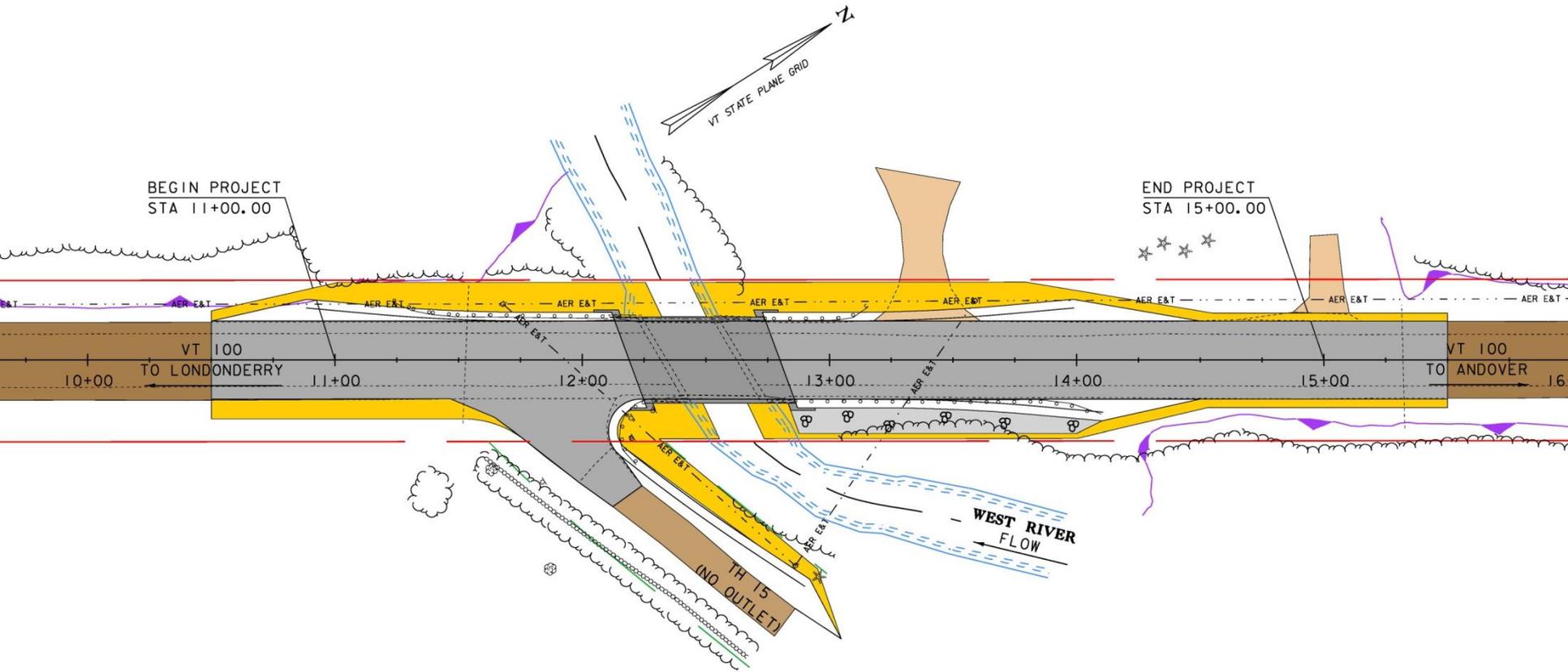
PROPOSED VT 100 TYPICAL SECTION

SCALE $\frac{3}{8}" = 1'-0"$

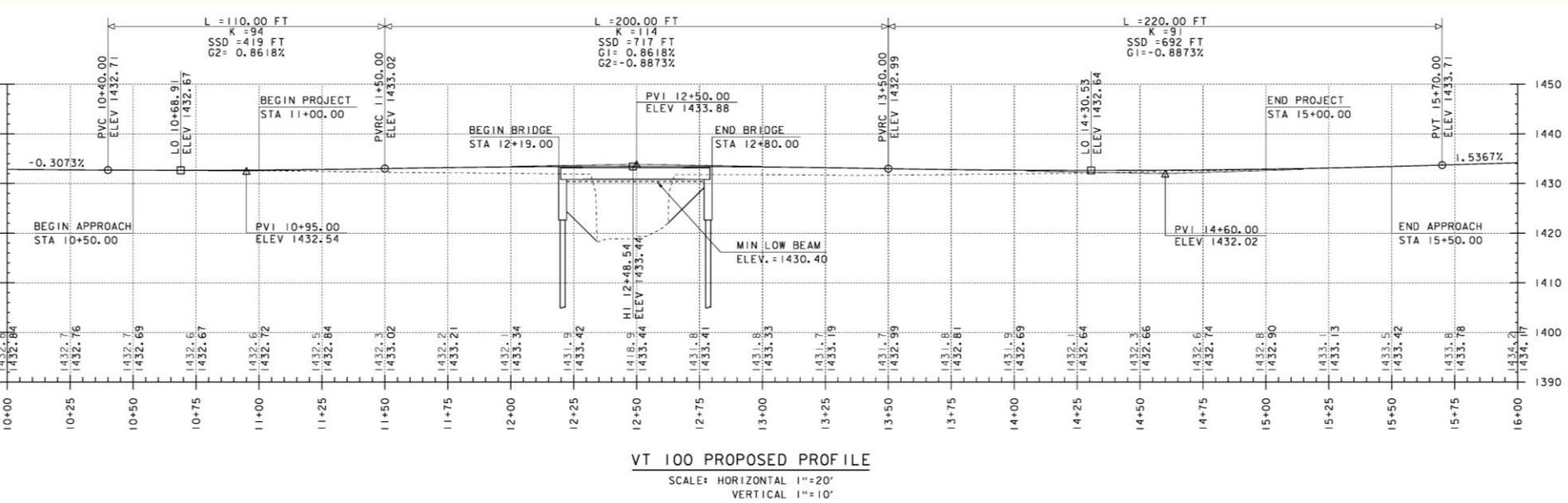
