Dover BF 013-1(20)
Bridge 59 on VT Route 100 over the Deerfield River
Regional Concerns Meeting

Presented by
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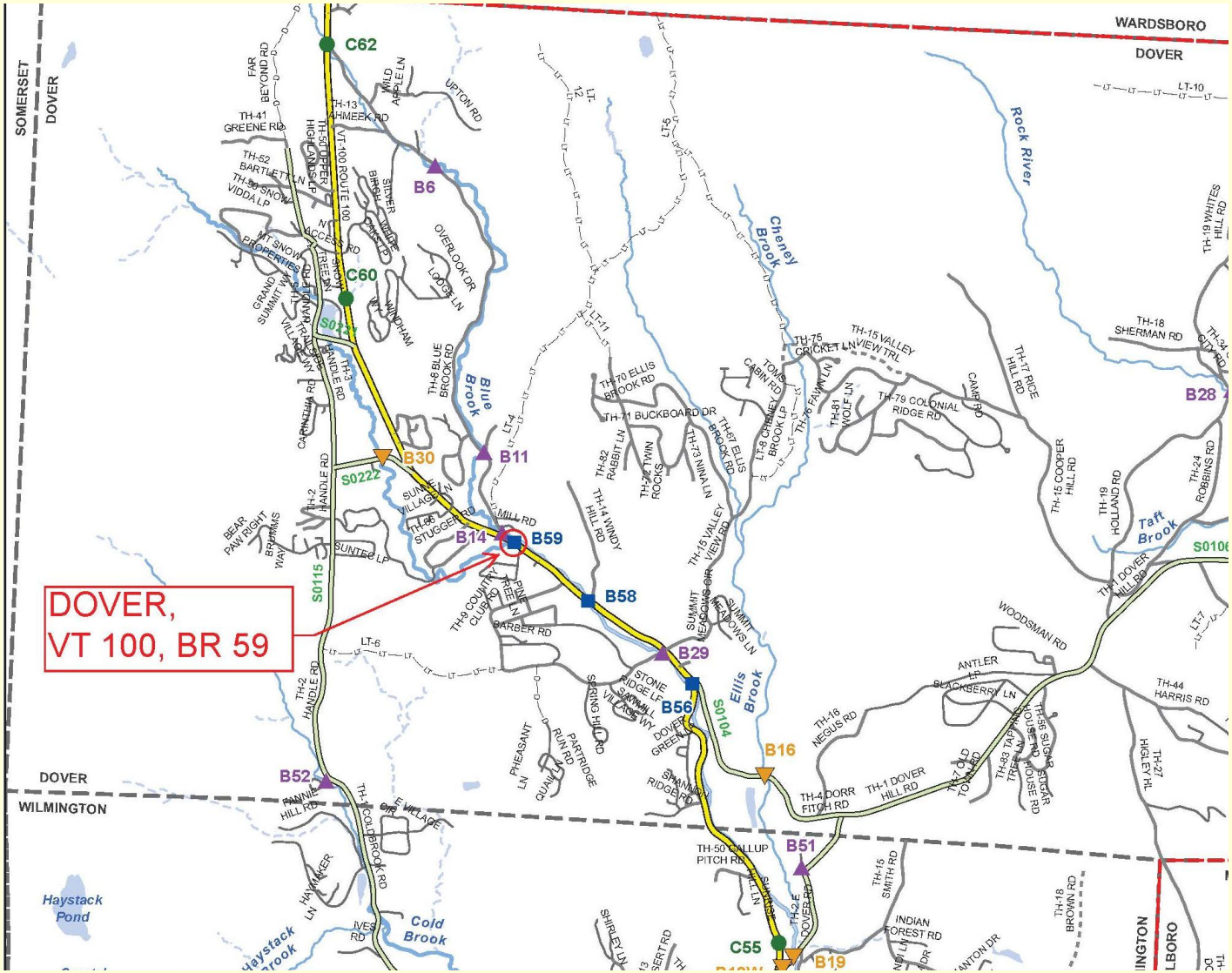
February 19, 2014

PROJECT LOCATION



Meeting Outline

- Purpose of the Meeting
- Accelerated Bridge Program
- 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

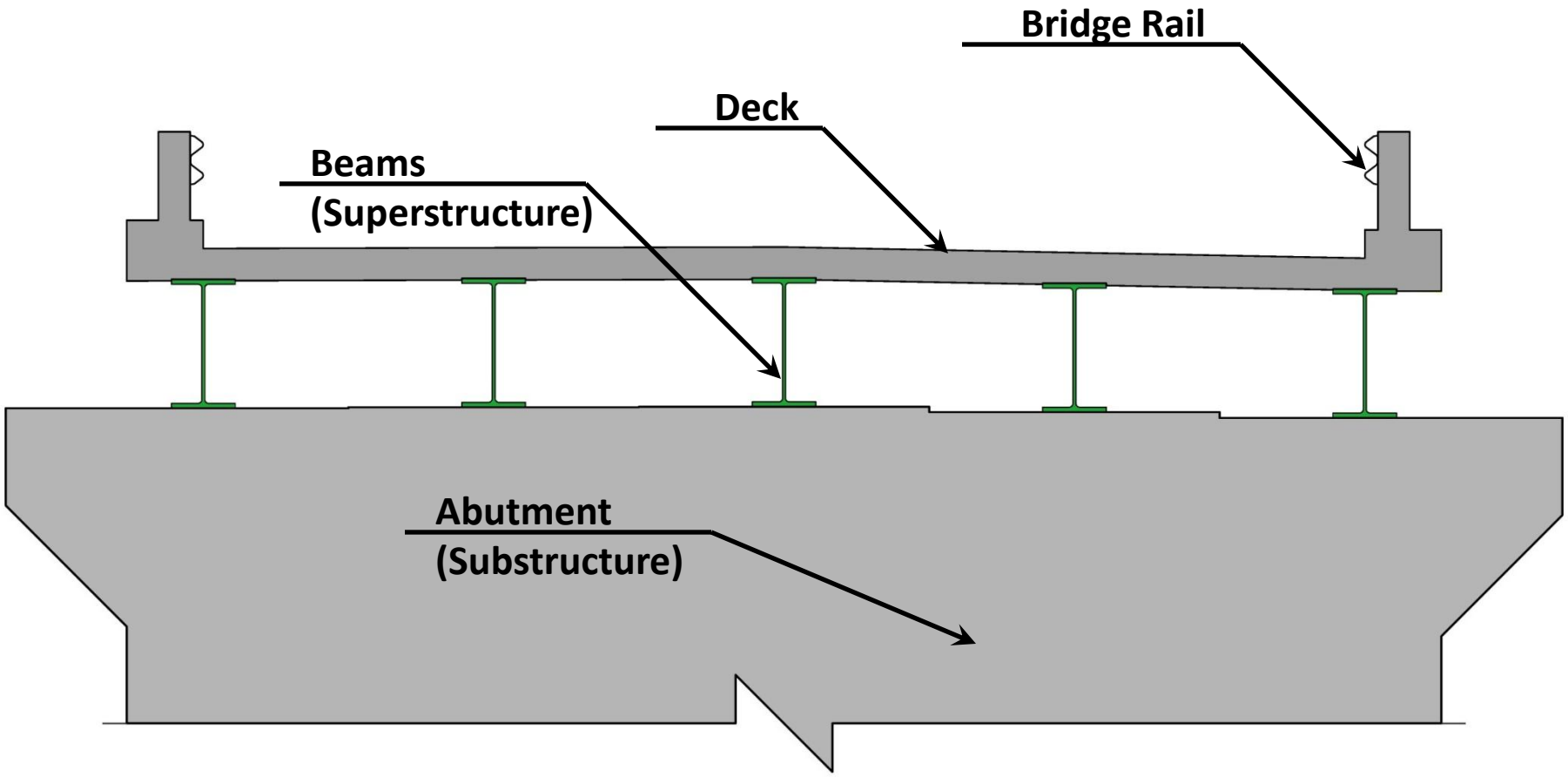
Evaluate alternatives

Public Participation

Build Consensus

- Quantify areas of impact
- Environmental permits
- Develop plans, estimate and specifications

Description of Terms Used



Cross Section of Bridge

Project Background

- The structure is owned and maintained by the State
- Funding will be 80/20 Federal/State (no local funds)
- Functionally labeled as a Rural Minor Arterial
- Posted Speed = 40 mph (Design Speed)
- Existing bridge is a single-span concrete T-beam that was widened with concrete slab in 1978
- Bridge length = 35 feet
- Bridge Width = 35 feet
- The bridge was built in 1926 (88 years old)

Traffic Data

	“Current Year” 2016	“Design Year” 2036
Average Annual Daily Traffic	**4,900**	**5,200**
Design Hourly Volume	**890**	**950**
Average Daily Truck Traffic	**390**	**630**
%Trucks	**6.0**	**9.1**

