



# Berlin IM DECK Informational Meeting

**Interstate 89 – Bridges #37 North & South over Cross Town Road**

May 15<sup>th</sup>, 2017





# Berlin IM DECK Informational Meeting

**Interstate 89 – Bridges #38 North & South over VT 62**

May 15<sup>th</sup>, 2017



# Introductions

**Carolyn Carlson, P.E.**

VTrans Senior Project Manager

**Rob Young, P.E.**

VTrans Design Project Manager

**Dan Beard**

VTrans Scoping Technician

**Jonathan Griffin, P.E.**

VTrans Scoping Engineer





Bridge 37 N&S  
Project Location

Min Clear Height is 14' on  
B37N on the South side

Bridge 38 N&S  
Project Location



Vietnam Veterans Memorial Hwy

Mallet's Creek

Sunset Dr

Bosworth Rd

Crosstown Rd

Shed Rd

Comfort Inn & Suites At Maplewood

Applebee's

802 Honda

Shaw's

Pike Dr

Paine Turnpike N

Richardson Rd

62

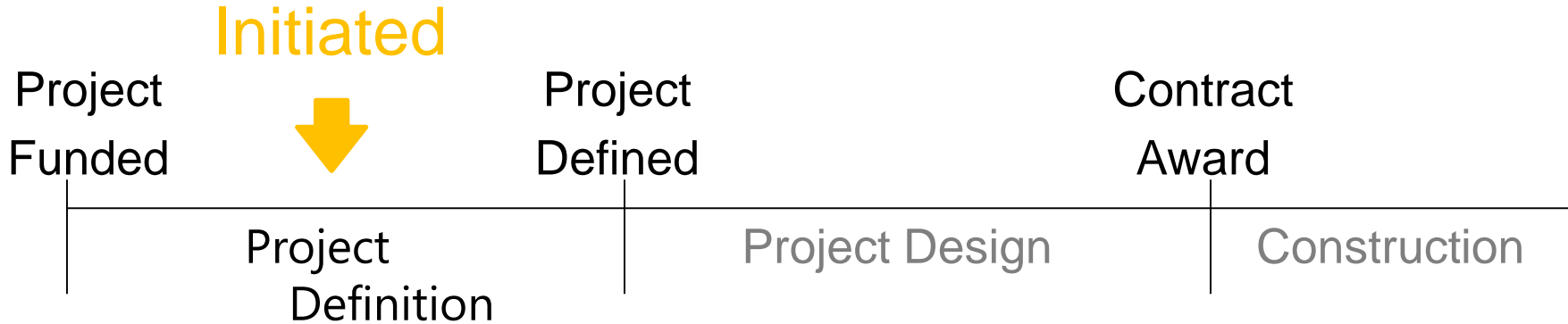
62

# Meeting Overview

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



# VTrans Project Development Process

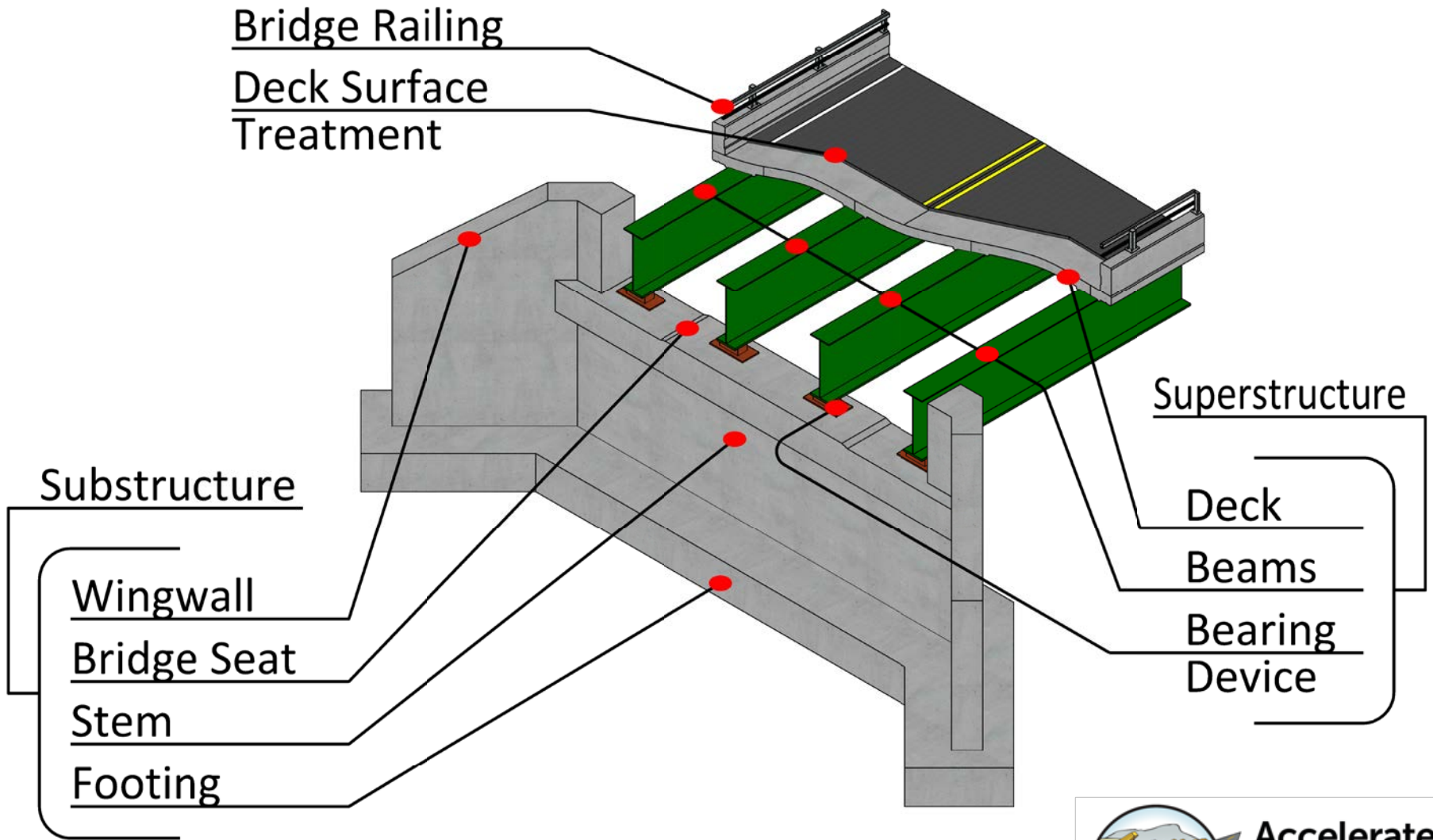


- Identify resources & constraints
- Evaluate alternatives
- Public participation
- Build Consensus