Bridge Typical



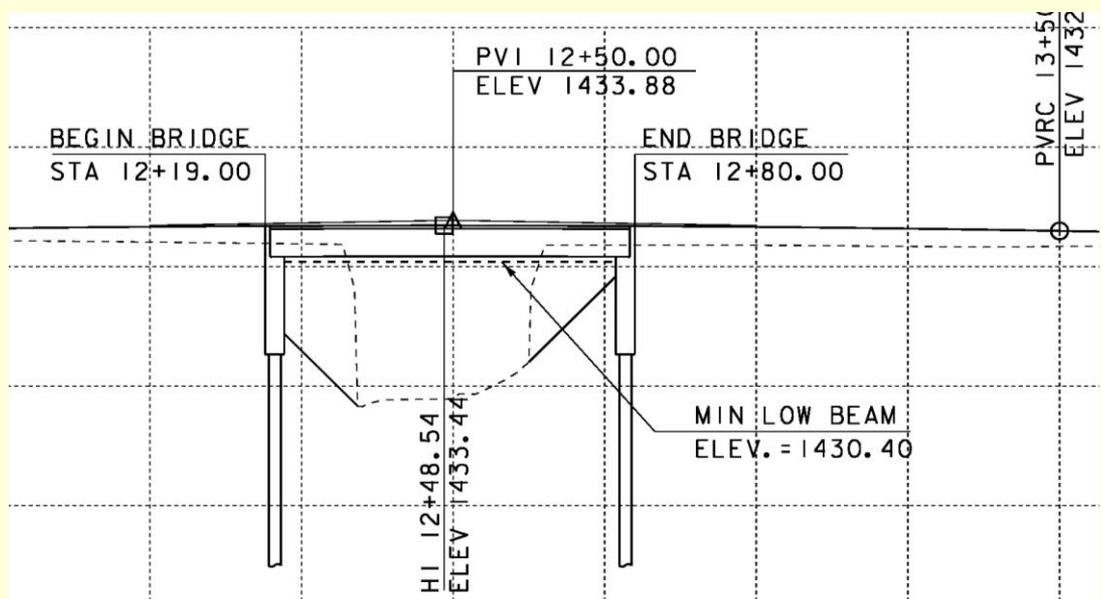
Full Replacement Layout



Full Replacement Profile



