

# Colchester IM 089-3(69) Collaboration Meeting

Interstate 89 – Bridges #76 North & South over Bay Road

February 17, 2015





# Colchester IM 089-3(69) Collaboration Meeting

Interstate 89 – Bridges #77 North & South over Mallet's Creek

February 17, 2015



#### **Introductions**

Jennifer Fitch, P.E.

VTrans Project Manager

Laura Stone, P.E.

VTrans Scoping Engineer

Kristin Higgins, P.E.

VTrans Project Manager

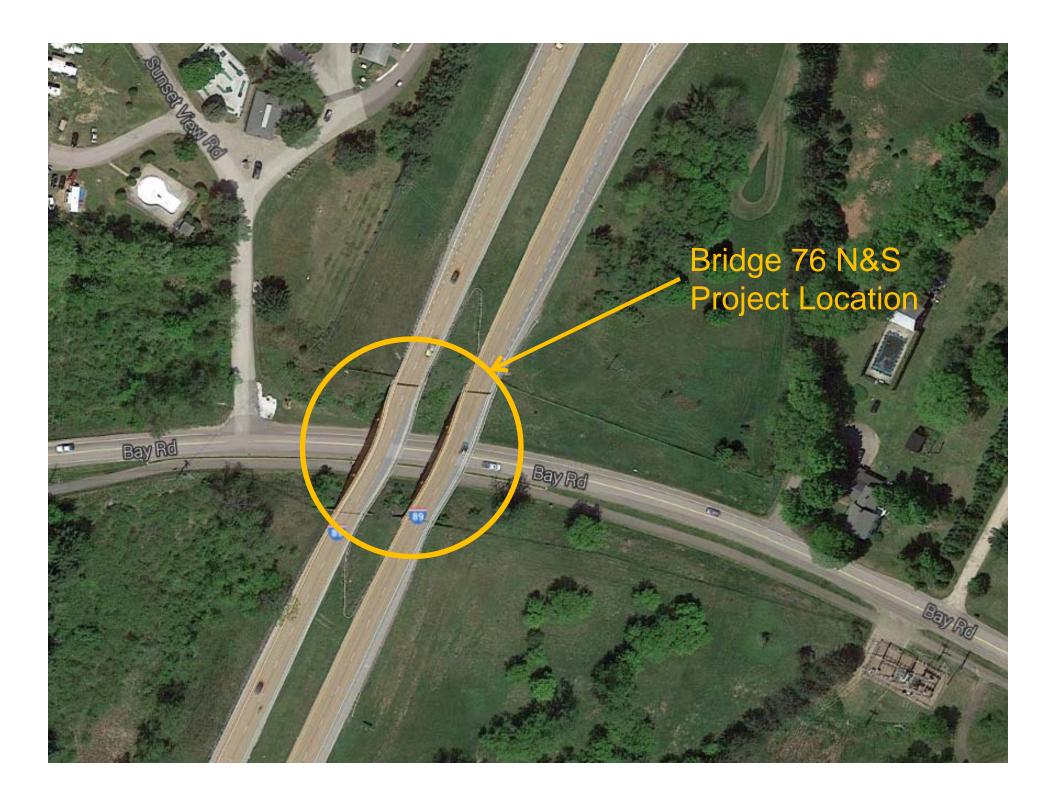


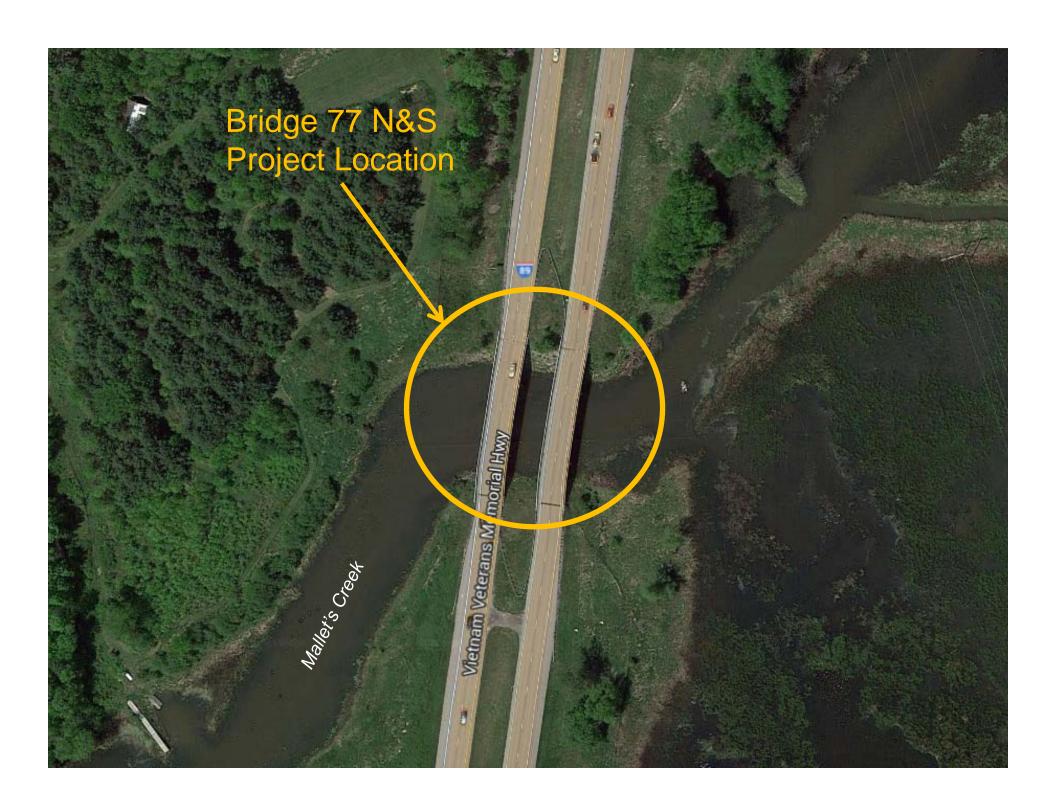
#### **Purpose of Meeting**

- Provide an understanding of our approach to the project
- Provide an overview of project constraints
- Discuss alternatives and MOT considered
- Provide an opportunity to ask questions and voice concerns
- Foster support for the recommended alternative









