



Essex, VT  
Route 15,  
Bridge 2 over  
Indian Brook



Essex, VT  
Route 2A,  
Bridge 11 over  
Unknown Brook



Essex, VT Route  
289, Bridge 17-A  
over Unknown  
Brook



Jericho, VT  
Route 15,  
Bridge 6A over  
Unknown Brook

# Essex-Jericho Culvert Bundle Public Informational Meeting

March 18, 2024

# Introductions

**Laura Stone, P.E.**

VTrans Scoping Project Manager

**Mahendra Thilliyar, P.E.**

VTrans Design Project Manager

**Dennis Vertiyev, P.E.**

Consultant Project Manager  
Green International Affiliates, Inc.

# Purpose of Meeting

- Provide an understanding of our approach to the project
- Identify current efforts and anticipated schedule
- Provide an opportunity to ask questions and voice concerns

# VTrans Project Development Process

Current  
Status



Project  
Funded

Project  
Defined

Contract  
Award

Project  
Definition

Project Design

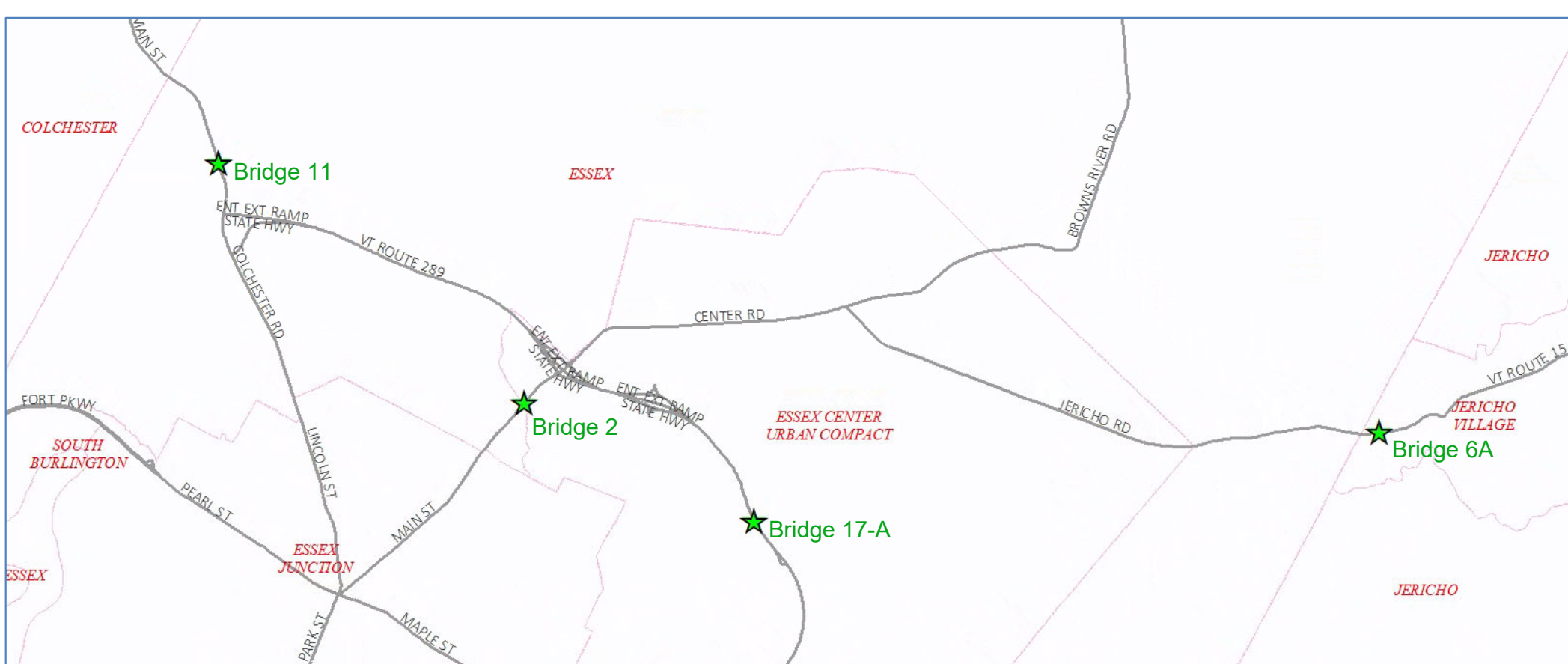
Construction

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

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

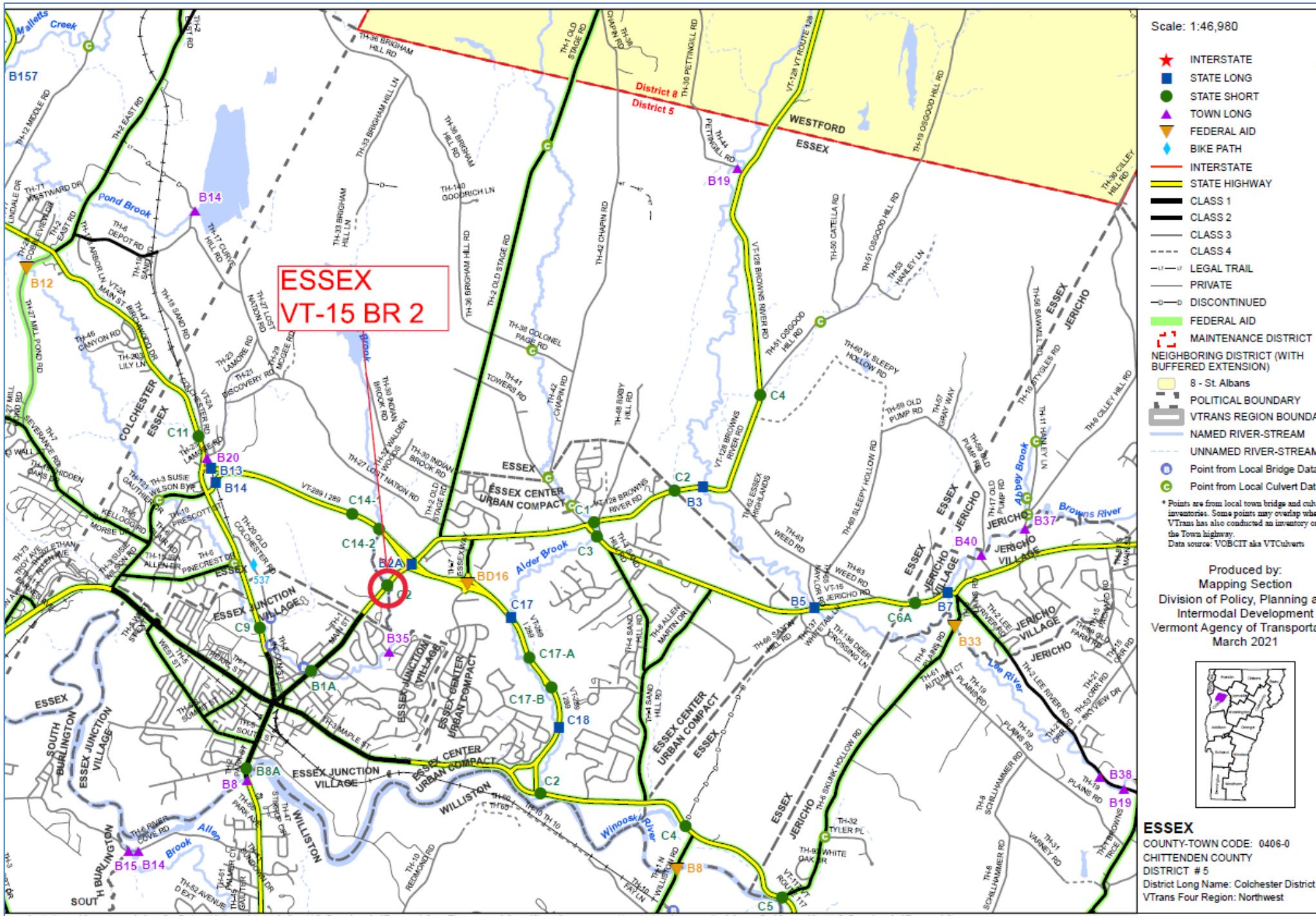
# Location Map

- ESSEX TOWN STP CULV(148) 23B688, Bridge 11 on VT Route 289
- ESSEX TOWN STP CULV(149) 23B689, Bridge 2 on VT Route 15
- JERICHO STP CULV(150) 23B690, Bridge 6A on VT Route 15
- ESSEX TOWN NH CULV(151) 23B691, Bridge 17-A on VT Route 289





**ESSEX TOWN STP CULV(149)**  
**ESSEX VT ROUTE 15 BRIDGE 2 OVER INDIAN BROOK**



Location Map

# Aerial View



Bridge 2

Upper Main St

Upper Main St

15

15



## Looking Northeast



### Existing Conditions – Bridge #2

- Roadway Classification – Principal Arterial (NHS)
- Bridge Type – 8' Span Concrete Box Culvert
- Ownership – State of Vermont
- Unknown construction year

# Looking Southwest



## Existing Conditions – Bridge #2

- Aerial utilities (electric, communications, and telephone) run parallel to VT15 on the northwest side
- Underground utilities (gas, sewer, fiberoptics) run parallel to VT15 on the southeast side

# Existing Site Conditions – Bridge #2

- The culvert is in poor condition. The box has (2) full perimeter cracks, heavy efflorescence leakage, rust staining, and heavy saturation. Timber bracing was placed between the midspan and upstream end to prevent further spalling and settlement in the roadway. Spalling and delaminations are present along cold joints and there is a large full depth hole at the upstream cold joint.
- The existing culvert does not meet the measured bank full width of Indian Brook.
- VT Route 15 has substandard shoulder widths along the VT Route 15 corridor through the project area.

