



08/11/2020

Fairfield BO 1448(46)
Alternatives Presentation Meeting
Town Highway 29 – Bridge 49 over Black Creek

August 22, 2022

Introductions

Rob Young, P.E.

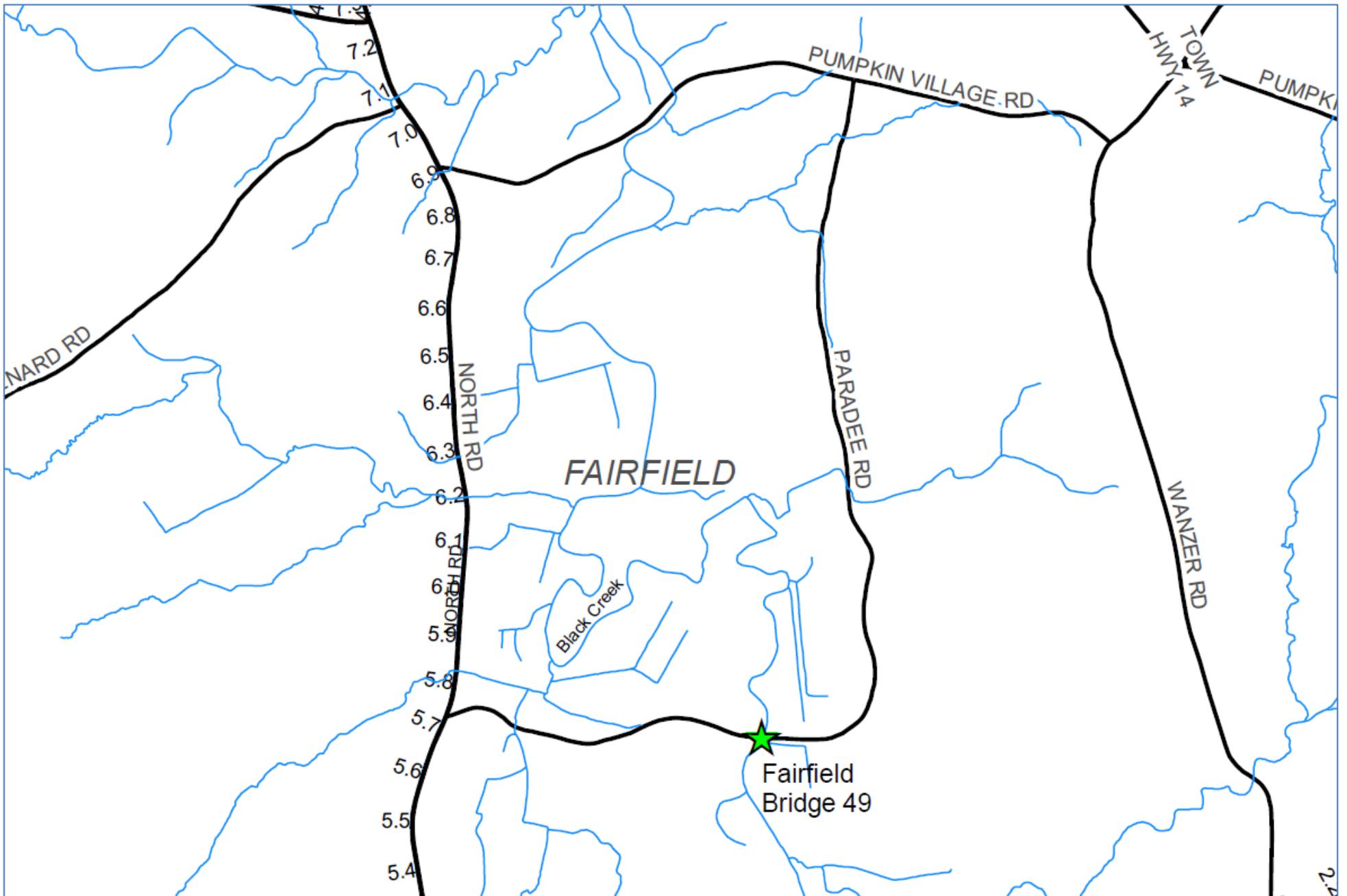
VTrans Design Project Manager

Laura Stone, P.E.

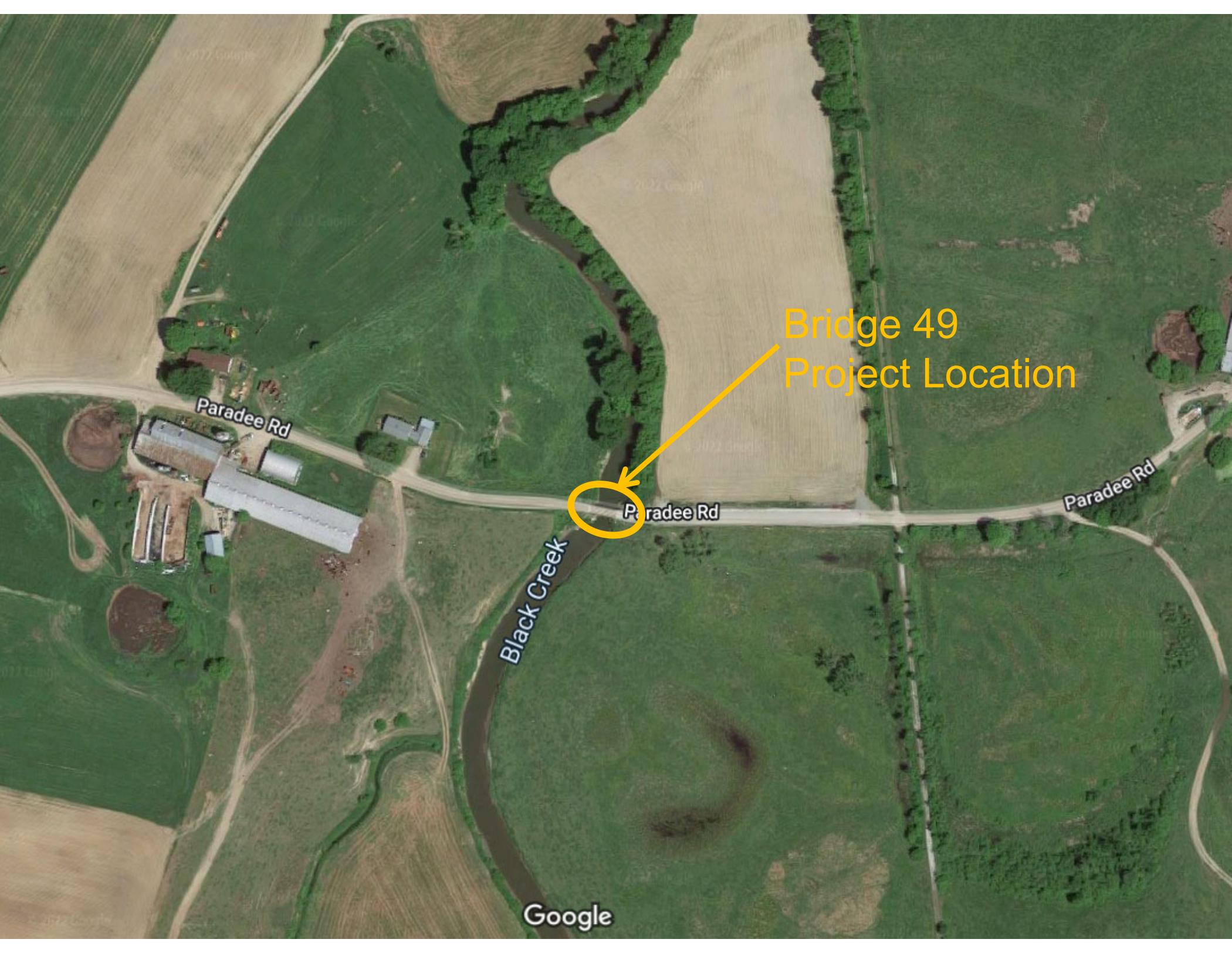
VTrans Scoping Engineer

Purpose of Meeting

- Provide an understanding of our approach to the project
- Provide an overview of project constraints
- Discuss alternatives that were considered
- Discuss our recommended alternative
- Provide an opportunity to ask questions and voice concerns