#### **Meeting Overview**

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



#### **VTrans Project Development Process**

# Project Project Contract Funded Defined 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

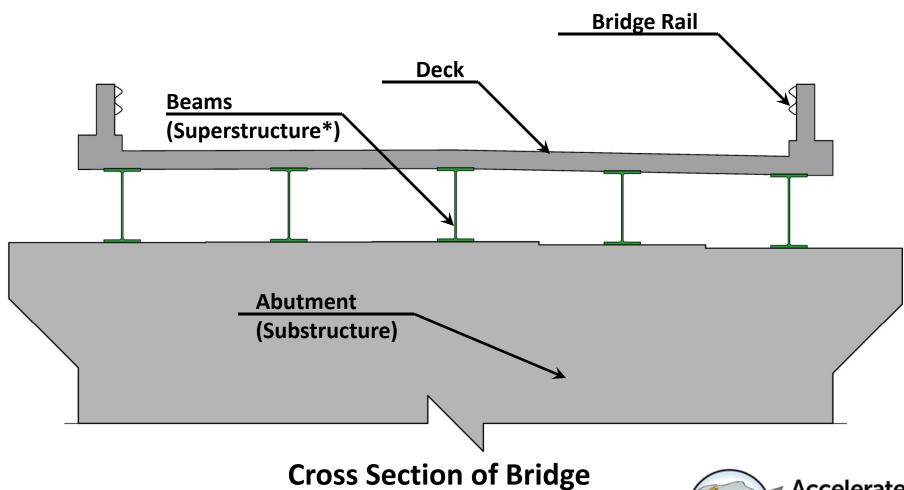


#### **Project Overview**

- Existing Conditions
- Alternatives Considered
- Recommended Alternative



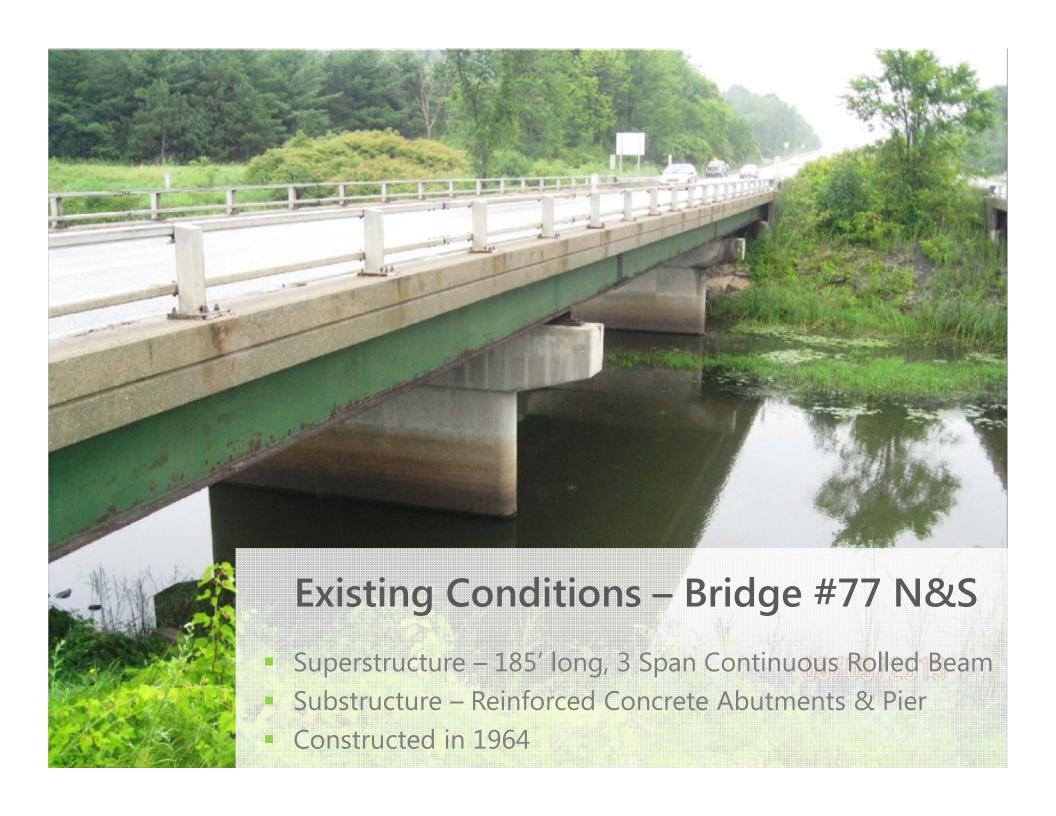
#### **Description of Terms Used**



 The Superstructure includes all components above the substructure







#### **Inspection Summary:**

Bridge	Deck Rating	Superstructure Rating	Substructure Rating	Channel Rating
76 N	5 (Fair)	6 (Satisfactory)	6 (Satisfactory)	N/A
76 S	5 (Fair)	6 (Satisfactory)	6 (Satisfactory)	N/A
77 N	5 (Fair)	6 (Satisfactory)	6 (Satisfactory)	8 (Very Good)
77 S	4 (Poor)	6 (Satisfactory)	6 (Satisfactory)	8 (Very Good)



