Richford BRF 0302(29)
Bridge 6 on FAS 0302 (TH 3) over Berry Brook
Alternatives Presentation

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

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PROJECT LOCATION

FAS 302 BR 6

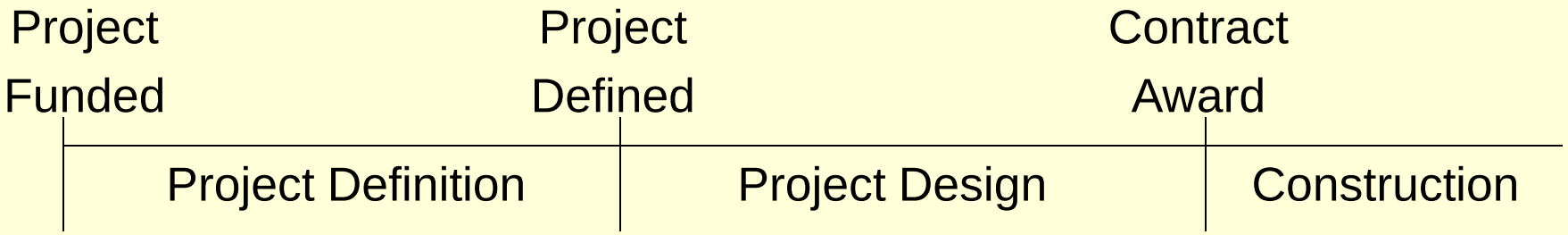
Meeting Outline

- 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 -

Phases of Development



Identify resources & constraints

Evaluate alternatives

Public Participation

Build Consensus

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

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

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 PM to continue Project Design phase -

Project Background

- **Priority 14** in the Town Highway Bridge Program
- The structure is owned and maintained by the Town
- FAS 302 (TH 3) is a Class 2 Town Highway
- Existing bridge is a single-span concrete T-beam bridge
- Span of 24 feet and width of 21 feet
- The bridge was built in 1900 (113 years old)
- Bridge is structurally deficient and has a Federal sufficiency rating of **70.8 (out of 100) -**

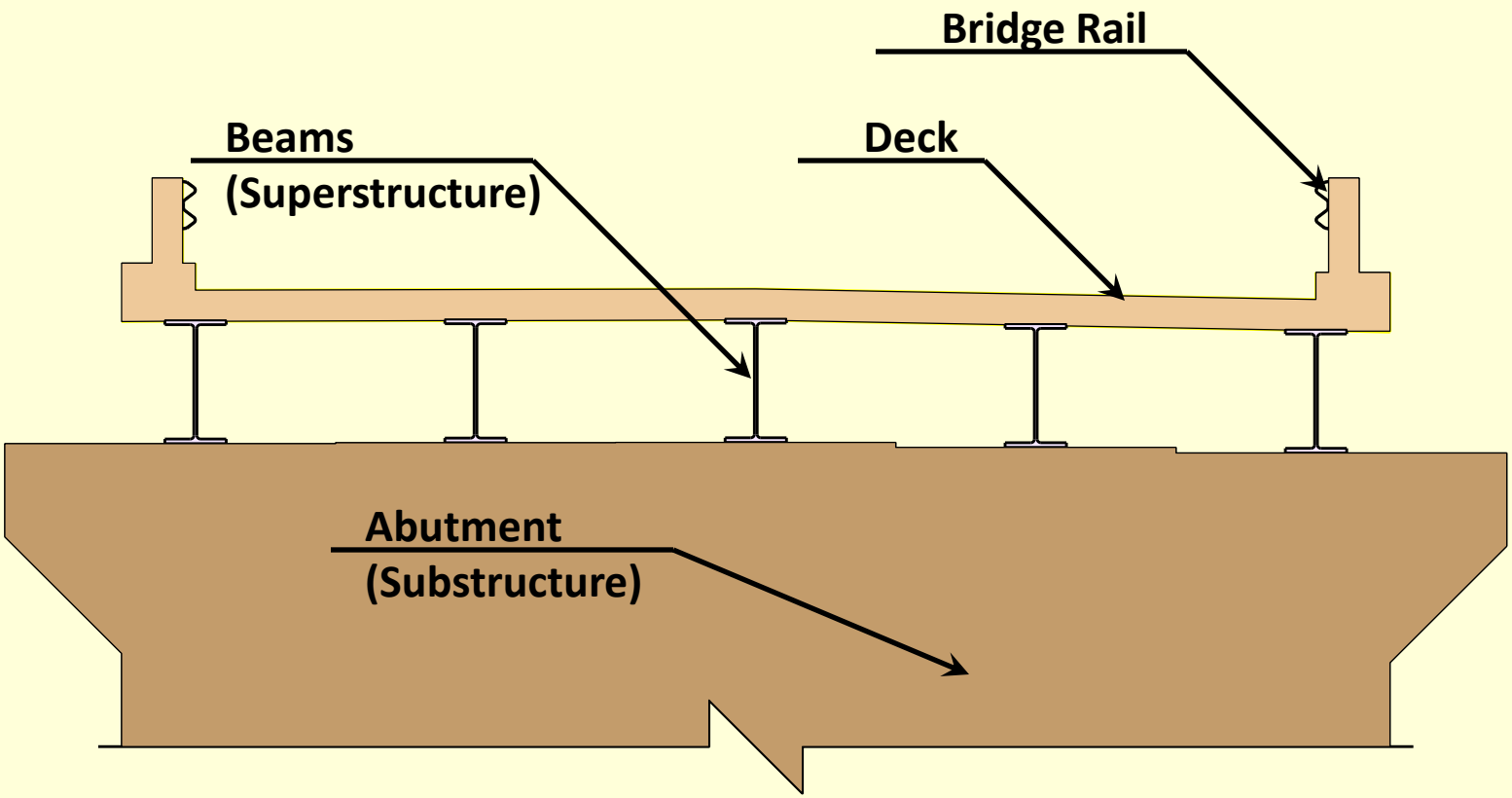
Project Background (Cont)

