Brattleboro BF 2000(28)
Alternatives Presentation Meeting

VT Route 9– Bridge #54 over Whetstone Brook

September 21st, 2021

VERMONT
AGENCY OF TRANSPORTATION

Introductions

Laura Stone, P.E.

VTrans Scoping Engineer

Gary Laroche, P.E.

VTrans Project Manager

Kyle Obenauer

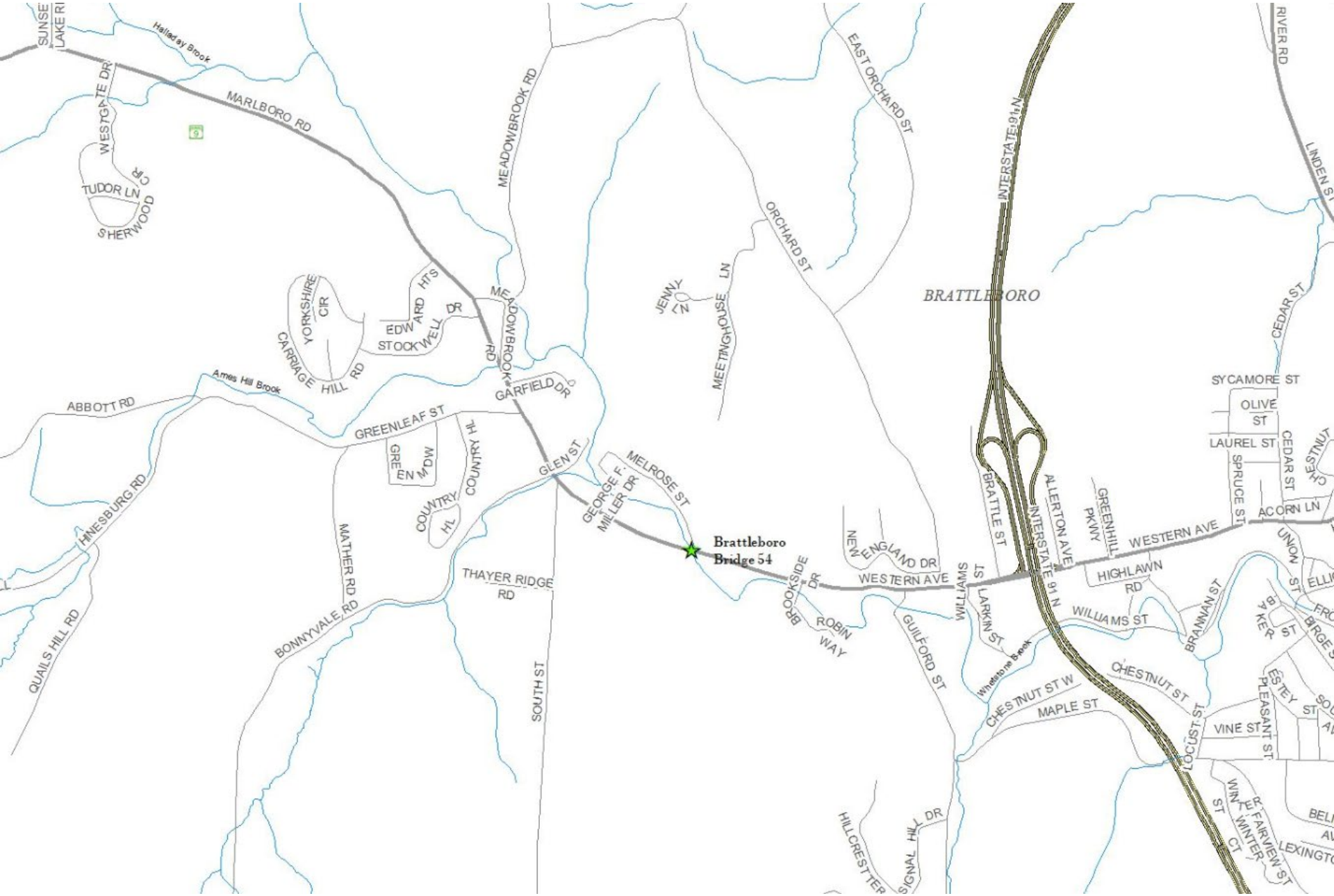
VTrans Historic Preservation Specialist

VERMONT
AGENCY OF TRANSPORTATION

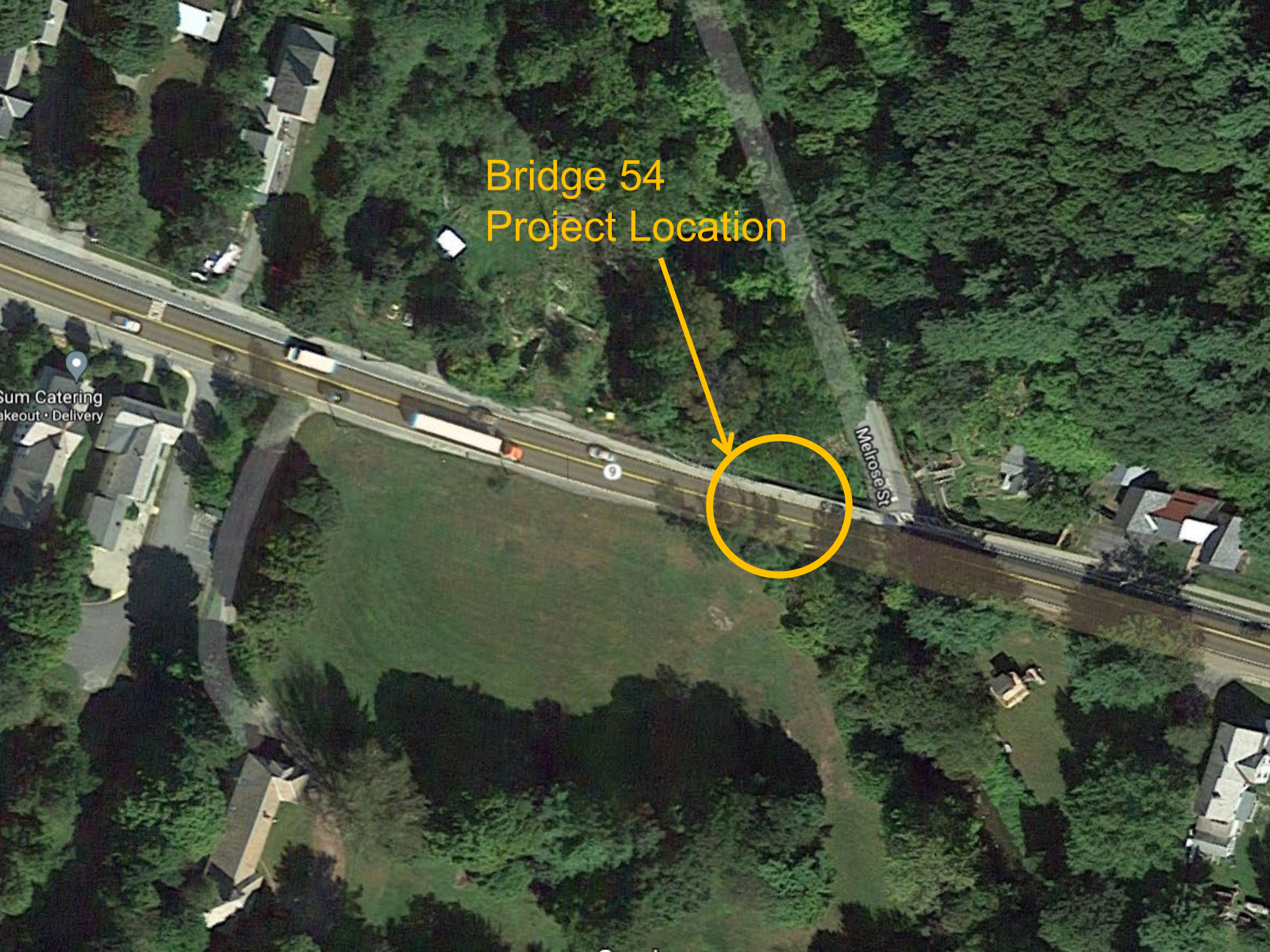
Purpose of Meeting

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

VERMONT
AGENCY OF TRANSPORTATION



Location Map

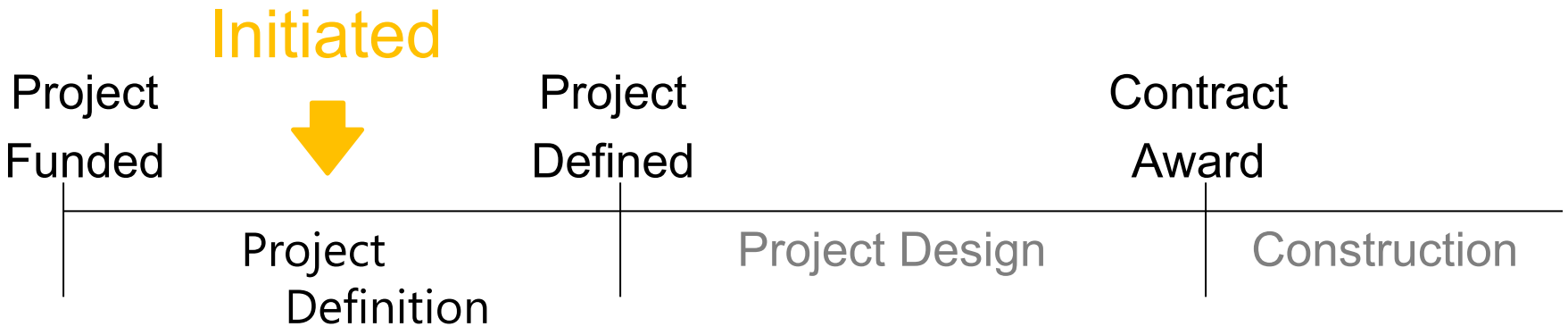

Bridge 54
Project Location
Melrose St
Sum Catering
akeout • Delivery

Meeting Overview

- VTrans Project Development Process
- Project Overview
  - Existing Conditions
  - Alternatives Considered
  - Recommended Alternative
- Maintenance of Traffic
- Schedule
- Summary
- Questions