#### Existing Conditions – Bridges #76 N&S

- The approach rail connections and bridge railing are substandard
- Both bridges have insufficiently protected piers.
- Both bridges have Leaky Bridge Joints
- Deck geometry is substandard
- Archaeologically sensitive area within limits
- Wetlands within project area limits



#### **Existing Conditions – Bridges #77 N&S**

- Bridge 77S is structurally deficient with some heavy deterioration of the deck
- The approach rail connections and bridge railing are substandard
- Deck geometry is substandard
- There are extensive wetland limits around the bridges



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



#### Existing Conditions – Bridges #76 and #77 N&S

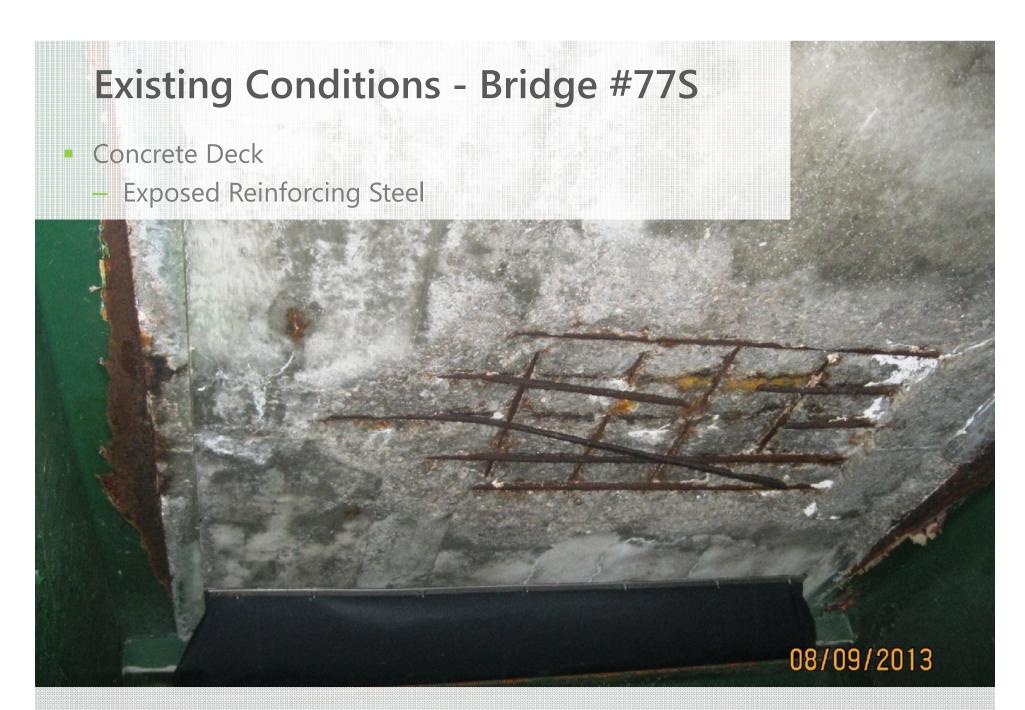
- Substandard Deck Geometry
- Substandard Railing