- Traffic Data

	2015	2035
AADT	**830**	**880**
DHV	**120**	**120**
ADTT	**120**	**160**
%T	**13.9**	**17.5**

- Design speed = 50 mph

Description of Terms Used



EXISTING BRIDGE DEFICIENCIES

Inspection Report Information (Based on a scale of 9)

Bridge Deck Rating	**7 Good**
Superstructure Rating	**6 Satisfactory**
Substructure Rating	**6 Satisfactory (was 4 before scour work)**

Deficiencies

- **Width of bridge and roadway approaches is substandard**
- **No approach guardrail leading to the bridge rail**
- **Scour and undermining issues on the south abutment**
- **Bridge does not meet hydraulic requirements**

Looking North

Looking South

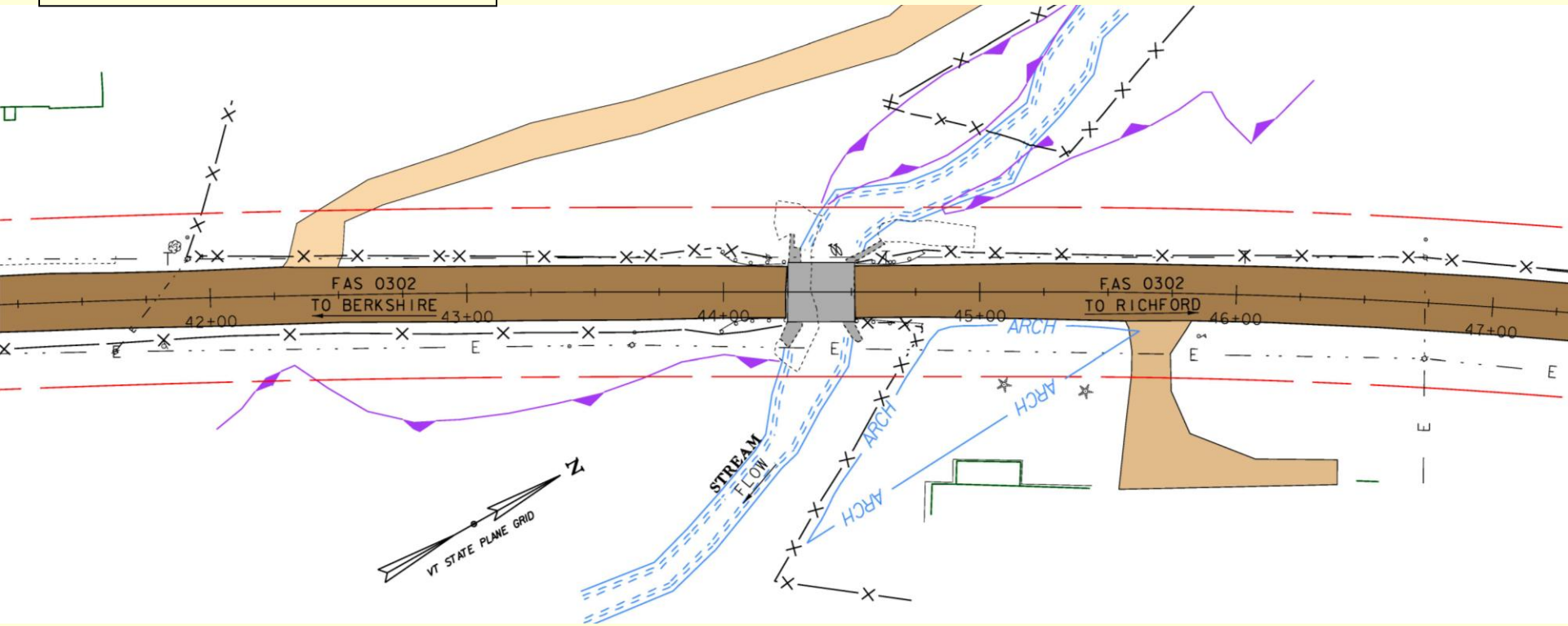
South Abutment at Upstream (West) side

South Abutment - Footing

North Abutment