VERMONT
AGENCY OF TRANSPORTATION

VTrans Project Development Process

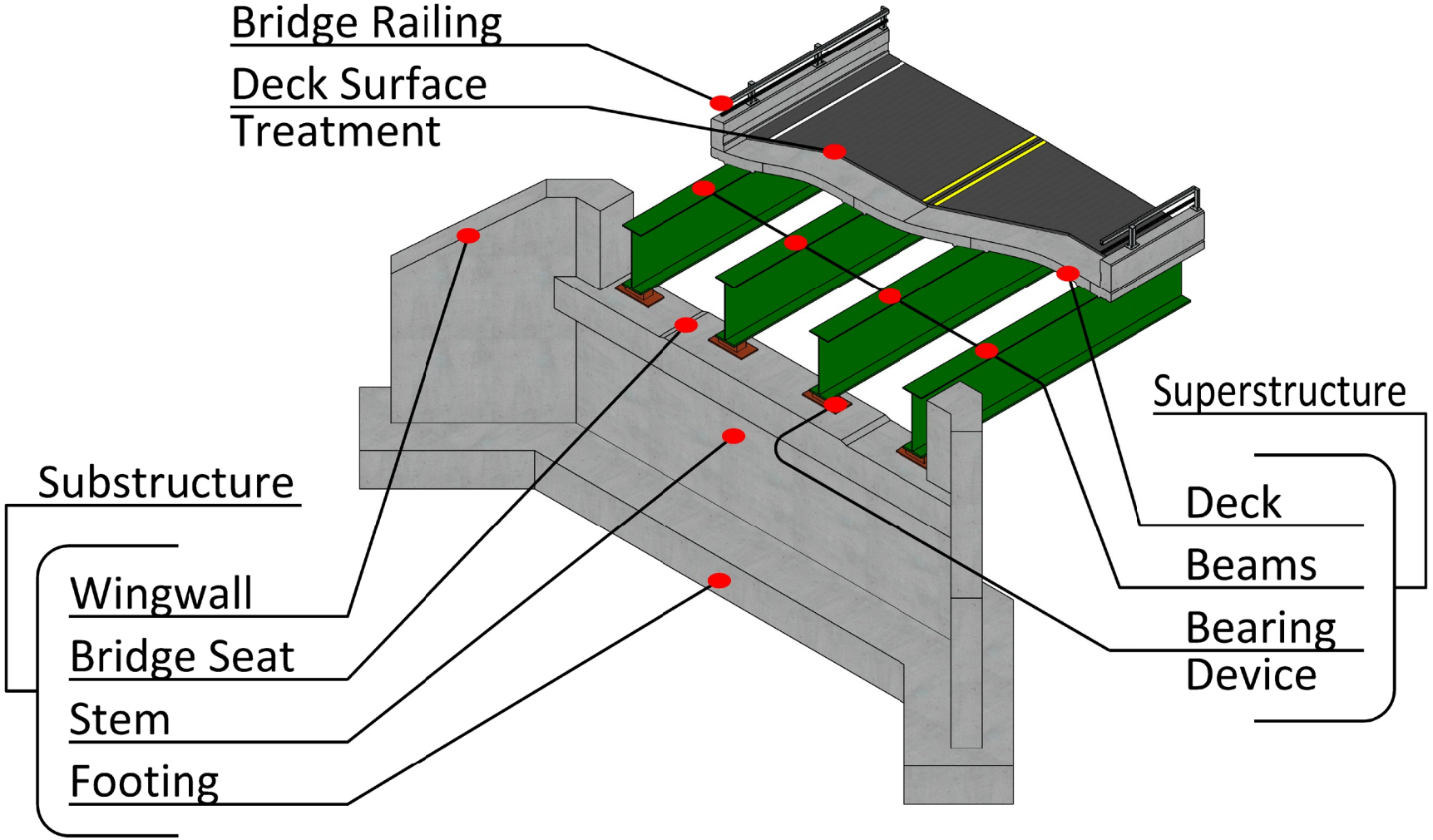


- Identify resources & constraints
- Evaluate alternatives
- Public participation
- Build Consensus

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

VERMONT
AGENCY OF TRANSPORTATION

Description of Terms Used



VERMONT
AGENCY OF TRANSPORTATION

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

VERMONT
AGENCY OF TRANSPORTATION

Looking West over Bridge

Existing Conditions – Bridge #54

- Roadway Classification – Principal Arterial, National Highway System, Urban (Class 1 Town Highway)
- Bridge Type – 60’ Span Single Span Cast-in-Place Concrete Arch
- Ownership – Town of Brattleboro
- Constructed in 1914

06/17/2019

Looking East over Bridge

Existing Conditions – Bridge #54

- Narrow sidewalk over north side of bridge
- Located in densely populated area
- Bridge is skewed 20 degrees

Existing Conditions – Bridge #54

- The sidewalk is in poor condition and does not meet the standard width.
- The barrel of the arch has scattered fine longitudinal and map cracks below the fascia areas with efflorescence staining.
- The headwalls have scattered fine map cracking with efflorescence.
- There is leakage and saturation in the concrete immediately surrounding the embedded waterline.
- There is heavy abrasion along the water line at both abutments.
- The paved width over the bridge is substandard by 18-feet.
- The embedded exposed waterline blocks high flood flows and catches debris. The arch is located within a flood insurance study area.

Existing Conditions - Bridge #54

- Culvert Rating 6 (Satisfactory)

Existing Conditions - Bridge #54

- Original railing is gone
- Cracking and efflorescence in headwalls
- Exposed waterline

Existing Conditions - Bridge #54

- Narrow and in poor condition
- Pavement patching and cracking

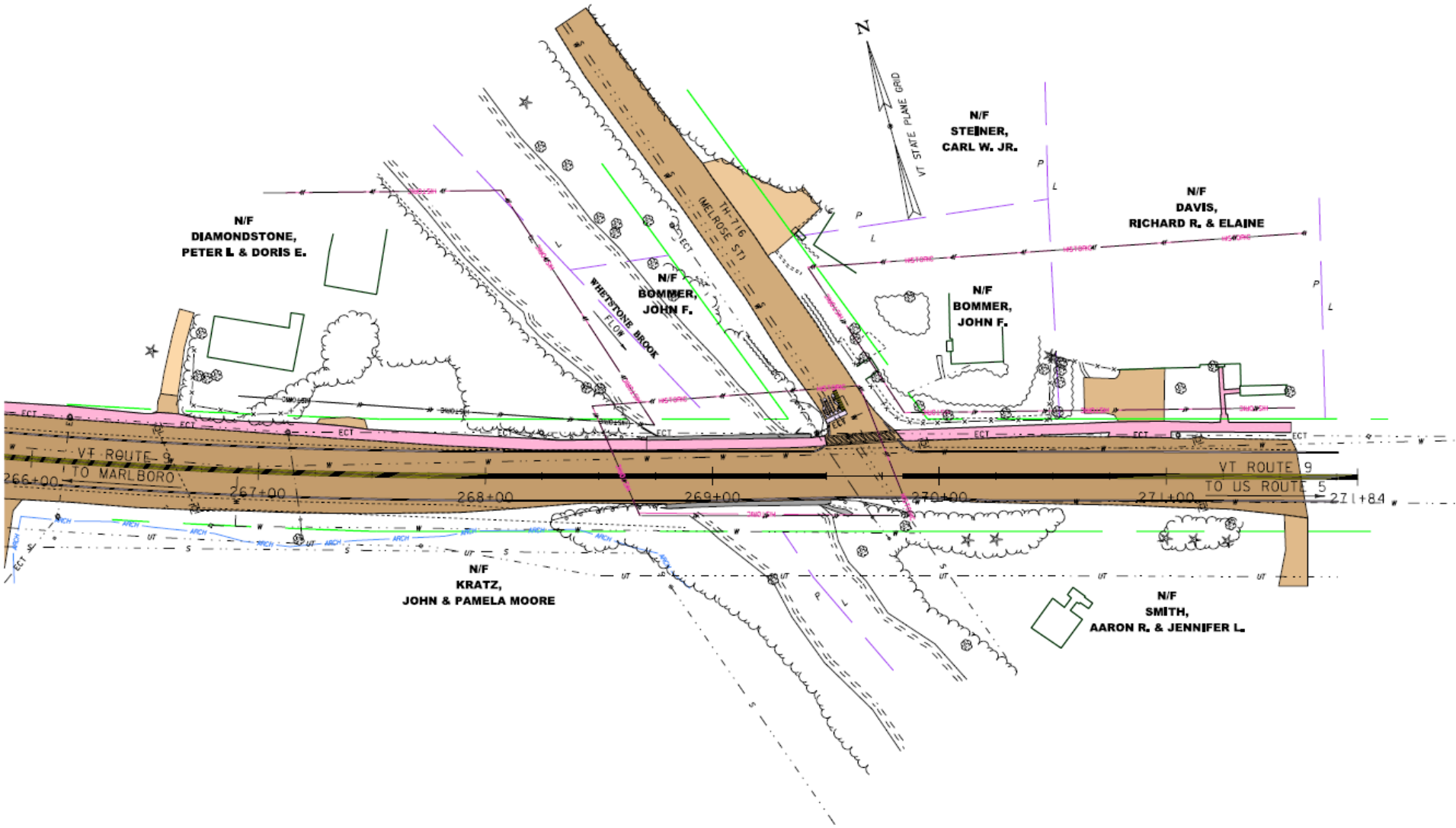
Existing Conditions - Bridge #54

- Northern Long Eared Bat Habitat
- Archaeological Resources (SW and SE quadrants)
- Historic Resources
  - Bridge No. 54 and several surrounding properties (755 Western Avenue, 747 Western Avenue, and 787 Western Avenue)
- FEMA Floodplains
- Utilities