#### **Unprotected Piers**



## **Existing Conditions - Bridge #76 N&S**

Piers are not protected from impact



Heavy Deterioration of Deck

#### **Design Criteria and Considerations:**

ADT: 19,600 (Bridges 76 & 77 Northbound)

19,600 (Bridges 76 & 77 Southbound)

5,800 (Bay Road, current)

DHV: 3,100 (Bridges 76 & 77 Northbound)

3,600 (Bridges 76 & 77 Southbound)

% Trucks: 11.3 (Bridges 76 & 77 Northbound)

9.4 (Bridges 76 & 77 Southbound)

**Bridge** 

Design Speed of 70 mph

Archaeologically sensitive area within Bridges 76 N&S limits

 Wetlands within Bridges 76 and 77 limits. Extensive limits around Bridge 77

Accelerated

#### Alternatives Considered – Bridges #76 & 77

- No Action
  - Additional maintenance required within 10 years
- Rehabilitation
  - Only considered for bridges 76 N&S
  - Superstructure and substructure patching with anodes
  - Substandard width
- Deck Replacement
  - Precast deck panels
  - Superstructure and substructure patching with anodes
  - Beams to be painted as part of a future project
  - Substandard width
- Superstructure Replacement
  - New beams, no field paint/hazardous materials issues
  - Substructure patching
  - Substandard width
- Full Bridge Replacement
  - Longest design life
  - Meets all geometric criteria



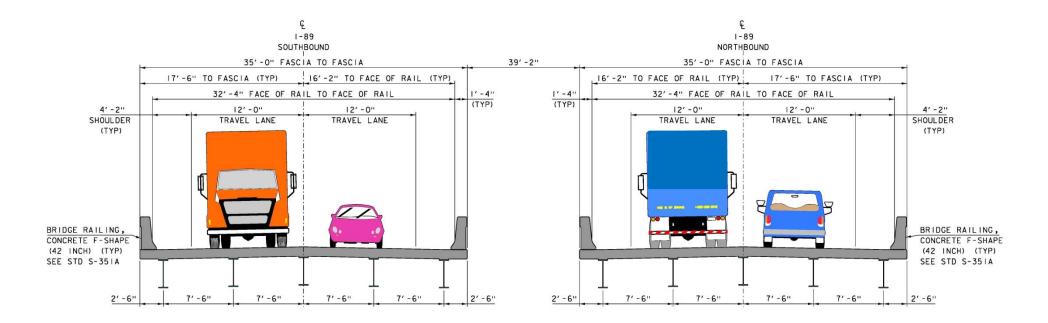
#### Selected Alternative - Bridges #76 & 77

- Replace all four decks utilizing precast deck panels
  - Bridges widened by 1 foot on each side (substandard width)
  - New approach railing and bridge railing
  - New joints
  - Bearing replacement as necessary
  - Composite construction
  - Guardrail placed along Bay Road under bridge 76 N and S for pier protection
  - Precast components for rapid construction