# Bridge Inspection Report Ratings



## Existing Conditions - Bridge #2

- Culvert Rating 4 (Poor)
- Channel Rating 7 (Good)

## Culvert Barrel – Timber Bracing



**Existing Conditions - Bridge #2**

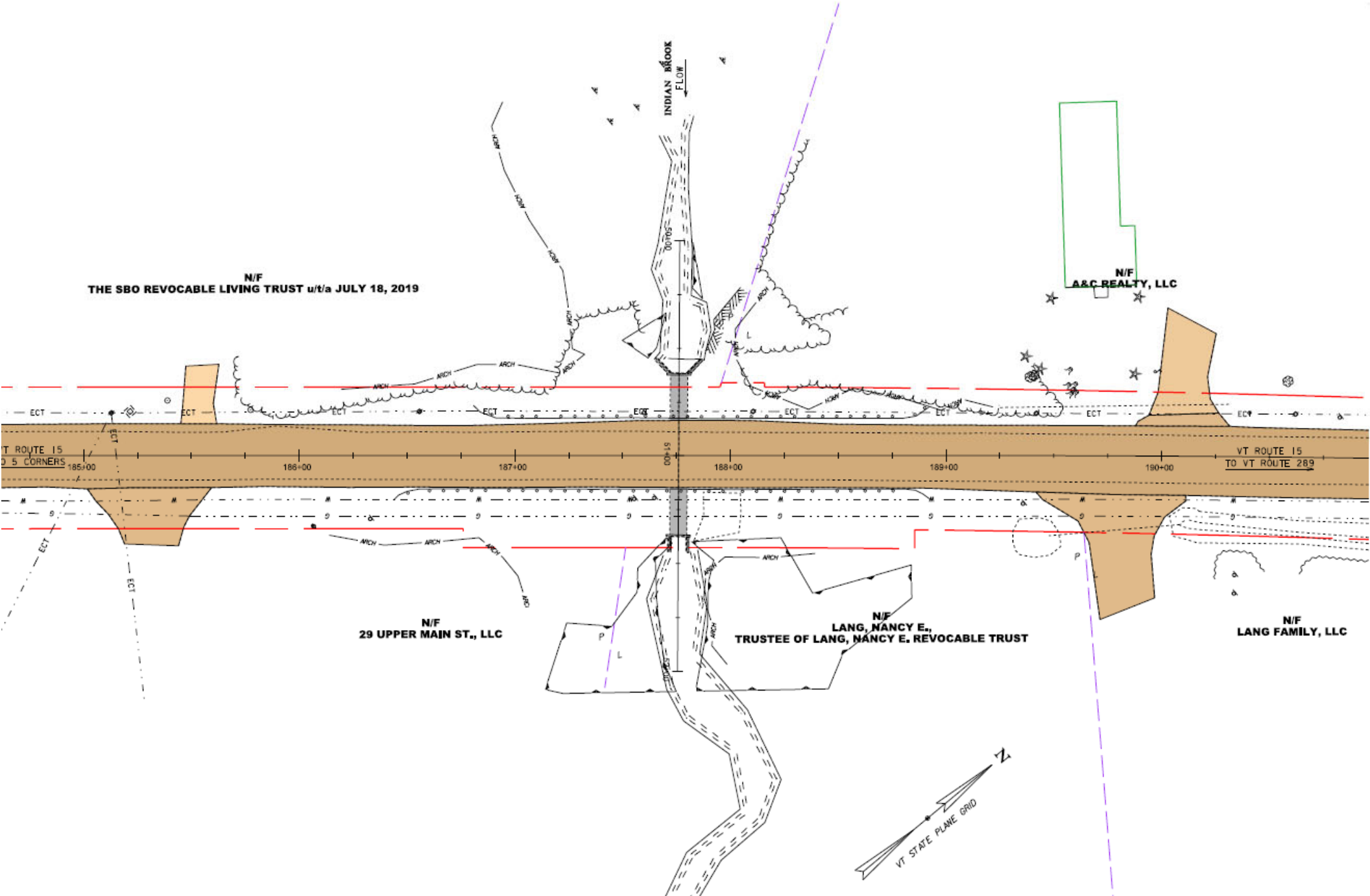
## Looking Downstream (Southeast)



### Existing Resources - Bridge #2

- Wetlands – there are wetlands on both inlet and outlet end of the culvert
- Archeological – one area of sensitivity identified downstream from culvert along east bank of Indian Brook.
- Wildlife Habitat – mapped as highest priority for wildlife

# Existing Conditions – Layout



# Design Criteria and Considerations

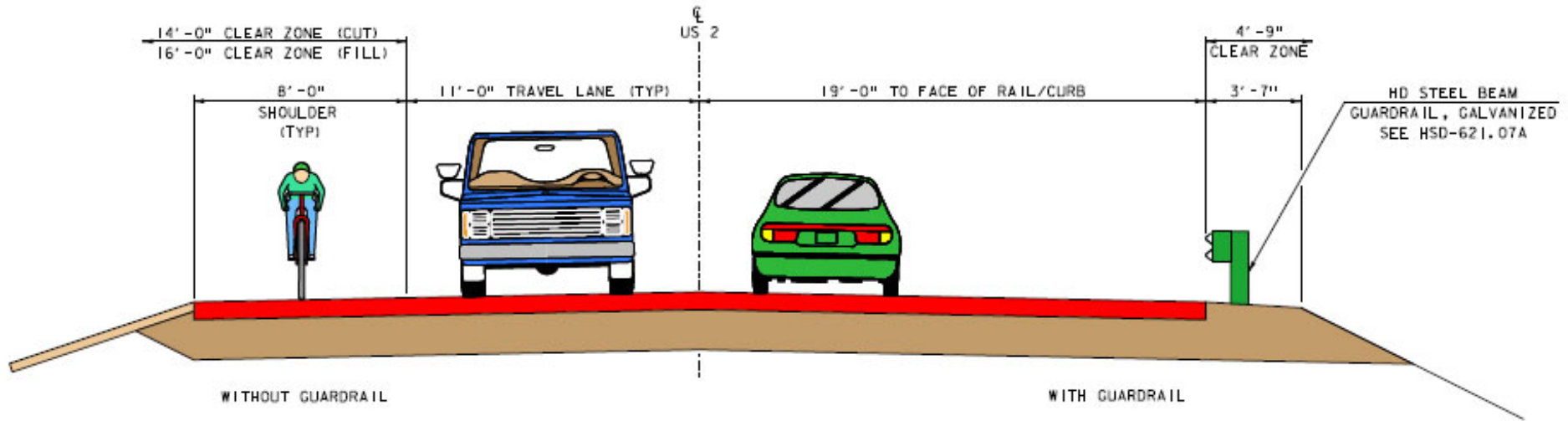
- Average Daily Traffic
  - 11,692 vehicles per day
- Design Hourly Volume
  - 1,467 vehicles per hour
- % Trucks
  - 3.5%



# Alternatives Considered – Bridge #2

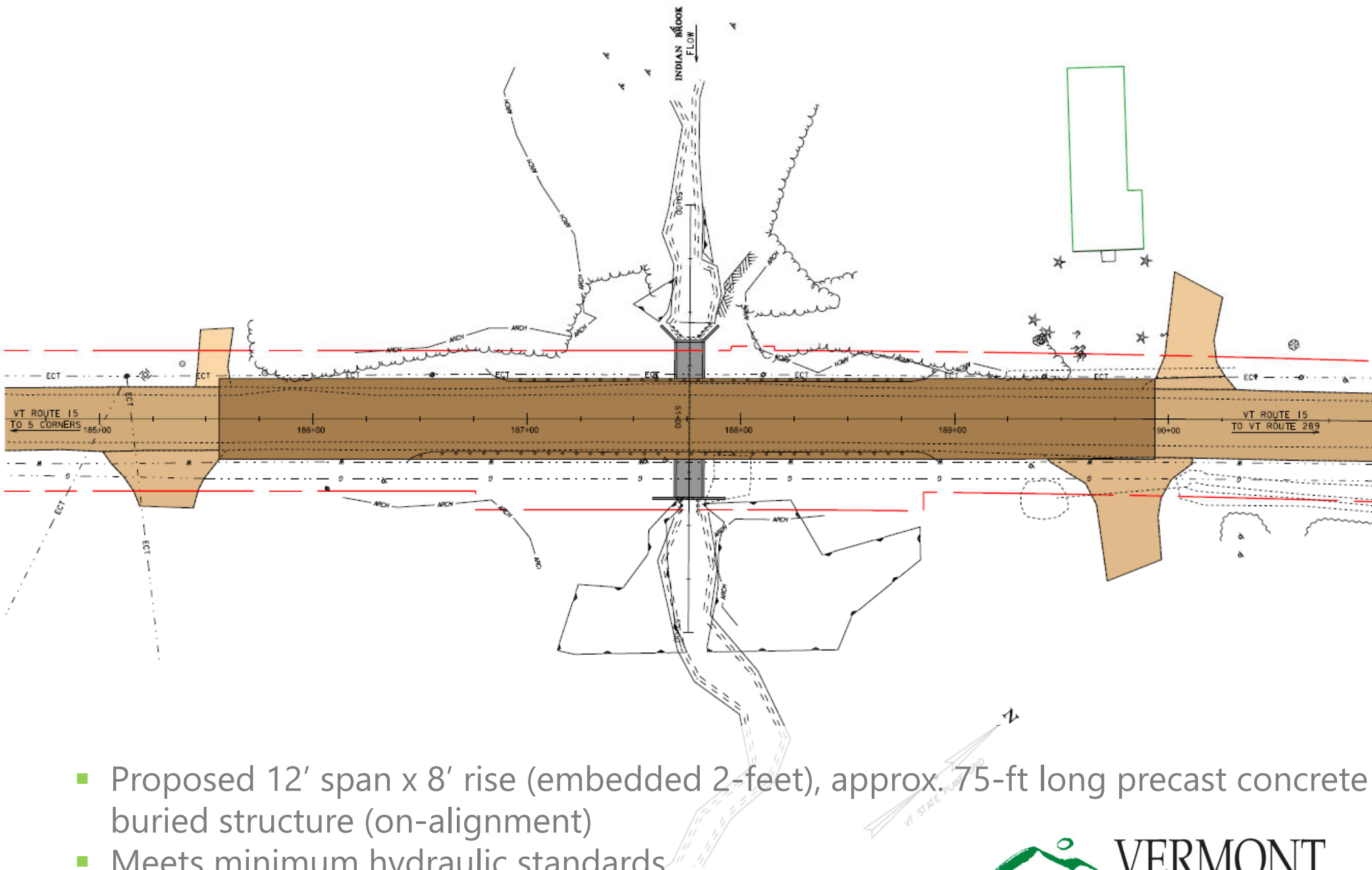
- No Action
  - Additional maintenance required within 10 years
  
- Culvert Rehabilitation
  - Typical rehab options are not an adequate solution to fix condition without reducing an already hydraulically inadequate structure
  
- Full Structure Replacement (Buried Structure) – Open Cut
  - Meets all VTrans hydraulic standards and bankfull width
    - 12' min span
  - New structure length designed to meet minimum roadway width standards
  - 75-year design life

# Proposed Typical Section



PROPOSED US ROUTE 2 TYPICAL SECTION

# Culvert Replacement – Box Culvert



- Proposed 12' span x 8' rise (embedded 2-feet), approx. 75-ft long precast concrete buried structure (on-alignment)
- Meets minimum hydraulic standards
- Design Life; 75 years

# Maintenance of Traffic Options Considered

- Offsite Detour
- Phased Construction
- Temporary Bridge

A photograph of a road closure barrier. The barrier consists of several horizontal white panels with red diagonal stripes. In the center, a white rectangular sign with a black border and black text reads "ROAD CLOSED". The sign is mounted on two white posts. The background shows a concrete curb, a chain-link fence, and green trees under a clear blue sky.