Layout Showing Constraints

Constraints
Right-of-Way (4 rods)
Houses
Wetlands
Archeology
Aerial Utilities



Alternatives Considered

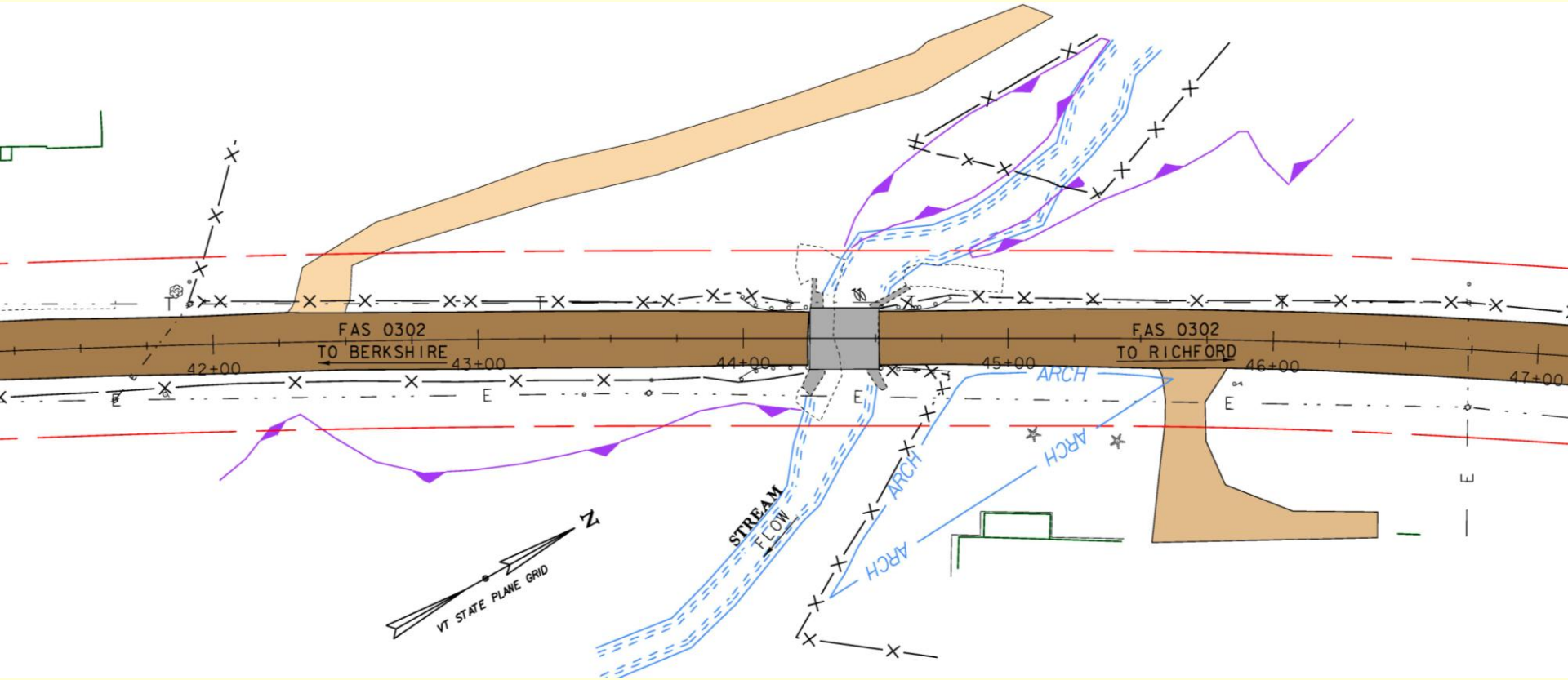
1. Preventive Maintenance
2. Full Bridge Replacement

Note: The method to maintain traffic during construction will be considered separately once the recommended alternative has been identified

Alternative 1
Preventive Maintenance Details

- Place a concrete apron in the stream at the south abutment down to 4 feet below stream bed to protect against undermining
- Hydraulic standards would not be met
- Existing bridge width would remain substandard
- Would require future monitoring for scour
- Expected 20 year life expectancy

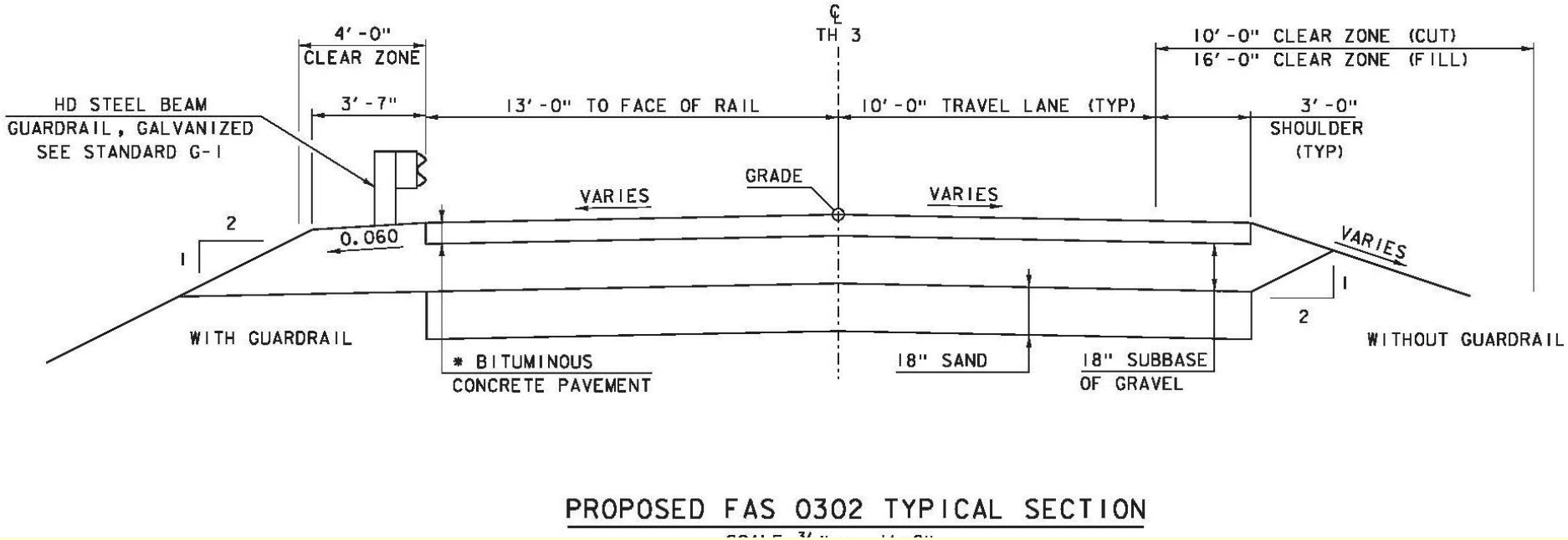
Alternative 1
Preventive Maintenance Plan