EXISTING BRIDGE DEFICIENCIES

Inspection Rating Information (Based on a scale of 9)

Bridge Deck Rating	**4 Poor**
Superstructure Rating	**6 Satisfactory**
Substructure Rating	**6 Satisfactory**

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 a Poor deck rating**
- **The bridge railing does not meet current standards**
- **The bridge does not meet the hydraulic standards**

Looking north over Bridge

Looking south over Bridge

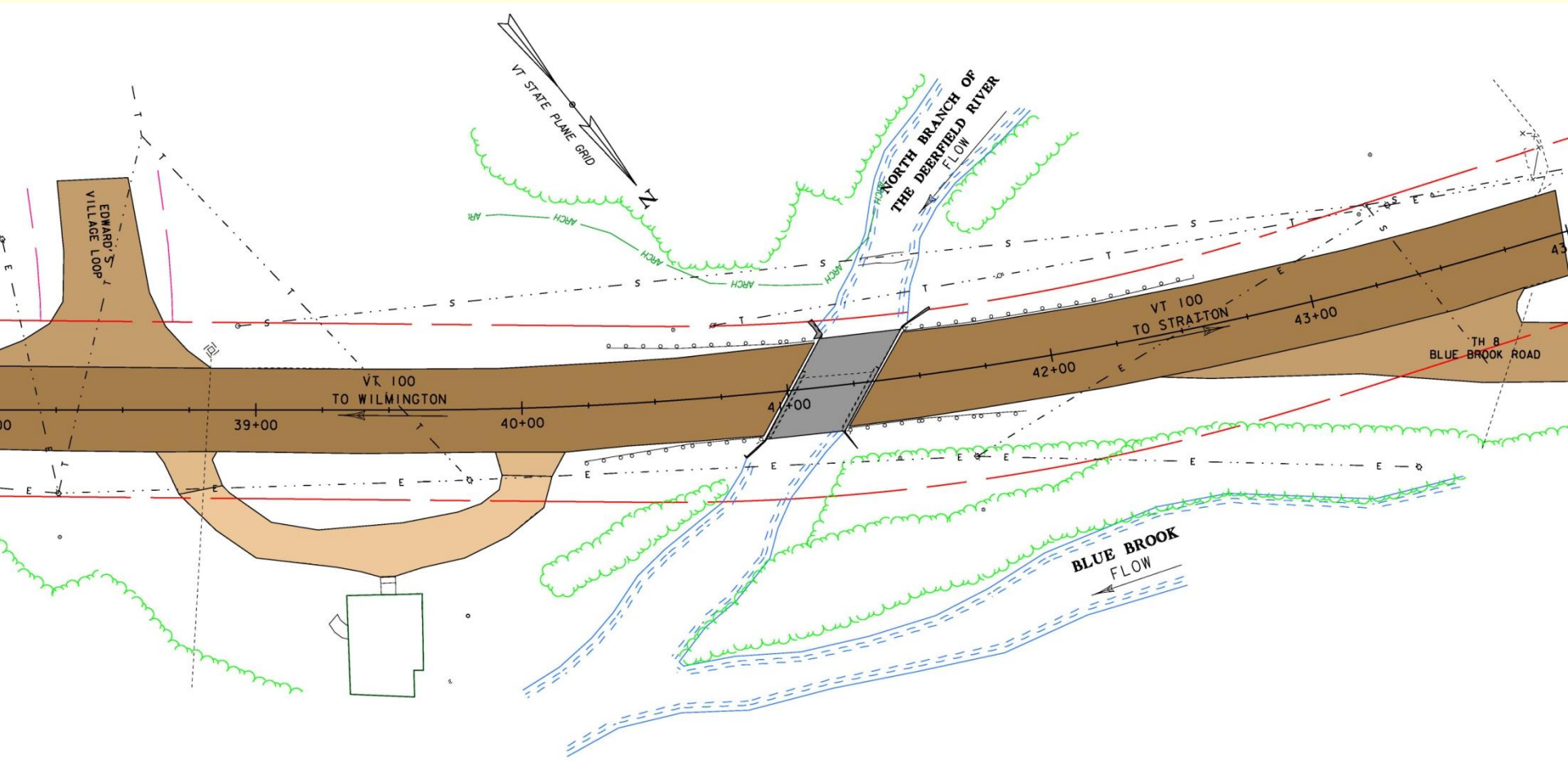
Failed downstream wingwall

Underside of Concrete Deck

Delamination in Underside of Concrete Deck

Layout Showing Constraints

Constraints present
- **Right of Way**
- **Archeological**
- **Utilities –Overhead & Underground**



Alternatives Discussion

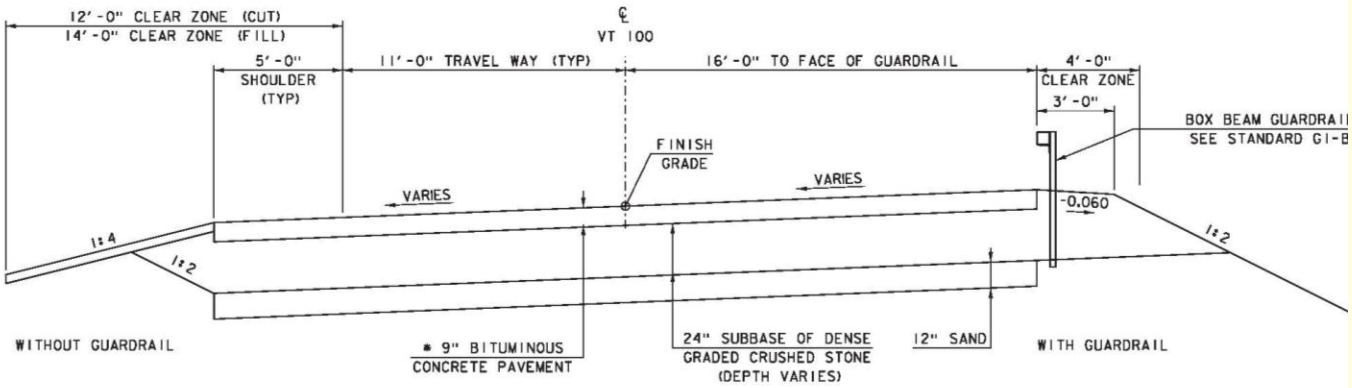
- Superstructure Replacement
- Full Bridge Replacement w/ 55’ span bridge
- Full Bridge Replacement w/ 65’ span bridge

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

Alternative 1
Superstructure Replacement Details

- 32’ width between face of railing (5-11-11-5)
- Replace superstructure but substructure would remain
- Rehabilitate or replace existing failed wingwall
- Maintain existing centerline of road (horizontal alignment)
- Maintain existing profile of road (vertical alignment)
- The bridge would remain hydraulically substandard
- Short-term (20 year) solution

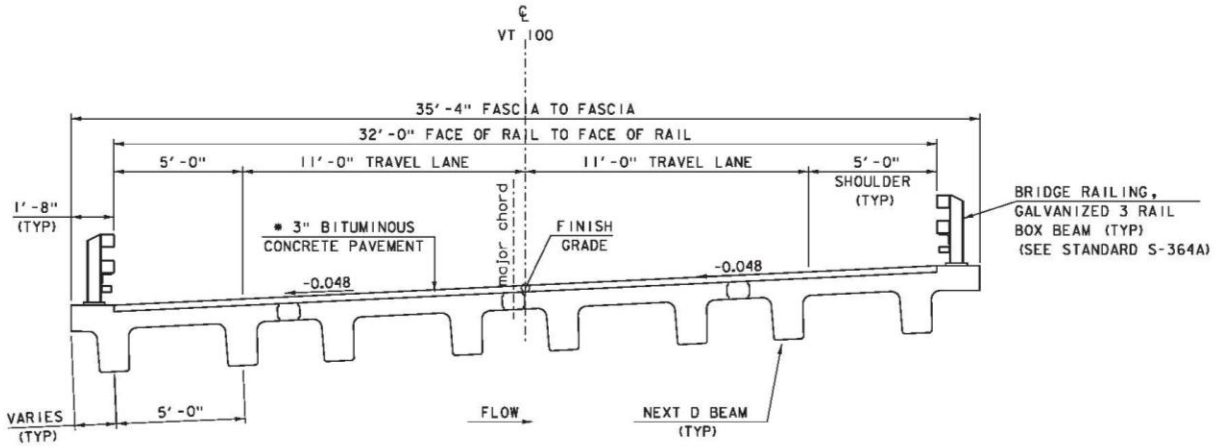
Typical Sections - Alternative 1



VT ROUTE 100 ROADWAY TYPICAL SECTION - ALTERNATIVE 1

SCALE: 3/8" = 1'-0"