Location Map



Bridge 49
Project Location

Paradee Rd

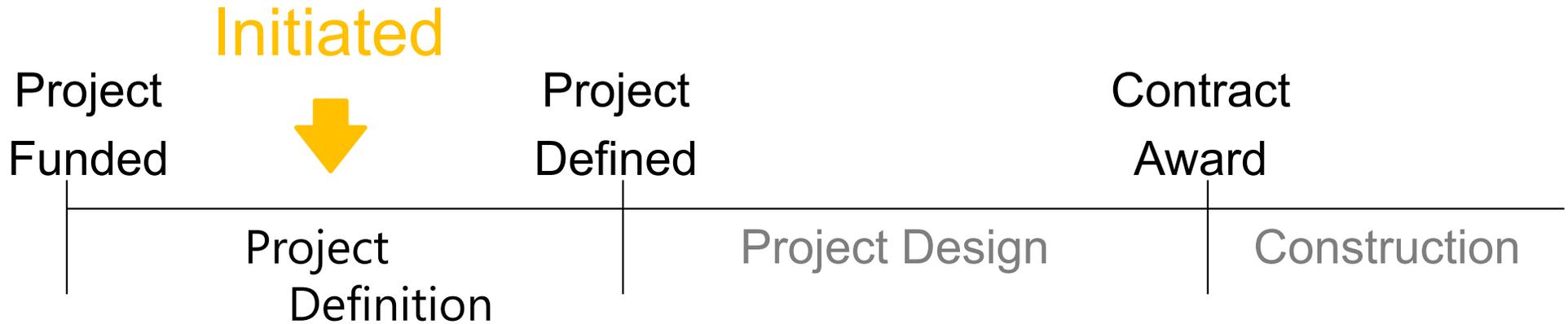
Paradee Rd

Paradee Rd

Black Creek

Google

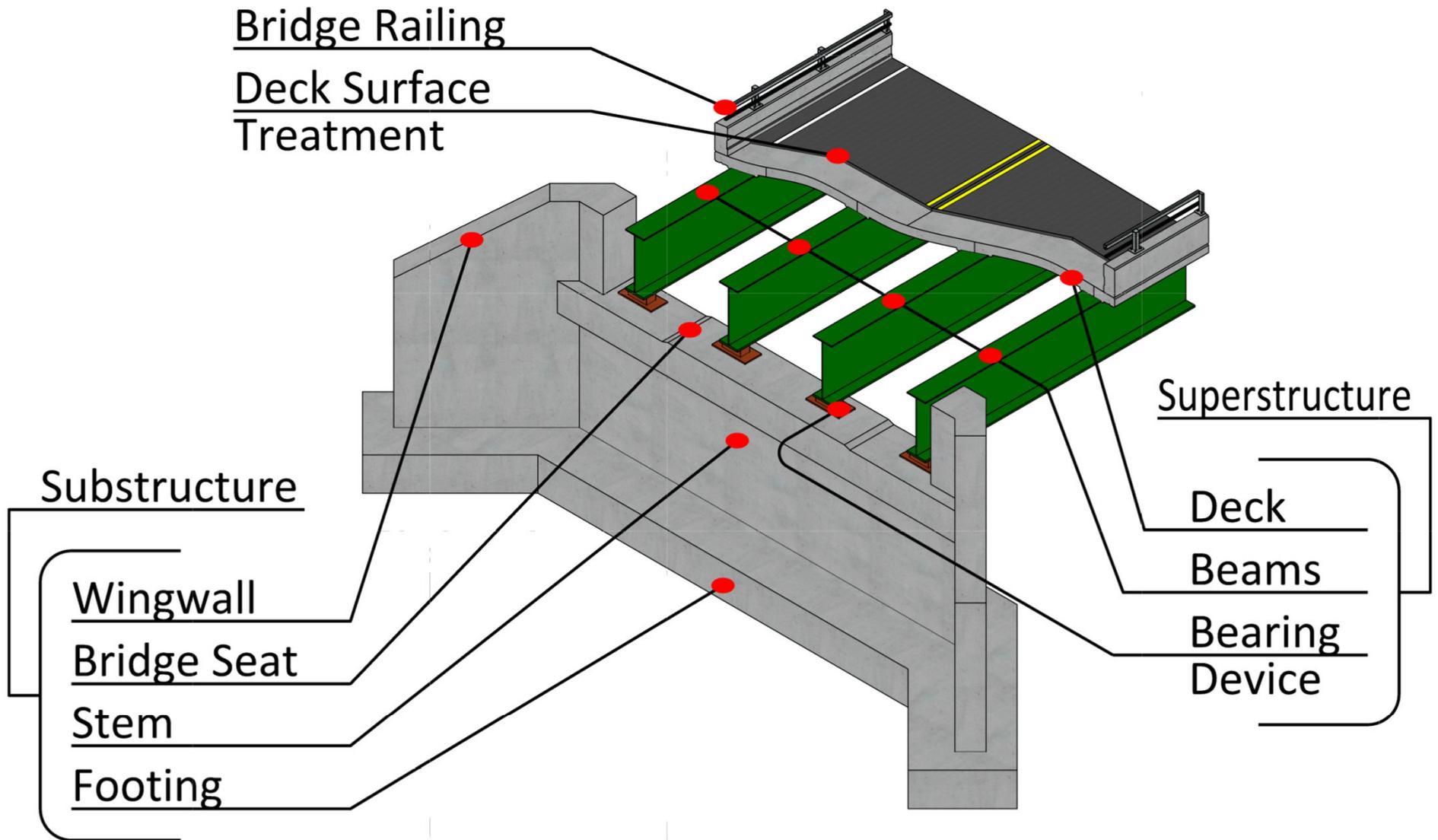
VTrans Project Development Process



- Identify resources & constraints
- Evaluate alternatives
- Public participation
- Build Consensus

- Quantify areas of impact
- Environmental permits
- Develop plans, estimate and specifications
- Right-of-Way process if necessary

Description of Terms Used



ACT 153 of the 2012 Legislative Session

	Local Share	
	Road Closed During Construction	Road Open During Construction
Rehabilitation	2.5%	5%
Replacement	5%	10%

- Per Act 153, the local share is reduced by 50% for rehabilitating versus replacement
- Per Act 153, the local share is reduced by 50% for closing the road to traffic during construction
- The construction phase of the project will be funded at 100% federal per the Infrastructure Investment and Jobs Act (IIJA)

Looking West over Bridge 49



Existing Conditions – Bridge #49

- Roadway Classification – Local Road
- Bridge Type – 45' Span Parker Pony Truss
- Ownership – Town of Fairfield
- Constructed in 1919, reconstructed in 1995

Looking East over Bridge 49



Existing Conditions – Bridge #49

- Utilities (aerial)

Existing Conditions – Bridge #49

- During the annual inspection, it was discovered that the superstructure is in poor condition with areas of significant section loss throughout the lateral bracing. There was also varying amounts of section loss in the older stringer ends and large perforations remain in the abutment 2 beam ends.
- The lane and shoulder widths on Bridge 49 are substandard with a curb-to-curb width of 13.8ft and out-to-out of 14ft.
- Bridge 49 does not span bank full width and roadway overtopping occurs.

Condition Ratings



Existing Conditions - Bridge #49

- Deck Rating 6 (Satisfactory)
- Superstructure Rating 4 (Poor)
- Substructure Rating 7 (Good)

Abutment 2 (eastern)