Alternative 2
Full Replacement Details

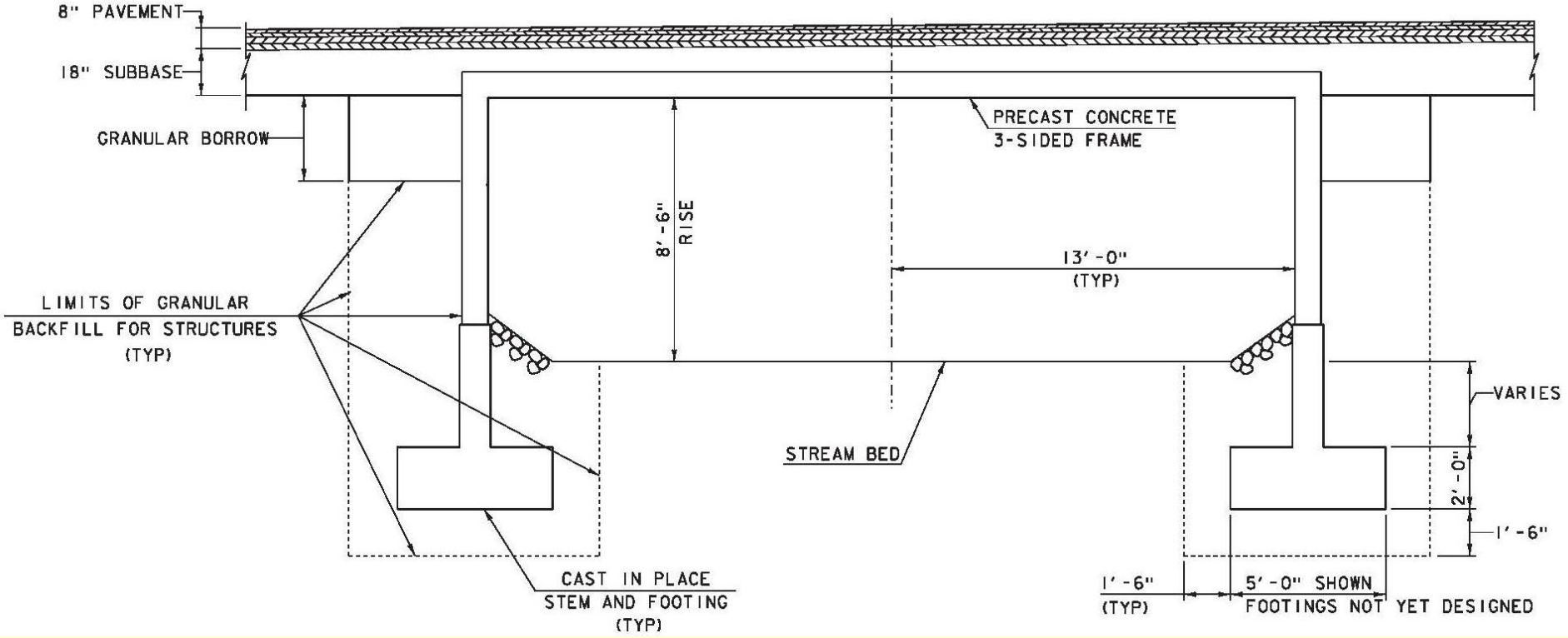
- Increase clear span to 26 feet
- Increase bridge rail-rail width to 26 feet (3’-10’-10’-3’)
- Precast 3-sided frame or arch proposed
- All substandard features would be eliminated
- All work would remain inside existing Right-of-Way
- Long-term 80 year fix