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



# Description of Terms Used

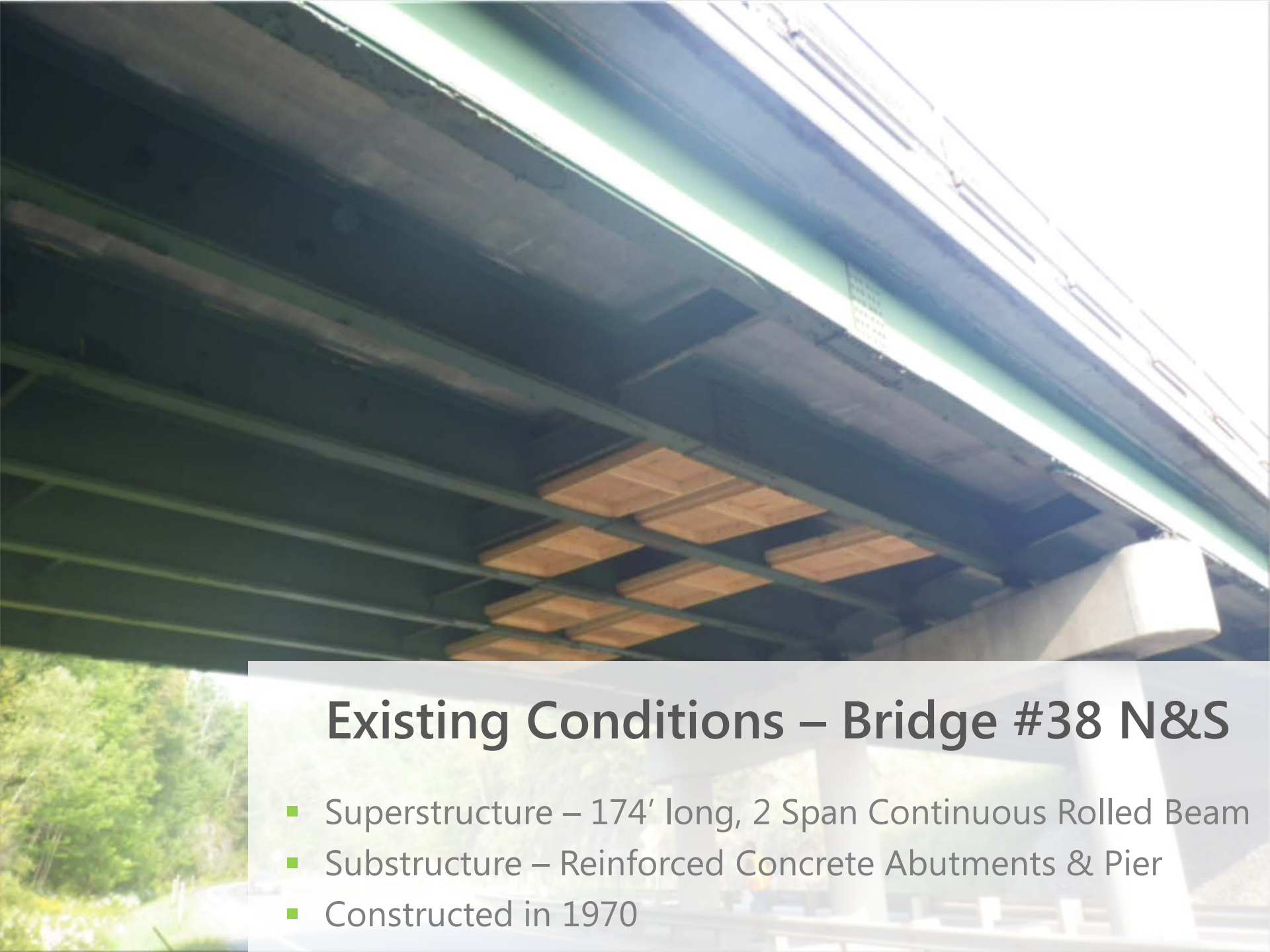






## Existing Conditions – Bridge #37 N&S

- Superstructure – 116' long, Welded Plate Girder
- Substructure – Reinforced Concrete Abutments
- Constructed in 1970



## Existing Conditions – Bridge #38 N&S

- Superstructure – 174' long, 2 Span Continuous Rolled Beam
- Substructure – Reinforced Concrete Abutments & Pier
- Constructed in 1970

# Inspection Summary:

Bridge	Deck Rating	Superstructure Rating	Substructure Rating	Channel Rating
37 N	5 (Fair)	8 (Very Good)	7 (Good)	N/A
37 S	6 (Satisfactory)	8 (Very Good)	7 (Good)	N/A
38 N	5 (Fair)	7 (Good)	6 (Satisfactory)	N/A
38 S	5 (Fair)	7 (Good)	7 (Good)	N/A



# Existing Conditions – Bridges #37 N&S

- The approach rail and bridge railing are substandard
- Bridge Joints have failed
- Significant deterioration at bridge end
- Deck is spalling



# Existing Conditions – Bridges #38 N&S

- Bridge Decks Spalling above ramp traffic
- The approach rail and bridge railing are substandard
- Some bearing failure





## Looking Over Bridge (Typical of all four bridges)



## Existing Conditions – Bridges #37 and #38 N&S

- Substandard Railing
- High Crash Location (13 crashes in last 5 years)

# Design Criteria and Considerations:

Location	Average Daily Vehicles	Average AM Peak Hourly Volume	Average PM Peak Hourly Volume	Average Saturday Peak Volume	Average Sunday Peak Volume
Bridge 38 North	7817	588	694	828	772
Bridge 38 South	9809	541	1043	1000	1081
Bridge 37 North	10118	858	910	933	918
Bridge 37 South	9809	541	1043	1000	1081

Section	AADT		DHV		%T		%D		ADTT		ESALs	
	2018	2038	2018	2038	2018	2038	2018	2038	2018	2038	(2018~2038)	(2018~2058)
38N	7,100	7,900	790	890	11.5	17.0	100	100	960	1,600	4,711,000	10,802,000
38S	9,500	10,700	1200	1400	10.4	15.4	100	100	1,600	2,700	9,036,000	20,965,000

- % Trucks: 11.5 (Bridges 37 & 38 Northbound)  
10.4 (Bridges 37 & 38 Southbound)
- Design Speed of 70 mph
- DHV for Southbound on Ramp ~240



# Existing Traffic Conditions





# Alternatives Considered – Bridges #37 & 38

- No Action
  - Additional maintenance required within near future
- Rehabilitation
  - Superstructure and substructure patching with anodes and/or ASR chemical treatments
- Deck Replacement
  - Precast deck panels or
  - Cast in Place Concrete (CIP)
  - Beams to be painted as part of a future project



# Recommended Alternative - Bridges #37 & 38

- Replace all four decks utilizing conventional CIP
  - New approach railing and bridge railing
  - New joints
  - Repair or replace curtain walls
  - Bearing replacement as necessary