**Enlarged view
of bridge**



Methods to Maintain Traffic

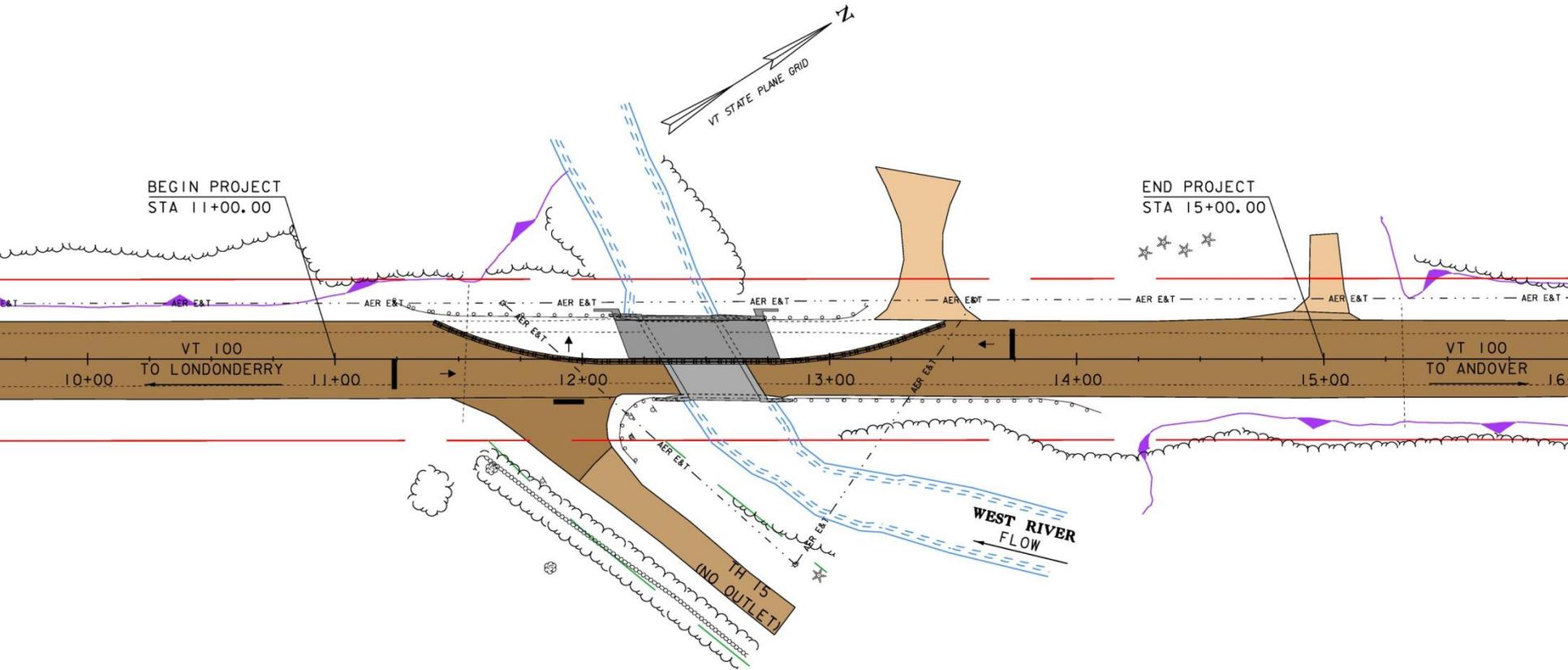
Three general methods available:

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

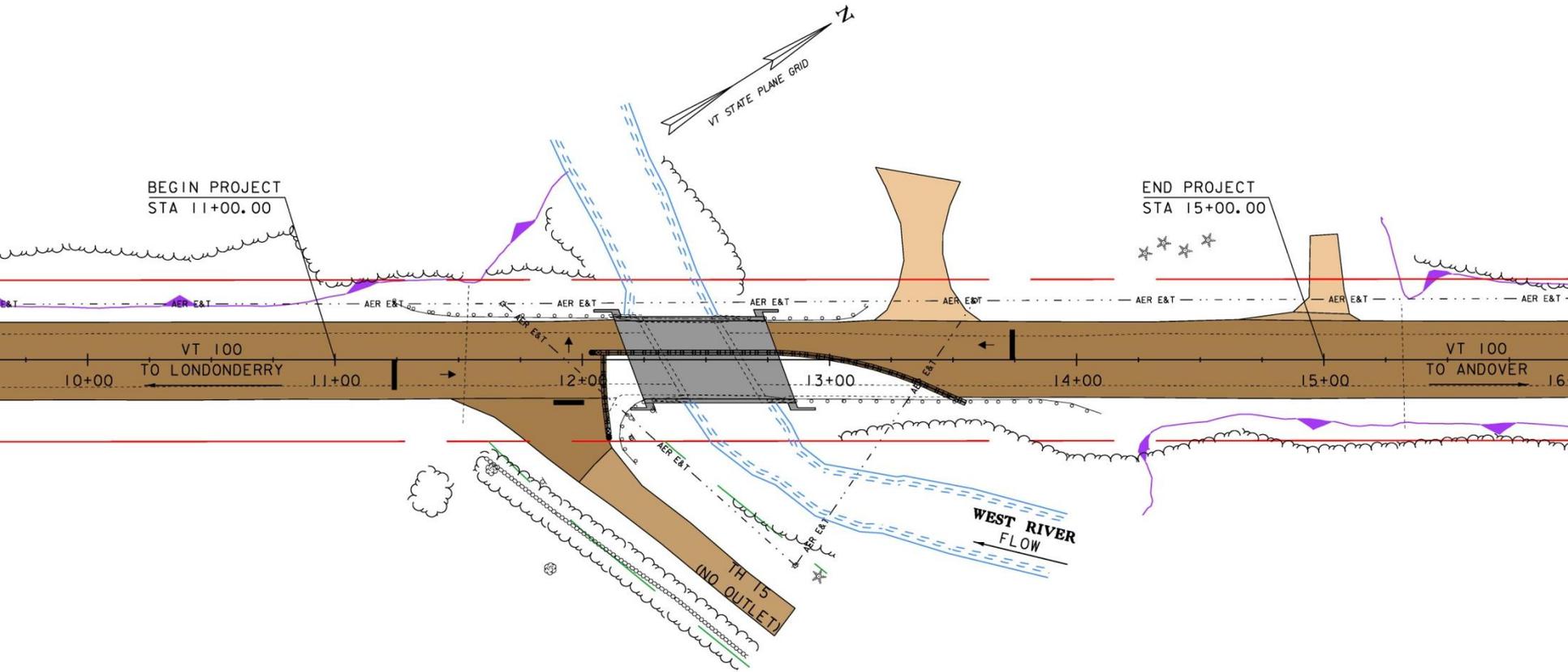
Phased Construction Option

- 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-

Layout of Phase 1



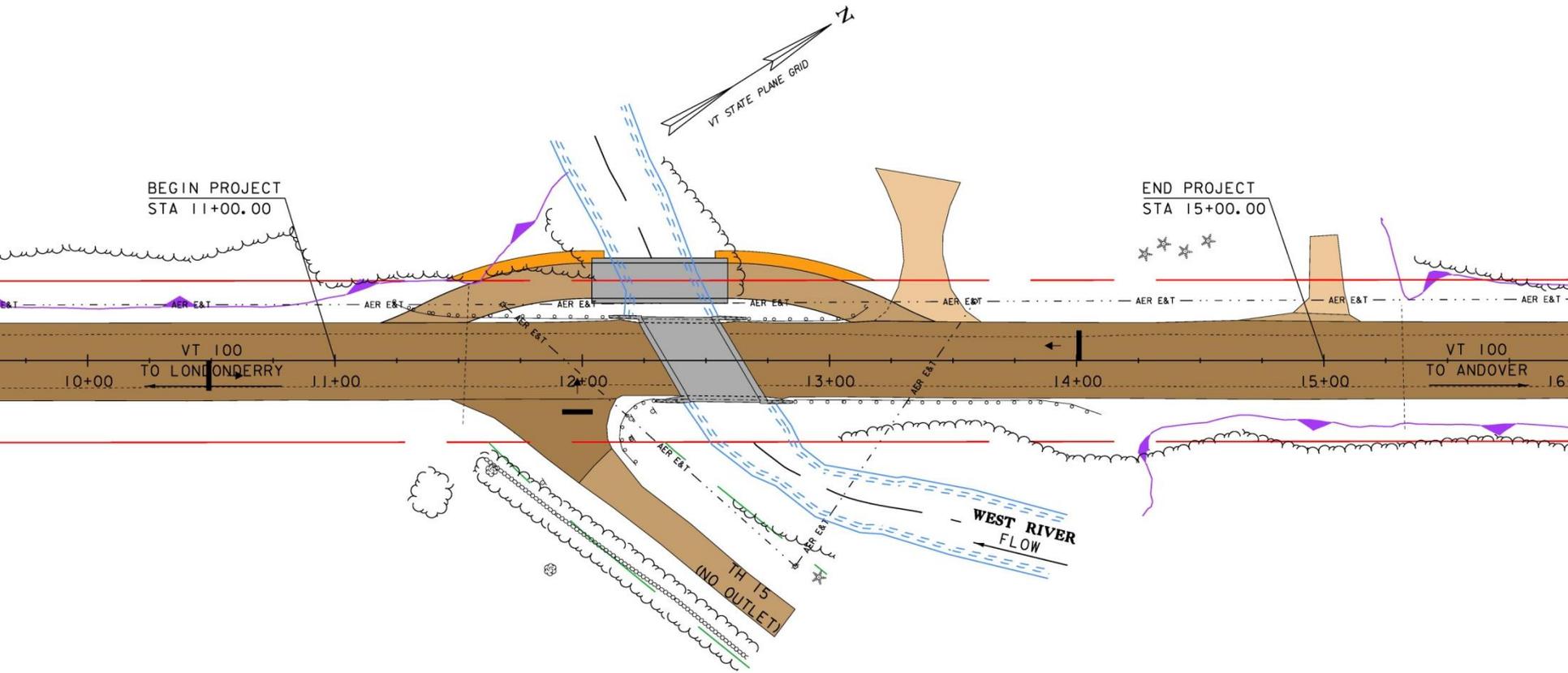
Layout of Phase 2