Proposed Roadway Section

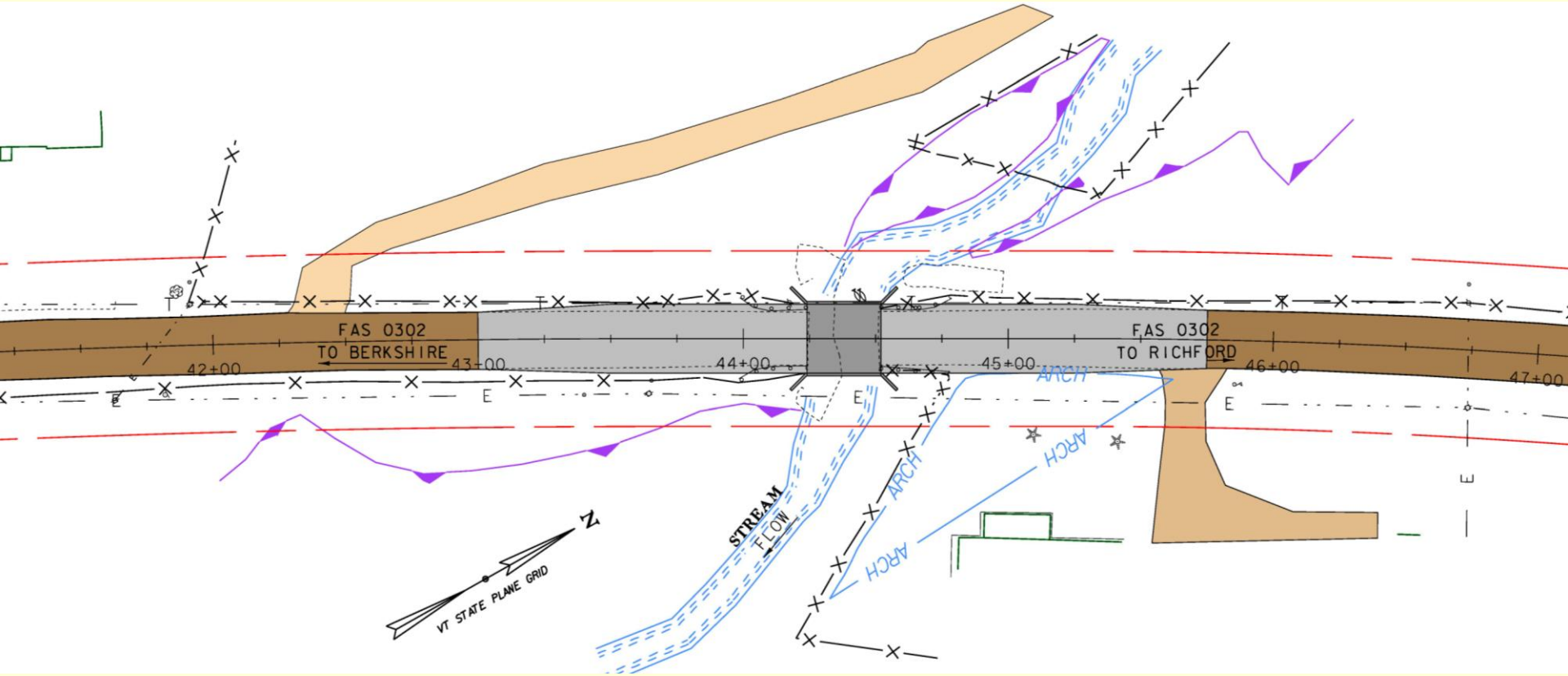


PROPOSED FAS 0302 TYPICAL SECTION

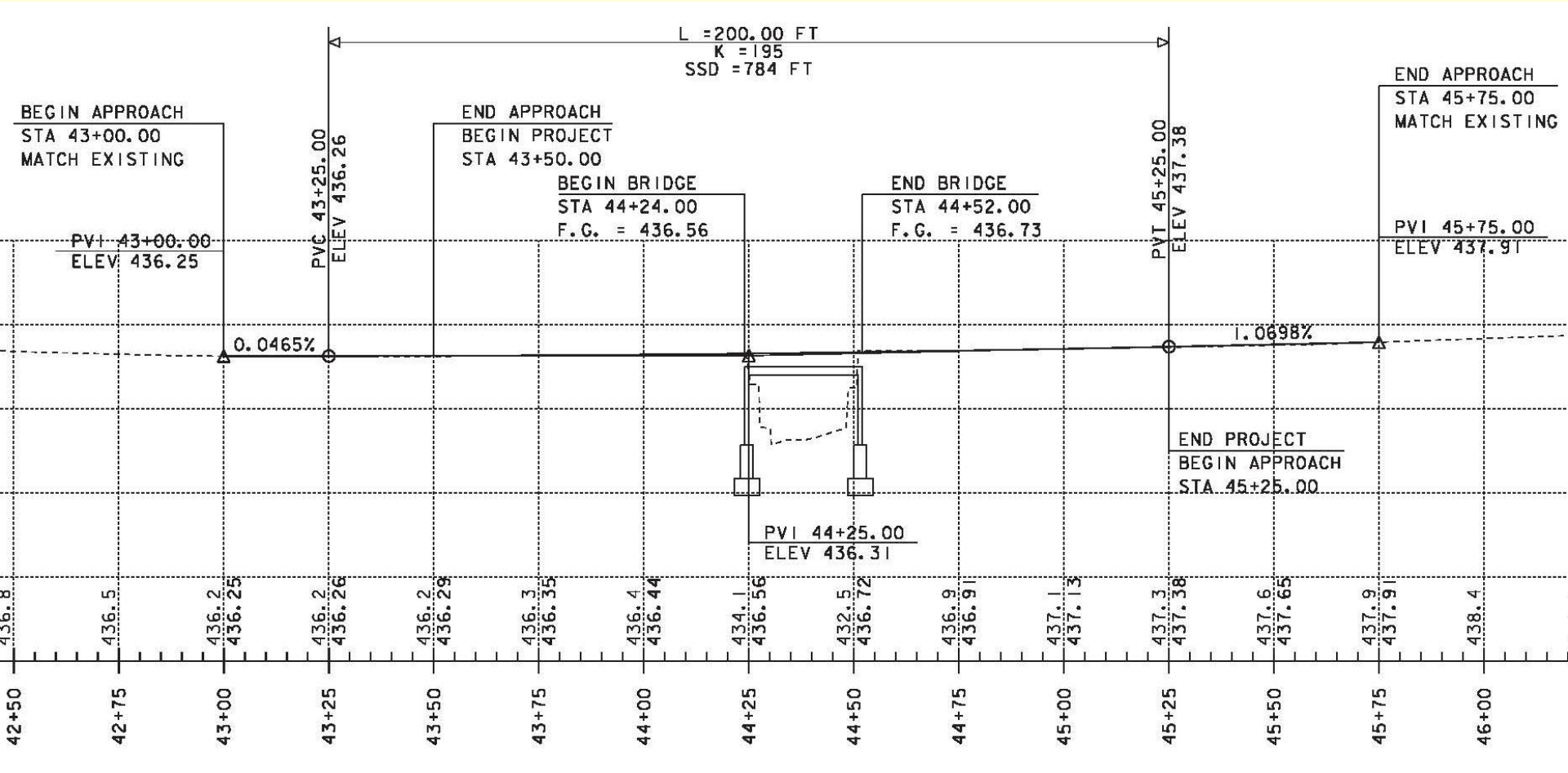
Proposed Bridge Section



Alternative 2
Full Replacement



Alternative 2
Profile



Recommendation on Alternatives

- VAOT recommends Alternative 2
- Complete bridge replacement warranted
- Good funding sources from Federal/State (90-95%)
- Long-term fix