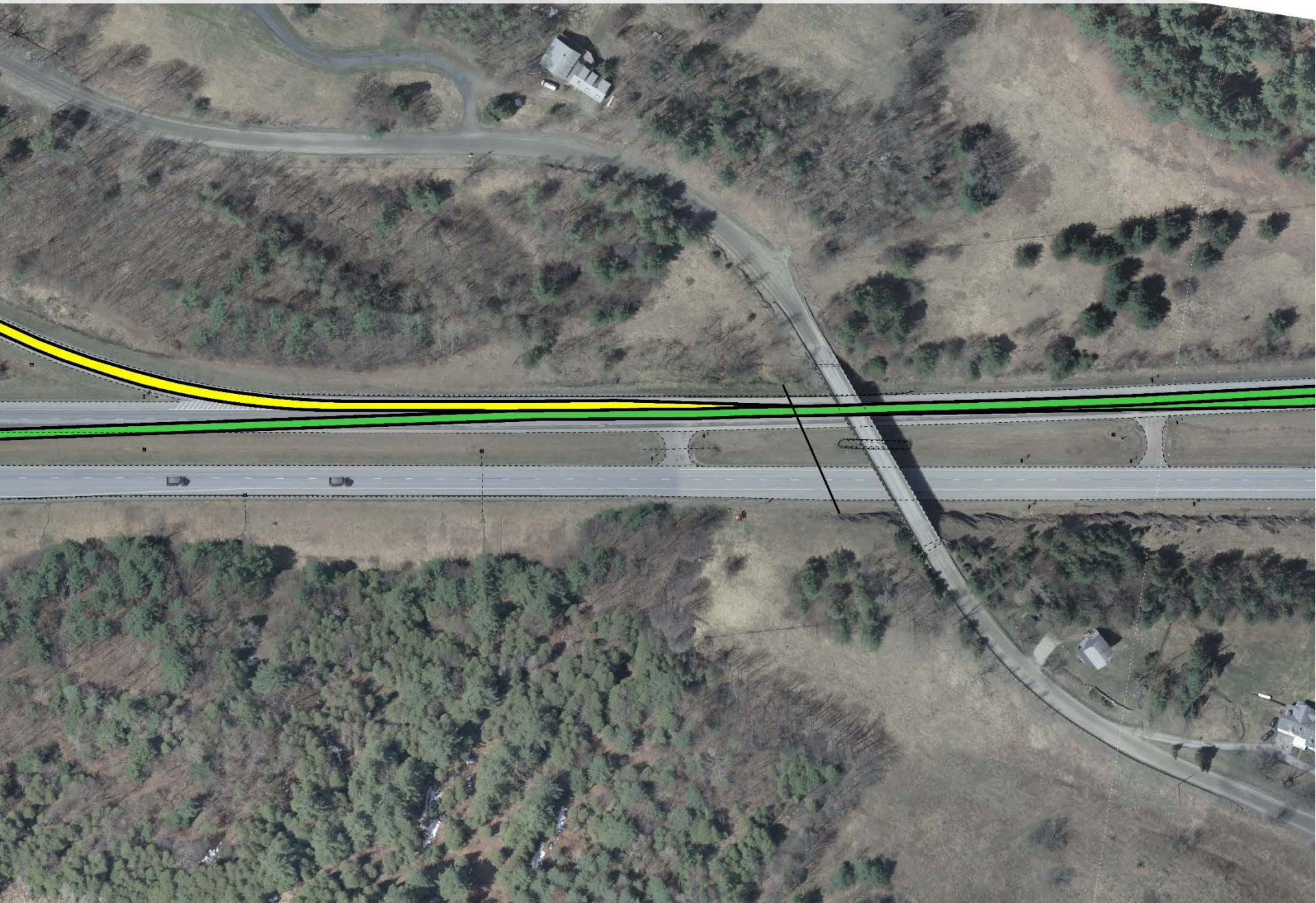


# Maintenance of Traffic Options Considered

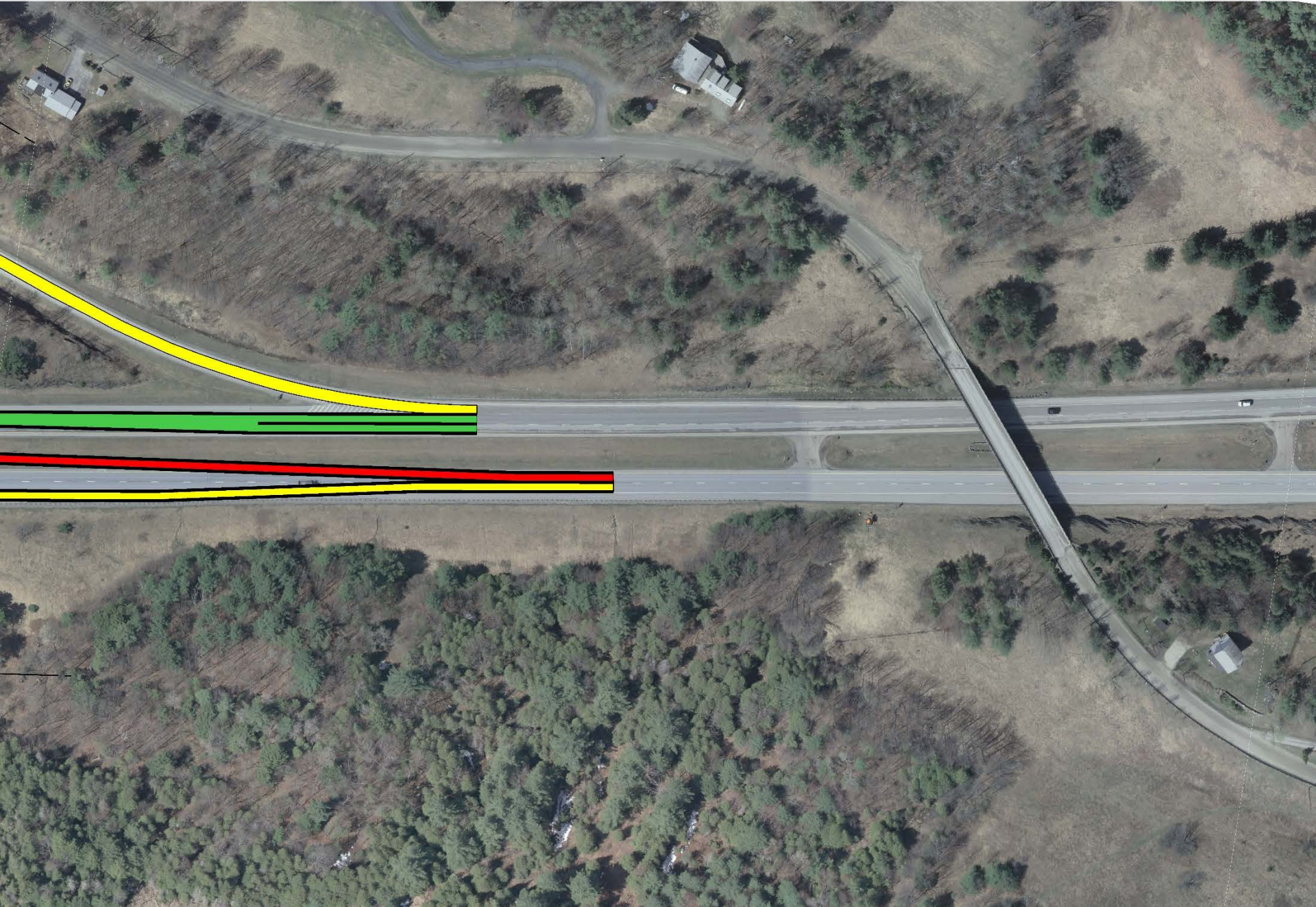
- Interstate Ramp Closures w/ Offsite Detour
  - Regional detour route parallel to I-89
- Phased Construction
  - Ruled out phasing alternatives that did not allow for all BRIDGE construction to occur in one season.
- Temporary Bridge
  - Can be constructed within the ROW
- Crossovers
  - A good alternative but must also be used in conjunction with another alternative in order to facilitate ramp traffic.