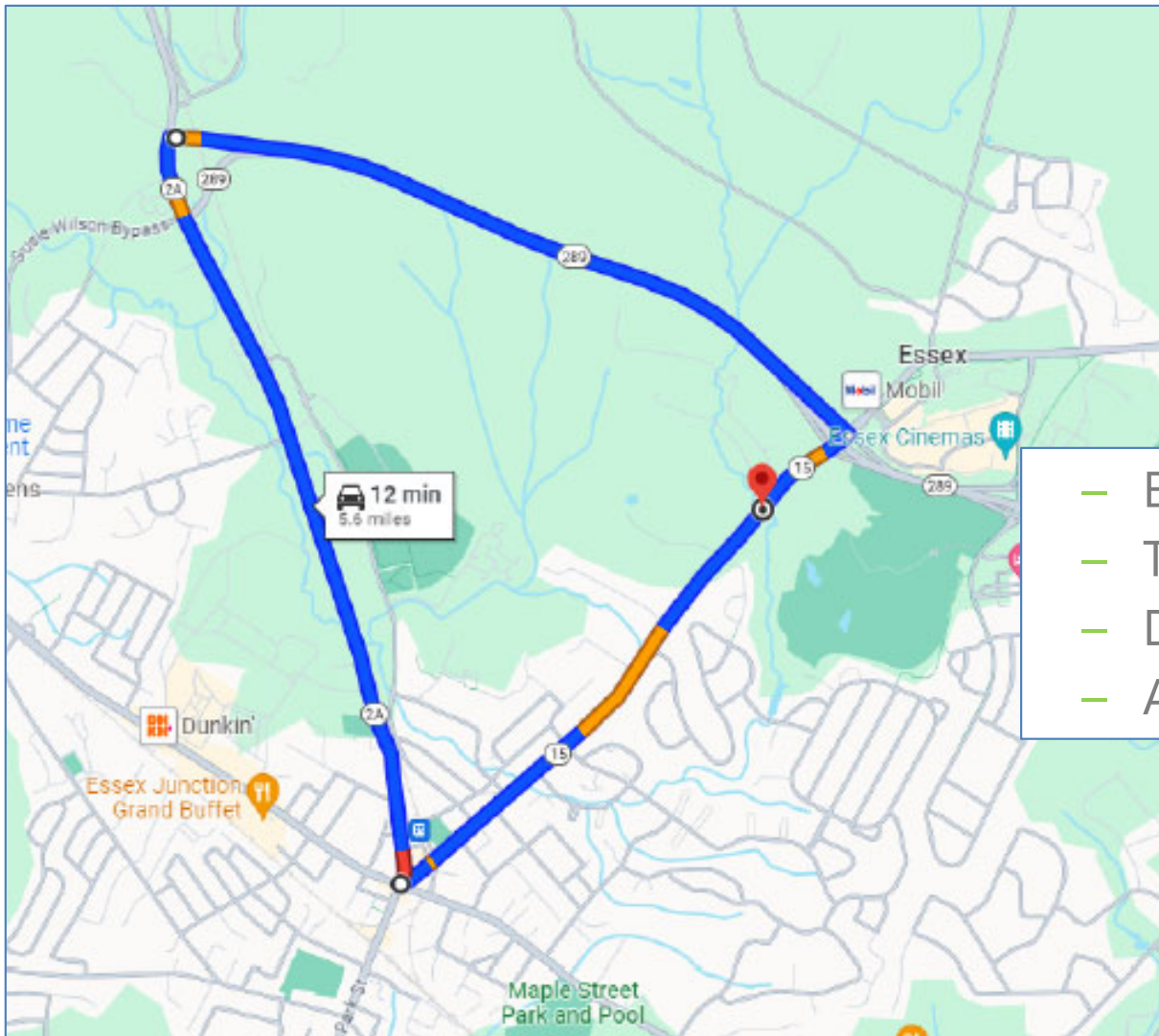
**ROAD  
CLOSED**

## Road Closure

- Detour chosen and signed by State
- Accelerated weekend closure
- Shortest Detour Route is 5.6 miles end-to-end

# Traffic Control – Shortest Detour Option

- **Regional #1 Detour Route:** VT Route 15, to VT Route 289, to VT Route 2A, back to VT Route 15



- End-to-End Distance: 5.6 miles
- Through Distance: 1.6 miles
- Detour Distance: 4.0 miles
- Added Distance: 2.4 miles

# Traffic Control – Alternative Detour Option

- **Regional #2 Detour Route** : VT Route 15, to VT Route 289, to VT Route 117, back to VT Route 15



- End-to-End Distance: 6.2 miles
- Through Distance: 1.6 miles
- Detour Distance: 4.6 miles
- Added Distance: 3.0 miles