* 1½" TYPE IVS OVER
1½" TYPE IVS OVER
3" TYPE IIS OVER
3" TYPE IIS

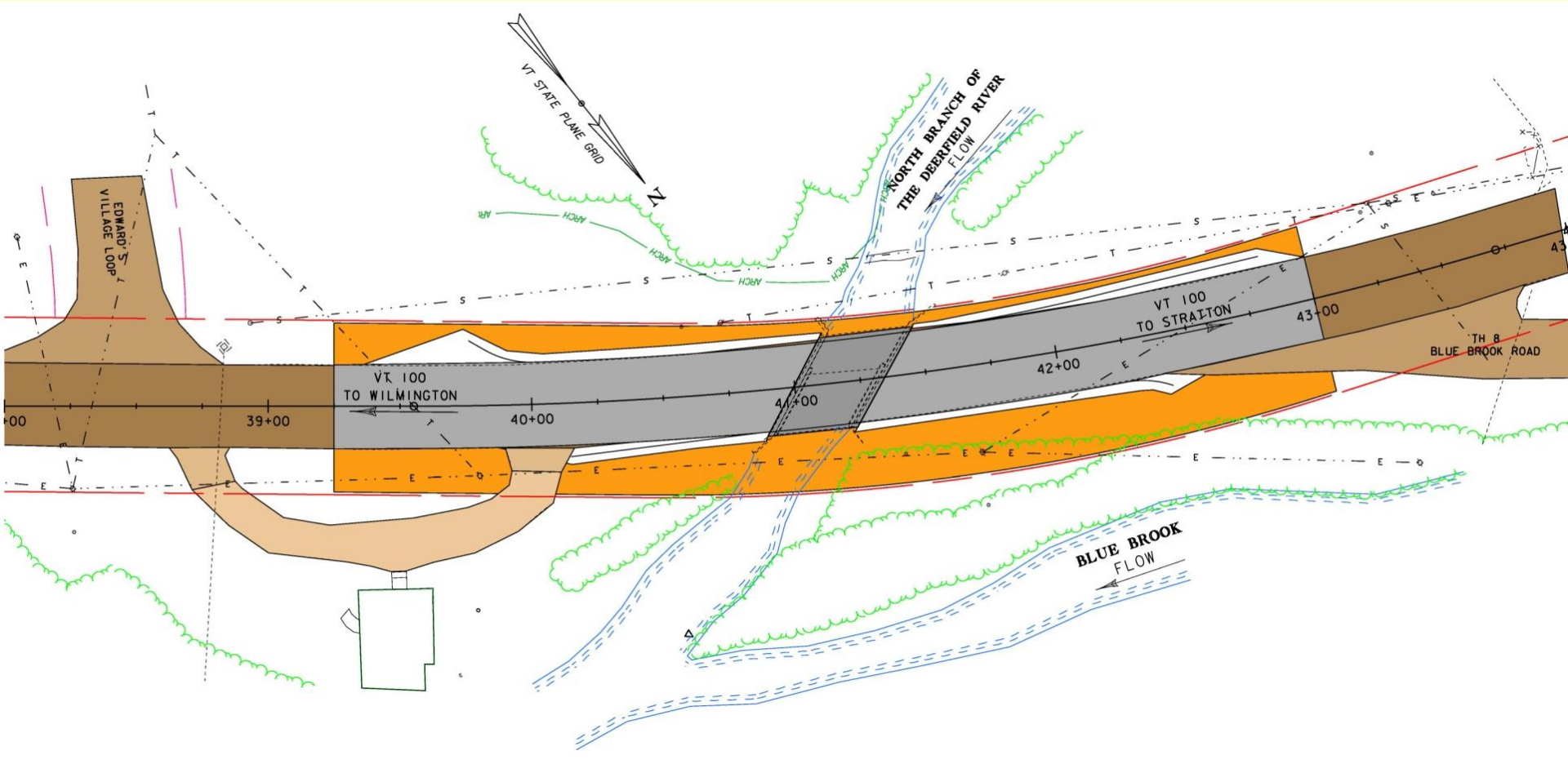


BRIDGE TYPICAL SECTION - ALTERNATIVE 1

SCALE: 3/8" = 1'-0"
ALL DIMENSIONS ARE RADIAL

* 1½" TYPE IVS OVER
1½" TYPE IVS

Layout – Superstructure Replacement



Alternative 2
55’ Span Replacement Details

- 34’ width between face of railing (6-11-11-6)
- Replace entire structure
- Increase span to 55’
- Maintain existing centerline of road
- Raise grade to meet the hydraulic standards
- Long term (80 year) solution

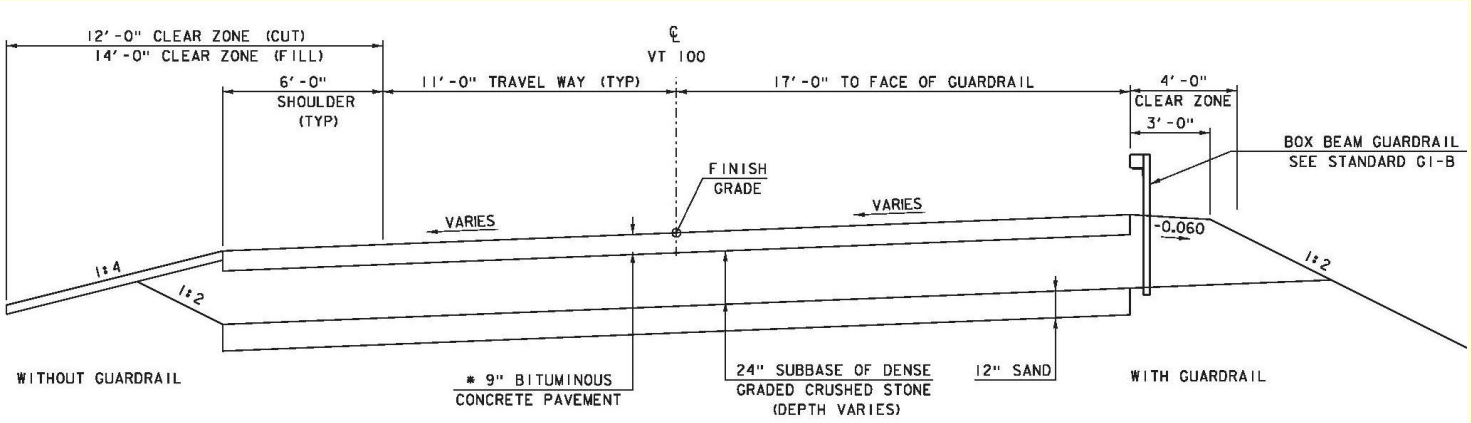
Pedestrian & Bicycle Accommodation

Local input asked for consideration for bikes/pedestrians

We consulted with the Vtrans Bike/Ped Program Manager

Due to the lack of sidewalks leading up to the bridge and the distance to the nearest shared-use path, appropriate bike/ped accommodation is provided in the 6’ shoulder

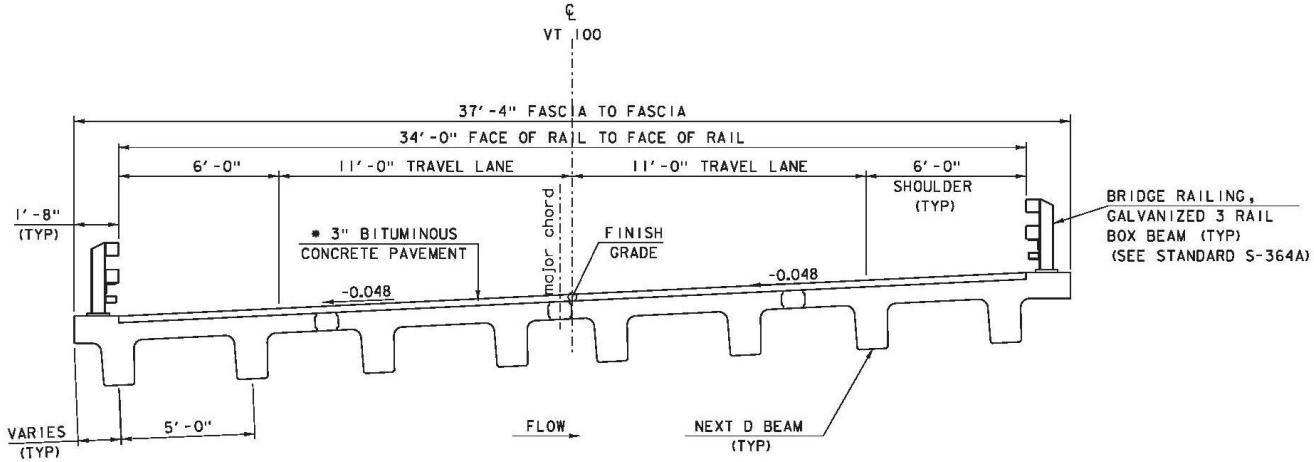
Typical Sections - Alternative 2



VT ROUTE 100 ROADWAY TYPICAL SECTION - ALTERNATIVE 2 & 3

SCALE: 3/8" = 1'-0"