Exit 7



Exit 7

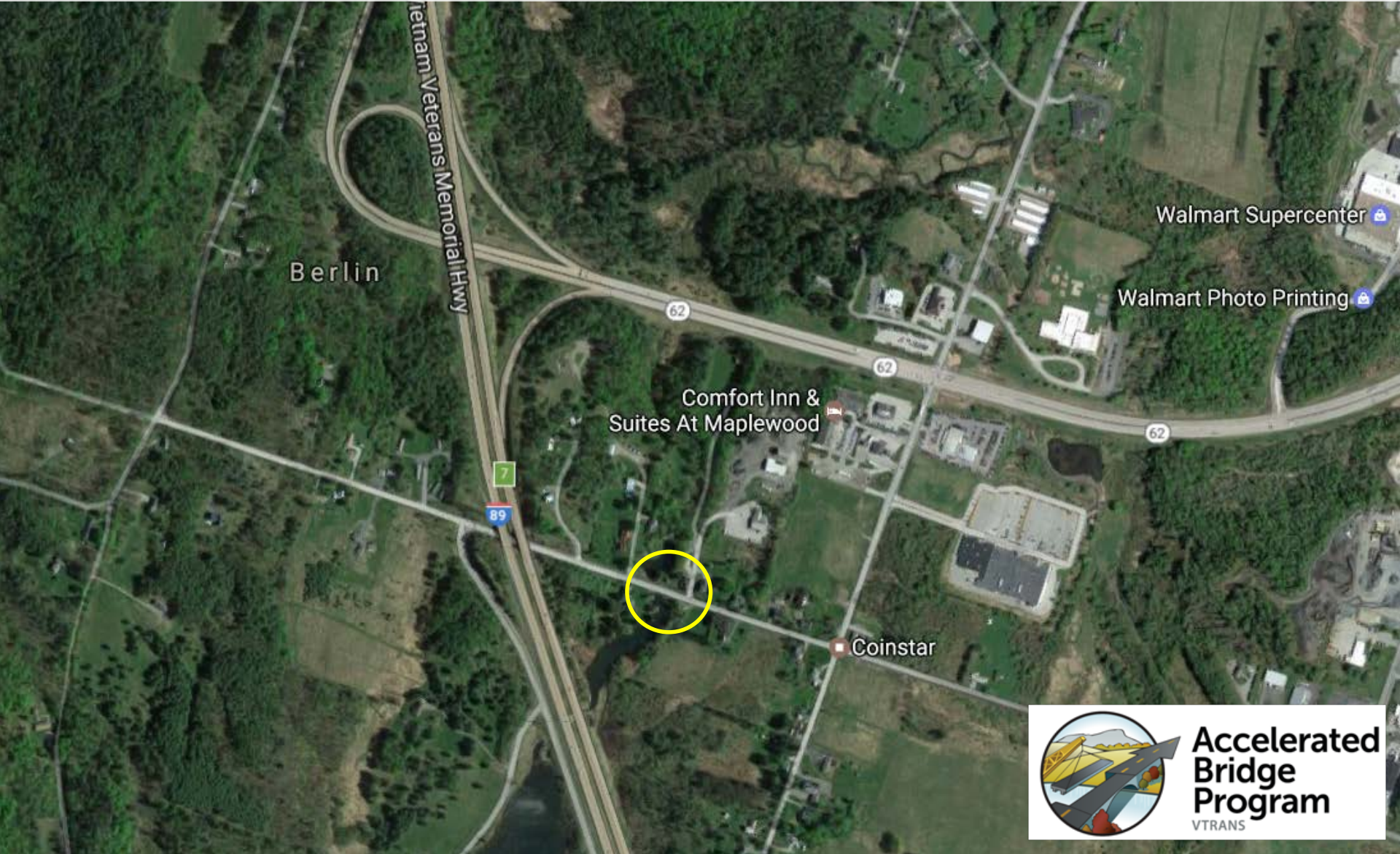


# Maintenance of Traffic

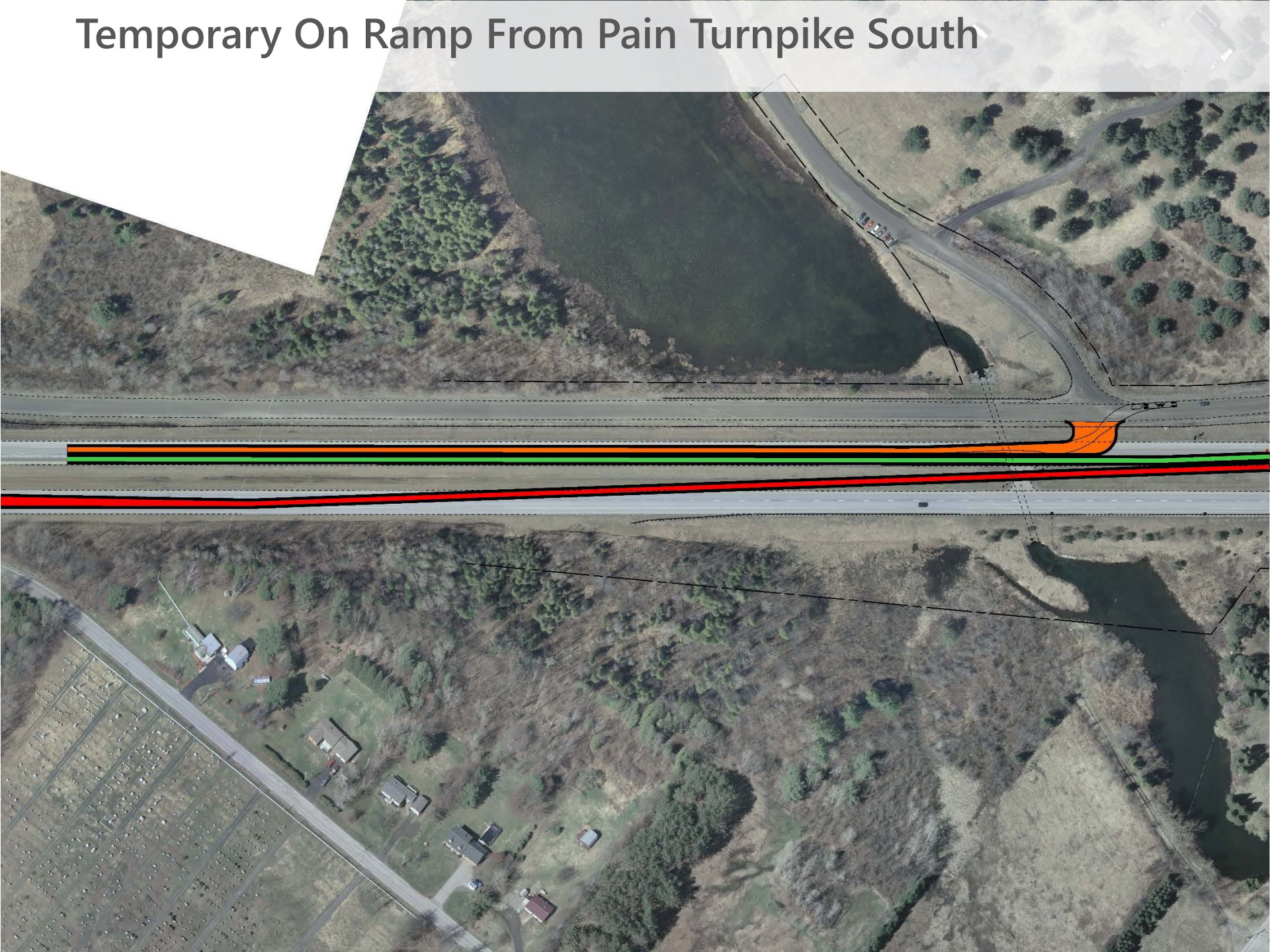
- 18 different combinations evaluated
- Ruled out options which did not allow construction of permanent infrastructure to occur in one season (concerns with interstate traffic delays)
- Ruled out options which required exit ramp closures (proximity to hospital)
- Ruled out options which would be cost prohibitive (2 Lane Temporary bridges in the median)
- Ruled out options which required a STOP condition for entering traffic (Safety Concerns)
  