Methods to maintain traffic will be based on recommended alternative

Methods to Maintain Traffic

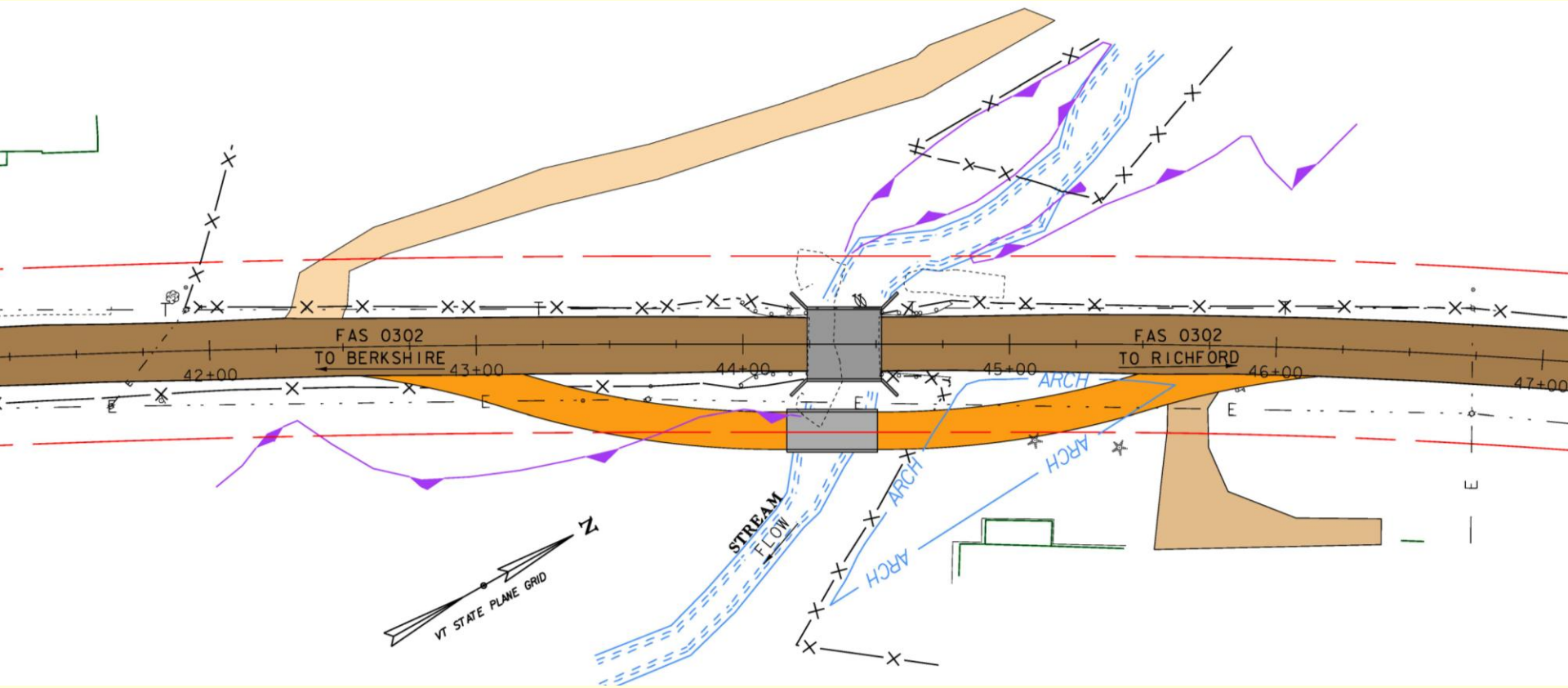
- Phased Construction
- Temporary Bridge
- Bridge Closure with off-site detour