* 1½" TYPE IVS OVER
1½" TYPE IVS OVER
3" TYPE IIS OVER
3" TYPE IIS



BRIDGE TYPICAL SECTION - ALTERNATIVE 2 & 3

SCALE: 3/8" = 1'-0"
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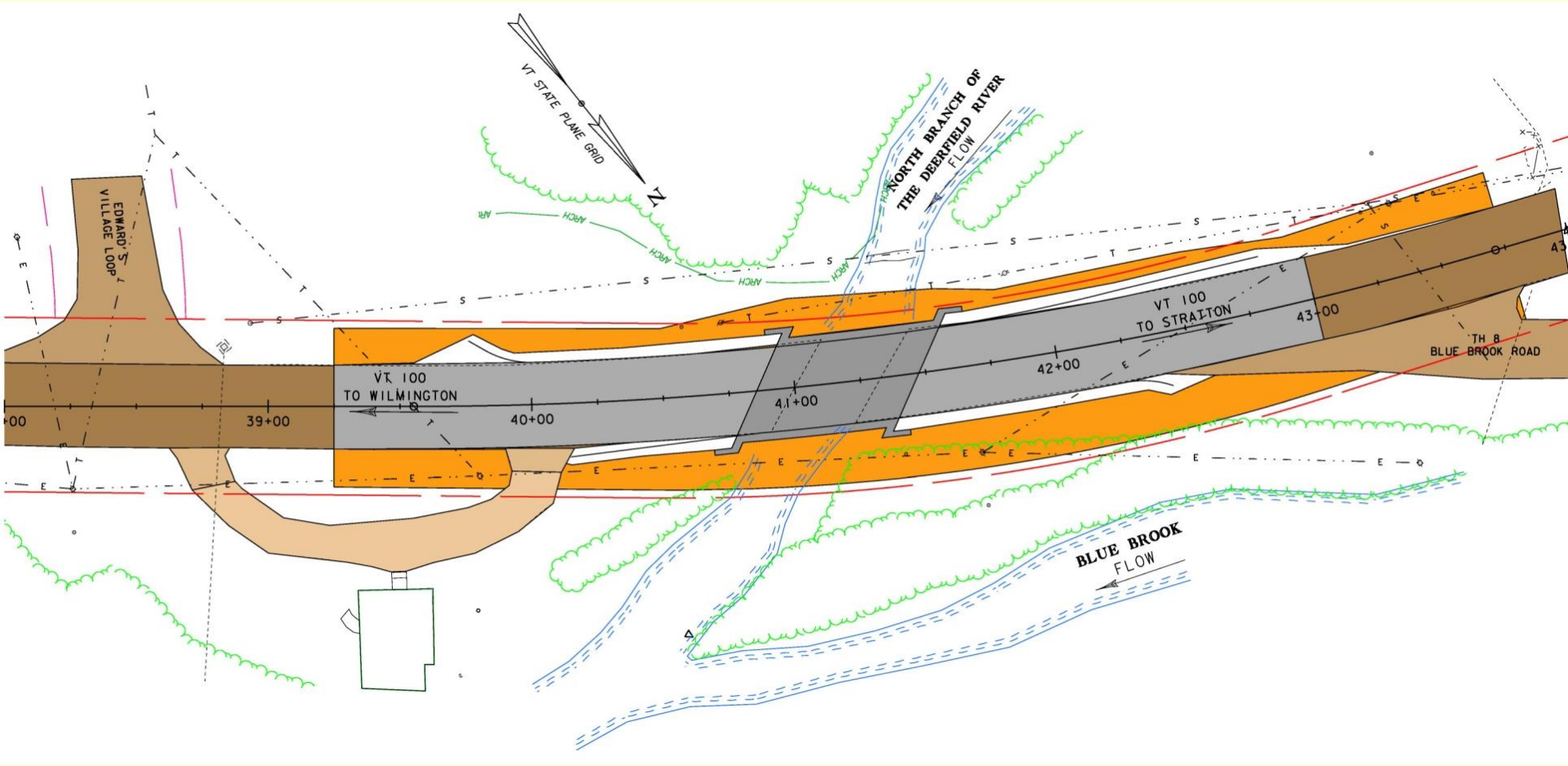
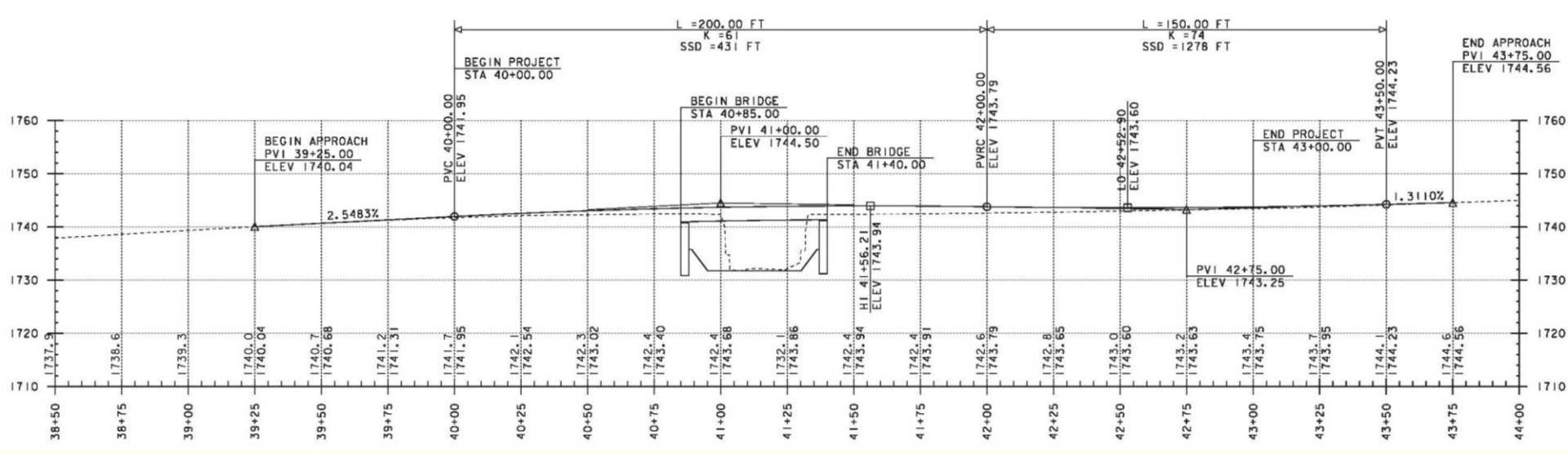
* 1½" TYPE IVS OVER
1½" TYPE IVS