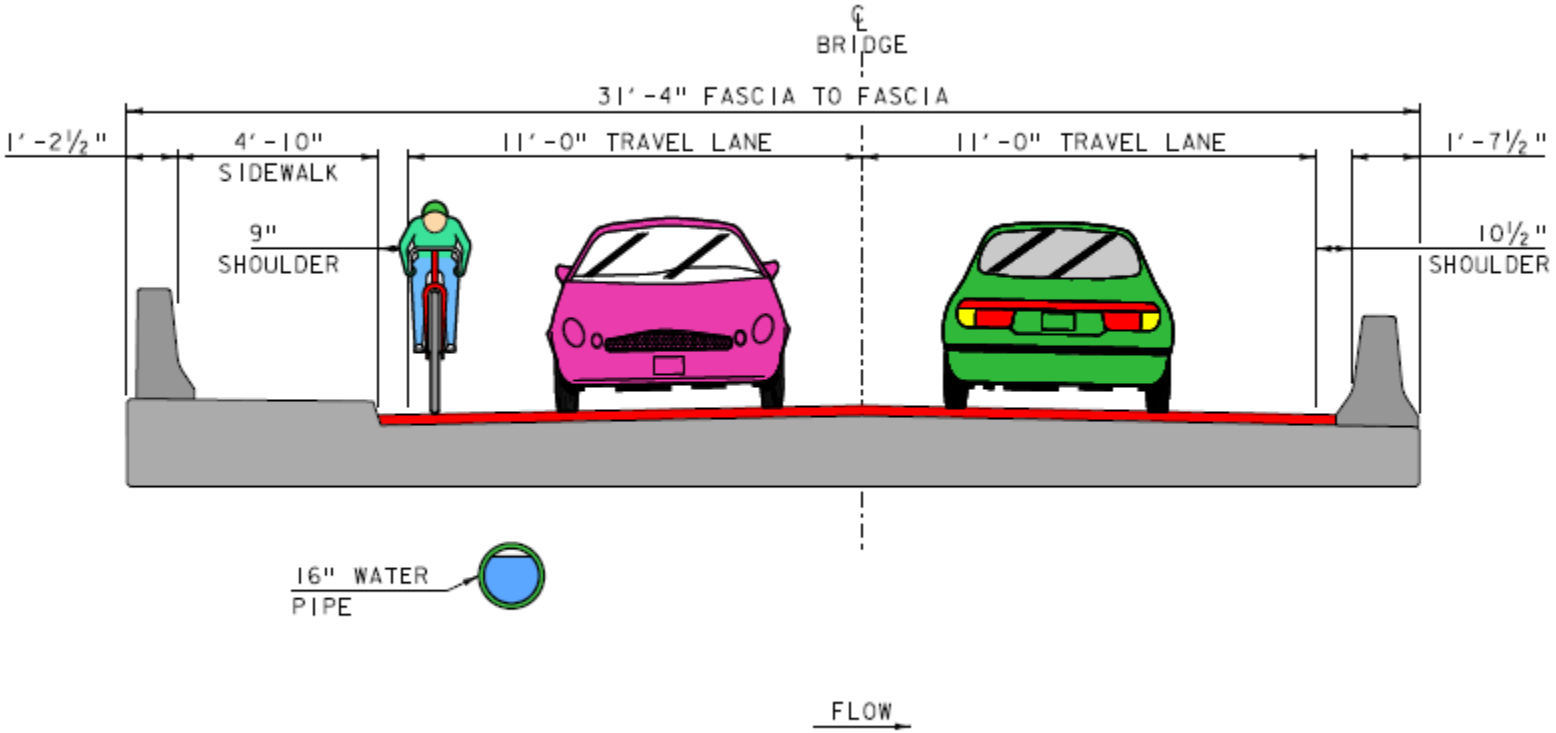
Existing Conditions - Bridge #54

- Existing Conditions with Debris Blockage: There is no freeboard (measured from the bottom of the waterline) at the 2% and 1% AEP. Roadway overtopping occurs approximately 200 ft west of the bridge at the 1% AEP with an approximate maximum water depth of 0.62-feet.

Existing Conditions – Layout



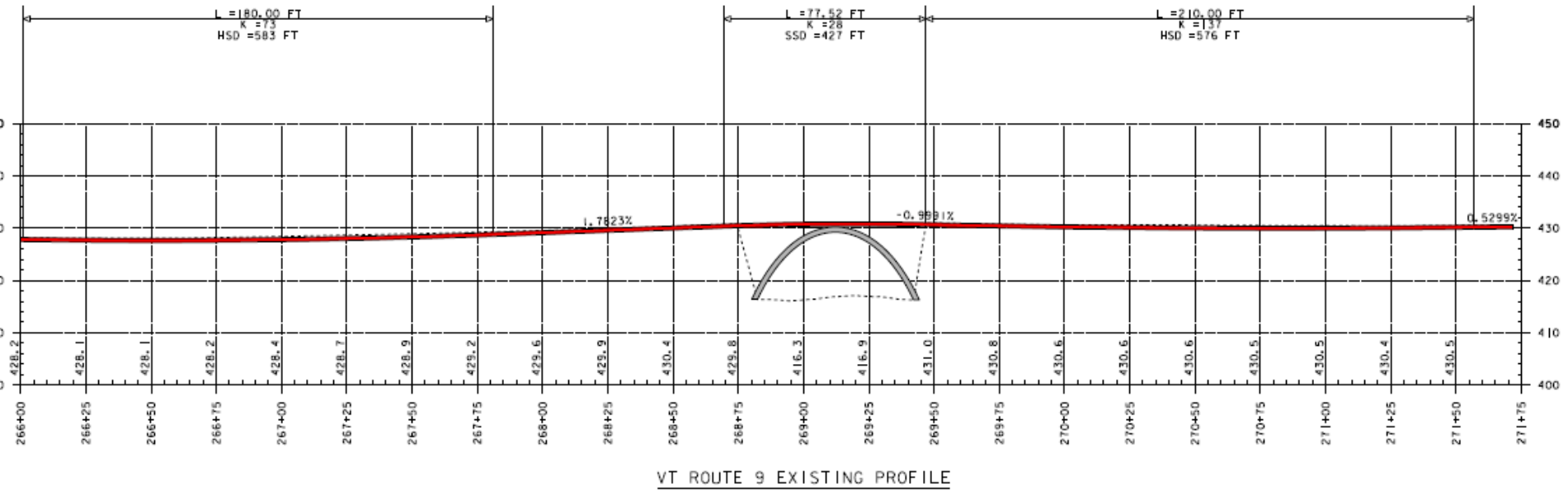
Existing Conditions – Typical Section



EXISTING BRIDGE TYPICAL SECTION

VERMONT
AGENCY OF TRANSPORTATION

Existing Conditions – Profile



VT ROUTE 9 EXISTING PROFILE

VERMONT
AGENCY OF TRANSPORTATION

Design Criteria and Considerations

- ADT of 17,500
- DHV of 1,700
- % Trucks: 8.5
- Design Speed of 30 mph
  - 30 mph (Car)
  - 25 mph (Bus, Truck)
- Utilities

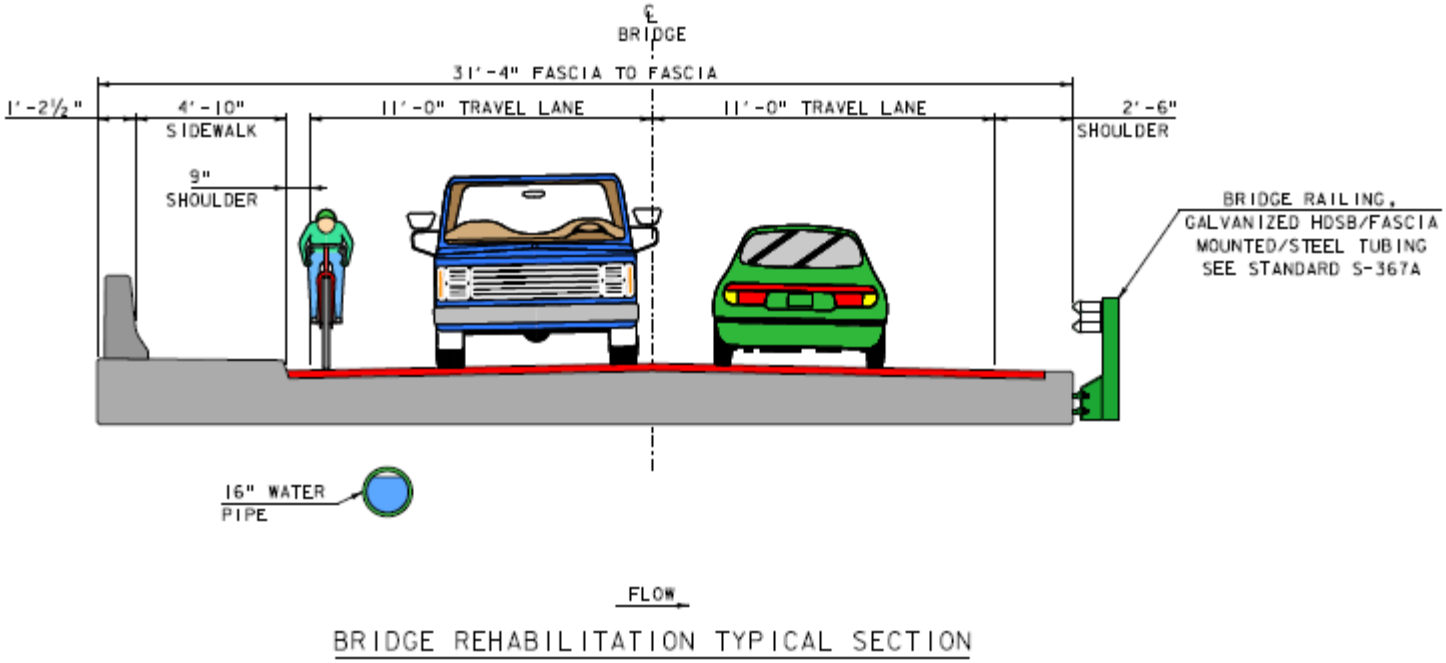
VERMONT
AGENCY OF TRANSPORTATION

Alternatives Considered – Bridge #54

- No Action
  - Additional maintenance required within 10 years
- Arch Rehabilitation
  - 1-11-11-1 with 4' sidewalk on north side
  - Repair/replace outer portions of arch ring and spandrel walls, new bridge railing, new pavement and sidewalk, relocation of waterline, and repairs to the foundation
  - 40-year design life
- Arch Rehabilitation with Widening
  - 10-11-11-10 with 5' sidewalk on north and south side
  - Removal of spandrel walls and addition of new conventional beams on both sides of the bridge, new bridge railing, new pavement and sidewalk, relocation of waterline.
  - 35-year design life (reduced due to longitudinal joints)
- Full Bridge Replacement with New Arch
  - 10-11-11-10 with 5' sidewalk on north and south side
  - Increased skew to channel for improved hydraulic condition
  - 100-year design life
- Full Bridge Replacement with Conventional Bridge
  - 10-11-11-10 with 5' sidewalk on north and south side
  - Increased skew to channel for improved hydraulic condition
  - 100-year design life