- Left with 2 viable MOT alternatives

# Maintenance of Traffic Alternative 1

- Cross over with Temporary Bridge for Northbound Exit and a Temporary onramp for Southbound Entrance

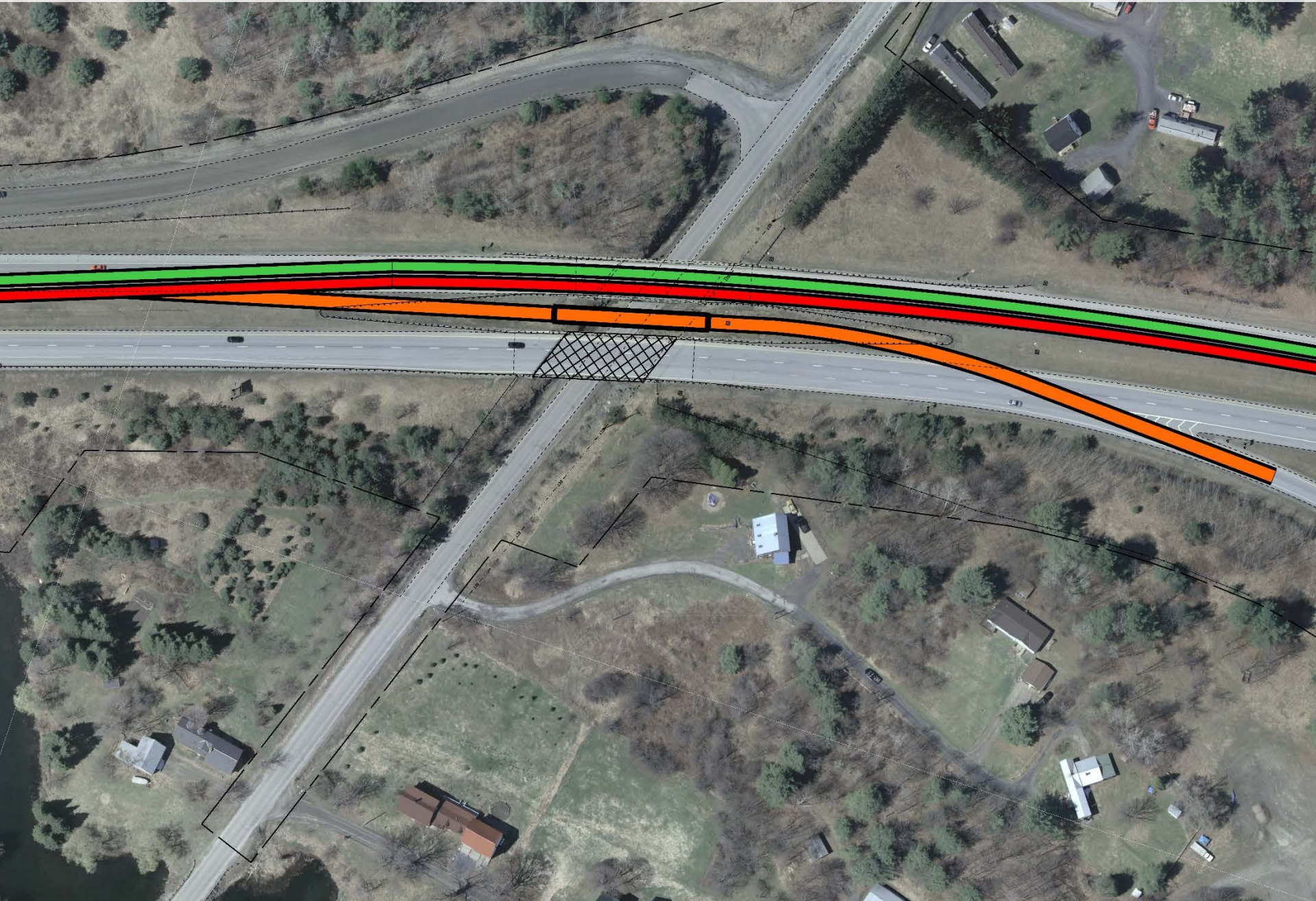


# Temporary On Ramp From Pain Turnpike South

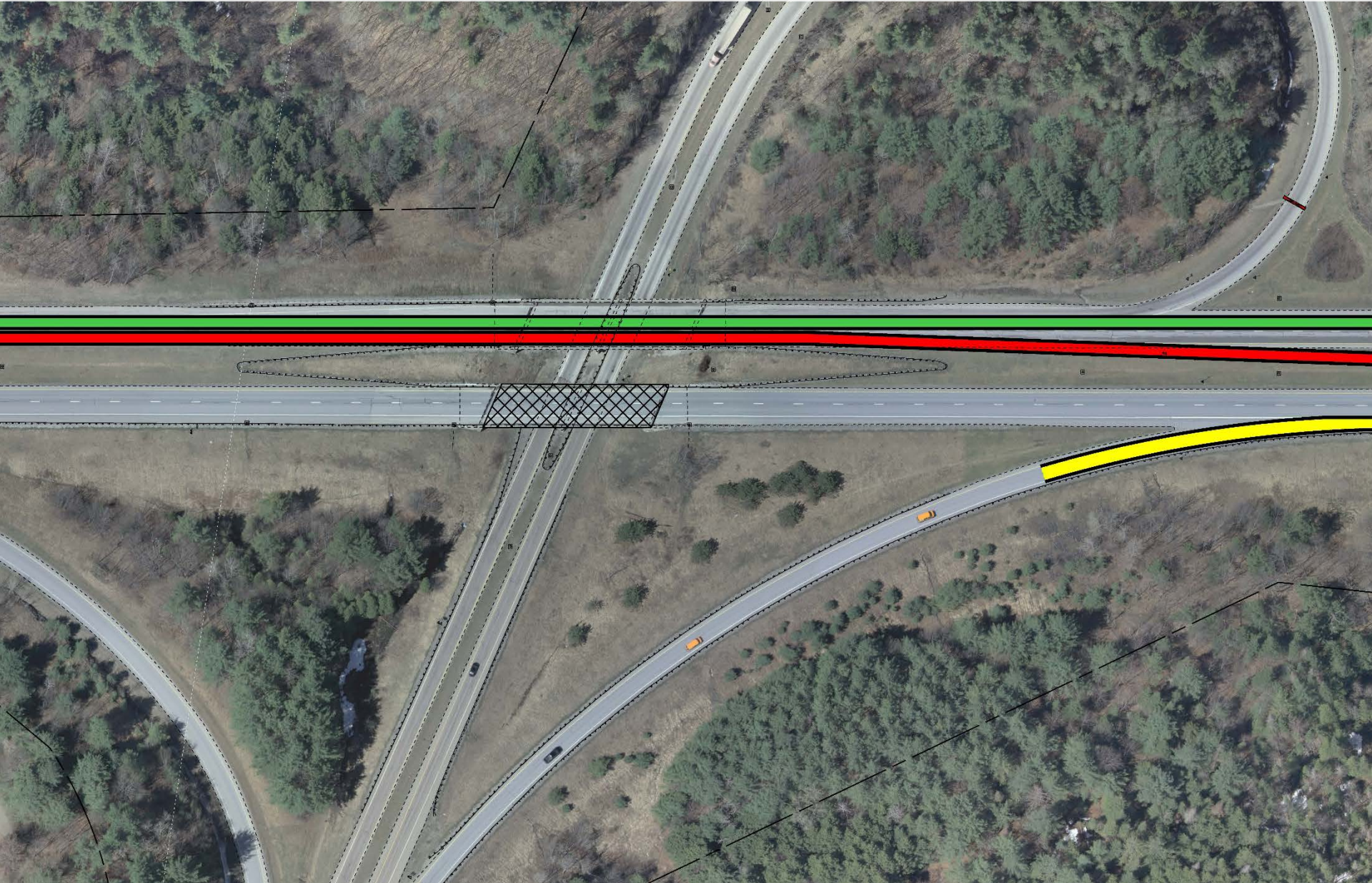