#### **Proposed Bridge Section**

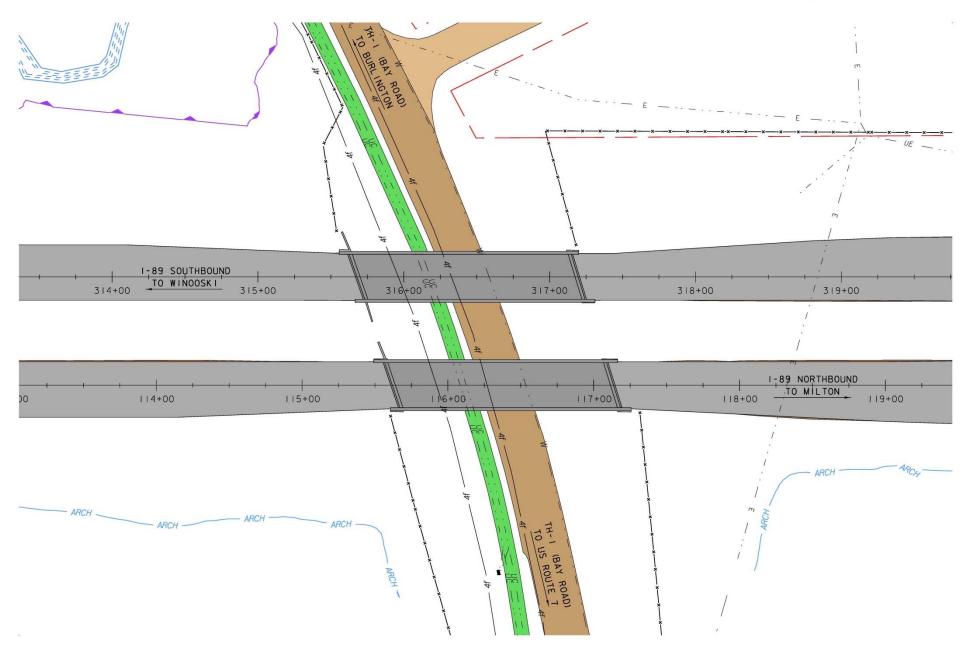
Proposed Bridge Rail to Rail = 32'-4" (Existing is 30')





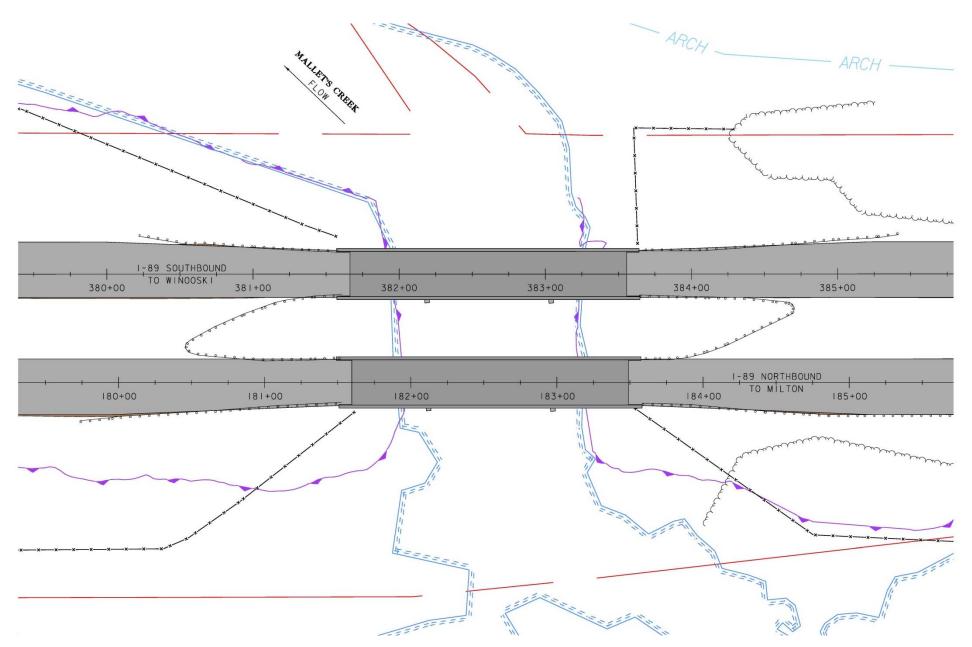
#### Proposed Layout Bridges #76 N&S





### **Proposed Layout Bridges #77 N&S**





#### Maintenance of Traffic Options Considered

- Nightly Interstate Closures w/ Offsite Detour
  - Regional detour route parallel to I-89 and adds no distance to travel

#### Phased Construction

- Two lanes in each direction need to be maintained
- Phasing is only an option for a complete replacement since the existing bridges are too narrow to accommodate 2 lanes of traffic and provide working space