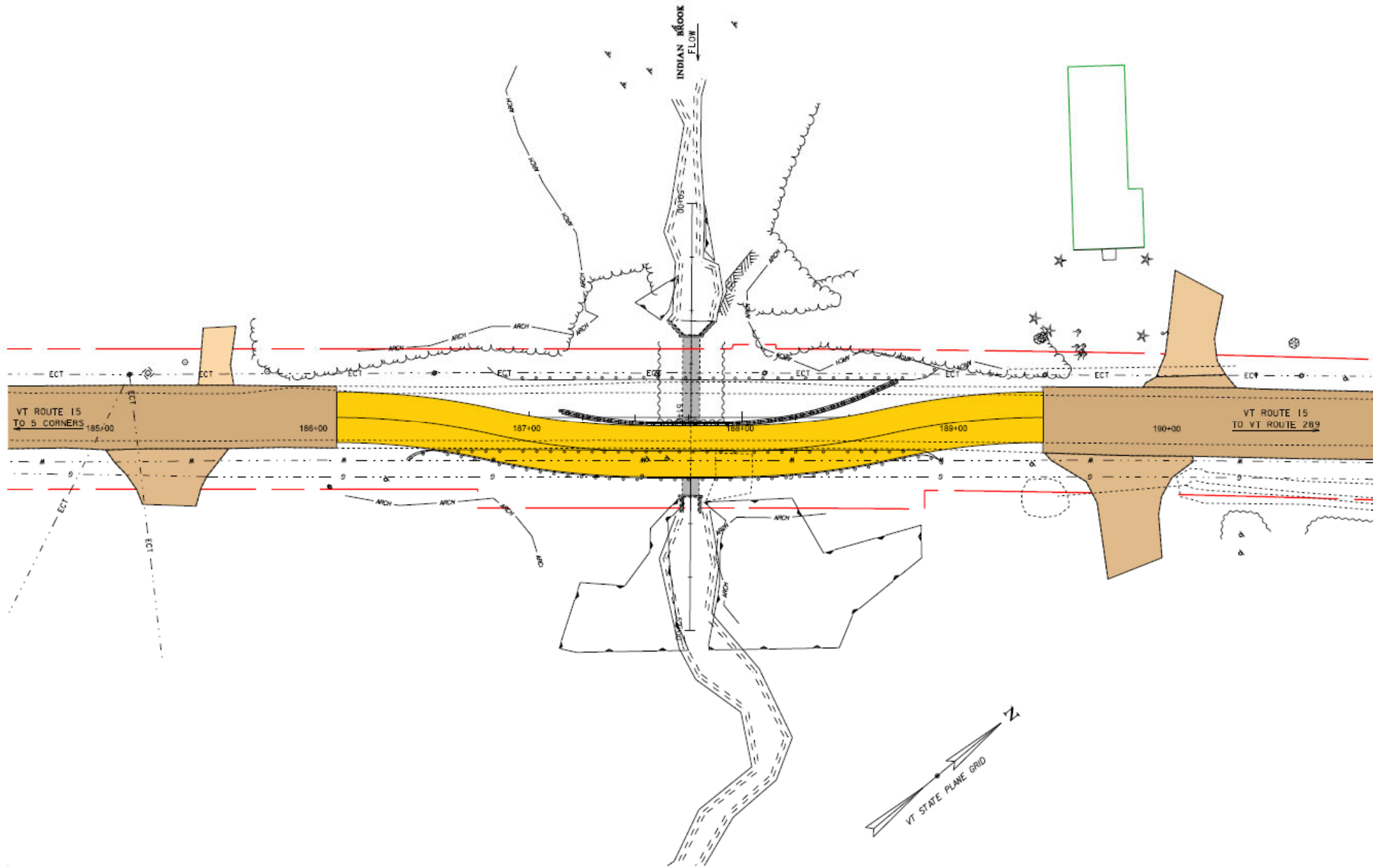


## Phased Construction

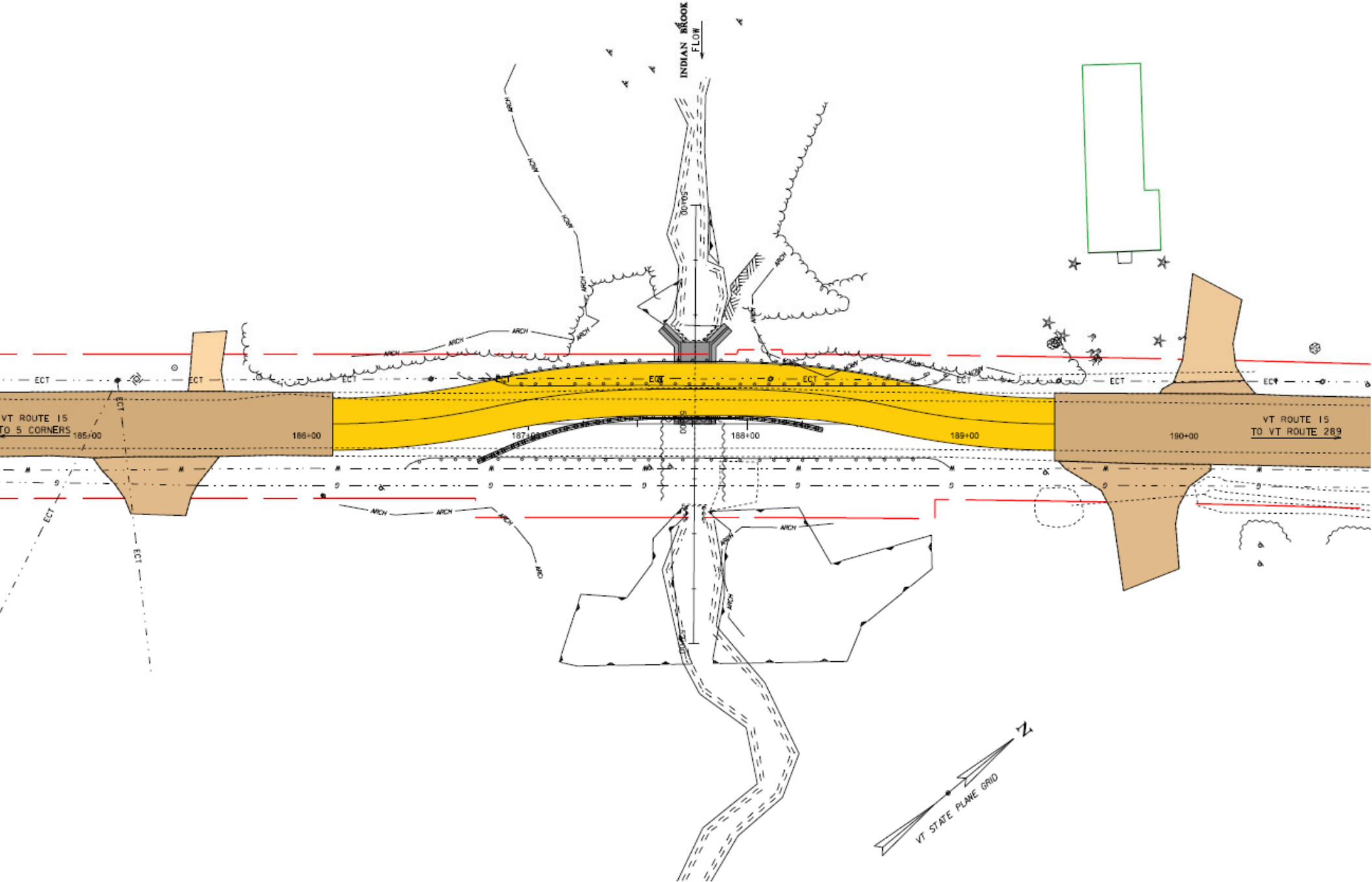
- 2 Phases with two-lane alternating traffic with Traffic Signal



# Phased Construction Layout 1



# Phased Construction Layout 2



## Recommended Alternative - Bridge #2

- Replace the existing culvert with a new 3-sided or 4-sided Precast Concrete Buried Structure
  - Traffic will be maintained via phased construction and/or an offsite detour, or a combination of the two in order to keep the corridor partially open during construction to be determined in design
  - Impacts to utilities, environmental resources and cultural resources will be minimized by not constructing a temporary bridge
  - Proposed 12' span, 75' long precast concrete box or frame (on-alignment)
  - Proposed 12' span meets the minimum hydraulic standards and bank full width conditions
  - New culvert length designed to meet minimum roadway width standards
  - 75-year Design life



**ESSEX TOWN STP CULV(149)**  
**ESSEX VT ROUTE 15 BRIDGE 2 OVER INDIAN BROOK**



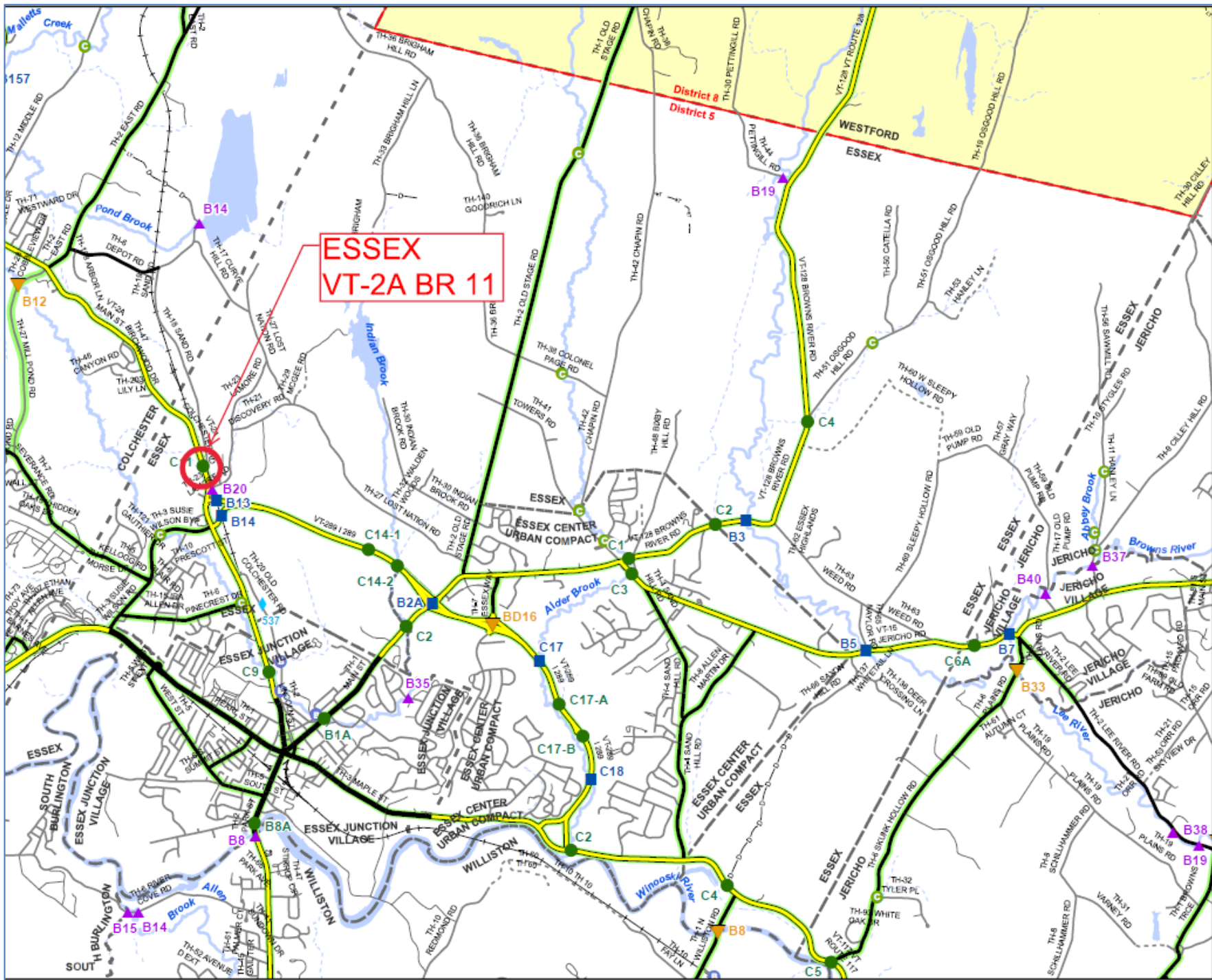
# ESSEX TOWN STP CULV(148)

ESSEX VT ROUTE 2A, BRIDGE 11 OVER UNNAMED BROOK



VERMONT

AGENCY OF TRANSPORTATION



Scale: 1:46,980

- ★ INTERSTATE
- STATE LONG
- STATE SHORT
- ▲ TOWN LONG
- ▼ FEDERAL AID
- ◆ BIKE PATH
- INTERSTATE
- STATE HIGHWAY
- CLASS 1
- CLASS 2
- CLASS 3
- CLASS 4
- - - LEGAL TRAIL
- - - PRIVATE
- - - DISCONTINUED
- FEDERAL AID
- MAINTENANCE DISTRICT
- NEIGHBORING DISTRICT (WITH BUFFERED EXTENSION)
- 8 - St. Albans
- POLITICAL BOUNDARY
- VTRANS REGION BOUNDARY
- NAMED RIVER-STREAM
- UNNAMED RIVER-STREAM
- Point from Local Bridge Data
- Point from Local Culvert Data

\* Points are from local town bridge and culvert inventories. Some points may overlap when VTrans has also conducted an inventory of the Town highway.  
Data source: VOB/CIT aka VTCulverts

Produced by:  
Mapping Section  
Division of Policy, Planning &  
Intermodal Development  
Vermont Agency of Transportation  
March 2021

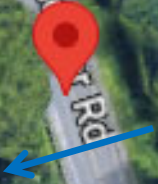


**ESSEX**  
COUNTY-TOWN CODE: 0406-0  
CHITTENDEN COUNTY  
DISTRICT # 5  
District Long Name: Colchester District  
VTrans Four Region: Northwest