Phased Construction Option

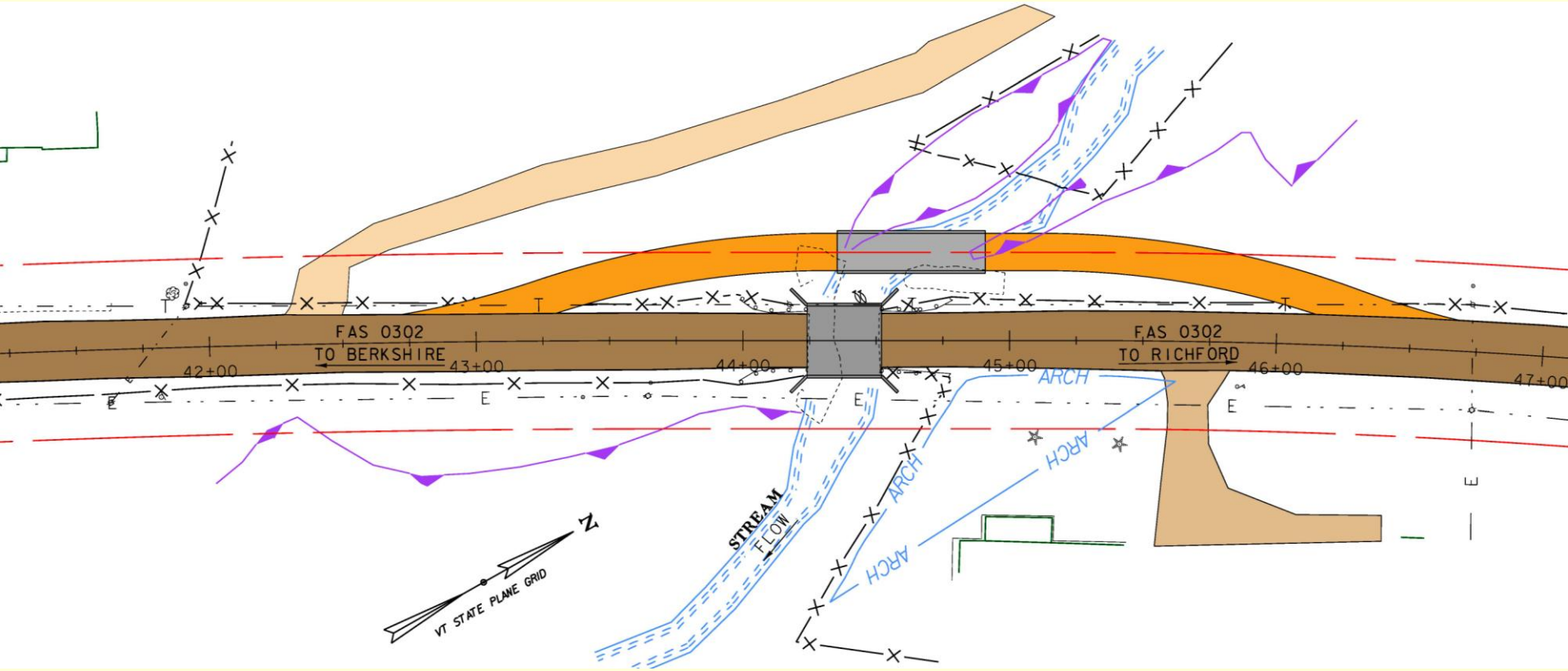
- Build half new bridge while traffic is on half of old bridge
- One-Way alternating traffic (no lights required here)
- Queue lengths and queue times can be inconvenient
- Access to side drives/buildings needs to be considered
- Relatively long construction duration
- Workers & motorists in close proximity
- Can usually be done without ROW acquisition

Phased construction ruled out due to width of existing bridge. Would require building a wider bridge than necessary or shifting the roadway alignment