Existing Conditions - Bridge #49

Upstream Fascia



Existing Conditions - Bridge #49

2020 Inspection Finding Photo – Major section loss on stinger beams



Existing Conditions - Bridge #49

2020 Inspection Finding Photo



08/11/2020

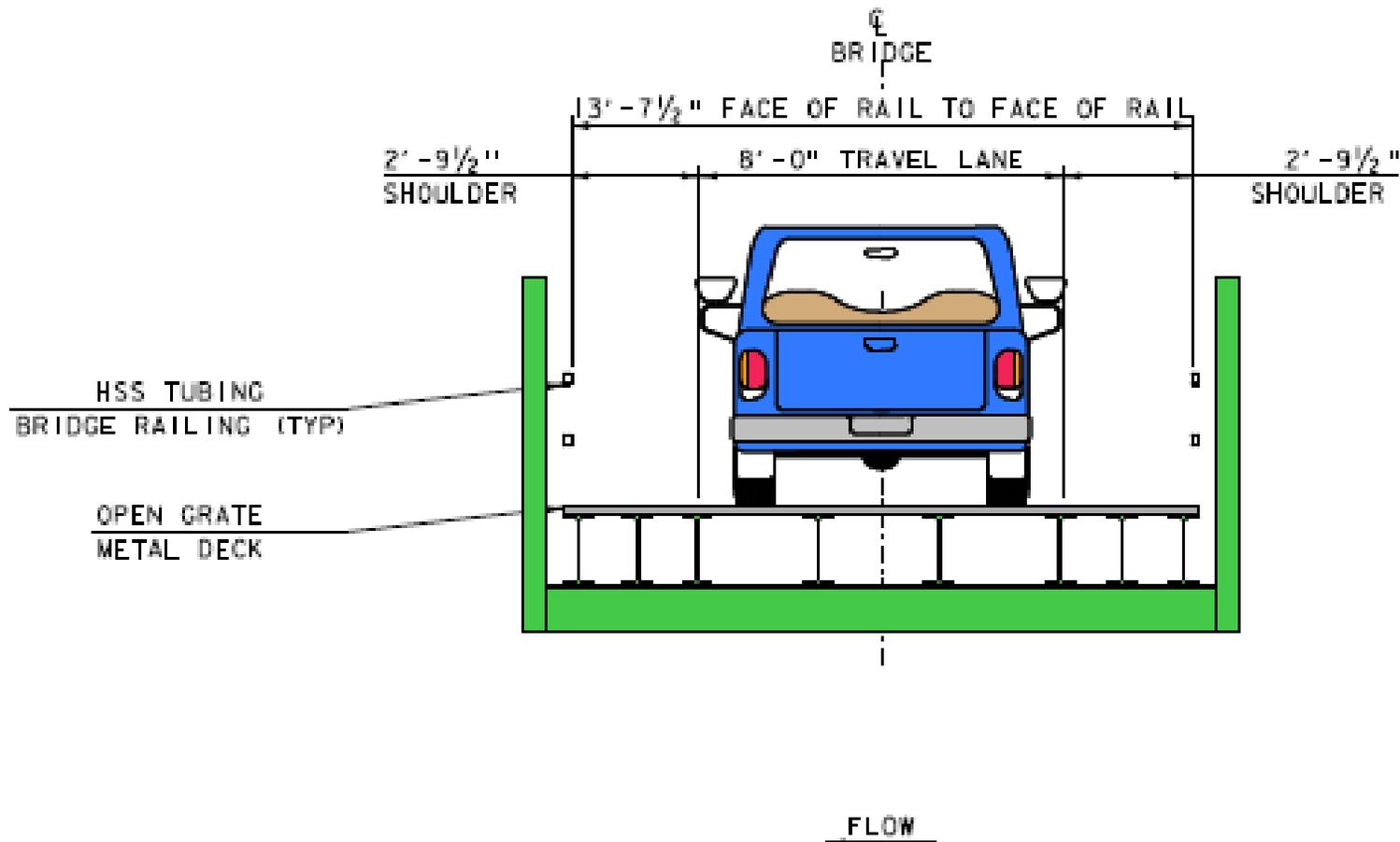
Existing Conditions - Bridge #49



Existing Conditions – Bridge #49

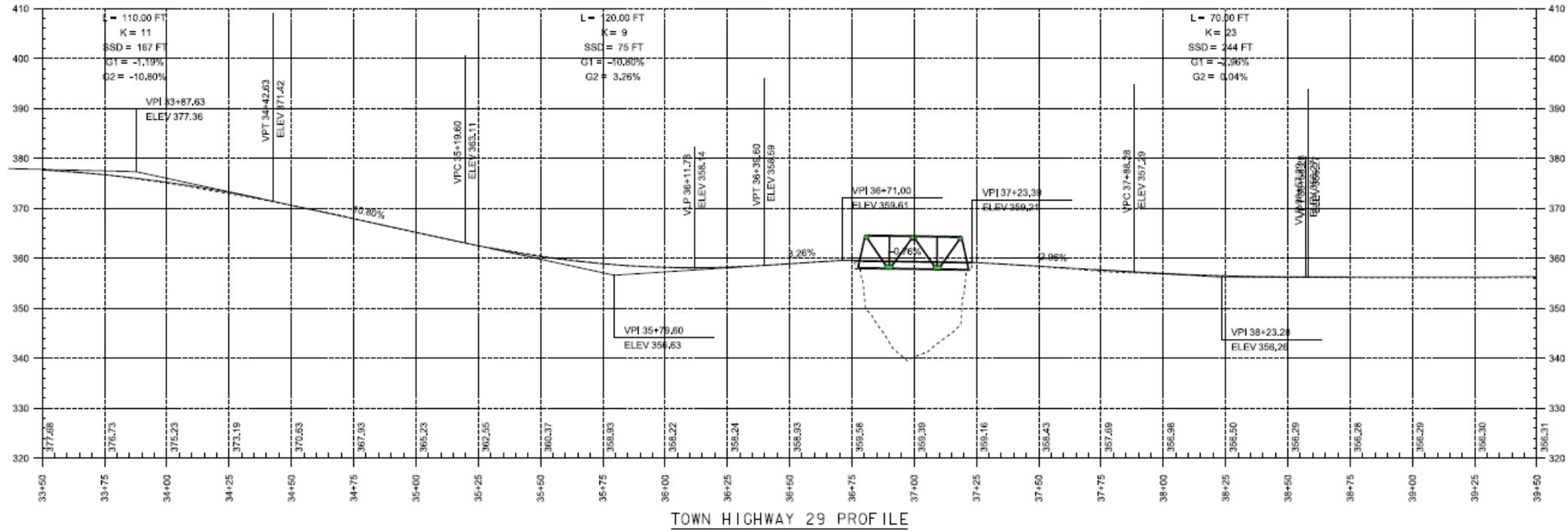
- Wetlands – 70' west and 130' east down the road from bridge
- Archaeologically sensitive all four quadrants of bridge approaches
- Historic Resources – Bridge 49 listed in SRHP

Existing Conditions – Typical Section



EXISTING BRIDGE TYPICAL SECTION

Existing Conditions - Profile



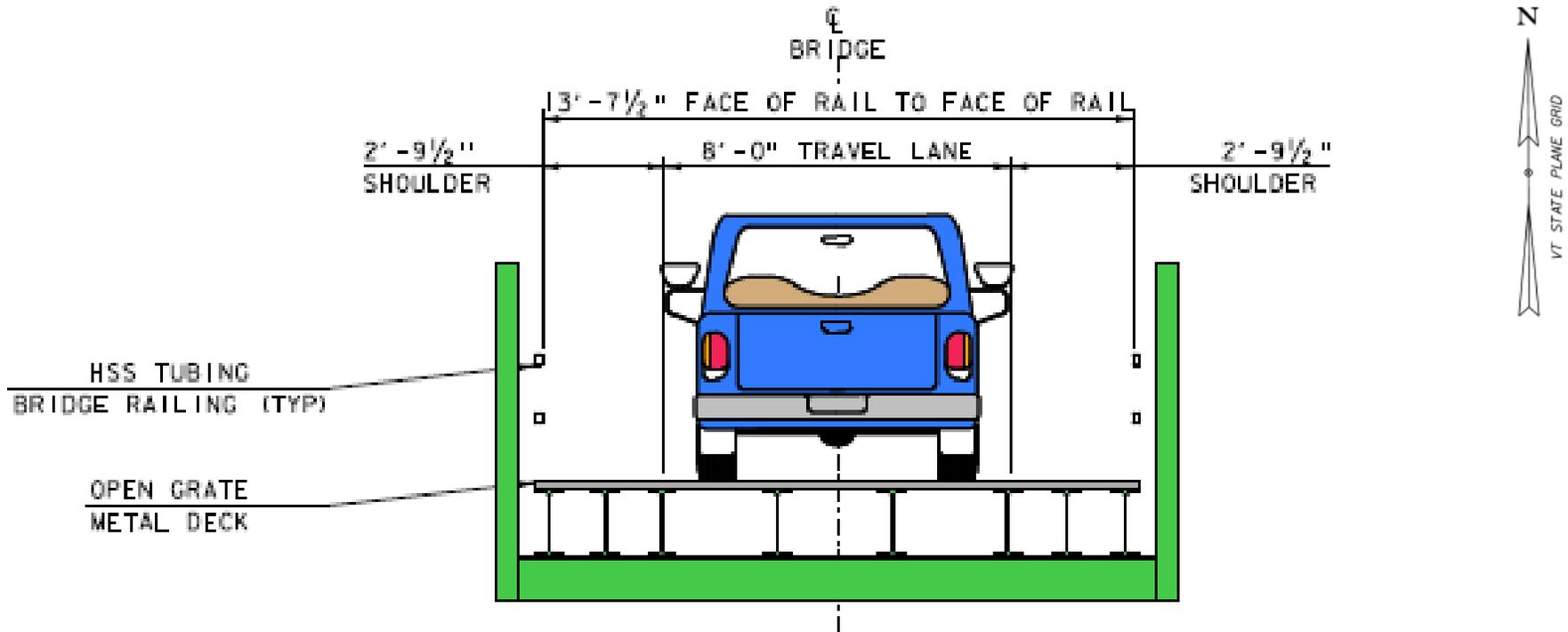
Design Criteria and Considerations

- Average Daily Traffic
 - 50 vehicles per day
- Design Hourly Volume
 - 10 vehicles per hour
- % Trucks
 - 10.3%

Alternatives Considered – Bridge #49

- No Action
 - Additional maintenance required within 10 years
- Truss Rehabilitation
 - Structural deficiencies would be addressed
 - Substandard lane and shoulder widths
 - 50-year design life
- Full Bridge Replacement with New Pony Truss (On and Off Alignment)
 - 55' span for improved hydraulics
 - Widen to meet minimum standard (9'/2')
 - 75-year design life
- Full Bridge Replacement with Steel Beam Bridge (On and Off Alignment)
 - 55' span for improved hydraulics
 - Widen to meet minimum standard (9'/2')
 - 75-year design life