Location Map



Bridge 11



Gentes Rd

Coolidge Rd

Gentes Rd

Vermont Estate Sales Services

Looking North



## Existing Conditions – Bridge #11

- Roadway Classification – Minor Arterial (National Highway System)
- Bridge Type – 6'x6' Single Span RC Concrete Box Culvert
- Ownership – State of Vermont
- Constructed in 1934



## Looking South



### Existing Conditions – Bridge #11

- Underground utilities, owned by Village of Essex Junction water and sewer, and Vermont Gas Systems buried throughout the project area (VGS lines parallel on west side of VT2A )
- Aerial utilities running parallel to VT2A on the eastern side of the road – Consolidated communications and Green Mountain Power

# Existing Site Conditions – Bridge #11

- The culvert is in poor condition. There are holes exposing backfill and thinning rebar, moderate cracking throughout sidewalls, southwest wingwall failed
- The existing culvert meets the measured minimum 6' bankfull width and VTrans hydraulic standards.
- The lane and shoulder widths along VT Route 2A through the project area do not meet the minimum standards of 11' travel lanes, 5' shoulders.
- The Existing structure is comprised of three different structures connected and directing flow under TH-24, NEC RR, and VT-2A:
  1. TH-24: two 3.5-ft x 5-ft cast-in-place concrete boxes
  2. NEC railroad: laid up stone box ~12-ft x 6-ft with 4-ft wide column (overall dimensions of two 4-ft x 6-ft boxes)
  3. **VT-2A: 6-ft x 6-ft concrete box (Bridge #11)**

# Bridge Inspection Report Ratings



## Existing Conditions - Bridge #11

- Culvert Rating 4 (Poor)
- Channel Rating 5 (Fair)

## First Section (Inlet, TH-24)



**Existing Conditions**

# Second Section (Barrel, NEC RR and start of Bridge 11)



**Existing Conditions - Bridge #11**

## Third Section (Outlet, VT-2A)



**Existing Conditions - Bridge #11**

3ft of Backfill Sediment Loss in Spalled Area



Existing Conditions - Bridge #11

## Looking Downstream (West)



### Existing Resources - Bridge #11

- Wetlands – there are wetlands on both inlet and outlet end of the culvert
- Archeological – Two areas of sensitivity identified directly south of the culvert on a sandy outwash plain.
- Wildlife Habitat – mapped as high priority for wildlife

12/09/2020



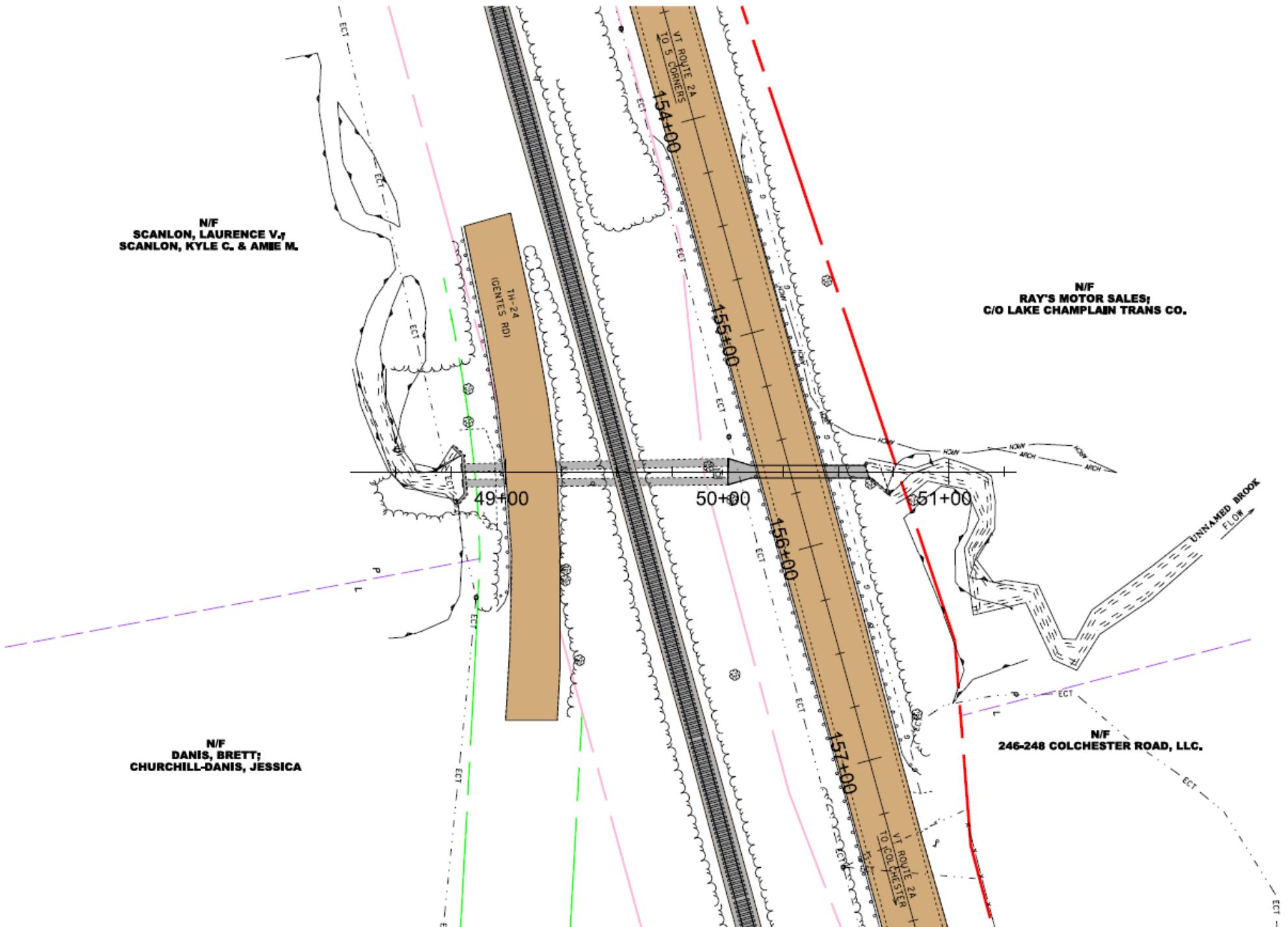
# Existing Conditions – Layout

N/F  
SCANLON, LAURENCE V.,  
SCANLON, KYLE C. & AMIE M.

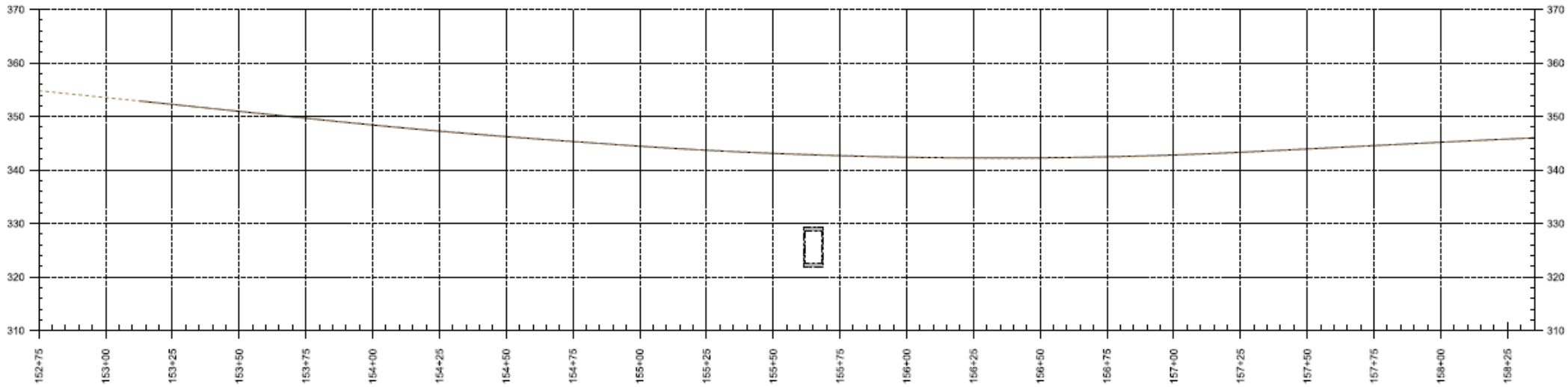
N/F  
RAY'S MOTOR SALES;  
C/O LAKE CHAMPLAIN TRANS CO.

N/F  
DANIS, BRETT;  
CHURCHILL-DANIS, JESSICA

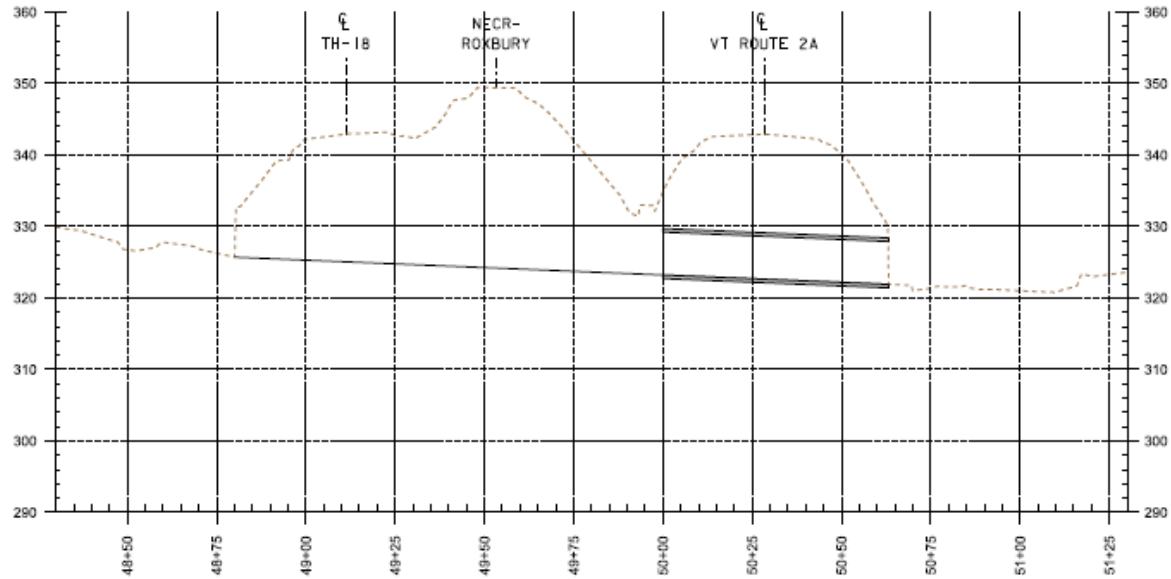
N/F  
246-248 COLCHESTER ROAD, LLC.