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-

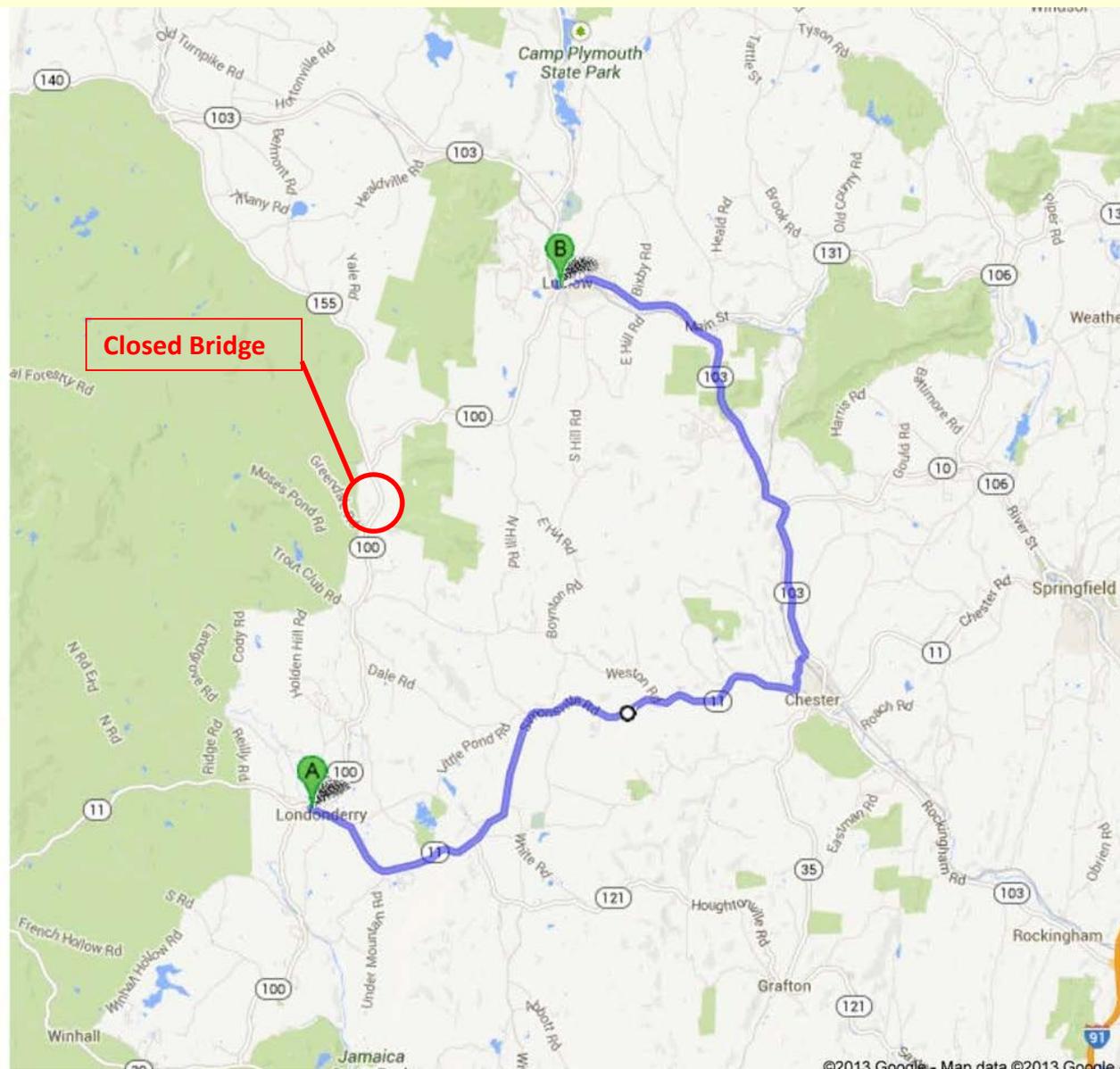
Temporary Bridge - Downstream



Accelerated Bridge Construction with Bridge Closure Option

- Bridge 98 to be closed for 28 days (maximum)
- Allow 24/7 construction during bridge closure
- Contract incentives/dis-incentives to encourage contractor
- Contractor will receive more \$ if closure is less than 28 days
- 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: 15.5 Miles
A to B on Detour Route: 27.5 Miles
Added Miles: 12 Miles
End to End Distance: 43 Miles