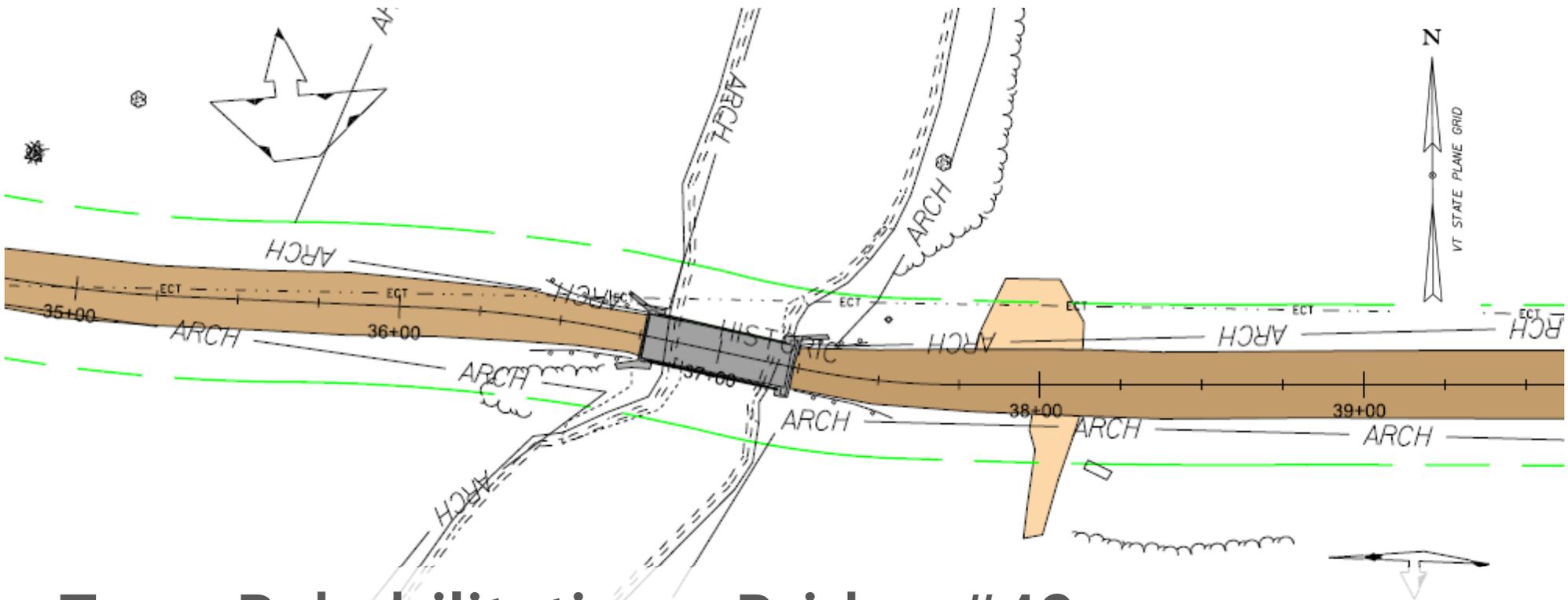
Alternative 1 Typical Section



Truss Rehabilitation - Bridge #49

- 13.8-foot rail-to-rail typical section

Alternative 1 Layout

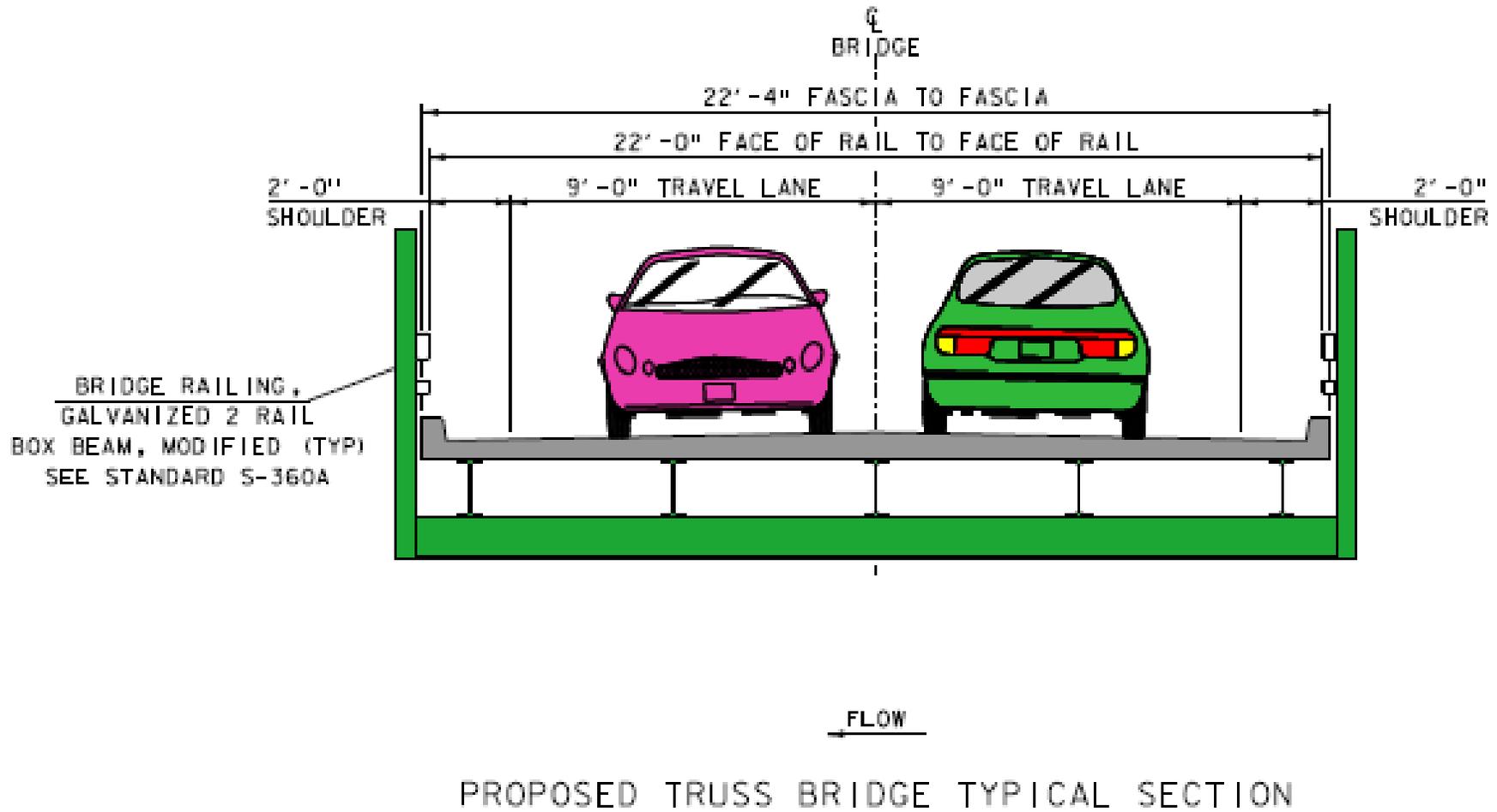


Truss Rehabilitation - Bridge #49

- 50-year design life
- 45' span
- Cleaning, repair or replacement of deteriorated truss members, strengthening of members, and repainting.
- Replacement of existing bridge seats and backwalls
- Construct new floor system and deck