# Existing Conditions – Profile



VT ROUTE 2A EXISTING PROFILE



BRIDGE II EXISTING CHANNEL PROFILE

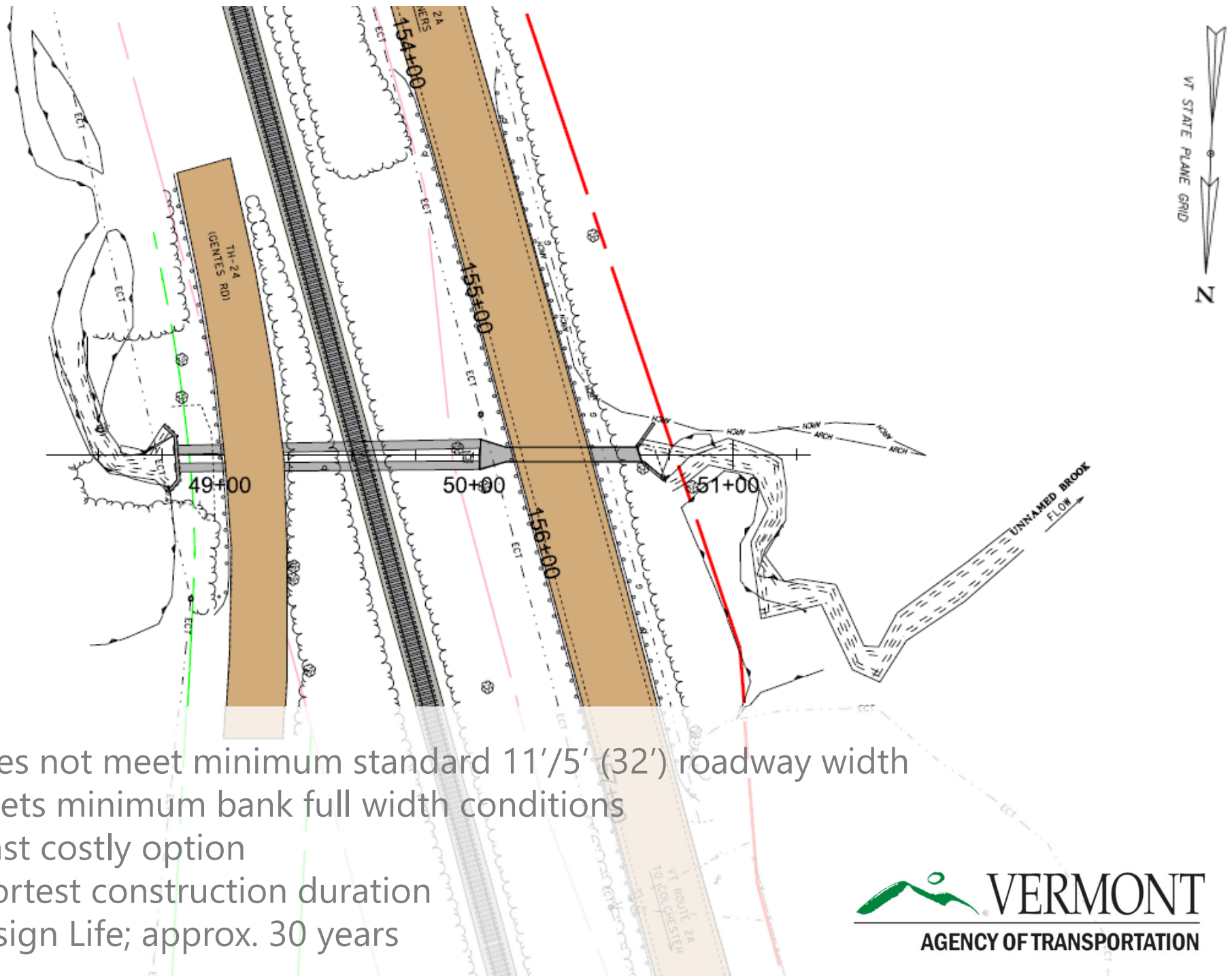
# Design Criteria and Considerations

- Average Daily Traffic
  - 10,683 vehicles per day
- Design Hourly Volume
  - 1,200 vehicles per hour
- % Trucks
  - 4.9%

# Alternatives Considered – Bridge #11

- No Action
  - Additional maintenance required within 10 years
- Culvert Rehabilitation – Concrete Repair and Slope Work
  - Class III concrete repair
  - Slope stability work including new wingwalls and headwall and armoring side slopes
  - Meets VTrans hydraulic standards
  - 30-year design life
- Partial Structure Replacement – VT2A
  - Meets VTrans hydraulic standards
    - 8' max span
  - 75-year design life
- Full Structure Replacement – TH-24, NEC RR, VT2A
  - Meets VTrans hydraulic standards
    - 8' min span
  - Would significantly impact traffic on VT2A, NEC RR, and TH24
  - Meets geometric standards
  - 75-year design life

# Culvert Rehabilitation – Concrete Repair and Slope Work



- Does not meet minimum standard 11'5" (32') roadway width
- Meets minimum bank full width conditions
- Least costly option
- Shortest construction duration
- Design Life; approx. 30 years

# Recommended Alternative - Bridge #11

- Rehabilitate the existing culvert with Class III concrete repair and slope stabilization work while maintaining traffic on the existing culvert with temporary lane closures as needed.
  - Class III concrete repair and slope stabilization work including new wingwalls and headwall, and armoring side slopes
  - Minimum hydraulic standard and bank full width conditions will be met
  - Temporary lane or shoulder closures as needed in order to mobilize/demobilize construction equipment or manage truck traffic
  - Extends the life of the structure an additional 30 years



# ESSEX TOWN STP CULV(148)

ESSEX VT ROUTE 2A, BRIDGE 11 OVER UNNAMED BROOK



VERMONT

AGENCY OF TRANSPORTATION

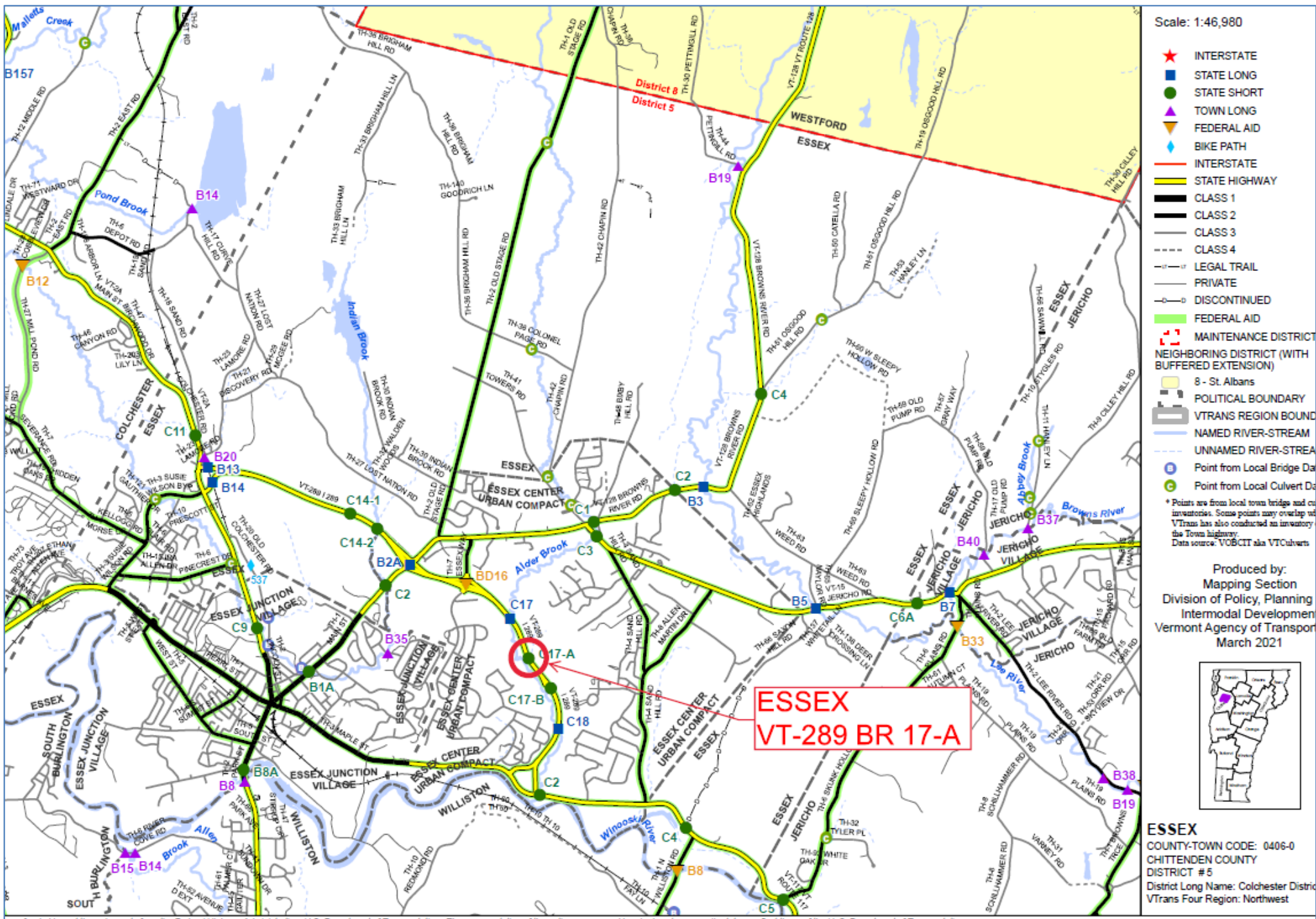


11/27/2018

**ESSEX TOWN NH CULV(151)**

**VT ROUTE 289, BRIDGE 17A OVER UNNAMED BROOK**





Location Map



Bridge 17-A

Alder E

289

289

Alder Brook

Evergreen Dr

# Looking Northwest



## Existing Conditions – Bridge #17A

- Roadway Classification – Other Principal Arterial (National Highway System)
- Bridge Type – 7' Corrugated Galvanized Metal Plate Pipe (CGMPP)
- Ownership – State of Vermont
- Constructed in 1993

## Looking Southeast



### Existing Conditions – Bridge #17A

- Underground utilities, owned by Town of Essex Public Works, Vermont Gas Systems, and Vermont Electric Power Company buried throughout the project area

# Existing Site Conditions – Bridge #17A

- The culvert is in fair condition. There are perforations throughout the entire invert and some areas are rusted through. The pipe shape is still in good condition with no distortion.
- On average there is over 60' of fill over this 565' long structure. Traditional open-cut replacement methods would significantly impact traffic
- The existing culvert exceeds the measured minimum 2'-4' bankfull width and meets VTrans hydraulic standards.
- The lane and shoulder widths along VT 289 through the project area meets the minimum roadway geometry standards.