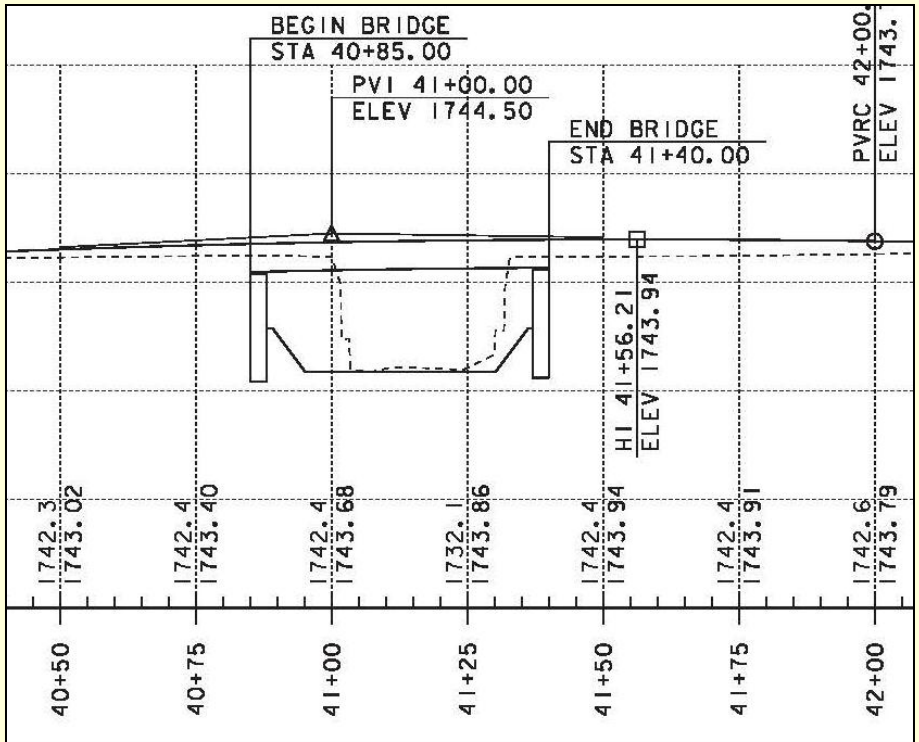
Layout – 55’ Complete Replacement



Profile - 55’ Span Complete Replacement



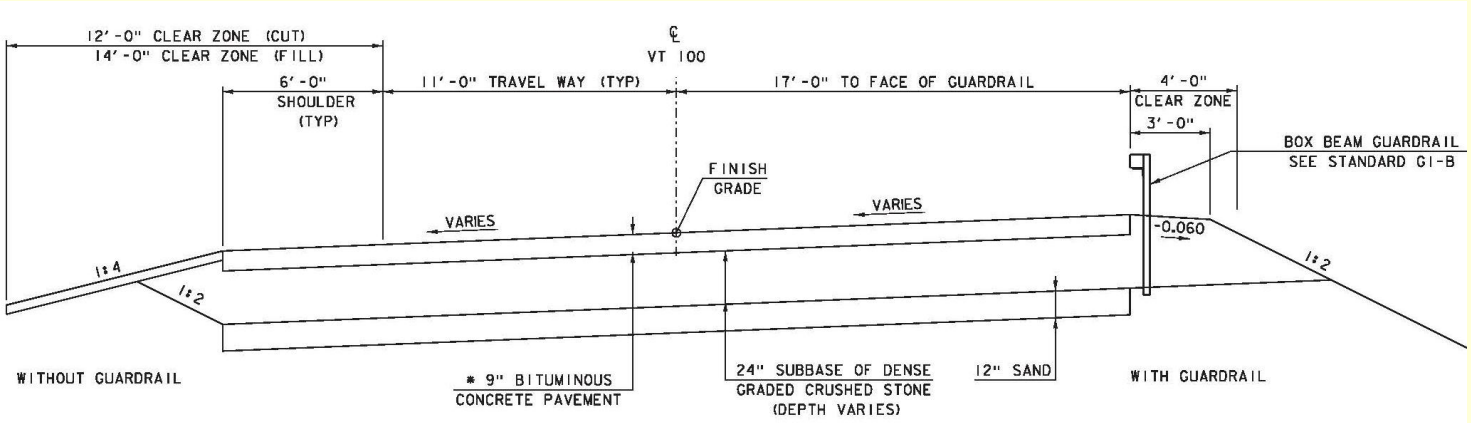
Enlarged view of bridge



Alternative 3
65’ Span Replacement Details

- 34’ width between face of railing (6-11-11-6)
- Bike/Ped accommodation in shoulders as in Alt 2
- Replace entire structure
- Increase span to 65’ (in order to not have to raise road grade)
- Maintain existing centerline of road
- Maintain existing grade (elevation) of road
- Long term (80 year) solution

Typical Sections - Alternative 3



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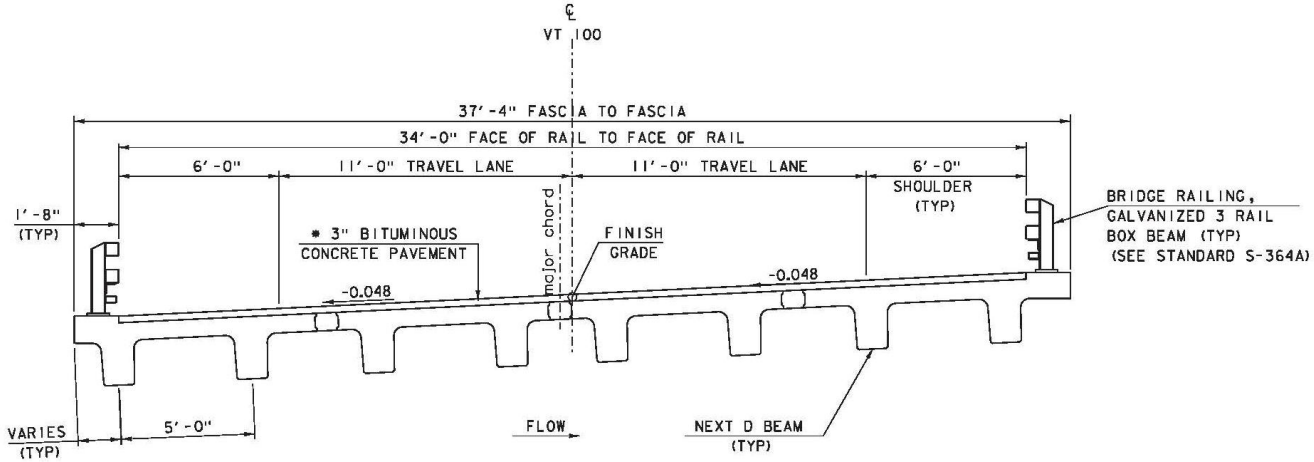

BRIDGE TYPICAL SECTION - ALTERNATIVE 2 & 3

SCALE: 3/8" = 1'-0"
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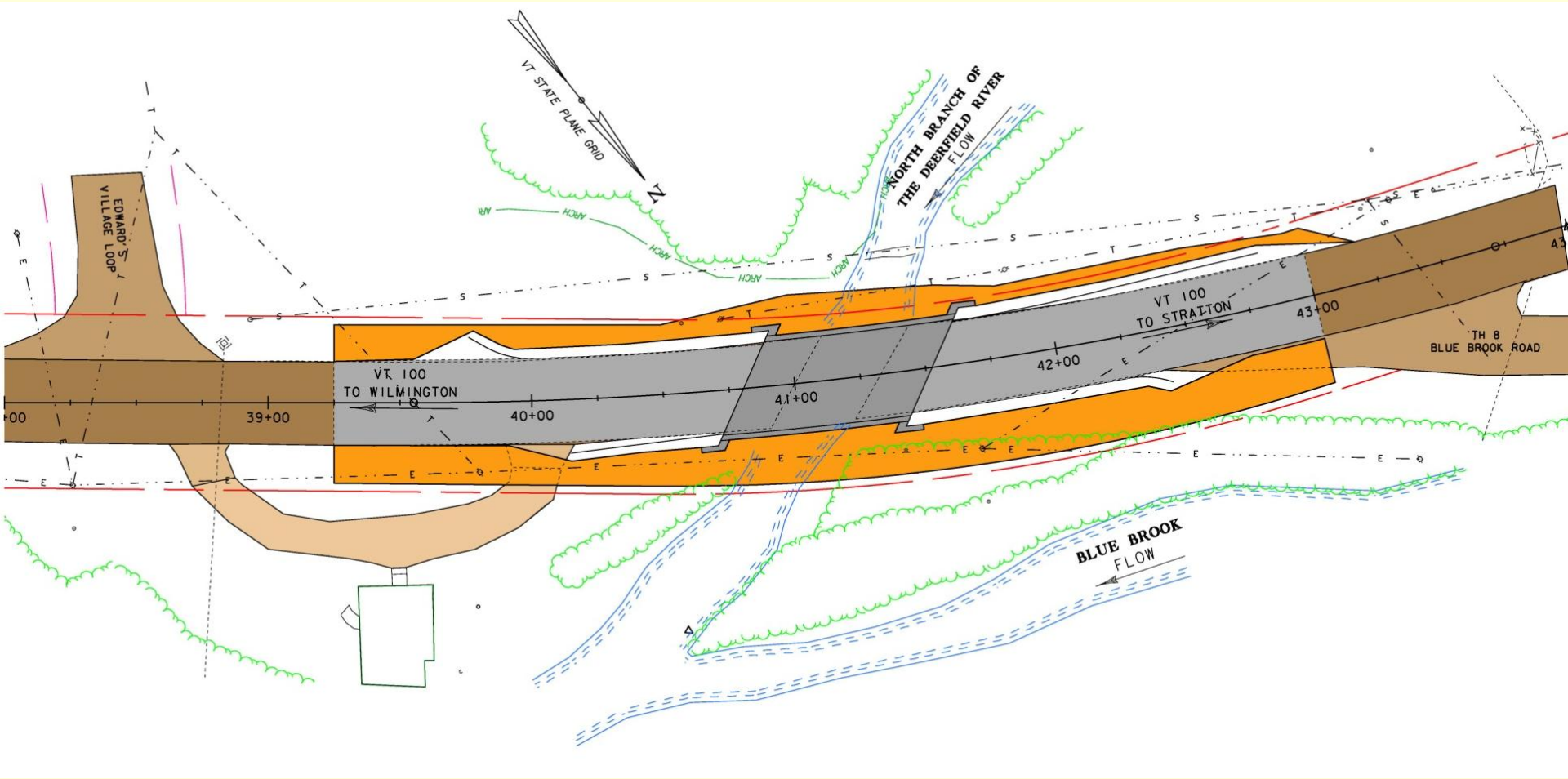
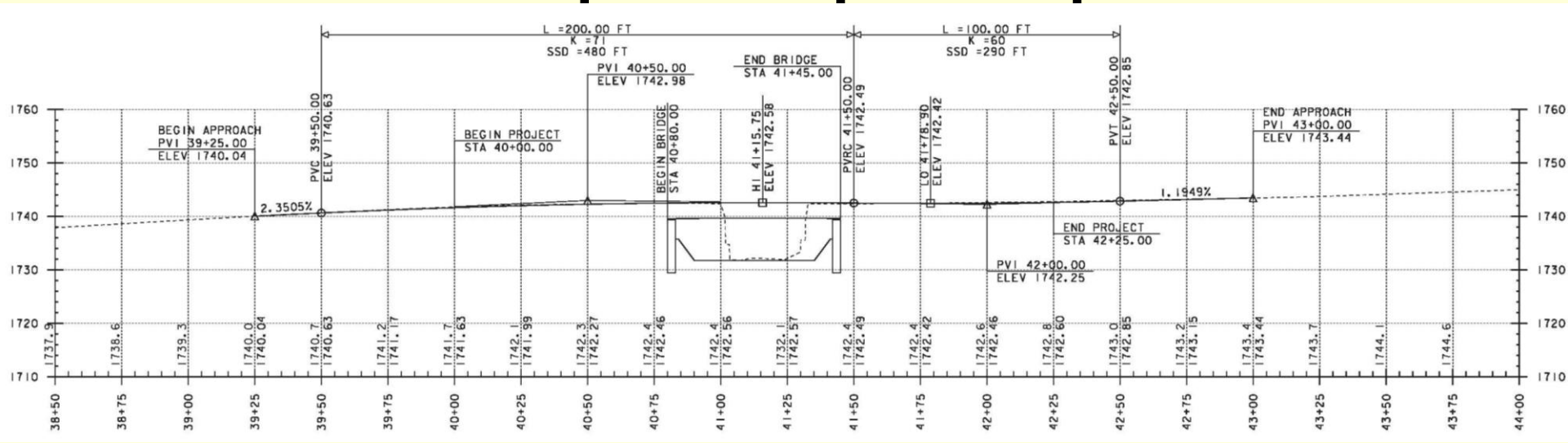
* 1½" TYPE IVS OVER
1½" TYPE IVS