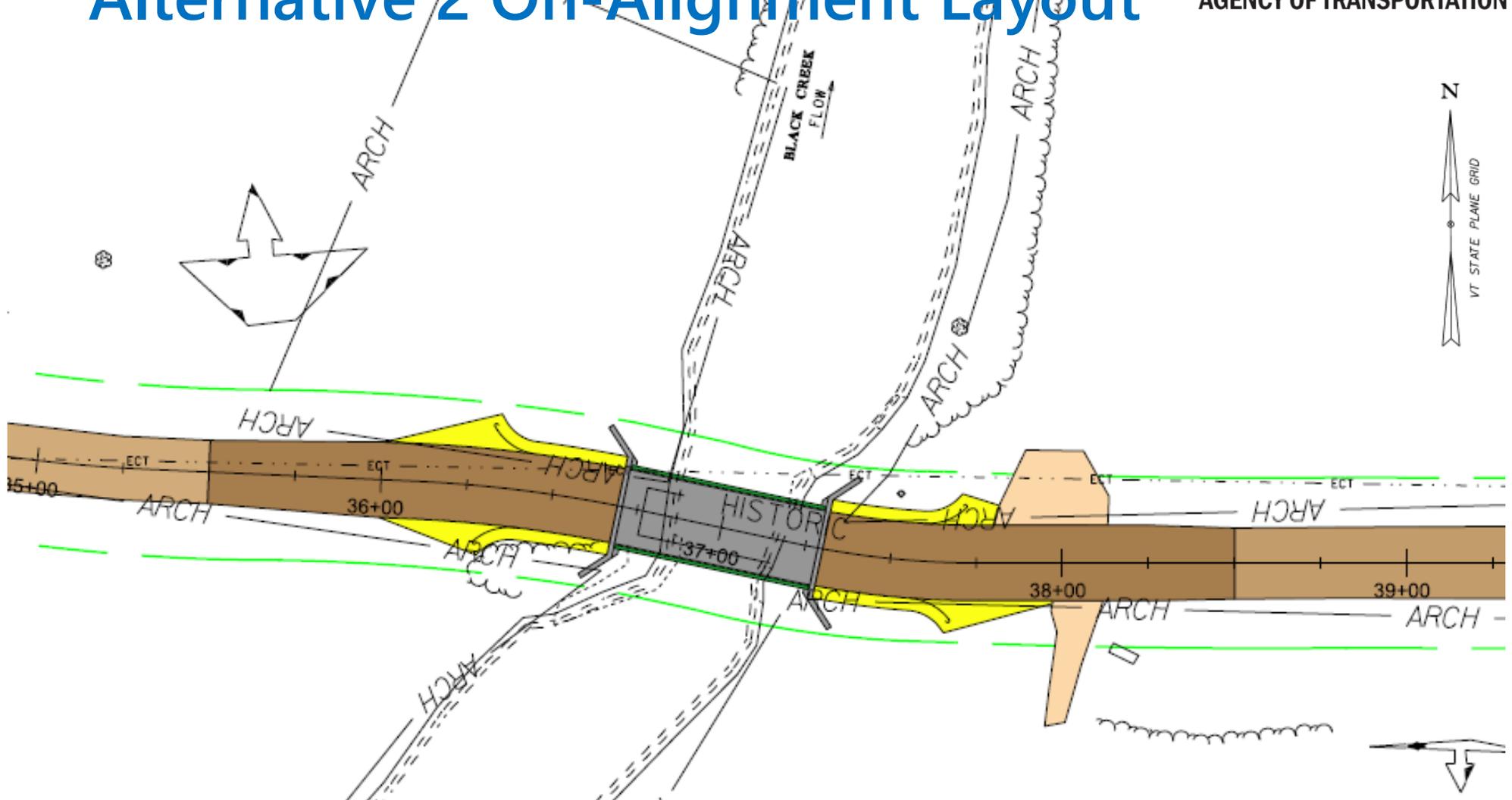
Alternative 2 Typical Section



New Parker Pony Truss - Bridge #49

- 9'/2' typical

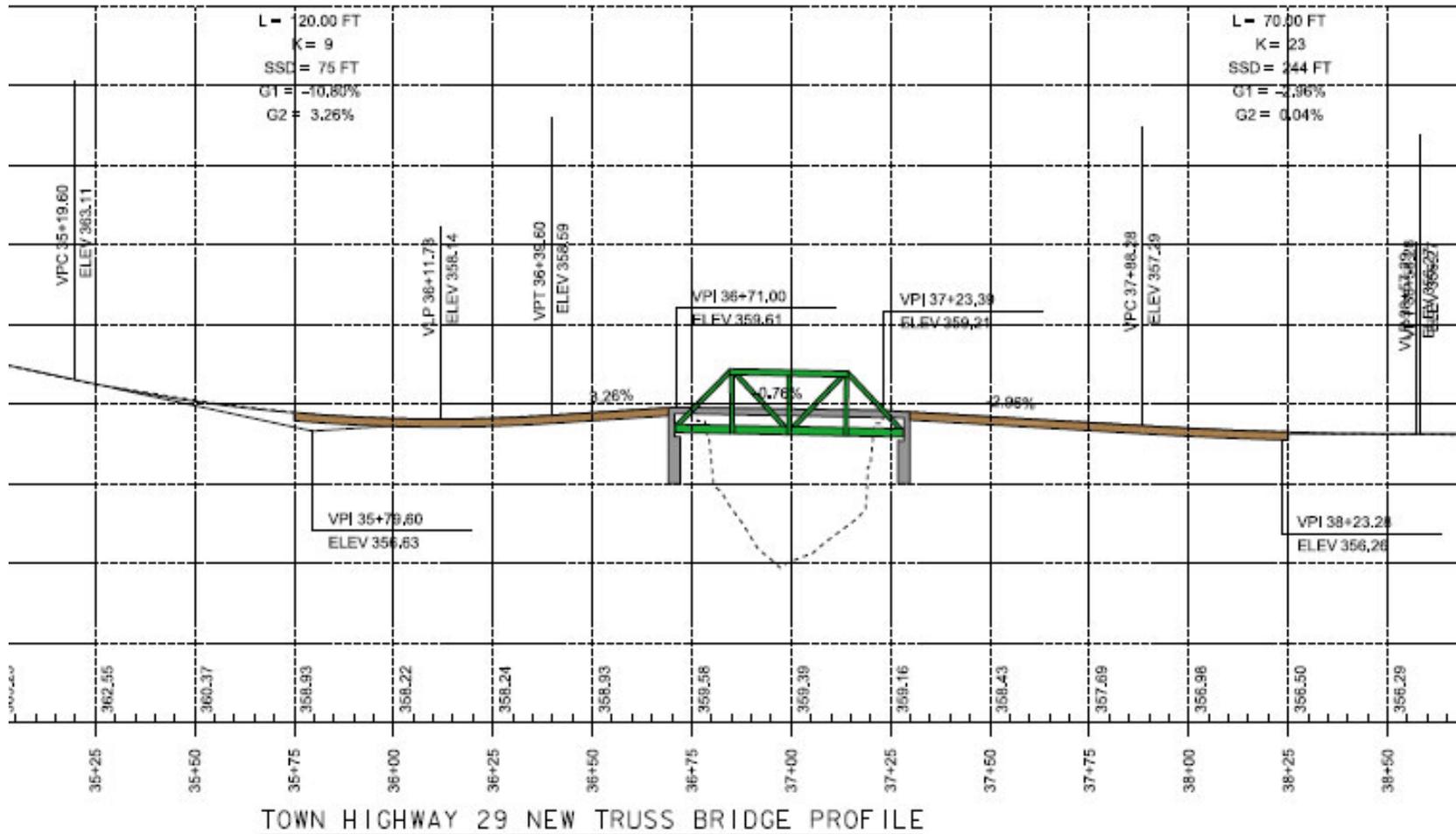
Alternative 2 On-Alignment Layout



New Parker Pony Truss - Bridge #49

- 9' / 2' typical, 75-year design life
- MIN 55' span for improved hydraulics

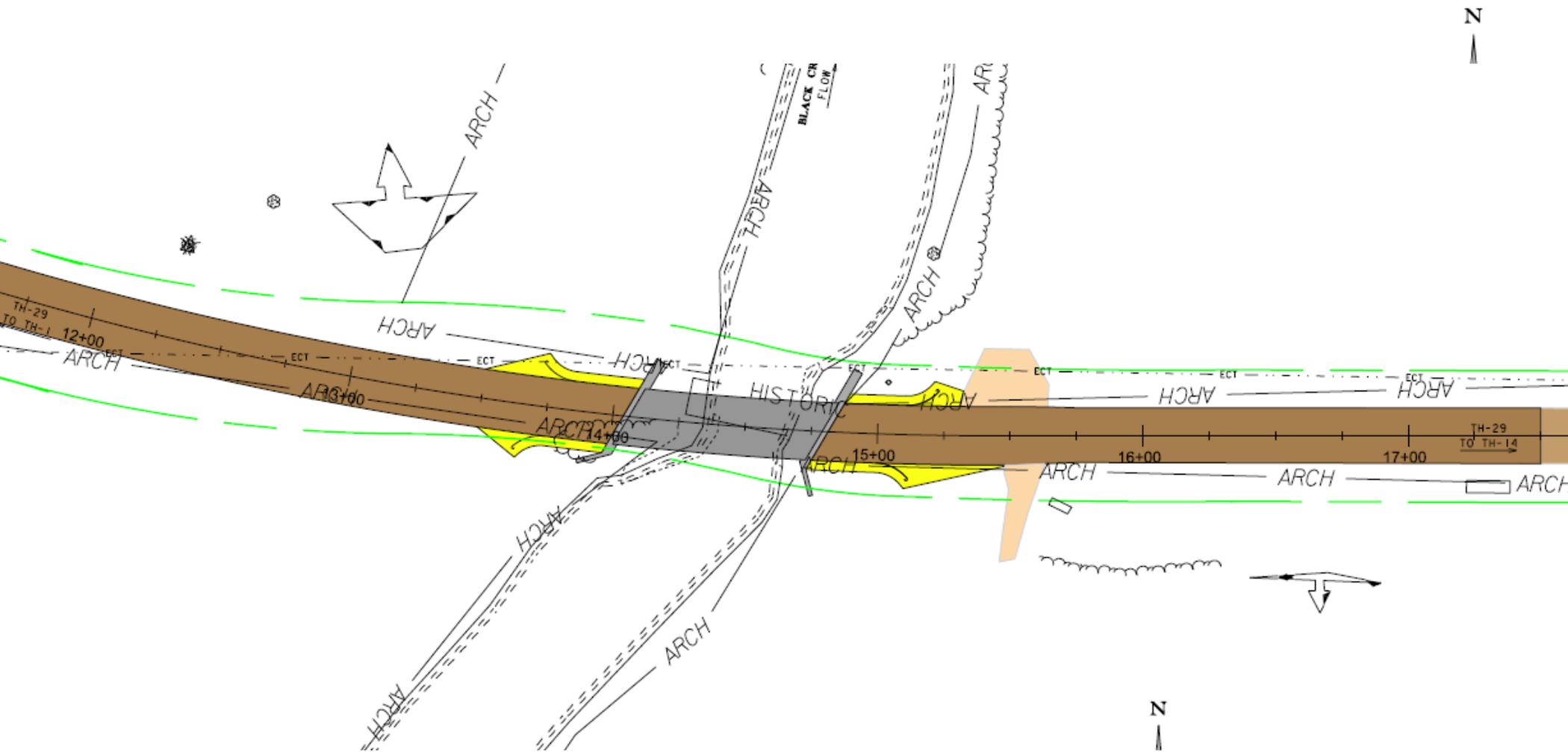
Alternative 2 On-Alignment Profile



New Parker Pony Truss - Bridge #49

- Span increased for hydraulics
- Matches existing roadway profile

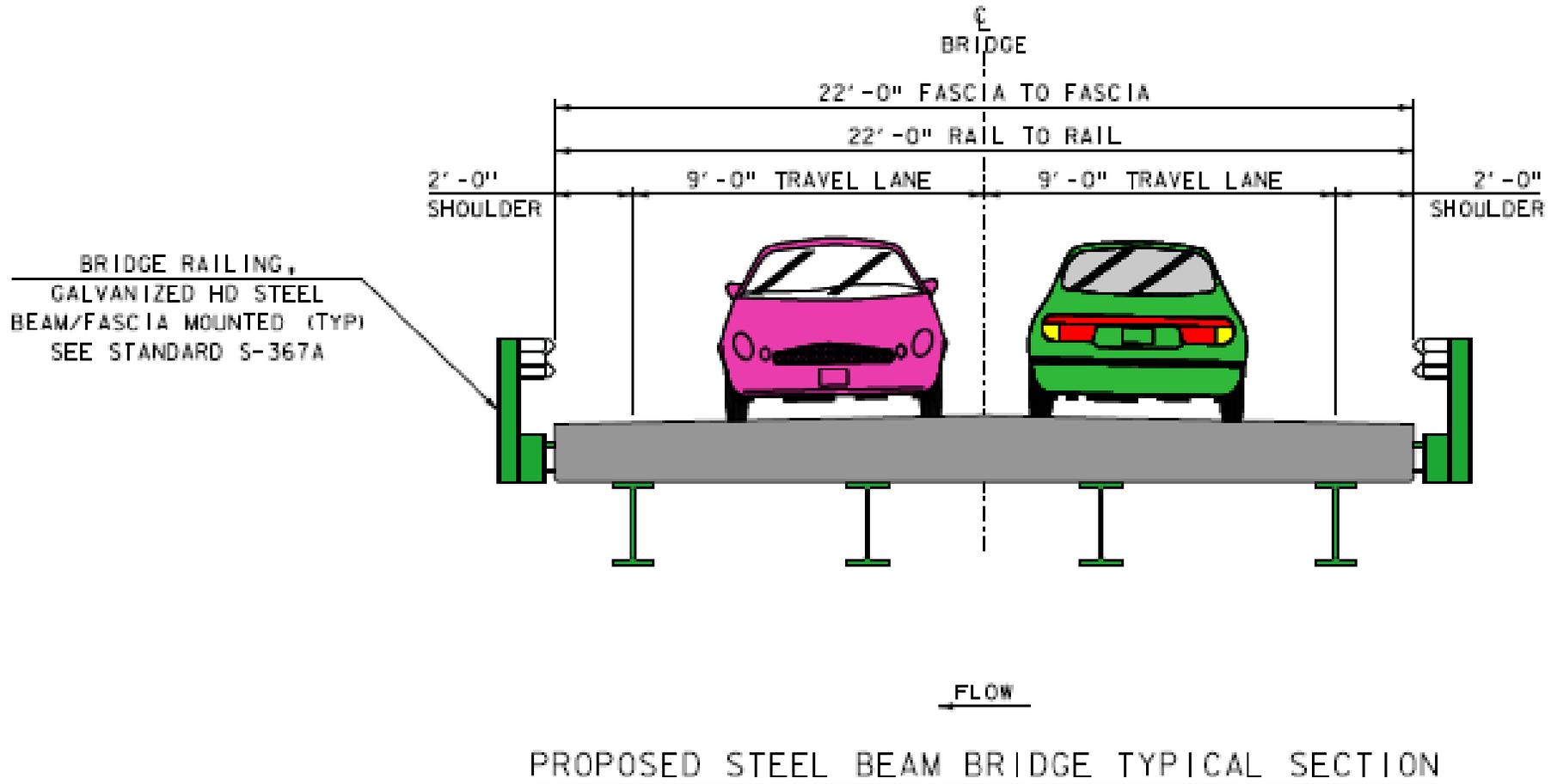
Alternative 2 Off-Alignment Layout



New Parker Pony Truss - Bridge #49

- 9'2' typical, 75-year design life
- MIN 55' span for improved hydraulics

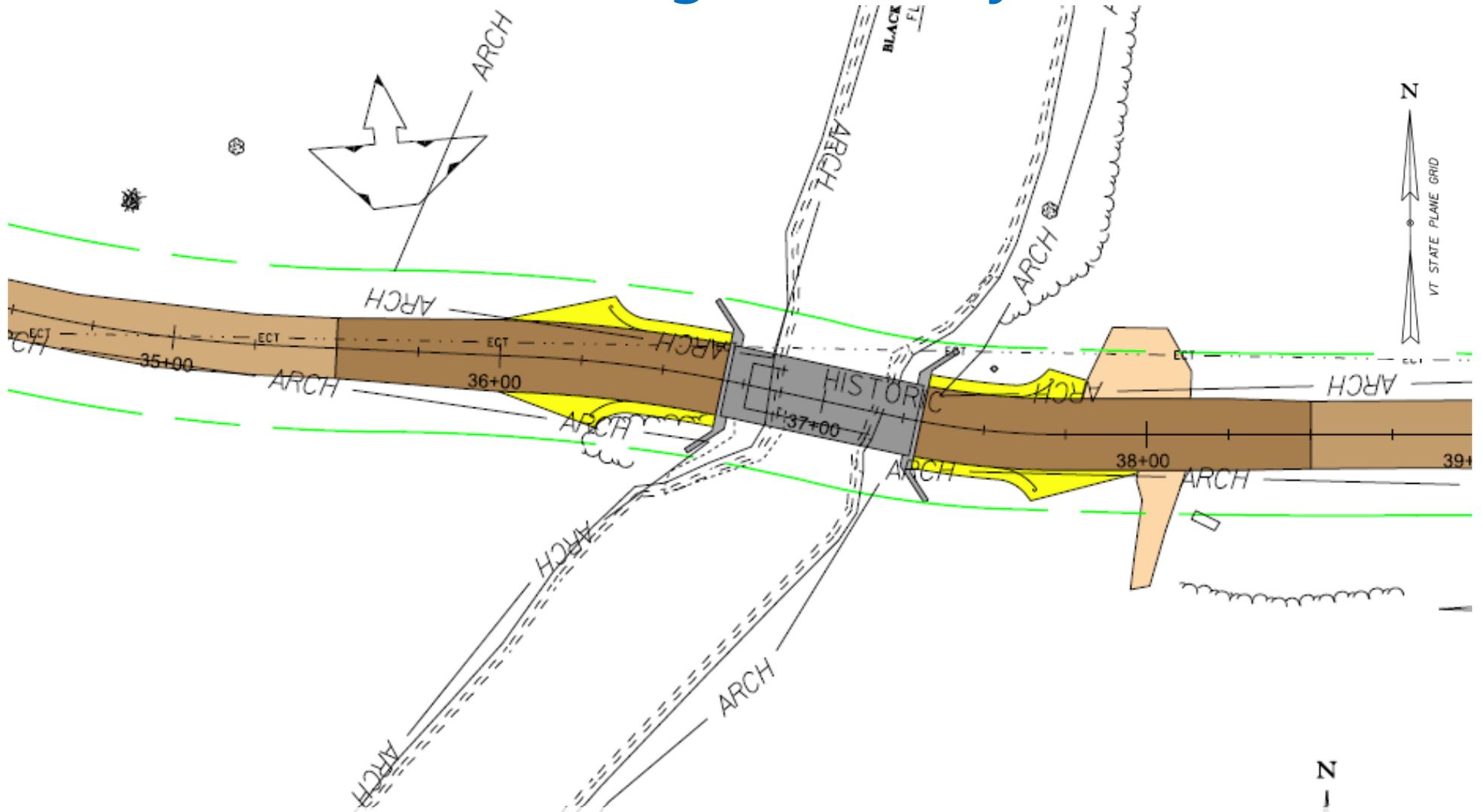
Alternative 2 Typical Section



New Steel Beam Bridge - Bridge #49

- 9'/2' typical

Alternative 3 On-Alignment Layout

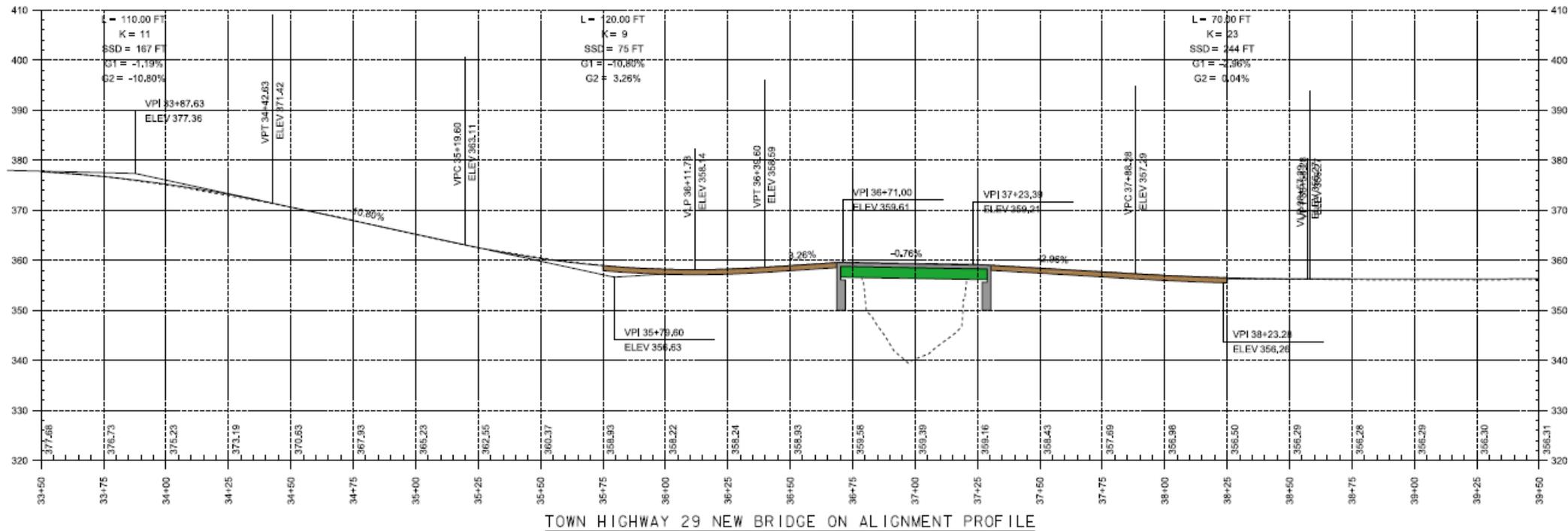


New Steel Beam Bridge - Bridge #49