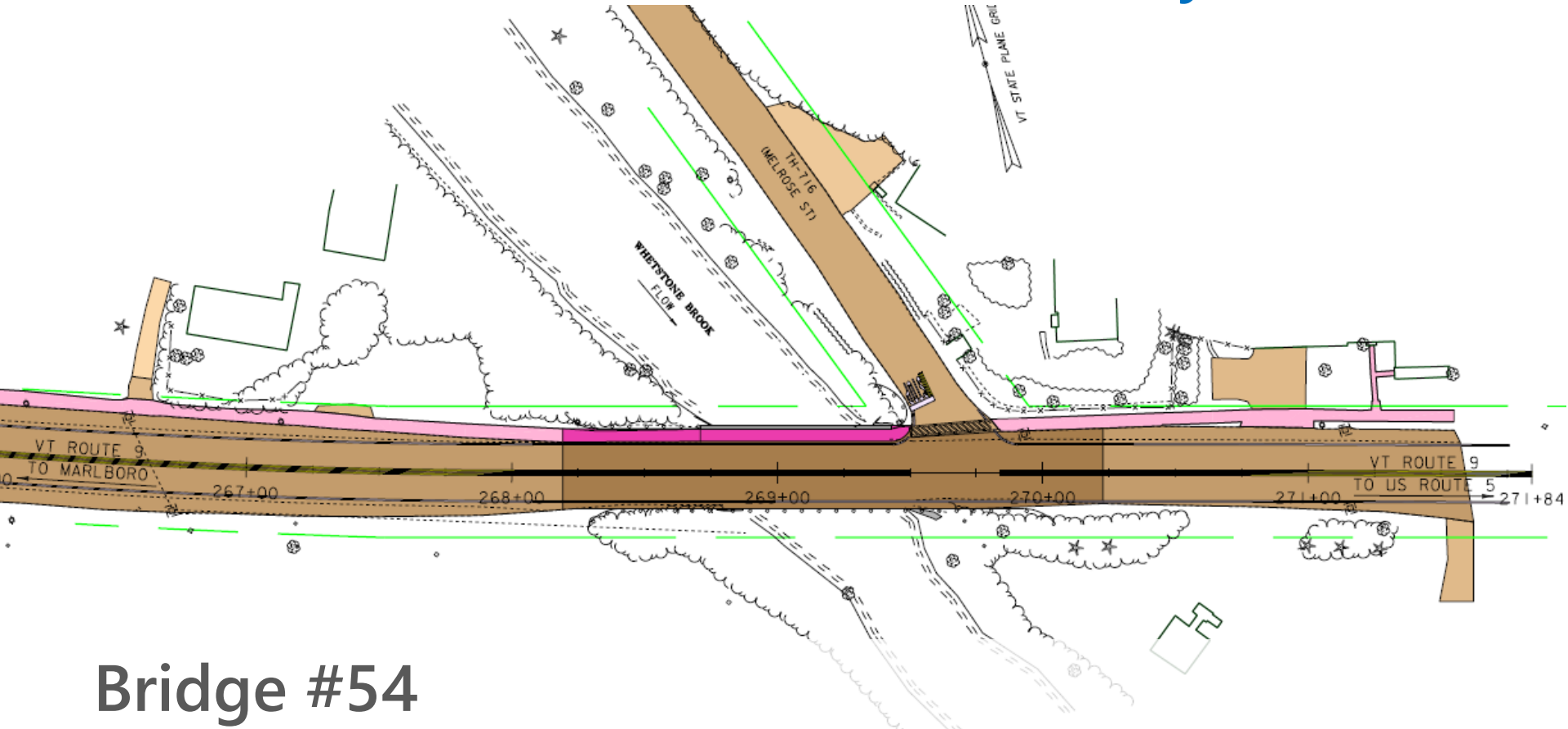
VERMONT
AGENCY OF TRANSPORTATION

Alternative 1: Arch Rehabilitation Typical Section



VERMONT
AGENCY OF TRANSPORTATION

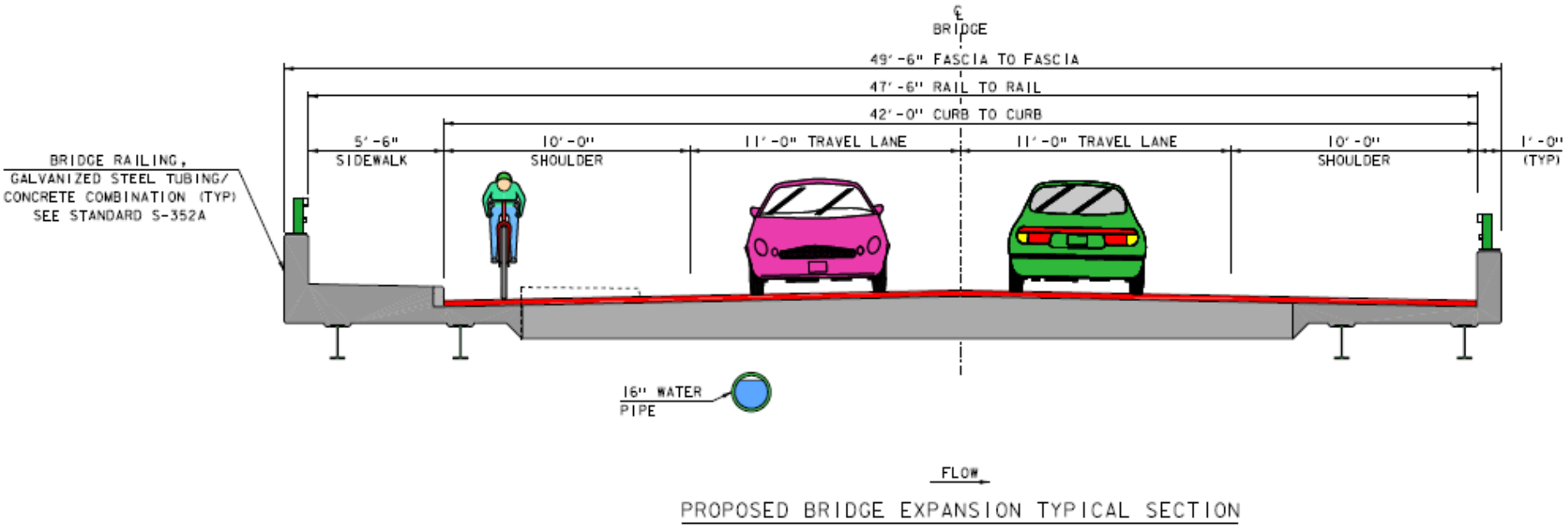
Alternative 1: Arch Rehabilitation Layout



Bridge #54

- 1-11-11-1 with 4' sidewalk on north side
- Repair/replace outer portions of arch ring and spandrel walls, new bridge railing, new pavement and sidewalk, relocation of waterline, and repairs to the foundation
- 40-year design life