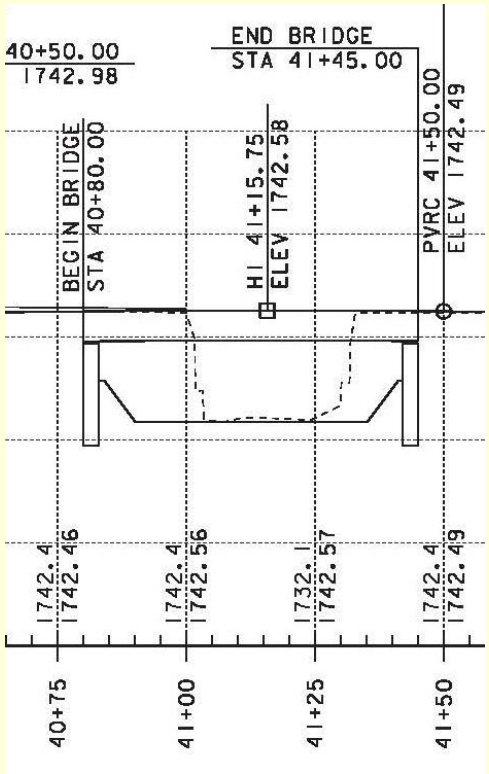
Layout – 65’ Complete Replacement



Profile - 65’ Span Complete Replacement



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

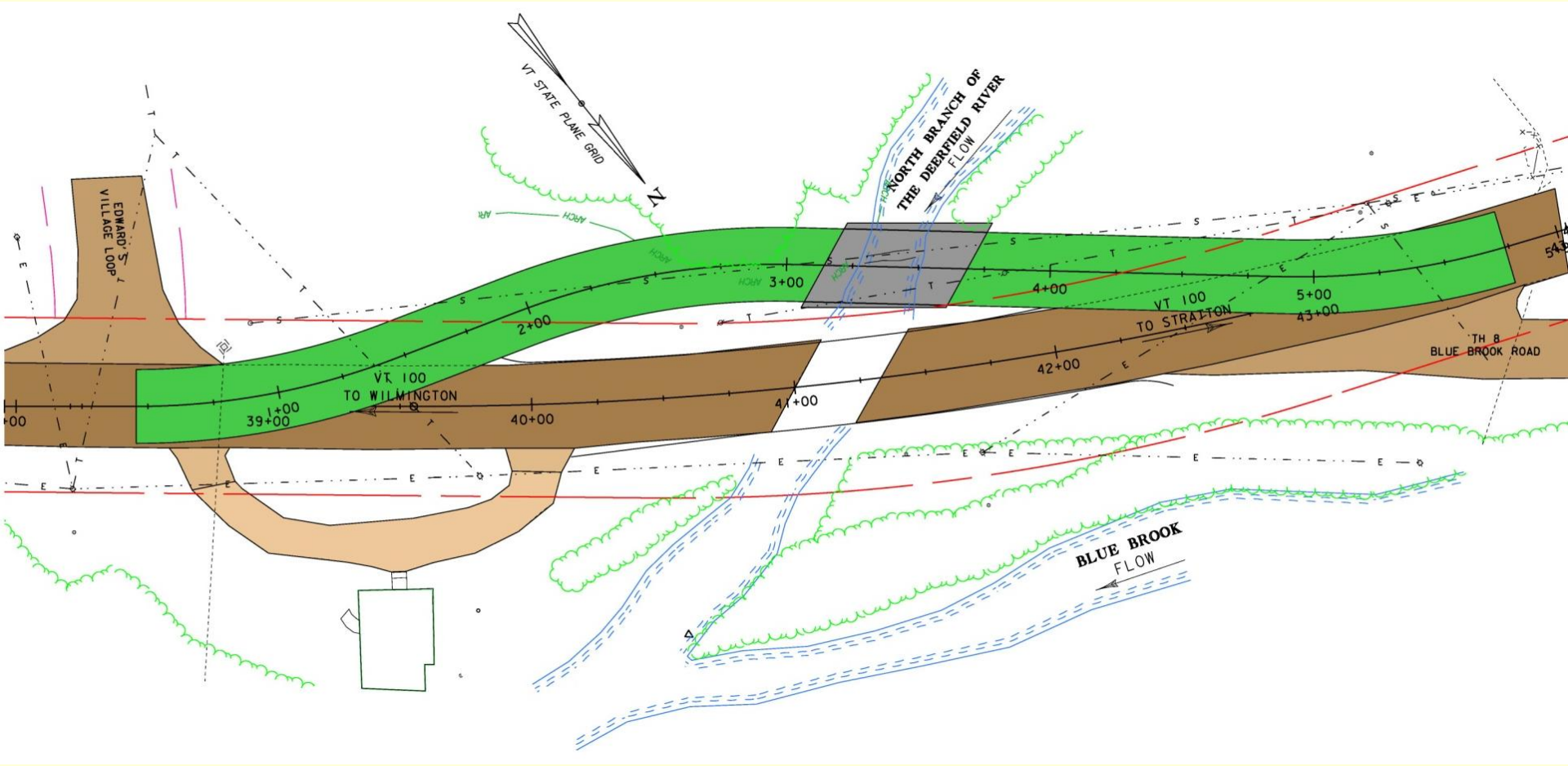
Phased Construction Option

- 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 sometimes be done without ROW acquisition
- **Ruled out due to unacceptable delays and traffic congestion caused by one lane of traffic**