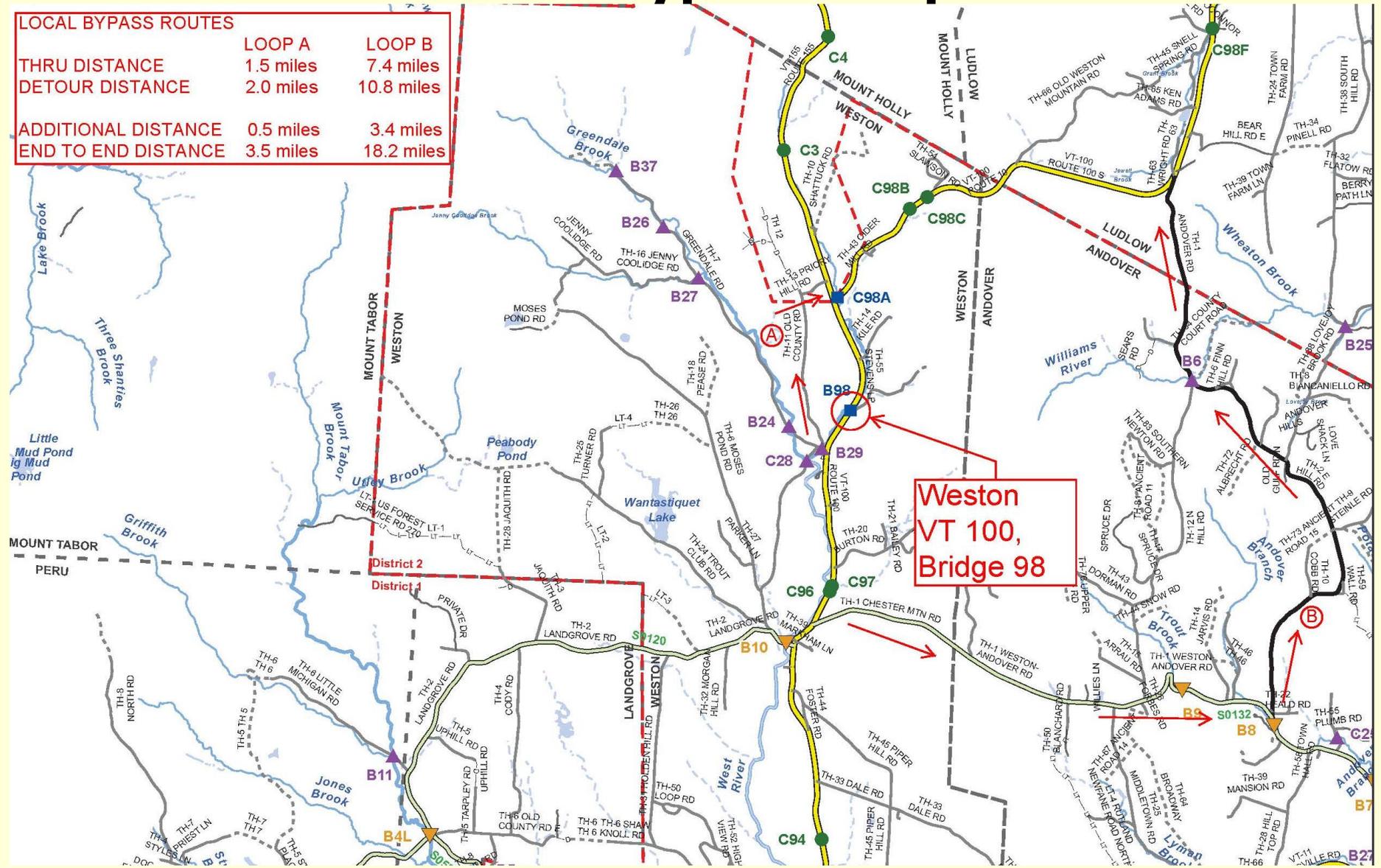
Major Factors
Added Miles: 12
Traffic Volume: 1,900 vpd
Duration: 4 weeks

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

LOCAL BYPASS ROUTES		
THRU DISTANCE	LOOP A 1.5 miles	LOOP B 7.4 miles
DETOUR DISTANCE	2.0 miles	10.8 miles
ADDITIONAL DISTANCE	0.5 miles	3.4 miles
END TO END DISTANCE	3.5 miles	18.2 miles