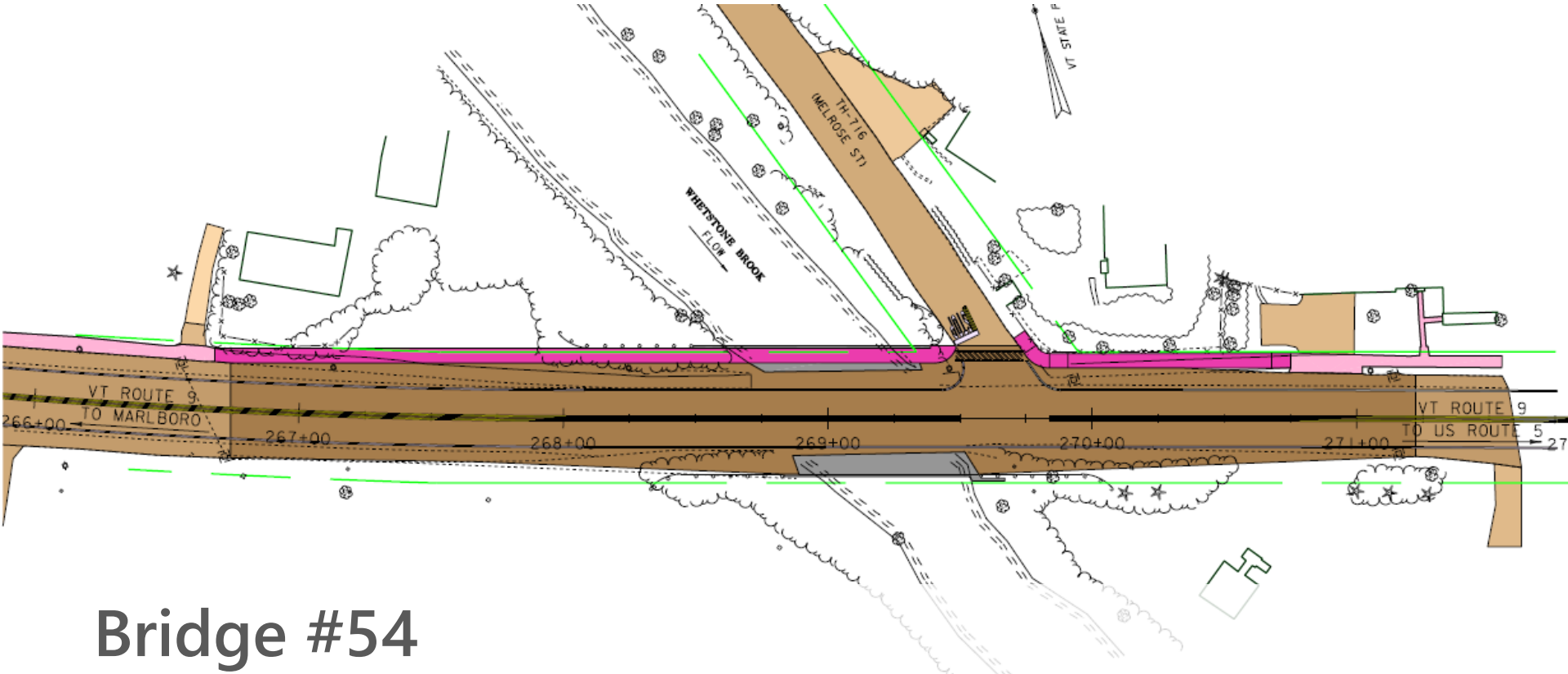
Alternative 2: Arch Rehabilitation with Widening Typical Section



PROPOSED BRIDGE EXPANSION TYPICAL SECTION

VERMONT
AGENCY OF TRANSPORTATION

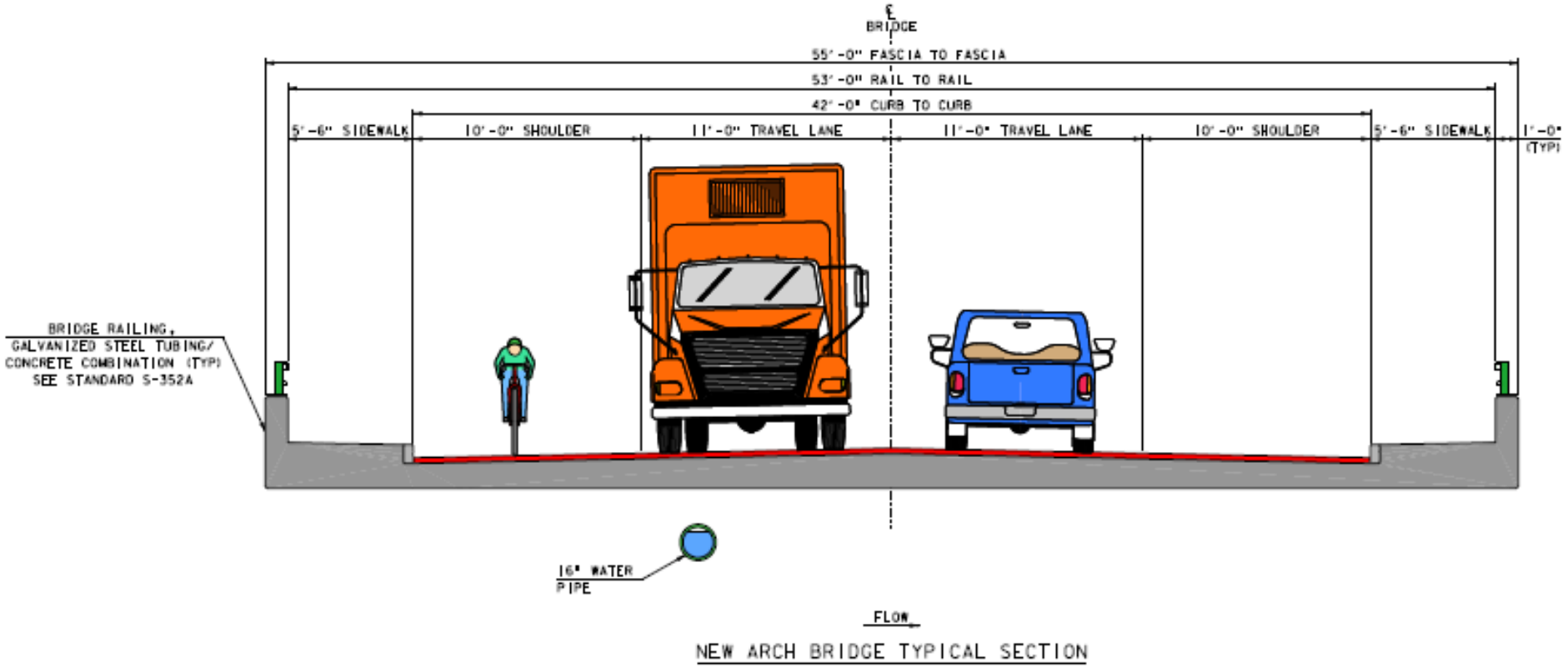
Alternative 2: Arch Rehabilitation with Widening Layout



Bridge #54

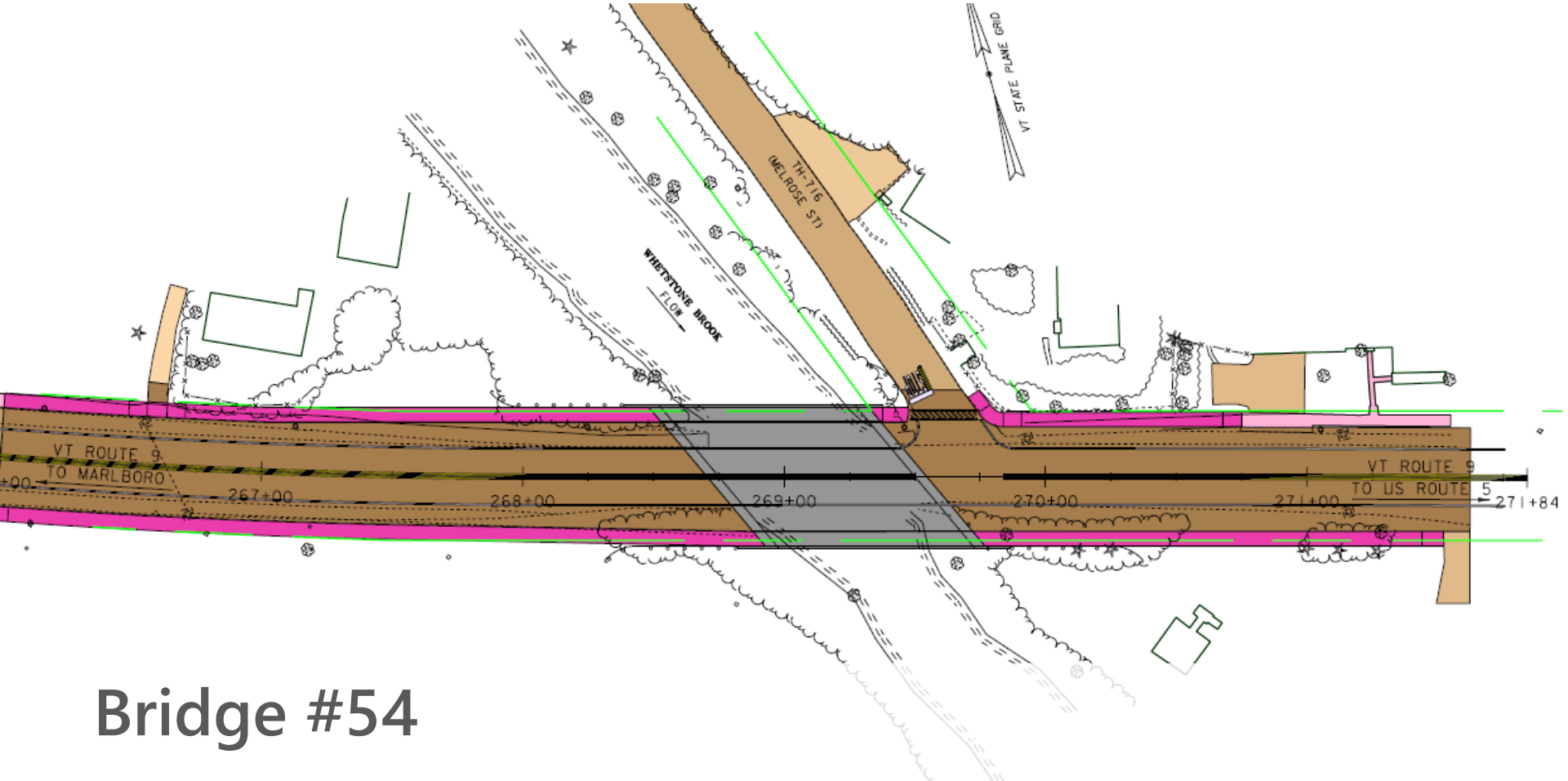
- 10-11-11-10 with 5' sidewalk on north and south side
- Removal of spandrel walls and addition of new conventional beams on both sides of the bridge, new bridge railing, new pavement and sidewalk, relocation of waterline.
- 35-year design life (reduced due to longitudinal joints)