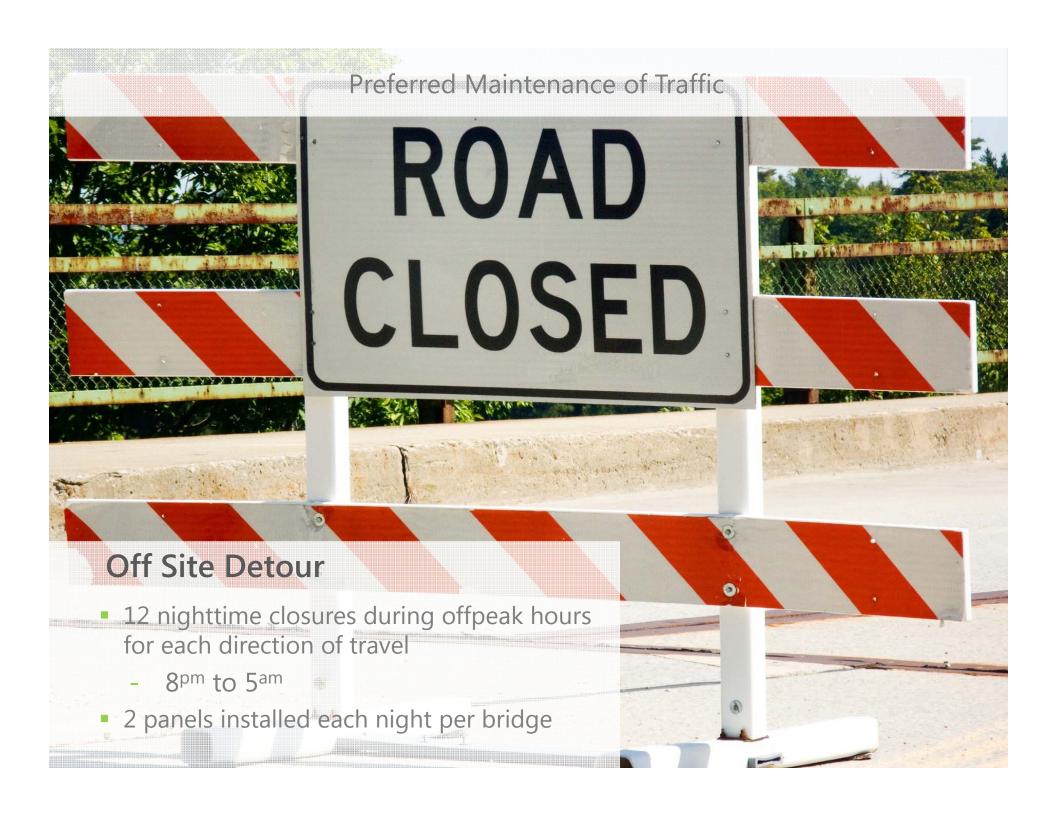
#### Temporary Bridge

- Two lanes in each direction need to be maintained
- Can be constructed within the ROW

#### Crossovers

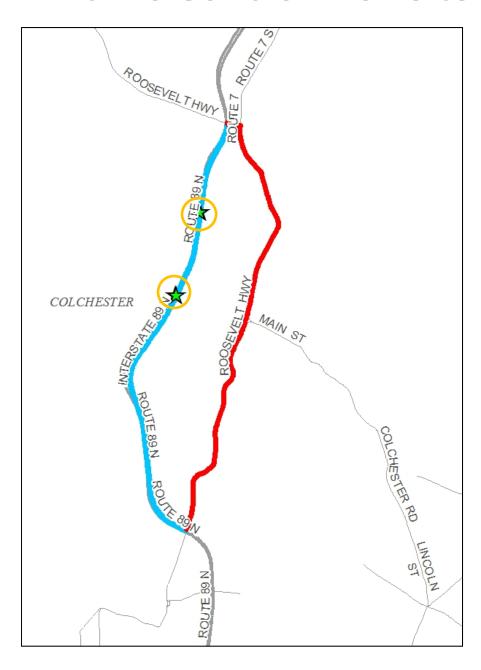
- Two lanes in each direction need to be maintained
- Crossovers are not an option since 4 lanes of traffic cannot be accommodated on either of the existing narrow bridges