# Temporary Bridge for North Bound Exit Ramp



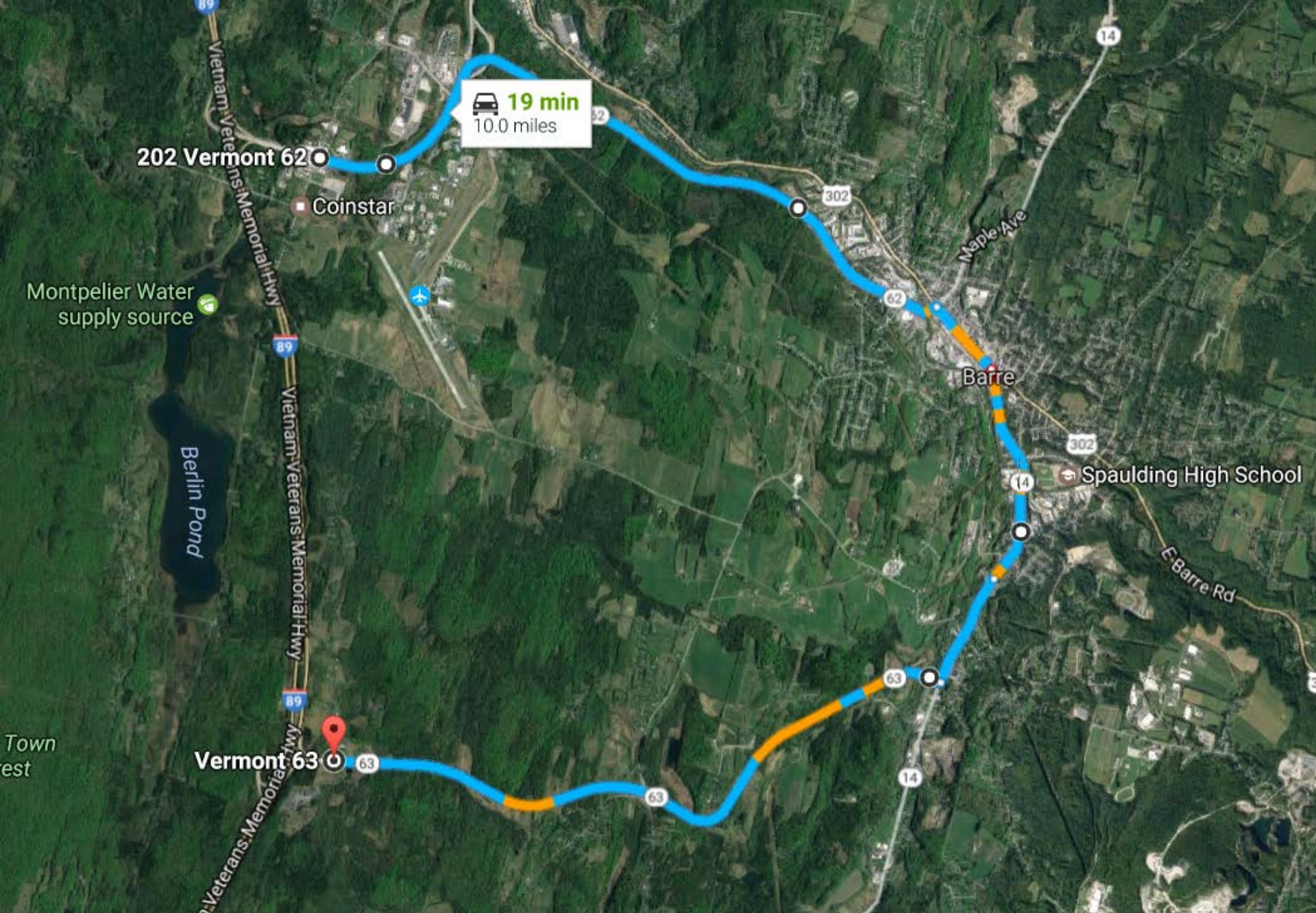
# South Bound On Ramp Closed (Traffic Located on Temporary On Ramp)



# Maintenance of Traffic Alternative 2

- Cross over with Temporary Off Ramp for Northbound Exit and a Short term closure Southbound Entrance