- 9'2' typical, 75-year design life
- MIN 55' span for improved hydraulics



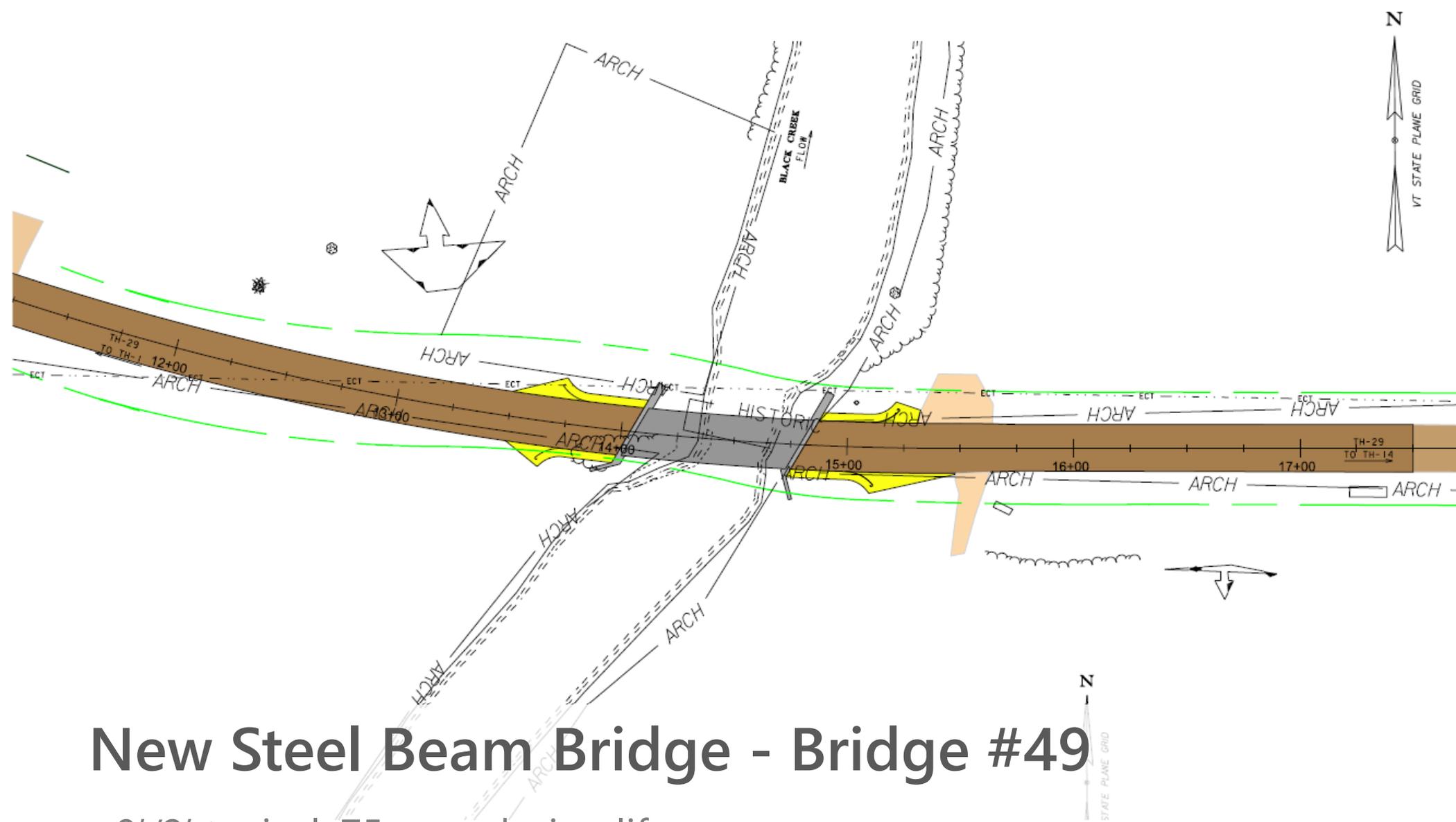
Alternative 3 On-Alignment Profile



New Steel Beam Bridge - Bridge #49

- 9'2' typical, 75-year design life
- MIN 55' span for improved hydraulics

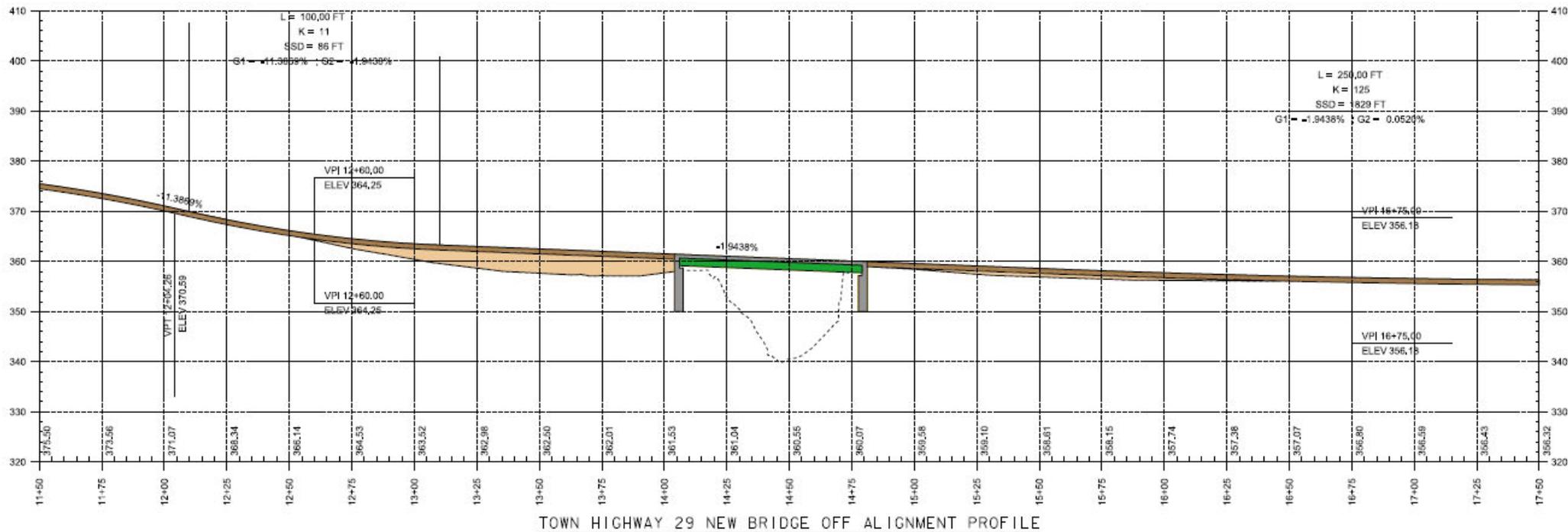
Alternative 3 Off-Alignment Layout



New Steel Beam Bridge - Bridge #49

- 9'2' typical, 75-year design life
- MIN 55' span for improved hydraulics

Alternative 3 Off-Alignment Profile



New Steel Beam Bridge - Bridge #49

- 9'2' typical, 75-year design life
- MIN 55' span for improved hydraulics

Recommended Alternative - Bridge #49

- A new 55-foot span (minimum) steel beam bridge constructed on-alignment
 - Original pony truss does not meet minimum width standards and does not meet the minimum hydraulic standards, warranting replacement.
 - Lengthened to 55' span to improve the hydraulic condition and reduce water surface elevations during flood events