# Bridge Inspection Report Ratings



## Existing Conditions - Bridge #17A

11/27/2018

- Culvert Rating 5 (Fair)
- Channel Rating 7 (Good)

Looking Upstream (North)



11/27/2018

Existing Conditions - Bridge #17A

Inlet



**Existing Conditions - Bridge #17A**



Outlet



**Existing Conditions - Bridge #17A**

# Culvert Barrel



11/27/2018

Existing Conditions - Bridge #17A

## Looking Downstream (South)

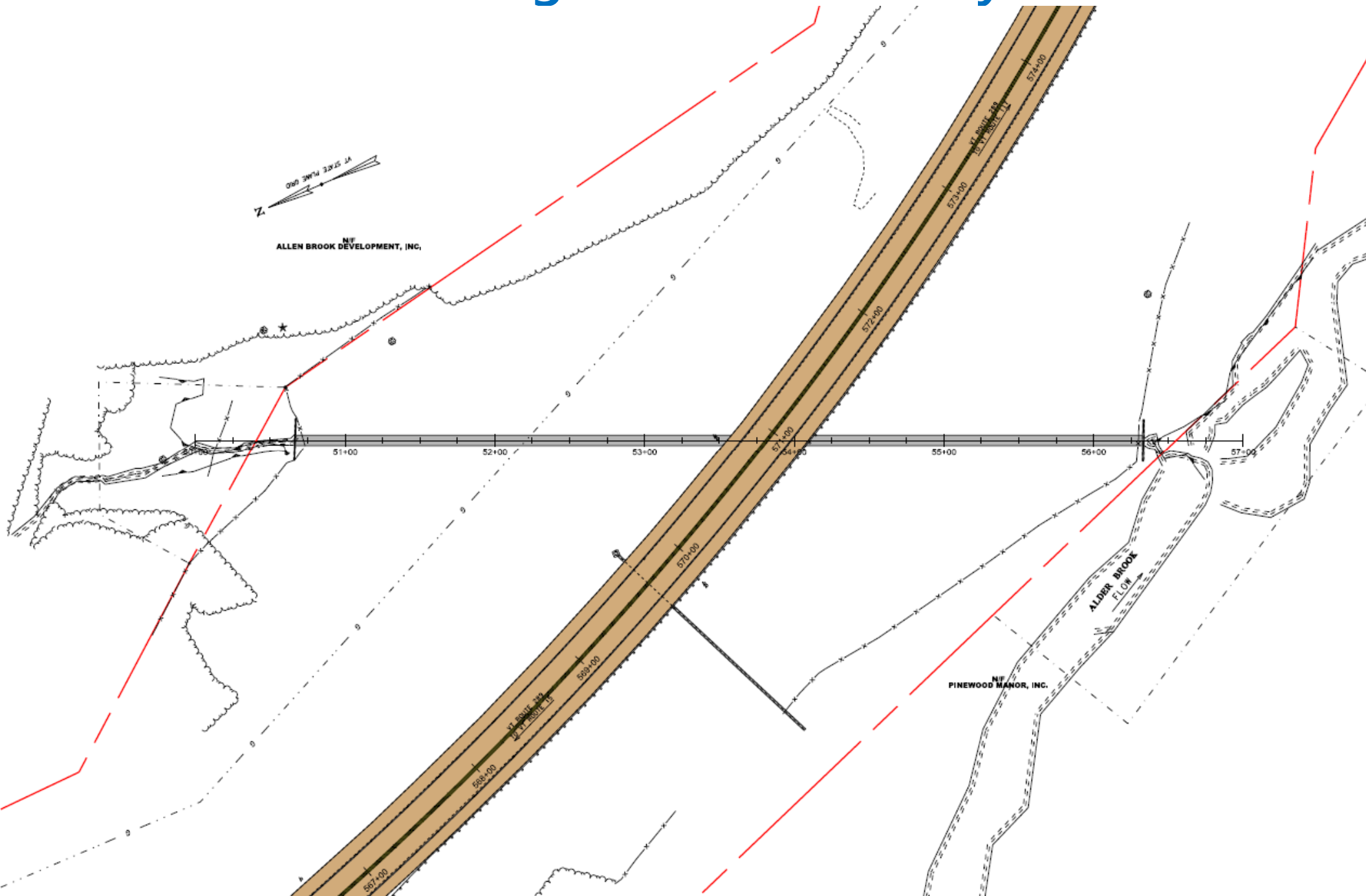


### Existing Resources - Bridge #17-A

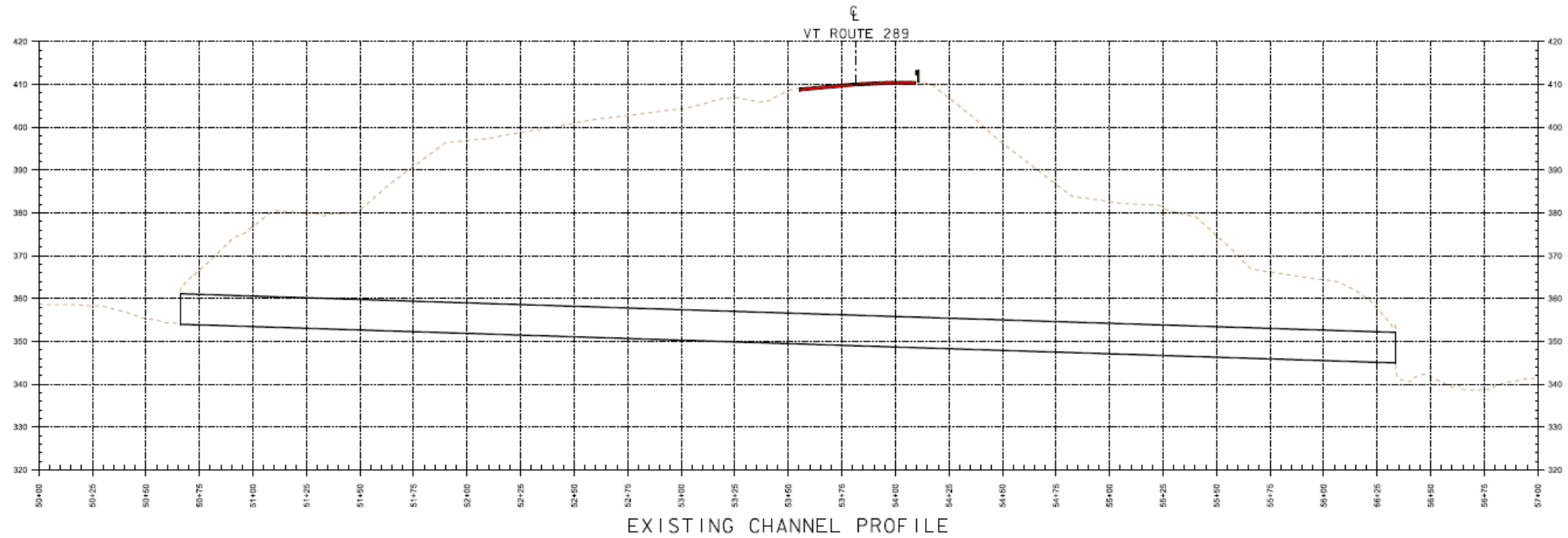
- Wildlife Habitat – High priority wildlife connectivity habitat blocks both up and downstream of the Alder brook corridor
- Wetland complexes are mapped on both inlet and outlet end of the culvert