Alternative 3: Full Bridge Replacement with New Arch Typical Section



VERMONT
AGENCY OF TRANSPORTATION

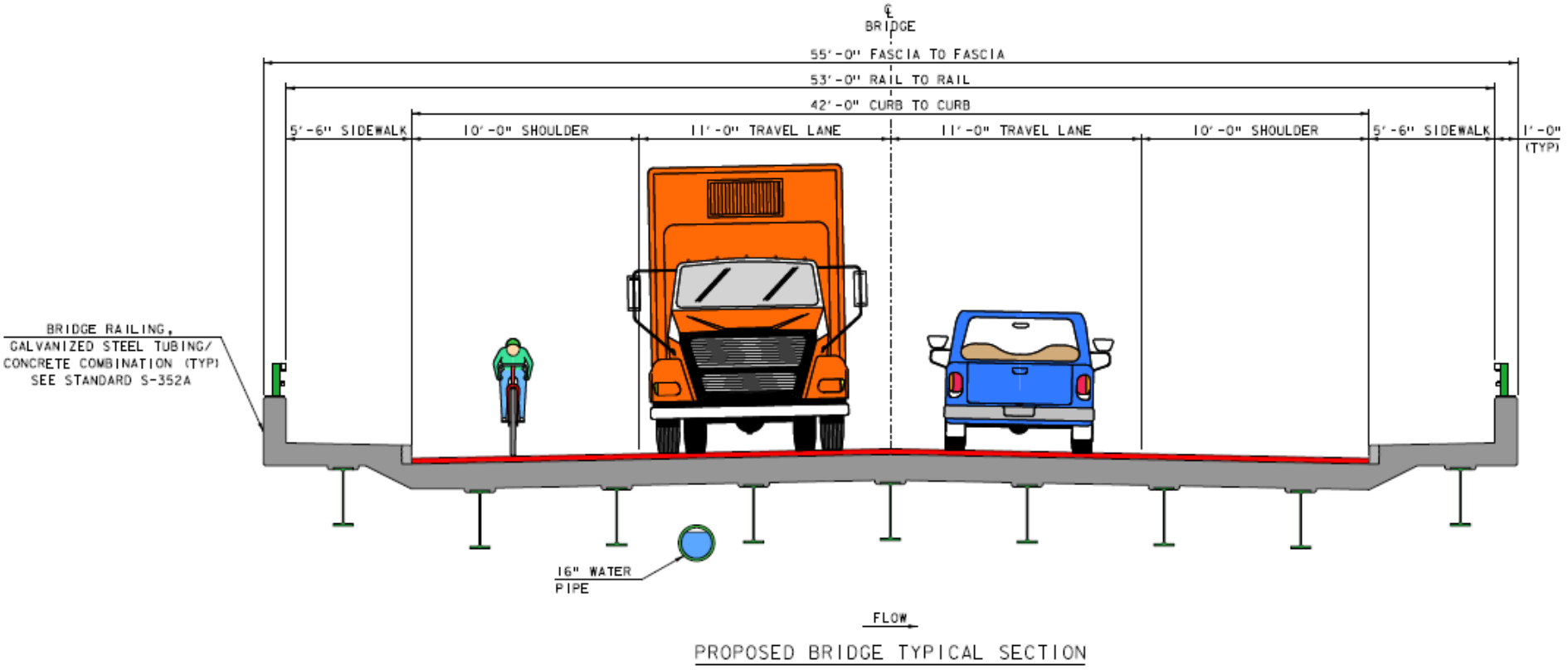
Alternative 3: Full Bridge Replacement with New Arch Layout



Bridge #54

- 10-11-11-10 with 5' sidewalk on north and south side
- Increased skew to channel for improved hydraulic condition
- 100-year design life

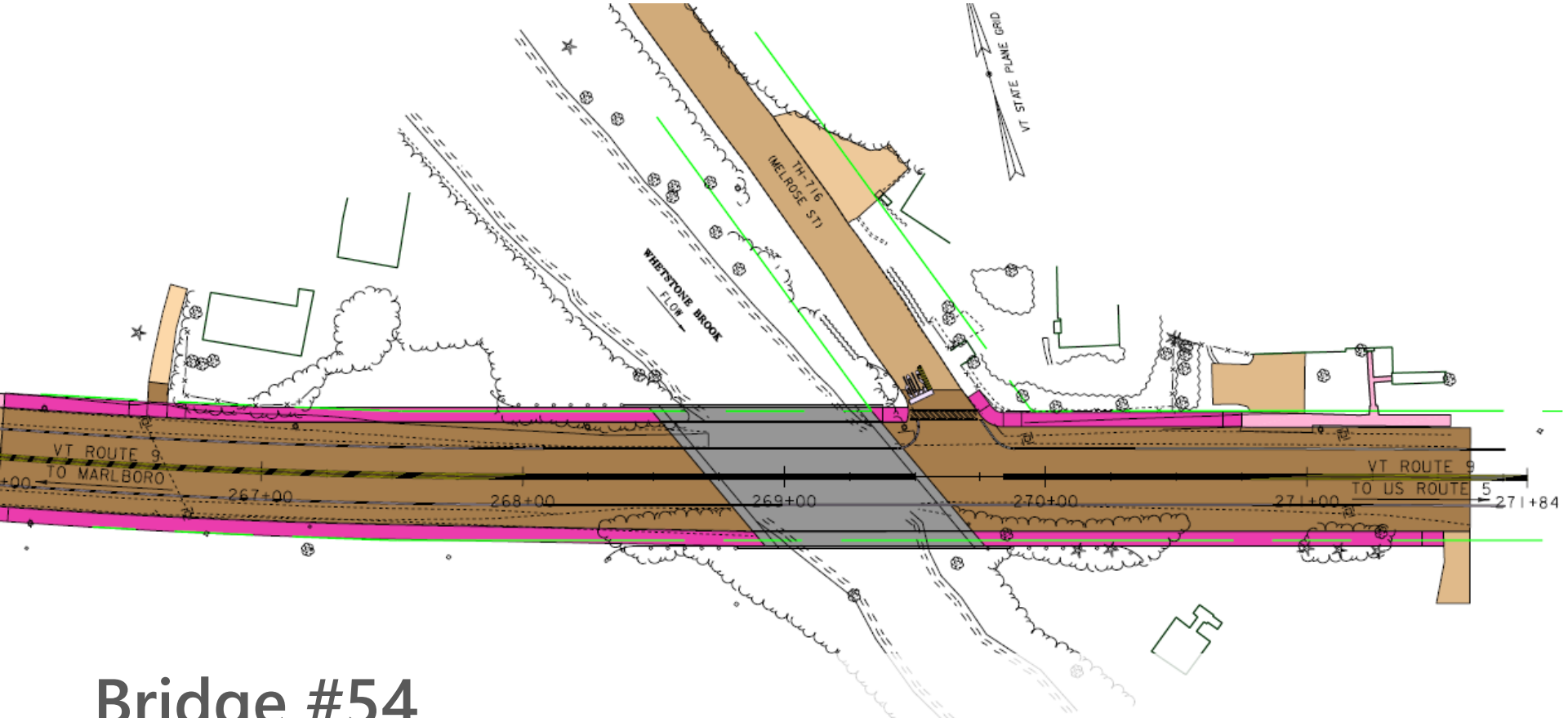
Alternative 4: Full Bridge Replacement with Conventional Bridge Typical Section



PROPOSED BRIDGE TYPICAL SECTION

VERMONT
AGENCY OF TRANSPORTATION

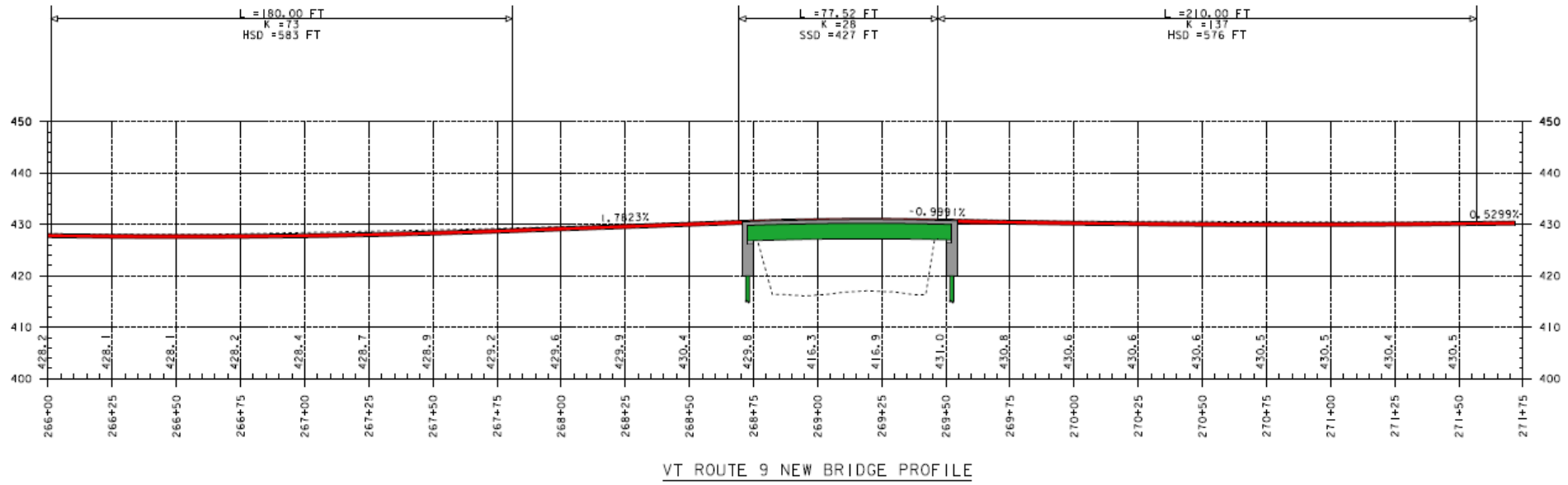
Alternative 4: Full Bridge Replacement with Conventional Bridge Layout



Bridge #54

- 10-11-11-10 with 5' sidewalk on north and south side
- Increased skew to channel for improved hydraulic condition
- 100-year design life