 **19 min**  
10.0 miles

202 Vermont 62

Coinstar

Montpelier Water supply source

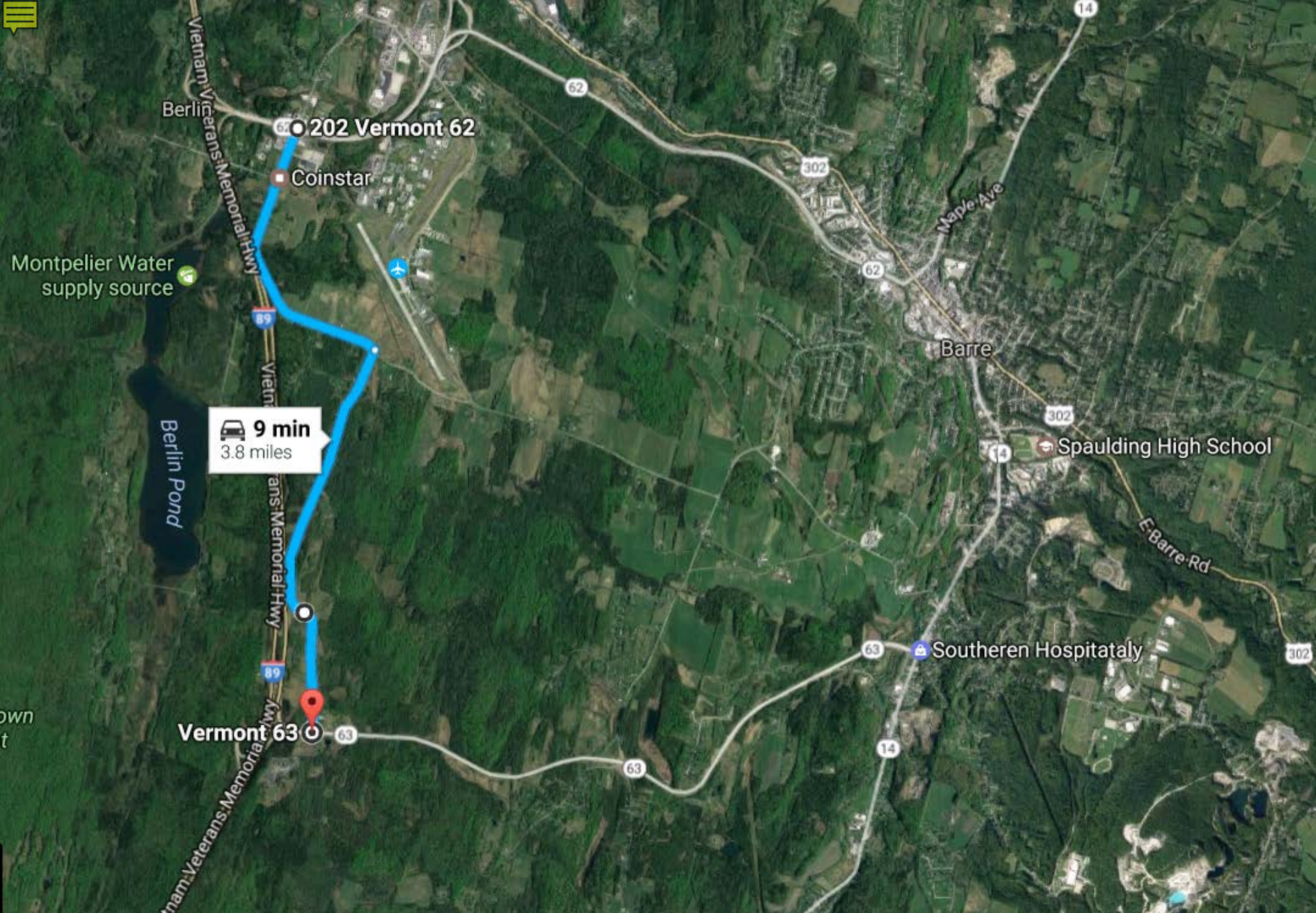
Berlin Pond

Barre

Spaulding High School

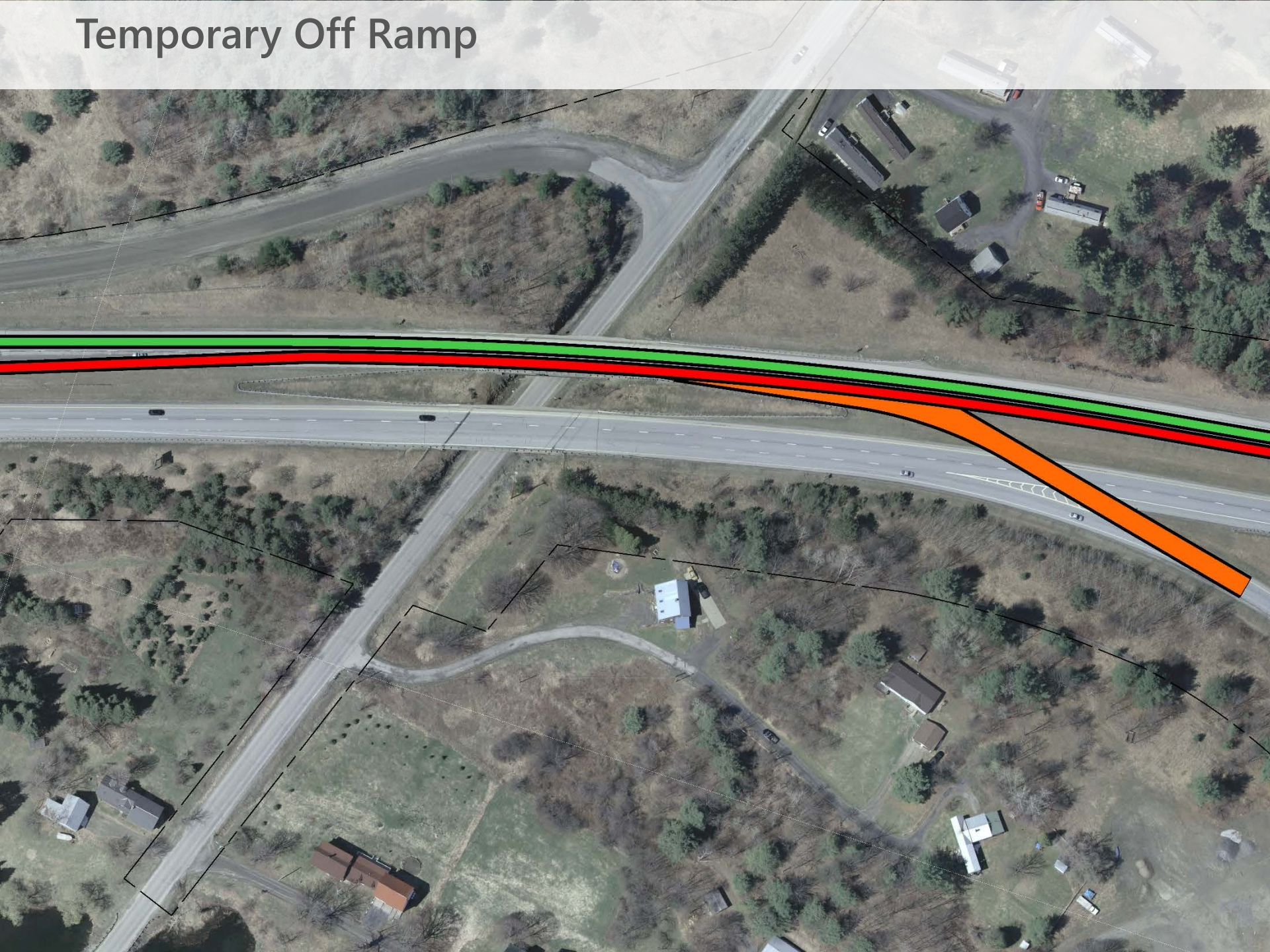
Vermont 63

State Detour Route



Potential Local Bypass Route

# Temporary Off Ramp



# Alternatives Matrix

Berlin IM DECK (42 & 43): Bridges 37 N&S		Do Nothing	Alt 1a	Alt 1b	Alt 2a	Alt 2b	Alt 2c	Alt 2d	Alt 2e	
			Rehabilitation		Deck Replacement					
			Phasing	Temp Bridge/ Cross Over	Phasing/ Temp Bridge & Temp onramp (2 lanes maintained)	Phasing & Temp onramp (1 lane maintained)	Temp Bridges in Median (1 lane maintained)	Crossover & Temp Bridge & Temp Onramp	Crossover & Temp Off-ramp & Temp onramp	
COST	Bridge Cost	\$0	\$640,132	\$589,412	\$1,041,102	\$1,037,780	\$989,063	\$778,595	\$778,595	
	Removal of Structure	\$0	\$33,930	\$33,930	\$419,796	\$419,796	\$419,796	\$349,830	\$349,830	
	Roadway	\$0	\$200,000	\$200,000	\$350,000	\$300,000	\$350,000	\$240,000	\$240,000	
	Maintenance of Traffic	\$0	\$100,000	\$590,000	\$985,000	\$100,000	\$967,500	\$590,000	\$535,000	
	Construction Costs (CIP)	\$0	\$974,062	\$1,413,342	\$2,795,898	\$1,857,576	\$2,726,359	\$1,958,425	\$1,903,425	
	Construction Costs (Pre-Cast)		N/A	N/A	\$3,881,204	\$2,942,217	\$3,654,690	\$2,830,844	\$2,709,344	
	Construction Engineering + Contingencies	\$0	\$341,000	\$494,700	\$978,600	\$650,200	\$818,000	\$587,600	\$571,100	
	Total Construction Costs w CEC	\$0	\$1,315,062	\$1,908,042	\$3,774,498	\$2,507,776	\$3,544,359	\$2,546,025	\$2,474,525	
	Preliminary Engineering	\$0	\$243,600	\$353,400	\$699,000	\$464,400	\$681,600	\$489,700	\$475,900	
	Right of Way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Total Project Costs (CIP)	\$0	\$1,558,662	\$2,261,442	\$4,473,498	\$2,972,176	\$4,225,959	\$3,035,725	\$2,950,425	
Total Project Costs (Pre-Cast)	\$0	N/A	N/A	\$5,558,804	\$4,056,817	\$5,154,290	\$3,908,144	\$3,756,344		
SCHEDULING	Project Development Duration	N/A	2 years	2 years	2 years	2 years	2 years	2 years	2 years	
	Construction Duration	N/A	6 months	12 months	18 months	18 months	18 months	18 months	18 months	
	Closure Duration (If Applicable)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
ENGINEERING	Typical Section - Roadway (feet)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Typical Section - Bridge (feet)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Geometric Design Criteria	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Traffic Safety	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Alignment Change	No	No	No	No	No	No	No	No	
	Bicycle Access	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Hydraulic Performance	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Pedestrian Access	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
OTHER	Utility	No	No	Yes	Yes	Yes	Yes	Yes	Yes	
	ROW Acquisition	No	No	No	No	No	No	No	No	
	Road Closure	No	No	No	No	No	No	No	No	
	Design Life	<10 years	20 years	20 years	50 years	50 years	50 years	50 years	50 years	

# Alternatives Matrix

Berlin IM DECK (44 & 45) Bridges 38 N&S		Do Nothing	Alt 1a	Alt 1b	Alt 2a	Alt 2b	Alt 2c	Alt 2d	Alt 2e	
			Rehabilitation		Deck Replacement					