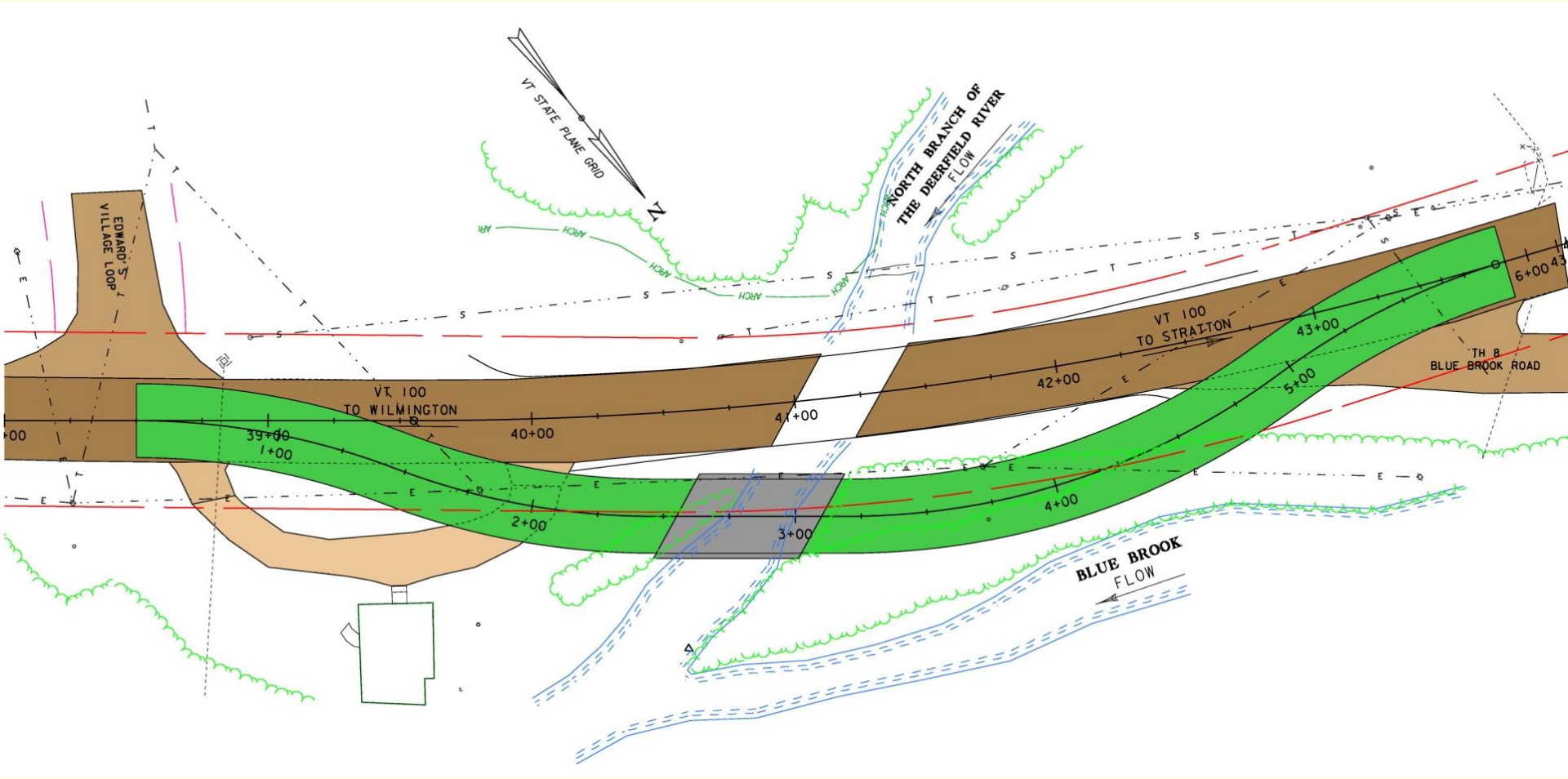
Temporary Bridge Option

- Construct temporary bridge to maintain traffic
- Two-Way bridge required due to traffic volumes
- Access to side drives/buildings needs to be considered
- Very long construction duration
- Right-Of-Way acquisition is necessary
- Environmental impacts are increased (archeol. area)
- Conflict with underground utilities
- Property owner impacts are increased
- Project Delivery time increased
- Project Costs increased-

Layout - Temporary Bridge Upstream



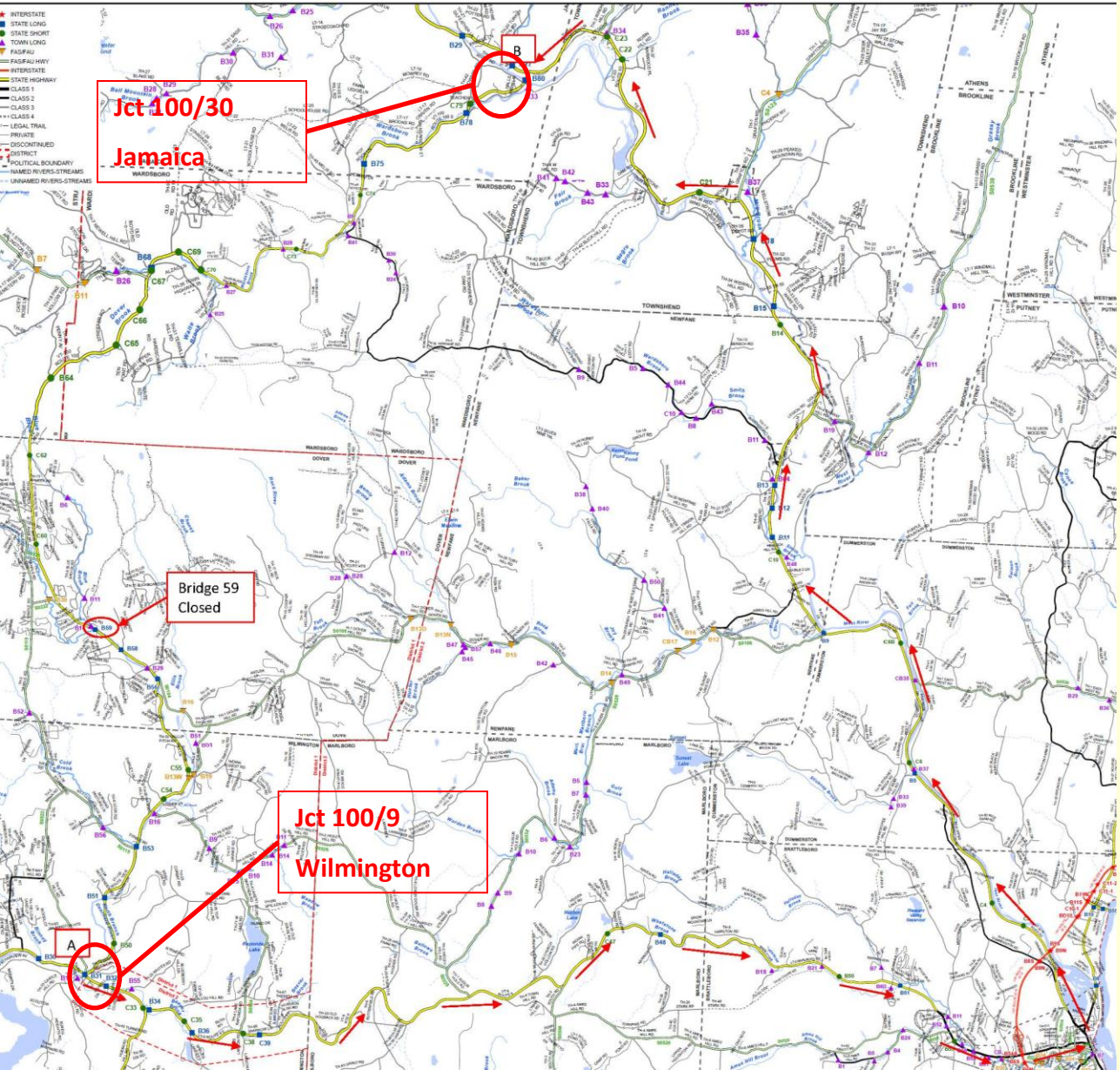
Layout - Temporary Bridge Downstream



Accelerated Bridge Construction with Bridge Closure Option

- Bridge 59 to be closed for 4 weeks (for full replacement)
- Provide signed detour during closure period
- 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)
- Public Outreach to provide advance notice for planning-

Detour Route on State Roads



A to B on Thru Route: 22.7 Miles

B to C on Detour Route: 42.0 Miles

Added Miles: 19.3 Miles

End to End Distance: 64.7 Miles

This detour <u>ruled out</u> due to combination of:

<u>Major Factors</u>

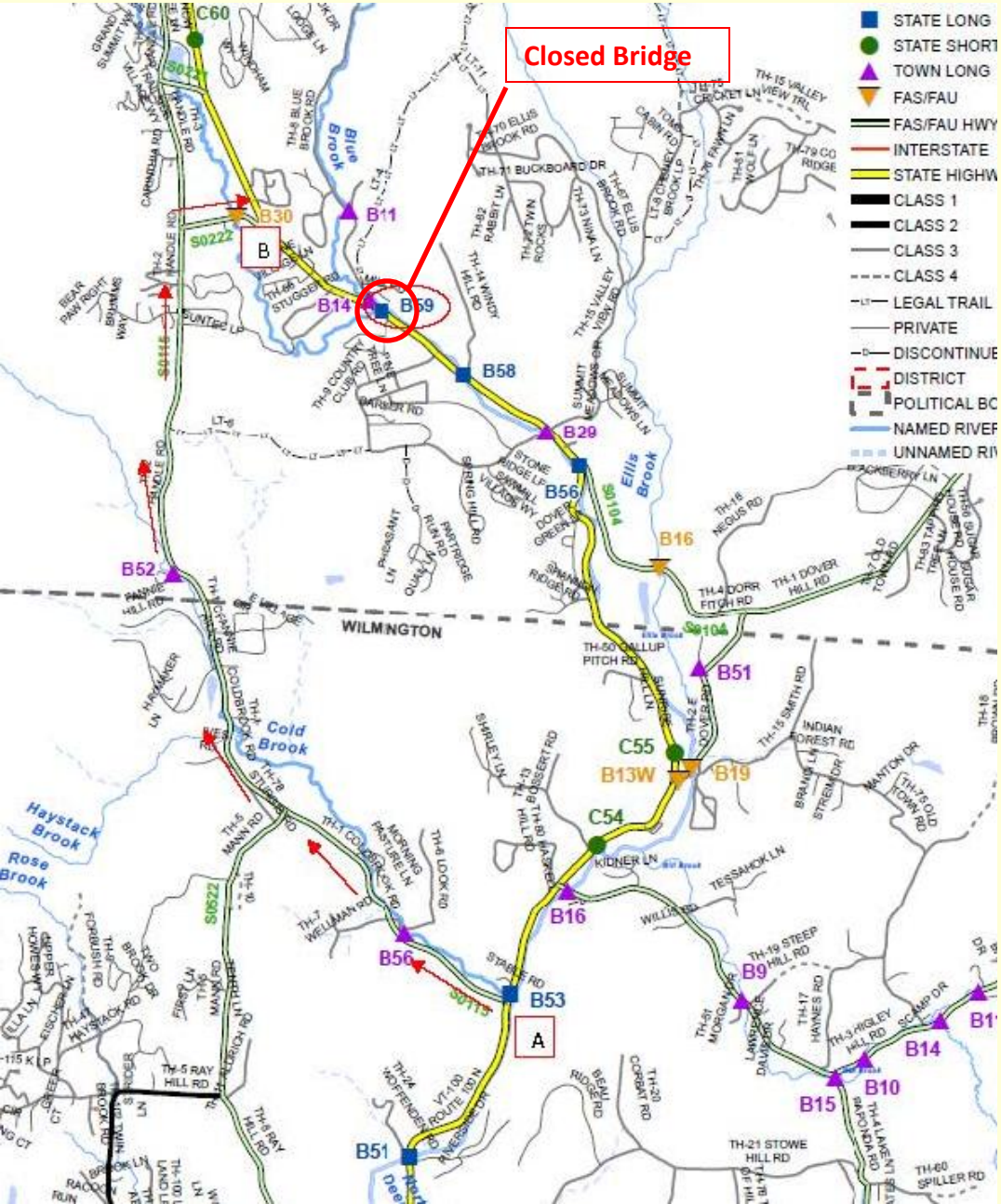
Added Miles: 19.3

Traffic Volume: 4,900 vpd

Duration: 2 weeks or 4 weeks

Due to the condition of the existing bridge and the desire to expedite the project development time, another detour route on local roads requiring local approval is being proposed

Local “Conditional” Detour Route



Cold Brook Rd – Handle Rd – Tannery Road

A to B on Thru Route: 5.2 Miles

B to C on Detour Route: 5.2 Miles

Added Miles: 0 Miles

End to End Distance: 10.4 Miles

Local Detour Details

- Local detour route is on local roads so will need approval from both Towns before proceeding
- Bridge contractor would be responsible for signing and maintaining the detour route as part of contract
- Roads would be in as good, or better, condition after project is complete
- When and where appropriate, we can provide:
  - Police presence to deter speeding
  - Uniformed Traffic Officers at peak times -

Concerned Stakeholders for Bridge Closures

A few groups we commonly hear concerns from:

- Businesses who lose drive-by traffic during the closure
- Schools who have a bus route over the closed bridge
- Motorists who have to travel a longer distance on the detour
- Emergency responders who have to respond quickly
- Owners living near the construction who are concerned with noise
- Owners living along a bypass route that will see increased traffic

Mitigation Strategies for Bridge Closures

Some ideas on how these impacts are often mitigated:

- Allow municipality input on time of year for closure
- Accelerated construction duration including:
  - Allowance for working 24 hours per day and 7 days per week
  - Incentive/Dis-incentive clause to encourage the contractor ($$)
- Noise limits included in contract for night time work
- Signing to notify motorists of business districts open for business
- Grant assistance from Agency of Commerce & Community Development
- Many examples of creative solutions from people impacted-

Alternatives Matrix

	Superstruct. Replacement w/ Detour	Superstruct. Replacement w/ Temp Bridge	55’ Span Replacement w/ Detour	55’ Span Replacement w/ Temp	65’ Span Replacement w/ Detour	65’ Span Replacement w/ Temp Bridge
Construction w/ CE + Contingencies	$640,900	$930,800	$1,358,500	$1,587,300	$1,380,600	$1,610,700
Preliminary Engineering	$172,550	$250,600	$313,500	$366,300	$318,600	$371,700
Right of Way	$0	$64,440	$94,050	$109,890	$95,580	$111,510
Total Project Cost	**$813,000**	**$1,246,000**	**$1,766,000**	**$2,063,000**	**$1,795,000**	**$2,094,000**
Design Life	20 Years	20 Years	80 Years	80 Years	80 Years	80 Years
Project Development Duration	2 years	4 years	4 years	4 years	4 years	4 years
Construction Duration	3 months	18 months	6 months	18 months	6 months	18 months
Closure Duration	2 weeks	None	4 weeks	None	4 weeks	None

Conclusion and “Conditional” Recommendation

Pending approval to use local roads we recommend:

Full bridge replacement using ABC & 28 day closure

The benefits of this approach are:

- Project delivery expedited
- Could prevent future emergency bridge closure
- Saves future costs to maintain existing bridge
- Lower direct costs (Design, ROW and Construction)
- Minimal environmental impacts
- Minimal impact to adjacent property owners
- Improved safety for public and construction workers -

Alternate Recommendation

If we can not obtain permission to use the local roads for the detour, we propose:

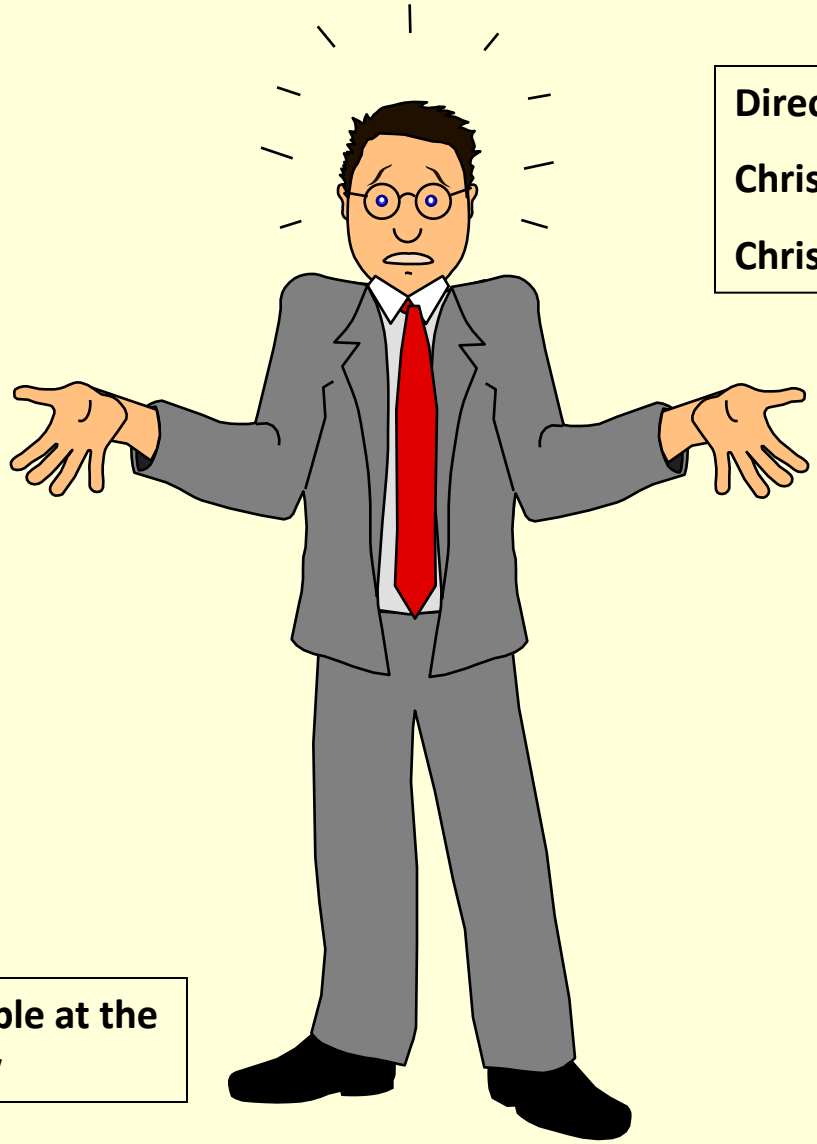
Full bridge replacement maintaining traffic on a two-way temporary bridge

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 then document
- Develop Conceptual Plans
- Hold public meeting if needed based on alternative
- PROJECT DEFINED milestone
- Develop Preliminary Plans
- Environmental permitting
- Utility relocation

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/13B058