11/27/2013

# Existing Conditions – Layout



# Existing Conditions – Profile



- 56' fill over Inlet
- 65' fill over Outlet

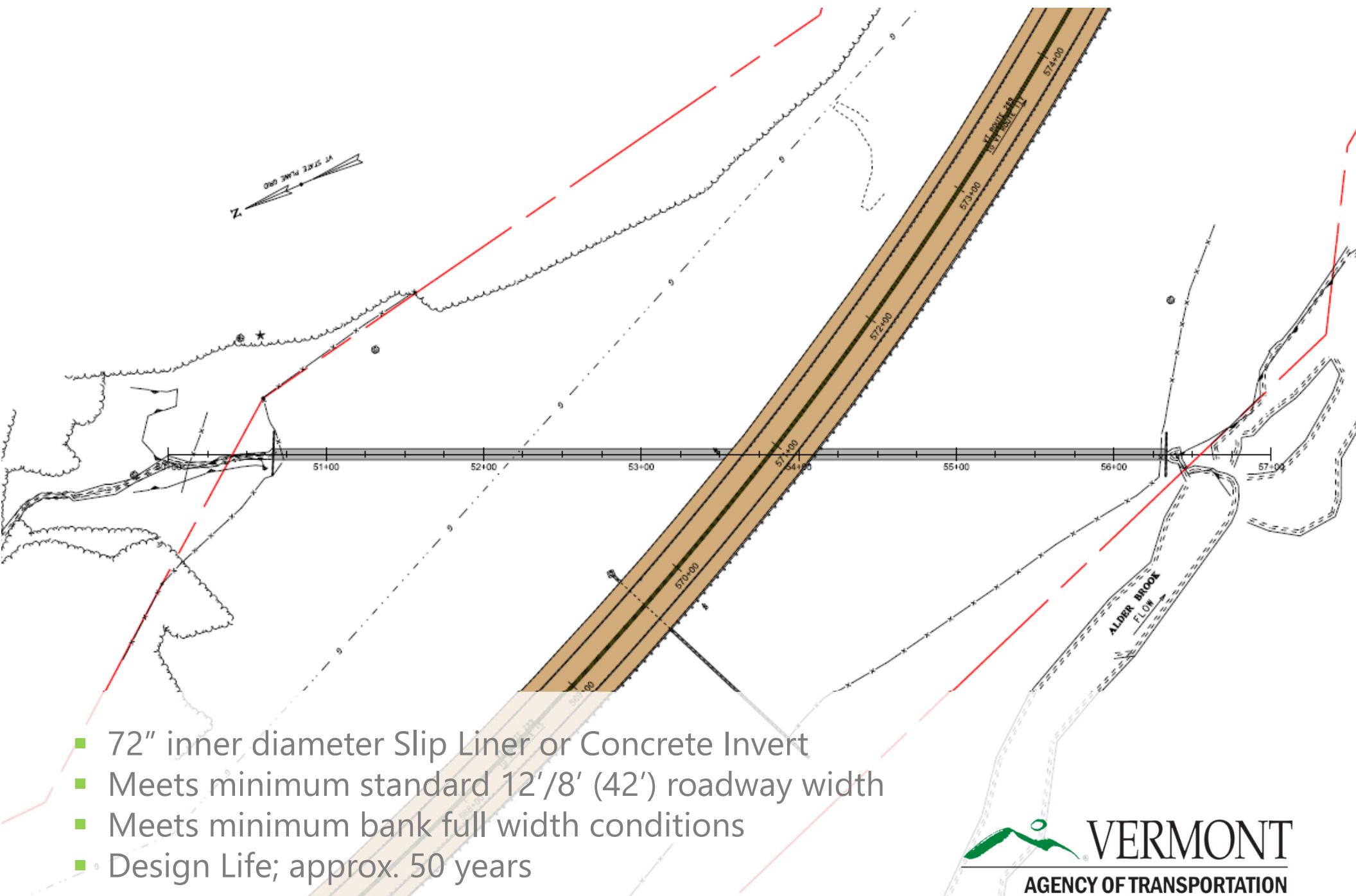
# Design Criteria and Considerations

- Average Daily Traffic
  - 5,351 vehicles per day
- Design Hourly Volume
  - 660 vehicles per hour
- % Trucks
  - 4.7%

# Alternatives Considered – Bridge #17A

- No Action
  - Additional maintenance required within 10 years
- Culvert Rehabilitation – Concrete Invert Repair
  - Concrete invert repair
  - Meets VTrans hydraulic and geometric standards
  - 15-year design life
- Culvert Rehabilitation – Slip Liner
  - 72" inner diameter culvert slip liner
  - Meets VTrans hydraulic and geometric standards
  - 50-year design life
- Full Structure Replacement (Round Pipe) – Trenchless
  - Meets all ANR and hydraulic standards
    - 7' inner diameter
  - Would not significantly impact traffic
  - 75-year design life
- Full Structure Replacement (Box Culvert) – Open Cut
  - Meets all ANR and hydraulic standards
    - 7' min span
  - Meets geometric standards
  - 75-year design life

# Culvert Rehabilitation – Invert or Slip Liner





# Recommended Alternative - Bridge #17A

- Rehabilitate the existing culvert with a slip liner or concrete invert while maintaining traffic on the existing culvert
  - Possible temporary lane or shoulder closures for mobilizing construction equipment and managing truck traffic
  - Meets Minimum hydraulic standard and bank full width
  - 8'/12'/12'/8' roadway typical meets minimum standard width
  - Extends the life of the structure an additional 50 years



11/27/2018

**ESSEX TOWN NH CULV(151)**

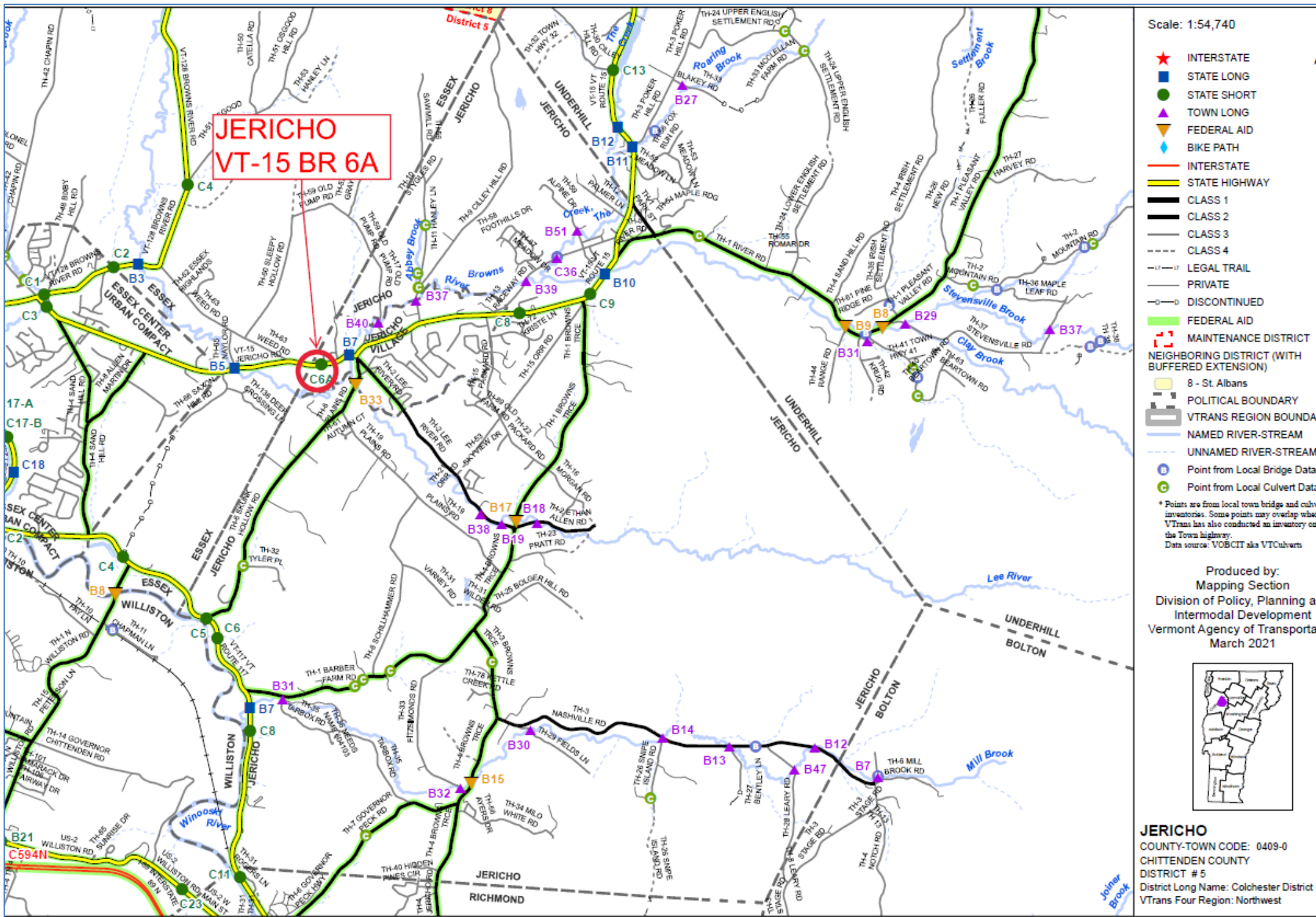
**VT ROUTE 289, BRIDGE 17A OVER UNNAMED BROOK**

 **VERMONT**  
AGENCY OF TRANSPORTATION



## Jericho STP CULV(150)

JERICO VT ROUTE 15, BRIDGE 6A OVER UNNAMED BROOK



Location Map

# Recommended Alternative - Bridge #6A

- Rehabilitate the existing culvert with a Round Pipe Slip Liner system while maintaining traffic on the existing culvert
  - Minimum 4-foot inside diameter slip liner system
  - Minimum hydraulic standards will be met
  - Substandard shoulder widths along the VT Route 15 corridor through the project area
  - Extends the life of the structure an additional 50 years
  - Possible temporary lane or shoulder closures for mobilizing construction equipment and managing truck traffic



## Jericho STP CULV(150)

JERICO VT ROUTE 15, BRIDGE 6A OVER UNNAMED BROOK

# Preliminary Project Schedule and Summary

- Construction Start – Summer 2026

- Essex Bridge 2 on VT Route 15: Full bridge replacement with traffic maintained via phased construction and/or an offsite detour, or a combination of the two

<https://outside.vermont.gov/agency/VTRANS/external/Projects/Structures/23B689>

- Essex Bridge 17A on VT Route 289: Culvert rehabilitation with minimal impacts to traffic

<https://outside.vermont.gov/agency/VTRANS/external/Projects/Structures/23B691>

- Essex Bridge 11 on VT Route 2A: Rehabilitation limited to the State-owned portion of the culvert with short term lane closures for access

<https://outside.vermont.gov/agency/VTRANS/external/Projects/Structures/23B688>

- Jericho Bridge 6A on VT Route 15: Culvert slip liner with temporary lane closures and minimal impacts to traffic

<https://outside.vermont.gov/agency/VTRANS/external/Projects/Structures/23B690>



Essex, VT  
Route 15,  
Bridge 2 over  
Indian Brook



Essex, VT  
Route 2A,  
Bridge 11 over  
Unknown Brook



Essex, VT Route  
289, Bridge 17-A  
over Unknown  
Brook



Jericho, VT  
Route 15,  
Bridge 6A over  
Unknown Brook

# Essex-Jericho Culvert Bundle Questions and Comments

March 18, 2024