**Weston
VT 100,
Bridge 98**

Alternatives Matrix

	Replacement w/ Off-Site Detour	Replacement w/ Temporary Bridge	Replacement w/ Phased Construction
Construction w/ CE + Contingencies	\$1,197,000	\$1,419,600	\$1,390,000
Preliminary Engineering	\$299,000	\$355,000	\$348,000
Right of Way	\$0	\$110,000	\$0
Total Project Cost	\$1,496,000	\$1,884,600	\$1,738,000
	Base	26% over Base	16% over Base
Design Life	80 Years	80 Years	80 Years
Project Development Duration	2 years	4 years	2 years
Construction Duration	5 months	12 months	8 months
Closure Duration	4 weeks	None	None

Conclusion and Recommendation

Structure Type

Full Bridge Replacement

- All design standards are met
- Cost effective
- Long term (80 year) fix

Traffic Maintenance Method

Bridge closure w/ off-site detour & ABC

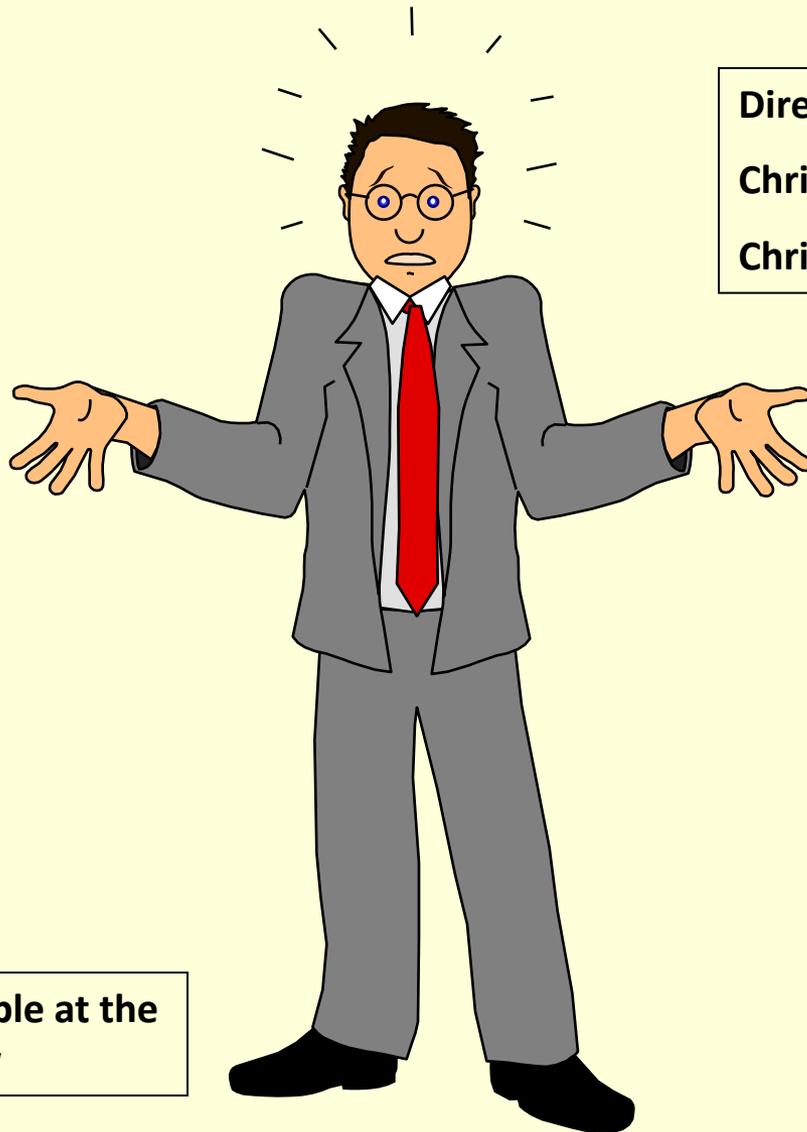
- Project Development time minimized
- Lowest cost alternative
- Safest alternative
- Least community impacts

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.
Chris.Williams@State.VT.US

**This presentation is available at the
web address shown below**

<https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/13B076>