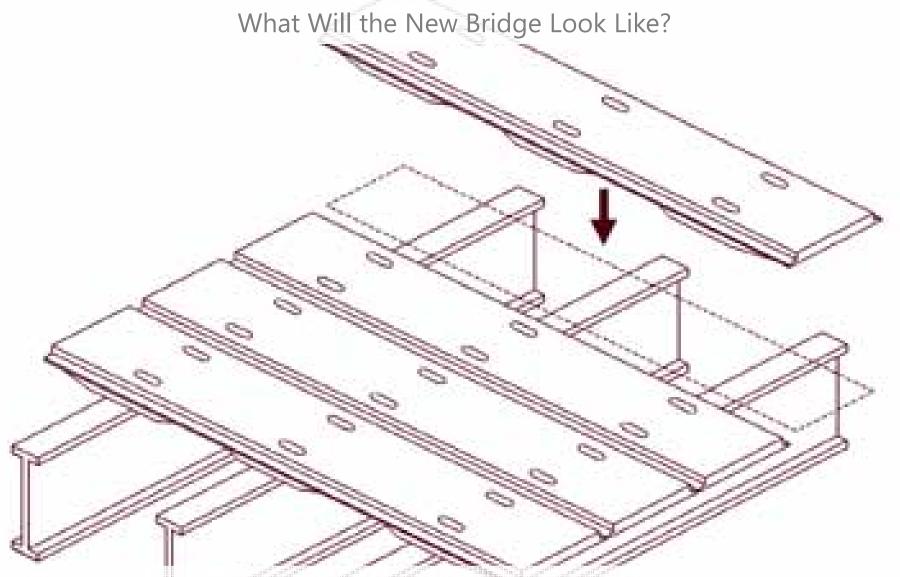
#### Traffic Control - Offsite Detour





- Short Term Road Closure w/ Offsite Detour
  - Signed by State, regional detour route parallel to I-89 and adds no distance to travel
  - End-to-end not applicable on Interstate
- I-89 to US Route 2/US Route7, back to I-89
  - Through Route: 6.7 MilesDetour Route: 6.3 MilesAdded Miles: 0 Miles

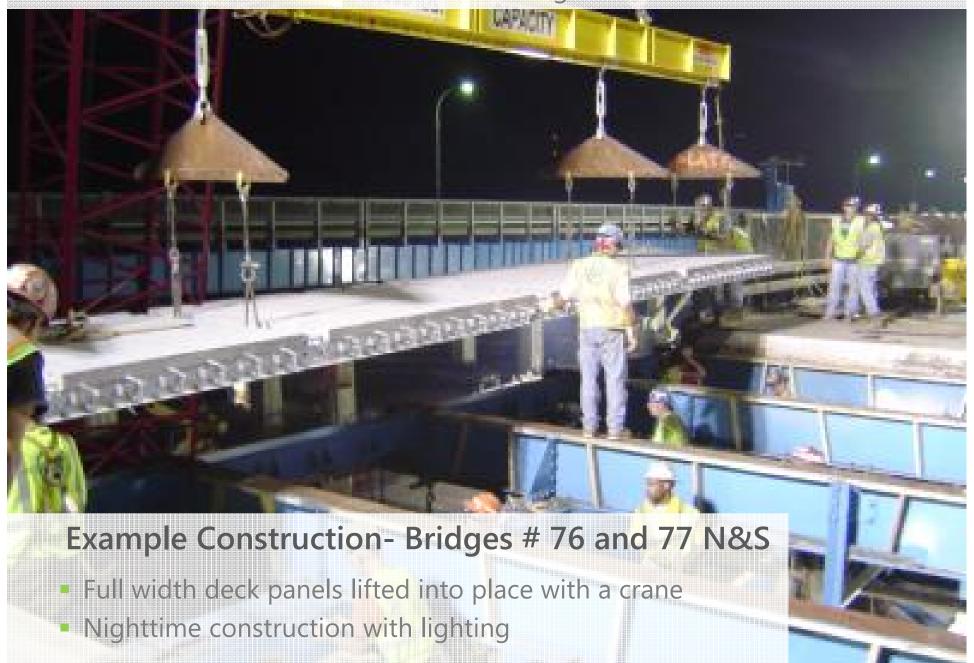
Additional travel time: 2 minutes (assuming free flow conditions)



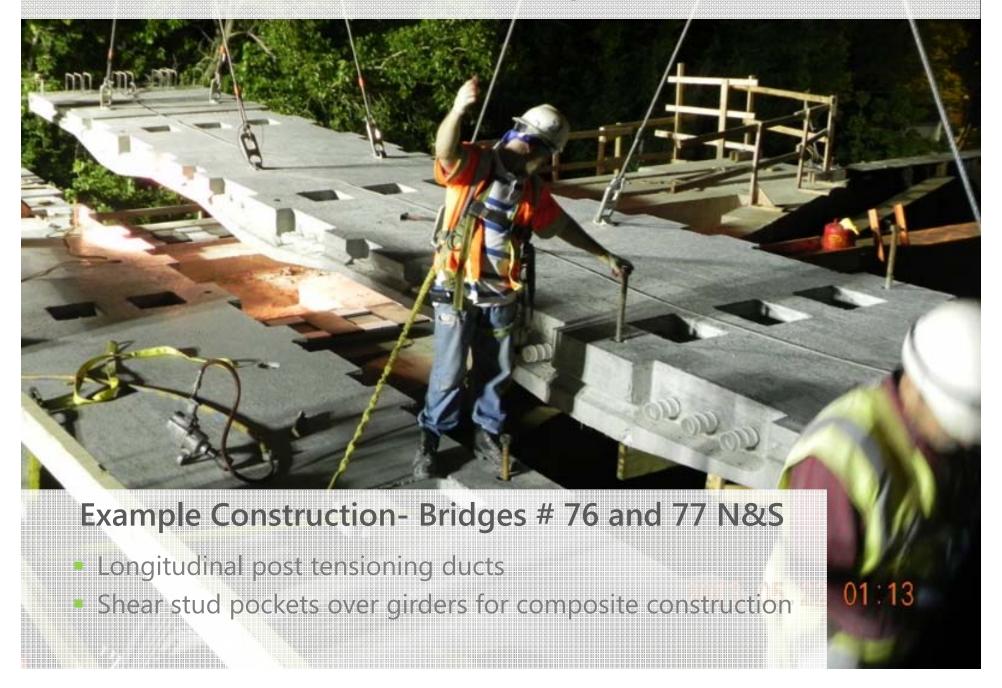
#### Example Construction- Bridges # 76 and 77 N&S