			Phasing	Temp Bridge/ Cross Over	Phasing/ Temp Bridge & Temp onramp (2 lanes maintained)	Phasing & Temp onramp (1 lane maintained)	Temp Bridges in Median (1 lane maintained)	Crossover & Temp Bridge & Temp Onramp	Crossover & Temp Off-ramp & Temp onramp	
COST	Bridge Cost	\$0	\$928,270	\$894,189	\$1,636,205	\$1,636,205	\$1,543,111	\$1,328,797	\$1,328,797	
	Removal of Structure	\$0	\$45,801	\$45,801	\$529,528	\$529,528	\$529,528	\$555,281	\$649,706	
	Roadway	\$0	\$200,000	\$200,000	\$350,000	\$300,000	\$350,000	\$240,000	\$240,000	
	Maintenance of Traffic	\$0	\$100,000	\$590,000	\$985,000	\$100,000	\$967,500	\$590,000	\$535,000	
	Construction Costs (CIP)	\$0	\$1,274,071	\$1,729,990	\$3,500,733	\$2,565,733	\$3,390,140	\$2,714,077	\$2,753,502	
	Construction Costs (Pre-Cast)		N/A	N/A	\$5,120,818	\$4,185,818	\$4,899,309	\$4,053,197	\$4,111,508	
	Construction Engineering + Contingencies	\$0	\$382,300	\$519,000	\$1,050,300	\$769,800	\$1,017,100	\$814,300	\$826,100	
	Total Construction Costs w CEC	\$0	\$1,656,371	\$2,248,990	\$4,551,033	\$3,335,533	\$4,407,240	\$3,528,377	\$3,579,602	
	Preliminary Engineering	\$0	\$318,600	\$432,500	\$875,200	\$641,500	\$847,600	\$678,600	\$688,400	
	Right of Way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Total Project Costs (CIP)	\$0	\$1,974,971	\$2,681,490	\$5,426,233	\$3,977,033	\$5,254,840	\$4,206,977	\$4,268,002	
Total Project Costs (Pre-Cast)	\$0	N/A	N/A	\$7,046,318	\$5,597,118	\$6,764,009	\$5,546,097	\$5,626,008		
SCHEDULING	Project Development Duration	N/A	2 years	2 years	2 years	2 years	2 years	2 years	2 years	
	Construction Duration	N/A	6 months	6 months	12 months	12 months	12 months	12 months	12 months	
	Closure Duration (If Applicable)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
ENGINEERING	Typical Section - Roadway (feet)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Typical Section - Bridge (feet)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Geometric Design Criteria	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Traffic Safety	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Alignment Change	No	No	No	No	No	No	No	No	
	Bicycle Access	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Hydraulic Performance	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
	Pedestrian Access	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	
OTHER	Utility	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	ROW Acquisition	No	No	No	No	No	No	No	No	
	Road Closure	No	No	No	No	No	No	No	No	
	Design Life	<10 years	20 years	20 years	50 years	50 years	50 years	50 years	50 years	





# Recommended Alternative

- Deck Replacement

- Replace all bridge decks using stay in place forms and cast in place concrete
- Widen bridges 38S and 37N
- Replace bridge and approach railing
- **Maintain traffic with crossovers, temporary off ramp, and 21 day SB on ramp closure**



# Maintenance of Traffic Alternative 2



ROAD  
CLOSED

## Construct NB First

- Construct Cross-Overs for NB and SB
- Construct Temporary NB off ramp
- Require each barrel of I-89 to be constructed within 8 weeks
- Maintain all traffic except SB on ramp
- SB Ramp - Approx. 21 day closure
- Detour route signed by State: 10 miles on State Highways

# For more information:

- <https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/15a112>

## Berlin IM DECK(42-45) Questions & Comments **I-89 Bridge's #37 & #38 North & South**

May 15, 2017