 - 75-year design life

Maintenance of Traffic Options Considered

- Offsite Detour
- Temporary Bridge

A photograph of a road closure barrier. The barrier consists of several horizontal white panels with red diagonal stripes. A central white sign with a black border and the words "ROAD CLOSED" in large, bold, black capital letters is mounted on two white posts. The background shows a concrete curb, a chain-link fence, and green trees under a clear blue sky.

**ROAD
CLOSED**

Road Closure

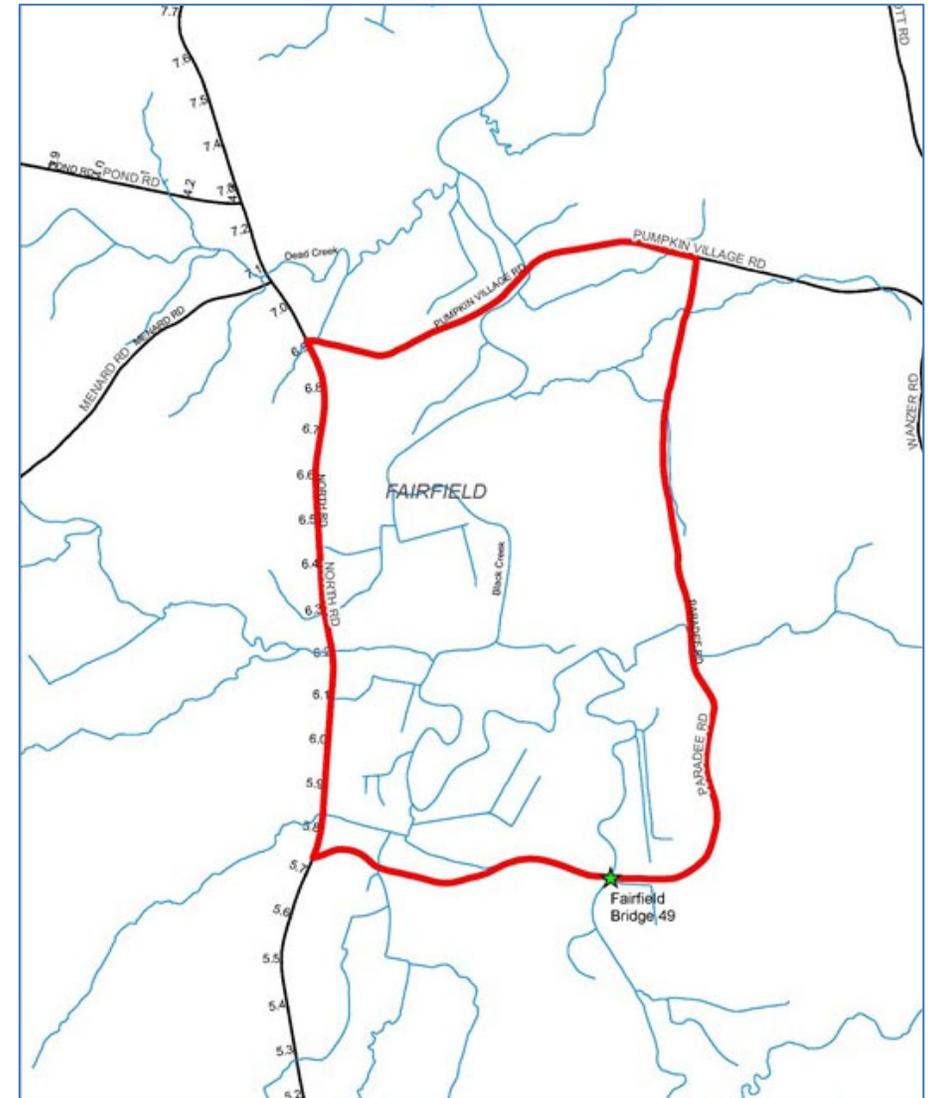
- Detour chosen and signed by Town
- Construction Season duration
- Shortest Detour Route is 4.3 miles end-to-end

Traffic Control – Detour

■ Regional Detour

Route: Paradee Road to Pumpkin Village Road, and North Road, back to Paradee Road

- End-to-End Distance: 4.3 miles
- Through Distance: 2.5 miles
- Detour Distance: 1.8 miles
- Added Distance: 0.7 miles