 Full width/Full depth precast concrete deck panels placed adjacent to each other on steel beams

#### What Will the New Bridge Look Like?



#### What Will the New Bridge Look Like?



#### What Will the New Bridge Look Like?



#### **Project Summary**

- Replace all four decks utilizing precast deck panels
  - Traffic maintained on an offsite detour during nightly closures
  - Both southbound bridges worked on at the same time for a total of 12 nightly closures for the southbound direction
  - Both northbound bridges worked on at the same time for a total of 12 nightly closures for the northbound direction
  - No utility relocation needed
  - NO ROW needed



## Alternatives Matrix – Bridges 76 N&S



	Alt 1a	Alt 1b	Alt 2a	Alt 2b	Alt 3a	Alt 3b	Alt 4
Colchester IM 089-3(69)	Rehabilitation		Deck Rep <mark>l</mark> acement		Superstructure Replacement		Complete Replacement
Bridges 76 N&S	Offsite Detour	Temporary Bridge	Offsite Detour	Temporary Bridge	Offsite Detour	Temporary Bridge	Phasing
Total Project Costs (including Engineering and Contingencies)	\$1,232,300	\$2,153,000	\$4,966,200	\$5,563,000	\$5,683,900	\$6,617,600	\$12,051,300
Project Development Duration	2 years	2 years	2 years	2 years	2 years	2 years	4 years
Construction Duration	6 months	18 months	9 months	18 months	18 months	24 months	30 months
Closure Duration (If Applicable)	N/A	N/A	12 ~ nights	N/A	4 ~ 3 day periods	N/A	N/A
Geometric Design Criteria	Substandard Width	Substandard Width	Substandard Width	Substandard Width	Substandard Width	Substandard Width	Meets Criteria
Alignment Change	No	No	No	No	No	No	No
Utilities	No	No	No	No	No	No	Yes
ROW	No	No	No	No	No	No	No
Design Life	15 years	15 years	40 years	40 years	40 years	40 years	100 years

## Alternatives Matrix – Bridge 77 N&S



	Alt 1a	Alt 1b	Alt 2a	Alt 2b	Alt 3a	Alt 3b	Alt 4
Colchester IM 089-3(69)	Rehabilitation		Deck Replacement		Superstructure Replacement		Complete Replacement
Bridges 77 N&S	Phasing	Temporary Bridge	Offsite Detour	Temporary Bridge	Offsite Detour	Temporary Bridge	Phasing
Total Project Costs (including Engineering and Contingencies)	Rehabilitation option was not		\$5,738,100	\$6,519,300	\$6,675,900	\$7,875,600	\$14,107,400
Project Development Duration			2 years	2 years	2 years	2 years	4 years
Construction Duration			9 months	18 months	18 months	24 months	30 months
Closure Duration (If Applicable)	considered for		12 ~ nights	N/A	4 ~ 3 day periods	N/A	N/A
Geometric Design Criteria	Bridges 77 N&S due to the poor deck condition of		Substandard Width	Substandard Width	Substandard Width	Substandard Width	Meets Criteria
Alignment Change	Bridge 77S		No	No	No	No	No
Utilities			No	No	No	No	Yes
ROW			No	No	No	No	No
Design Life			40 years	40 years	40 years	40 years	100 years

#### **Preliminary Project Schedule**

 Construction – Summer 2018 (to be coordinated with the double diamond interchange project)





# Colchester IM 089-3(69) Questions and Comments

February 17, 2015