Temporary Bridge Option Downstream



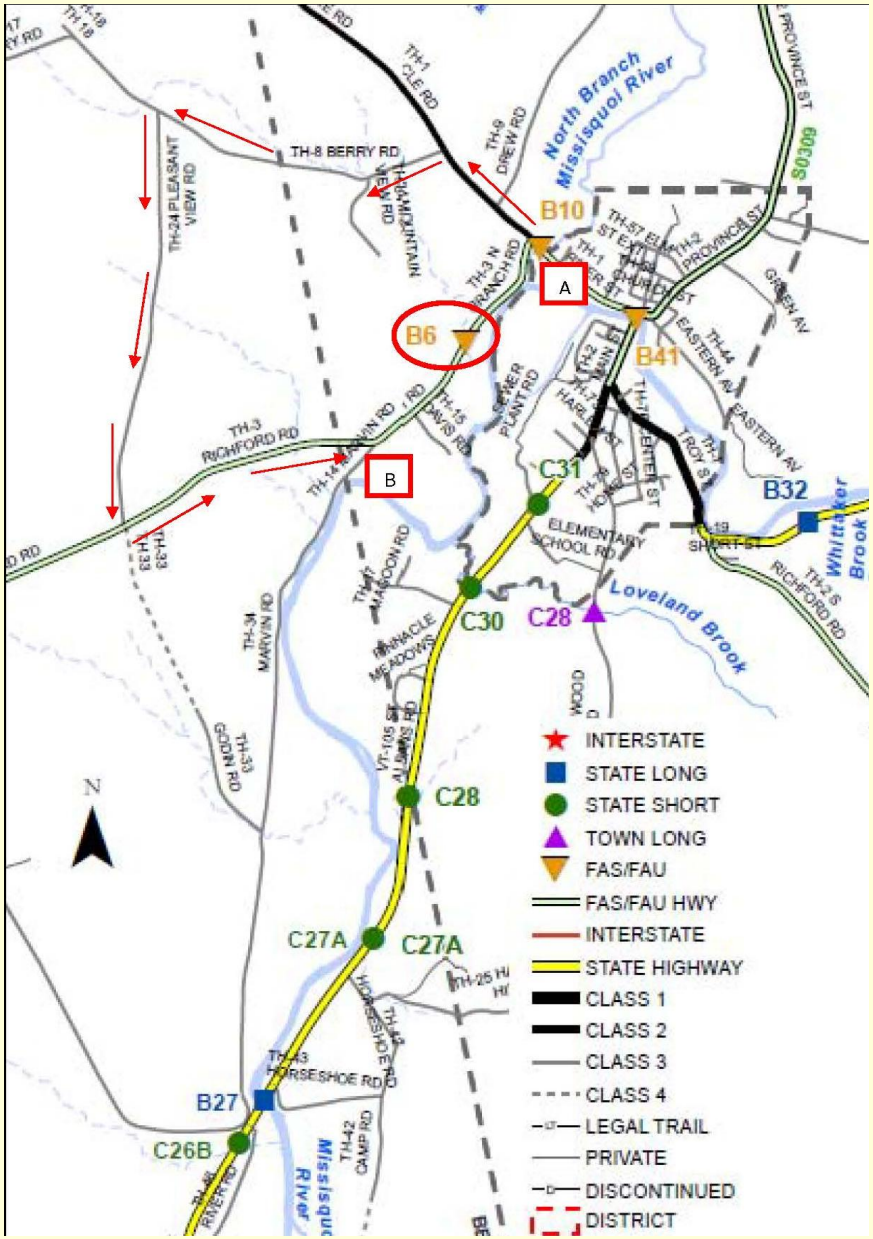
Temporary Bridge Option Upstream



ABC with Bridge Closure Option

- Bridge 6 to be closed for 28 days (maximum)
- 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)
- Town will be responsible for detour route (location, signing, installing, maintaining)
- Public Outreach to provide advance notice for planning
- Local share will be cut in half (10% reduced to 5%)-

Detour Map



Mileage Summary

A-B Thru = 1 miles

A-B Detour = 4.2 miles

Added Miles = 3.2 miles

End-End Dist. = 5.2 miles

Major Factors

Traffic Volume = 830

Added Miles = 3.2 miles

Duration = 4 weeks

NOTE: There are other possible detour routes. The Town is responsible for choosing the best route.

Alternatives Matrix

	Preventive Maintenance	Replacement w/ ABC and off-site detour	Replacement w/ Temporary Bridge
Maintenance of Traffic	$31,000	$105,000	$245,000
Construction w/ CE + Contingencies	$170,745	$701,732	$964,982
Preliminary Engineering	$52,537	$188,928	$222,688
Right of Way	$0	$0	$89,075
Total Cost (Rounded)	**$223,300**	**$890,700**	**$1,276,700**
Town Share	**$11,200 (5%)**	**$44,500 (5%)**	**$127,700 (10%)**
Design Life	**20 Years**	**80 Years**	**80 Years**
Project Development Duration	1 year	2 years	>4 years
Construction Duration	2 months	3 months	18 months
Closure Duration	None	28 days	None
Mobility Impact Duration	None	28 days	8 months

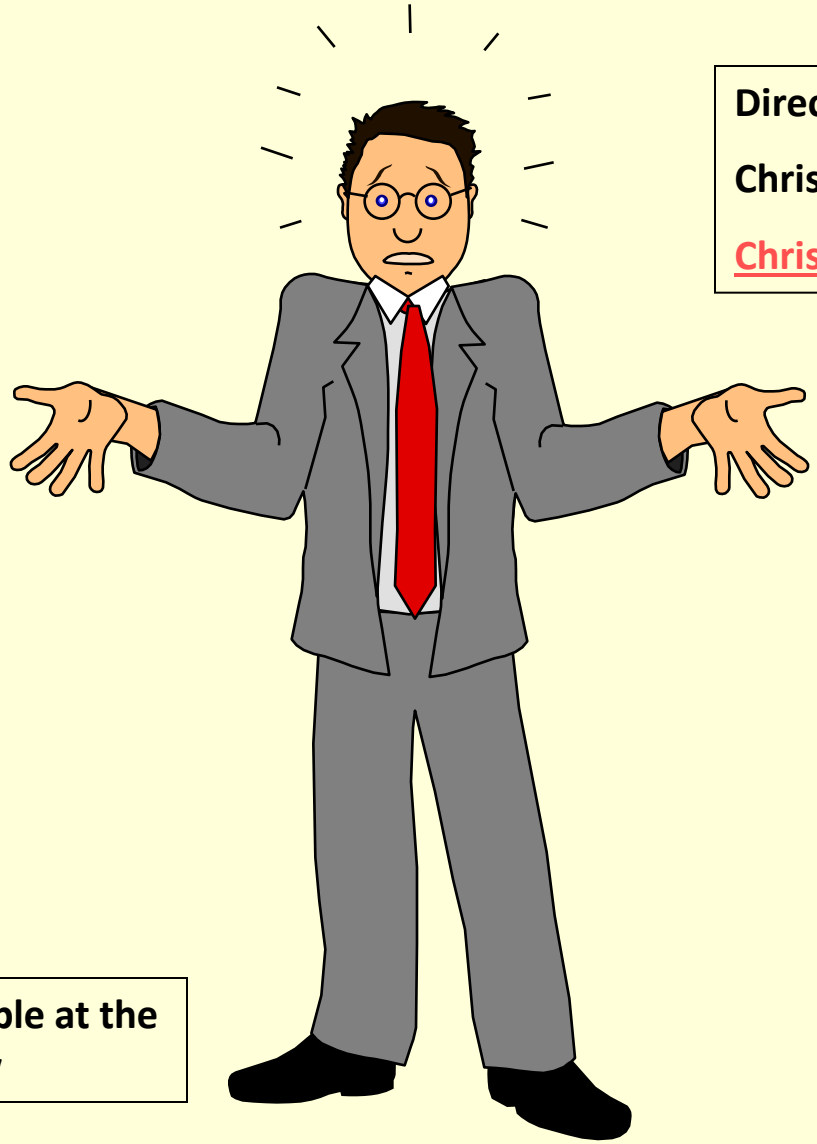
Conclusion and Recommendation

- Full bridge replacement using ABC & 28 day closure

The benefits of this approach are:

- Project delivery expedited
- Lower direct costs (Design, ROW and Construction)
- Minimal environmental impacts
- Minimal impact to adjacent property owners
- Improved safety for public and construction workers
- Long term 80 year fix
- Takes advantage of reduced local share -

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/12J158