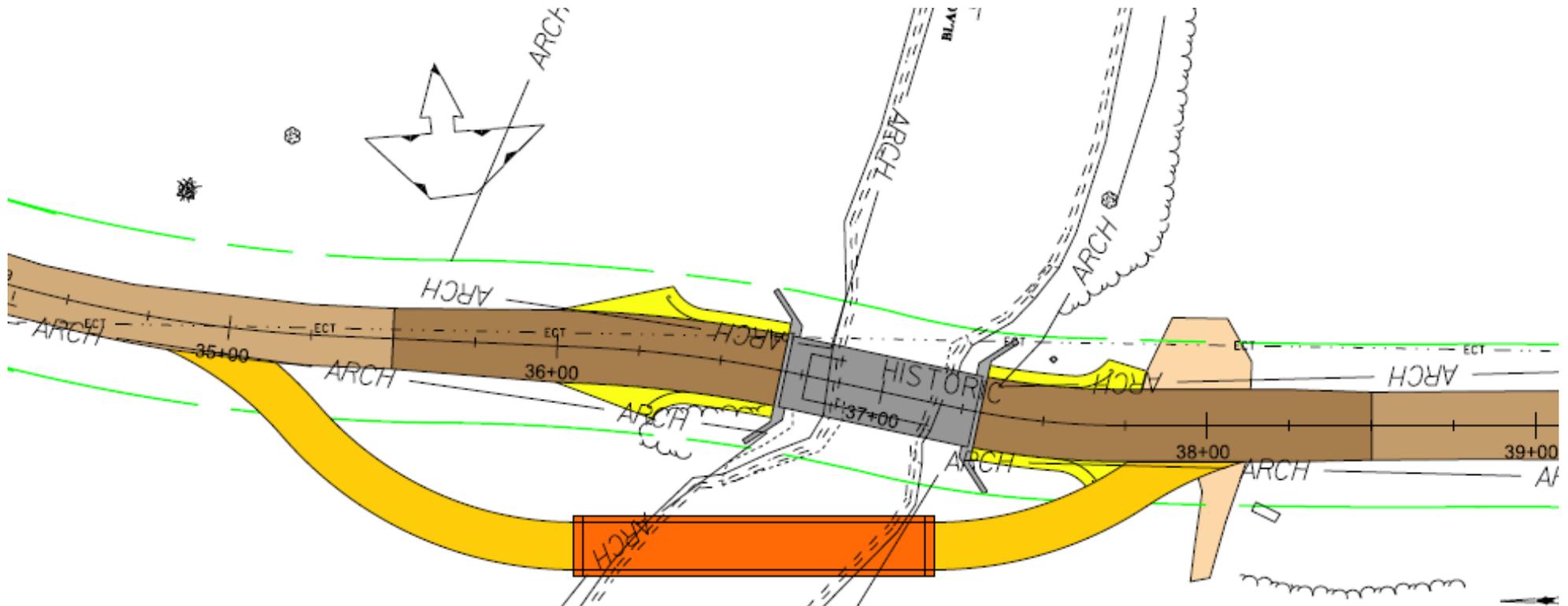




Temporary Bridge

- One Lane Temporary Bridge constructed either Upstream or Downstream side of Paradee Road

Upstream Temporary Bridge Layout

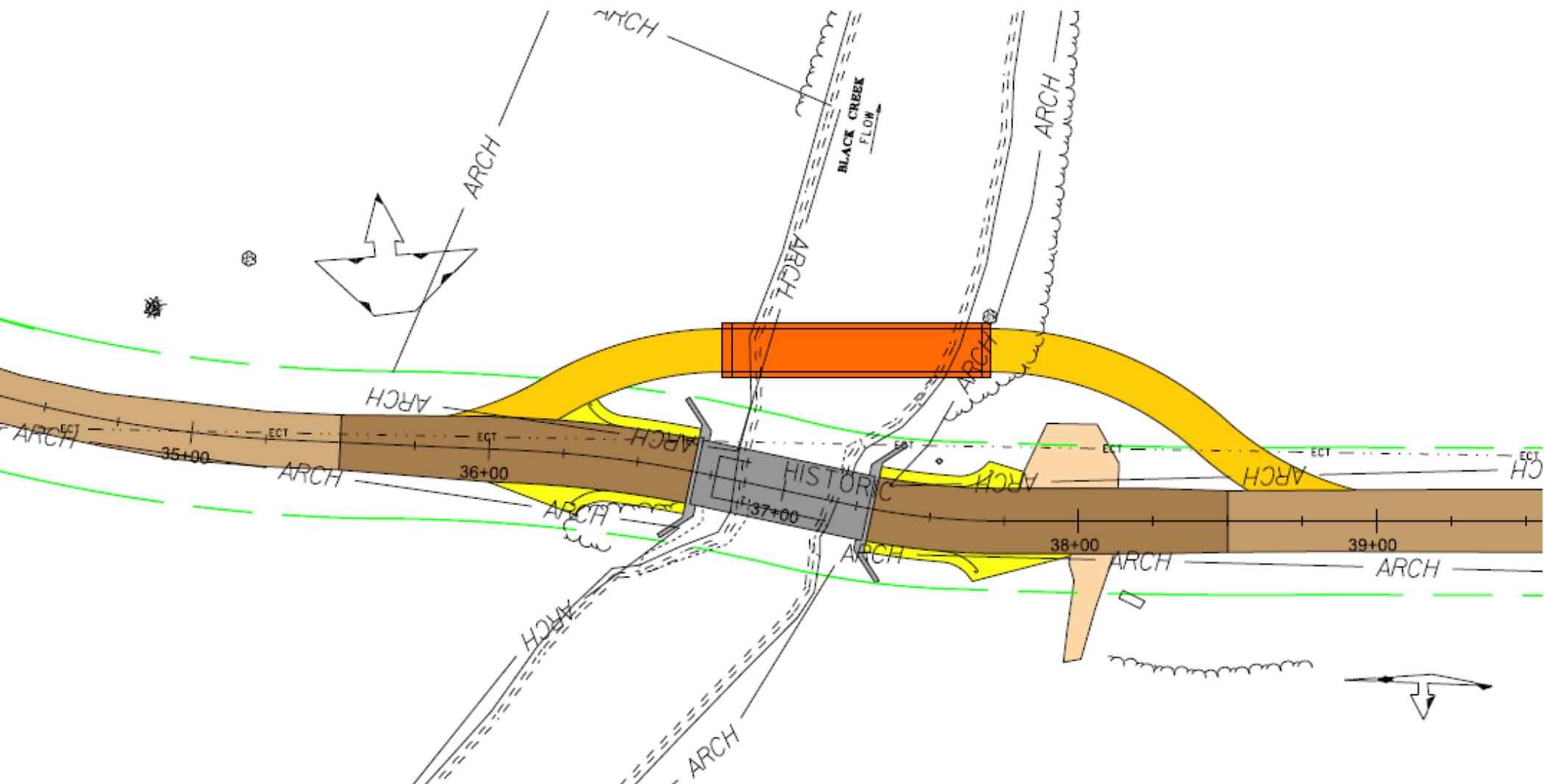


Upstream Temporary Bridge

- Impacts to archaeologically sensitive areas



Downstream Temporary Bridge Layout



Downstream Temporary Bridge

- Impacts to archaeologically sensitive areas



Recommendation: Bridge 49

- A new 55-foot span steel bridge constructed on-alignment with traffic maintained on an Offsite Detour
 - Bridge closed for the construction season
 - Minimum 55' span for improved hydraulics
 - 9'/2' typical to match minimum standard
 - 75-year design life
- Utility Relocation (Aerial)
- Construction Year: 2025

Alternatives Matrix

Fairfield BO 1448(46)	Do Nothing	Alternative 1		Alternative 2				Alternative 3			
		Truss Rehabilitation		Full Bridge Replacement with New Parker Pony Truss				Full Bridge Replacement with New Steel Beam Bridge			
		On-Alignment		On-Alignment		Off-Alignment		On-Alignment		Off-Alignment	
		a. Off-site Detour	b. Temporary Bridge	a. Off-site Detour	b. Temporary Bridge	c. Off-site Detour	d. Temporary Bridge	a. Off-site Detour	b. Temporary Bridge	c. Off-site Detour	d. Temporary Bridge
Total Project Costs	\$0	1,215,850	2,070,522	1,880,674	2,795,459	2,435,404	3,359,209	1,375,882	2,282,459	1,752,262	2,664,959
Annualized Costs	\$0	\$24,317	\$41,410	\$25,076	\$37,273	\$32,472	\$44,789	\$18,345	\$30,433	\$23,363	\$35,533
TOWN SHARE*	N/A	\$7,500	\$21,500	\$17,500	\$48,000	\$17,500	\$48,000	\$17,500	\$48,000	\$17,500	\$48,000
TOWN %	N/A	2.5%	5%	5%	10%	5%	10%	5%	10%	5%	10%
Construction Duration	N/A	6 months	8 months	6 months	8 months	6 months	8 months	6 months	8 months	6 months	8 months
Closure Duration (If Applicable)	N/A	Construction Season	NA	Construction Season	NA	Construction Season	NA	Construction Season	NA	Construction Season	NA
Typical Section - Roadway (feet)	16	16	16	22	22	22	22	22	22	22	22
Typical Section - Bridge (feet)	14	14	14	22	22	22	22	22	22	22	22
Geometric Design Criteria	Substandard Width	Substandard Width		Meets Minimum Standard		Meets Minimum Standard		Meets Minimum Standard		Meets Minimum Standard	
Alignment Change	No Change	No Change	No Change	No Change		Alignment shifted upstream		No Change		Alignment shifted upstream	
Hydraulics	Substandard BFW and freeboard	Substandard BFW and freeboard		Meets Minimum Standard		Meets Minimum Standard		Meets Minimum Standard		Meets Minimum Standard	
Utilities	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
ROW Acquisition	No Change	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Road Closure	No Change	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Design Life (years)	<10	50	50	75	75	75	75	75	75	75	75

*The construction phase of the project will be funded at 100% federal per the Infrastructure Investment and Jobs Act (IIJA)

Preliminary Project Schedule

- Construction Start – 2025
 - Total Cost Estimate: \$1,380,000
 - Town Share: \$18,000 (5% share of PE and ROW costs)

Next Steps – Bridge #49

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

- ➔ Wait for Town response to recommendation on proposed project
 - Develop Conceptual plans and distribute for comment
 - Process local agreements
 - Right-of-Way process
 - Updates on project plans and estimates at each submittal

For more information:

- <https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/12J624>



Fairfield BO 1448(46) Questions and Comments

Town Highway 29 – Bridge 49 over Black Creek

August 22, 2022