Proposed Profile



VT ROUTE 9 NEW BRIDGE PROFILE

VERMONT
AGENCY OF TRANSPORTATION

Recommended Alternative - Bridge #54

- Full Bridge Replacement
  - 11’/10’ typical with 5.5-foot-wide sidewalk on each side
  - Span length of approximately 75’
  - Skew increased to 40 degrees to match channel
  - Shallow superstructure type to be chosen
  - 100-year design life (National Highway System)

VERMONT
AGENCY OF TRANSPORTATION

Maintenance of Traffic Options Considered

- Offsite Detour
- Temporary Bridge

- Phased Construction
  - Not considered due to existing narrow width of bridge and need to maintain two-way traffic

VERMONT
AGENCY OF TRANSPORTATION

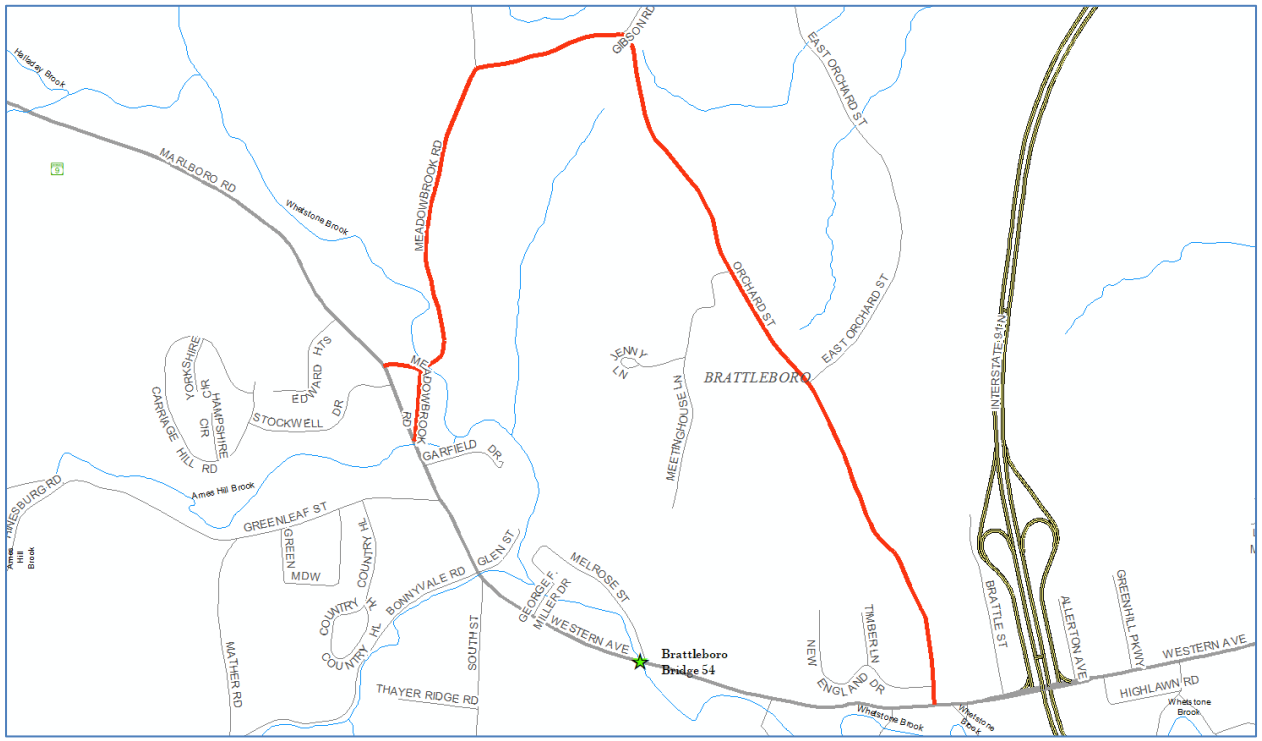
Road Closure

- Detour signed by State
- Shortest route is 3.7 miles end-to-end
- 60-day closure
- Separate Route for Trucks (64.8 miles end-to-end)

Traffic Control – Offsite Detour: Passenger Cars

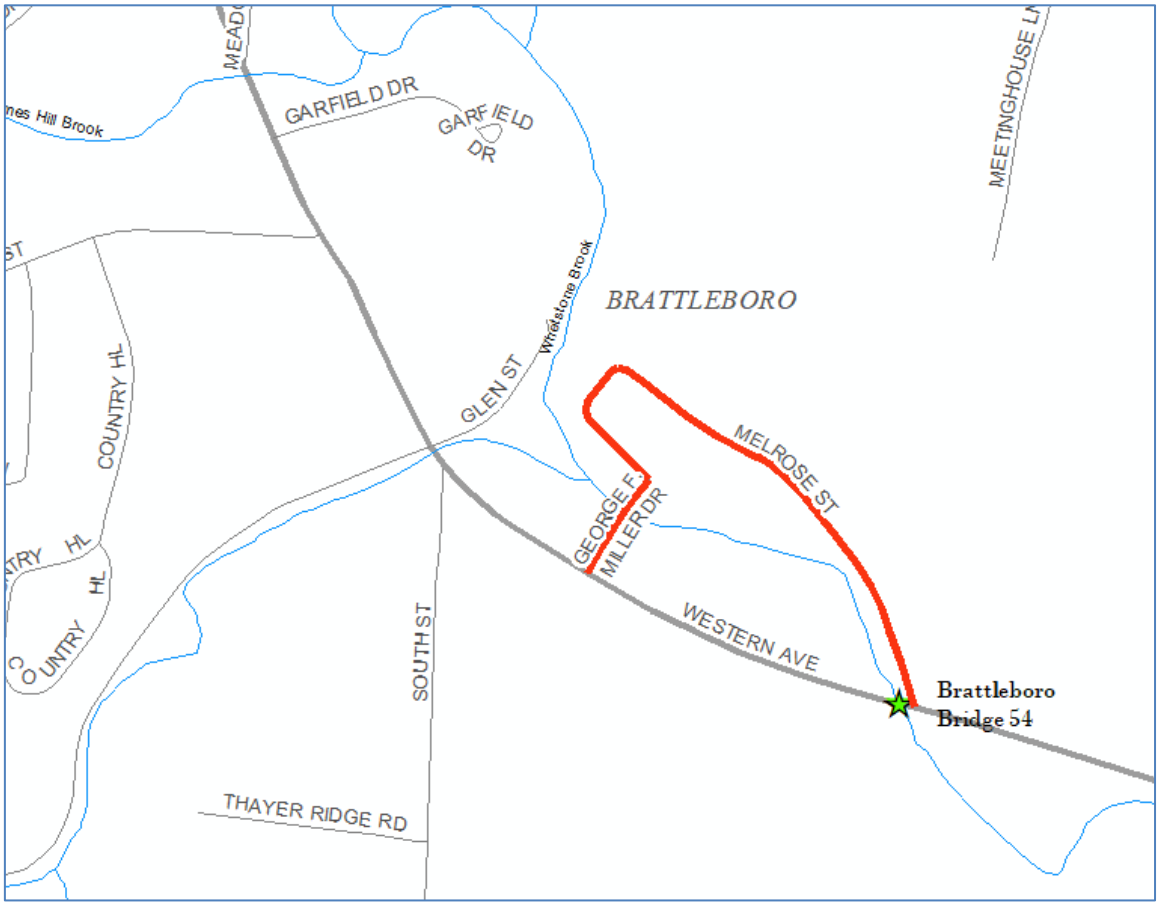
Passenger Car Route: VT Route 9, to Orchard Street and Meadowbrook Road, back to VT Route 9

Detour Route: 2.5 miles
Through Route: 1.2 miles
End-to-end Distance: 3.7 miles
Added Distance: 1.3 miles



Traffic Control – Offsite Detour: Pedestrians

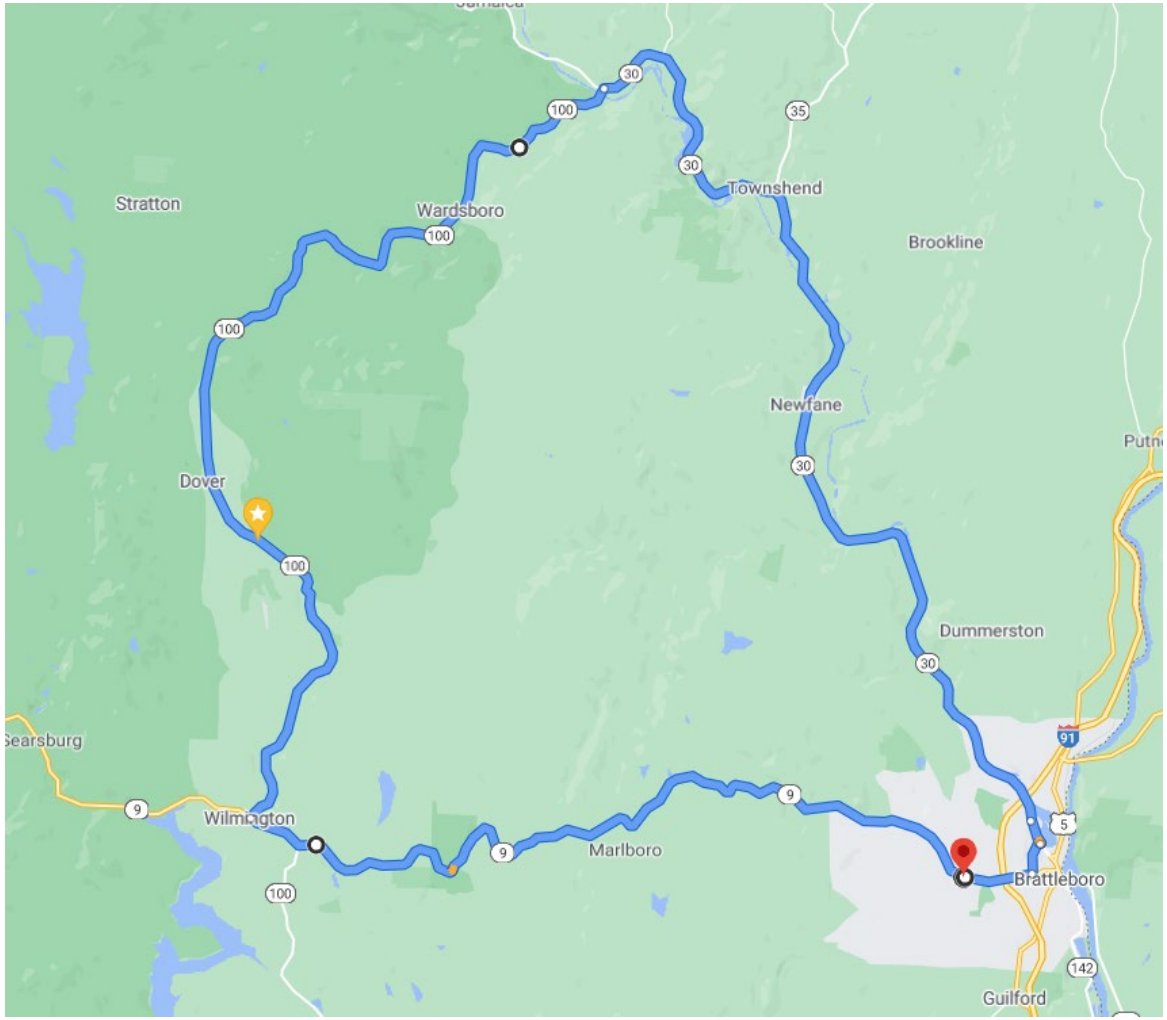
Pedestrian Bypass Route: VT Route 9, to Melrose Street, and George F. Miller Drive, back to VT Route 9



Detour Route: 0.5 miles
Through Route: 0.2 miles
End-to-end Distance: 0.7 miles
Added Distance: 0.3 miles

Traffic Control – Offsite Detour: Truck Route

State Signed Truck Detour Route: VT Route 9, to VT Route 30, and VT Route 100, back to VT Route 9

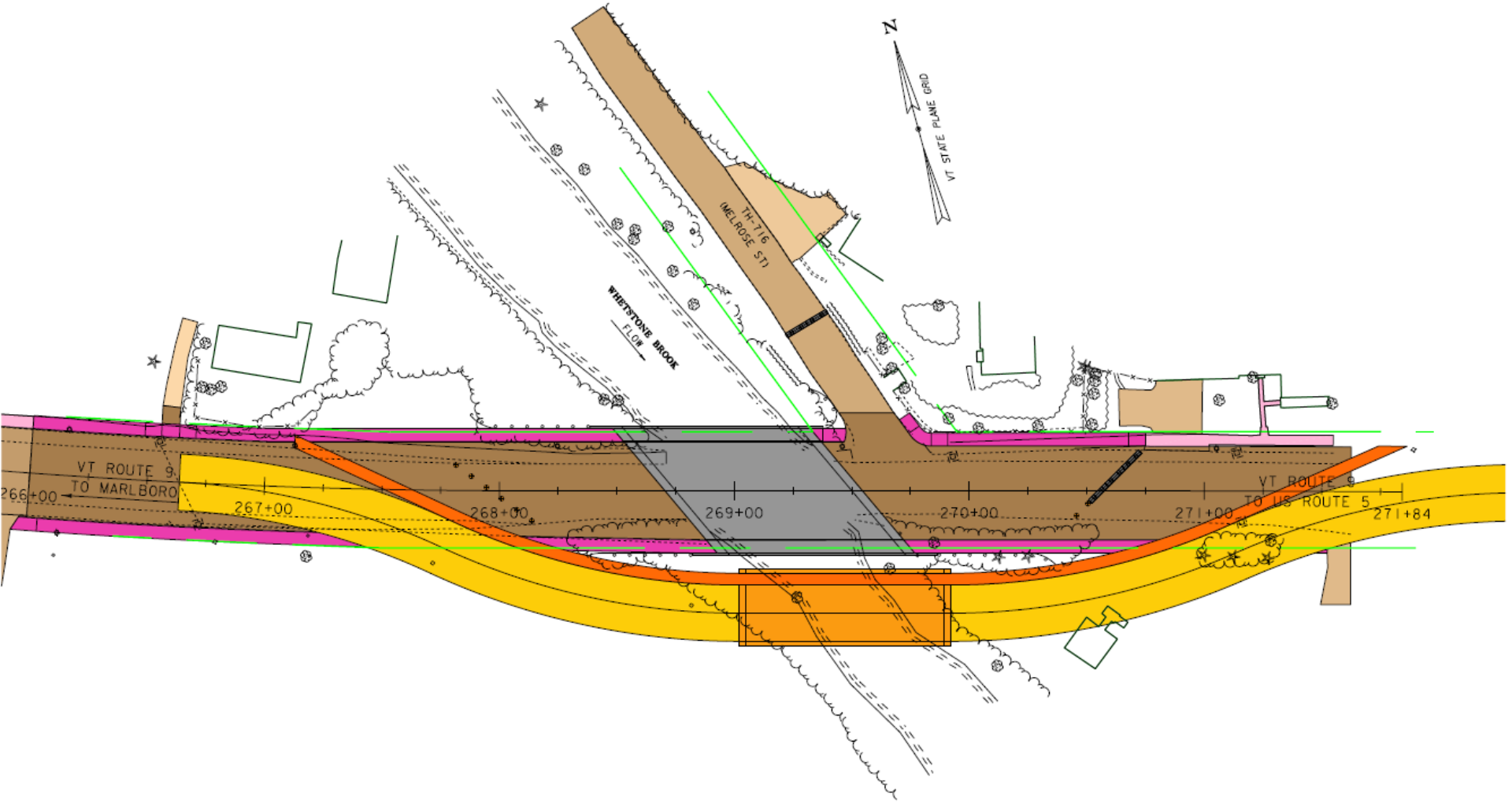


Detour Route: 45.4 miles
Through Route: 19.4 miles
End-to-end Distance: 64.8 miles
Added Distance: 26.0 miles

Temporary Bridge

- Two Lane Temporary Bridge Downstream

Downstream Temporary Bridge Layout



VERMONT
AGENCY OF TRANSPORTATION

Temporary Bridge

- Play structure relocation

Recommended Scope

- Full Bridge Replacement with a Conventional Bridge and Traffic Maintained on a Temporary Bridge
  - 11’/10’ typical with 5.5-foot-wide sidewalk on each side
  - Span length of approximately 75’
  - Skew increased to 40 degrees to match channel
  - Shallow superstructure type to be chosen
  - 100-year design life (National Highway System)
  - Right-of-Way Needed
  - Aerial Utility Relocation
  - Municipal Utility Relocation

VERMONT
AGENCY OF TRANSPORTATION

Alternatives Matrix

Brattleboro BF 2000(28)	Alt 1a	Alt 1b	Alt 2a	Alt 2b	Alt 3a	Alt 3b	Alt 4a	Alt 4b
	Arch Rehabilitation		Arch Rehabilitation with Widening		Full Bridge Replacement with new Arch		Full Bridge Replacement with New Steel Beam Bridge	
	a. Off-Site Detour	b. Temporary Bridge	a. Off-Site Detour	b. Temporary Bridge	a. Off-Site Detour	b. Temporary Bridge	a. Off-Site Detour	b. Temporary Bridge
Total Project Costs	**2,117,905**	**2,555,197**	**2,575,757**	**2,993,697**	**5,195,506**	**5,545,763**	**4,644,965**	**5,159,901**
Annualized Costs	52,948	63,880	73,593	85,534	51,955	55,458	46,450	51,599
TOWN SHARE	52,948	127,760	64,394	149,685	259,775	554,576	232,248	515,990
	2.5%	5.0%	2.5%	5.0%	5.0%	10.0%	5.0%	10.0%
Construction Duration	4 months	9 months	6 months	18 months	8 months	18 months	8 months	18 months
Closure Duration (If Applicable)	21 days	NA	30 days	NA	120 days	NA	60 days	NA
Typical Section - Roadway (ft)	24	24	42	42	42	42	42	42
Typical Section - Bridge (ft)	1-11-11-1 with 4' sidewalk on north side		10-11-11-10 with 5' sidewalk on north and south side		10-11-11-10 with 5' sidewalk on north and south side		10-11-11-10 with 5' sidewalk on north and south side	
Geometric Design Criteria	Substandard Width		Meets Minimum Standard		Meets Minimum Standard		Meets Minimum Standard	
Traffic Safety	Substandard Width for Safety and Service		Improved - Meets Minimum Standard		Improved - Meets Minimum Standard		Improved - Meets Minimum Standard	
Bicycle Access	Substandard Width for Shared Use		Improved - Meets Minimum Standard		Improved - Meets Minimum Standard		Improved - Meets Minimum Standard	
Pedestrian Access	Substandard Sidewalk Width		Improved - Meets Minimum Standard		Improved - Meets Minimum Standard		Improved - Meets Minimum Standard	
Hydraulics	Substandard	Substandard	Substandard	Substandard	Meets Minimum Standard		Meets Minimum Standard	
Utilities	Municipal Water Line Relocation		Municipal Water Line and Aerial Relocation		Municipal Water Line and Aerial Relocation		Municipal Water Line and Aerial Relocation	
ROW Acquisition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Road Closure	Yes	No	Yes	No	Yes	No	Yes	No
Design Life (yrs)	40	40	35	35	100	100	100	100

Preliminary Project Schedule

- Construction Start – 2025
  - Total Cost Estimate: $5,160,000
    - Town Share: $516,000

VERMONT
AGENCY OF TRANSPORTATION

Next Steps – Bridge #54

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
  - Request a Public Information meeting
  - Process local agreements
  - Right-of-Way process (if needed)

VERMONT
AGENCY OF TRANSPORTATION

For more information:

- https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/12J608

Brattleboro BF 2000(28)
Questions and Comments

VT Route 9– Bridge #54 over Whetstone Brook

September 21st, 2021

VERMONT
AGENCY OF TRANSPORTATION