



# Colchester IM 089-3(69) Regional Concerns Meeting

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

May 28, 2015





**Colchester IM 089-3(69)**  
**Regional Concerns Meeting**  
**Interstate 89 – Bridges #77 North & South over Mallets Creek**

May 28, 2015



# Introductions

**Jennifer Fitch, P.E.**

VTrans Scoping Project Manager

**Laura Stone, P.E.**

VTrans Scoping Engineer

**Kristin Higgins, P.E.**

VTrans Design Project Manager

**Scott Burbank, P.E.**

VHB Consultant Designer

**Jill Barrett**

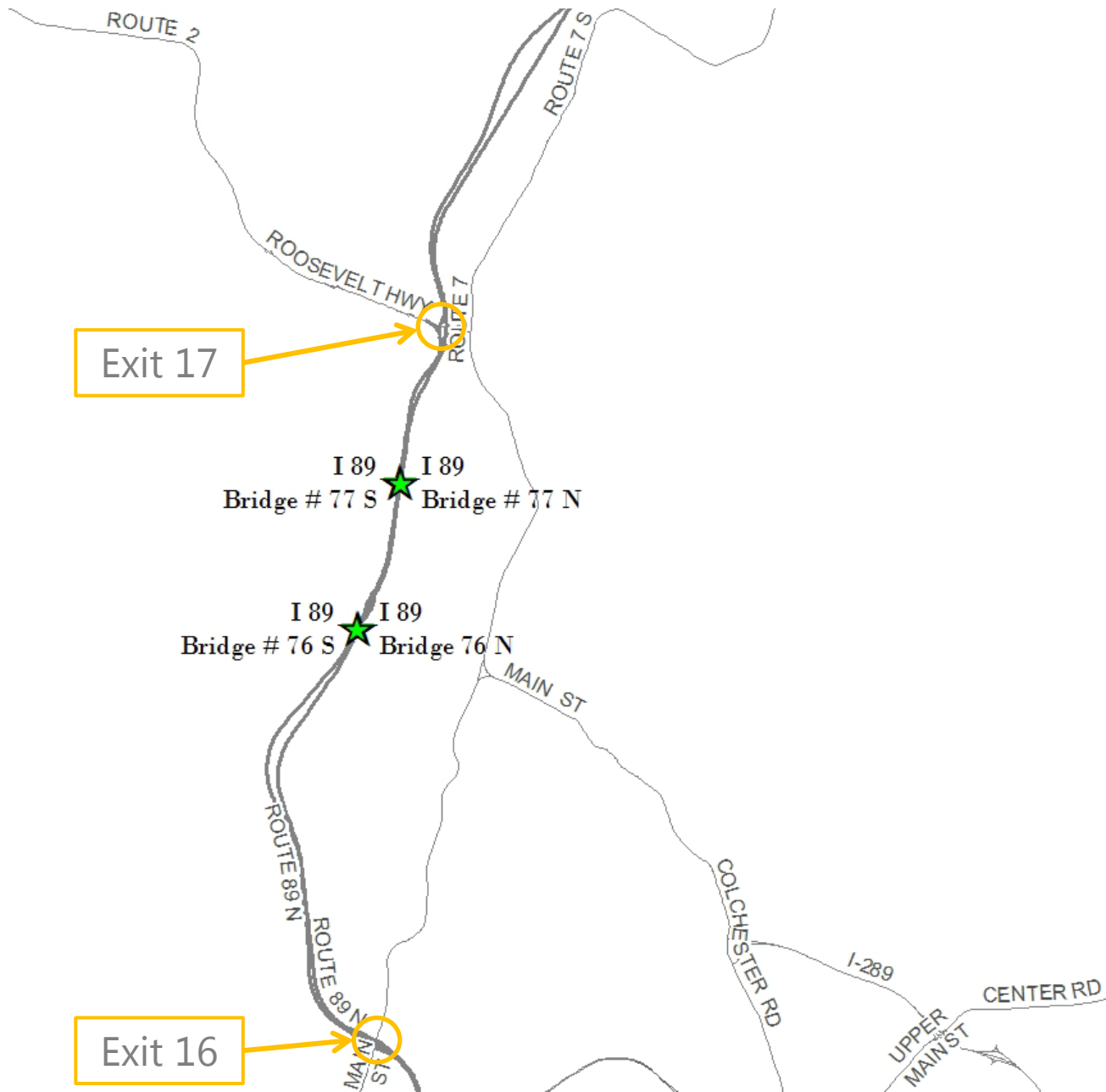
Project Outreach Coordinator



# Purpose of Meeting

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





Exit 17

Exit 16

Location Map



Bridge 76 N&S  
Project Location

Bay Rd

Bay Rd

Bay Rd

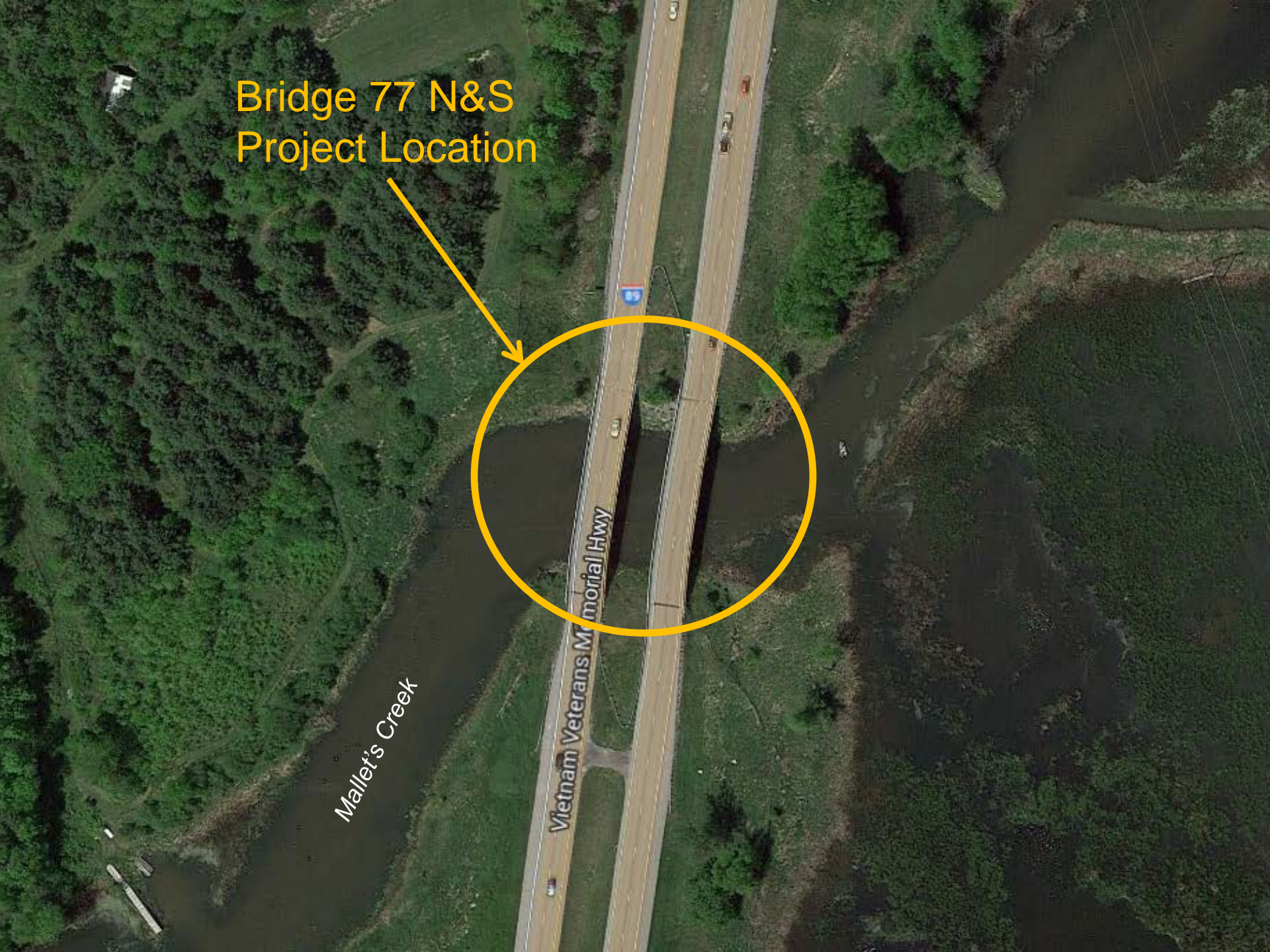
89

Bridge 77 N&S  
Project Location



Mallet's Creek

Vietnam Veterans Memorial Hwy



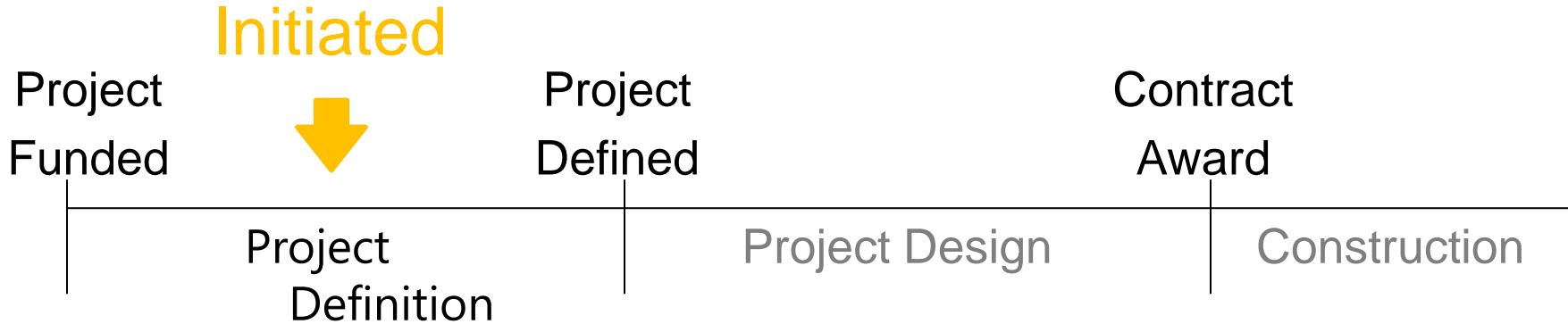
# Meeting Overview

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





# VTrans Project Development Process



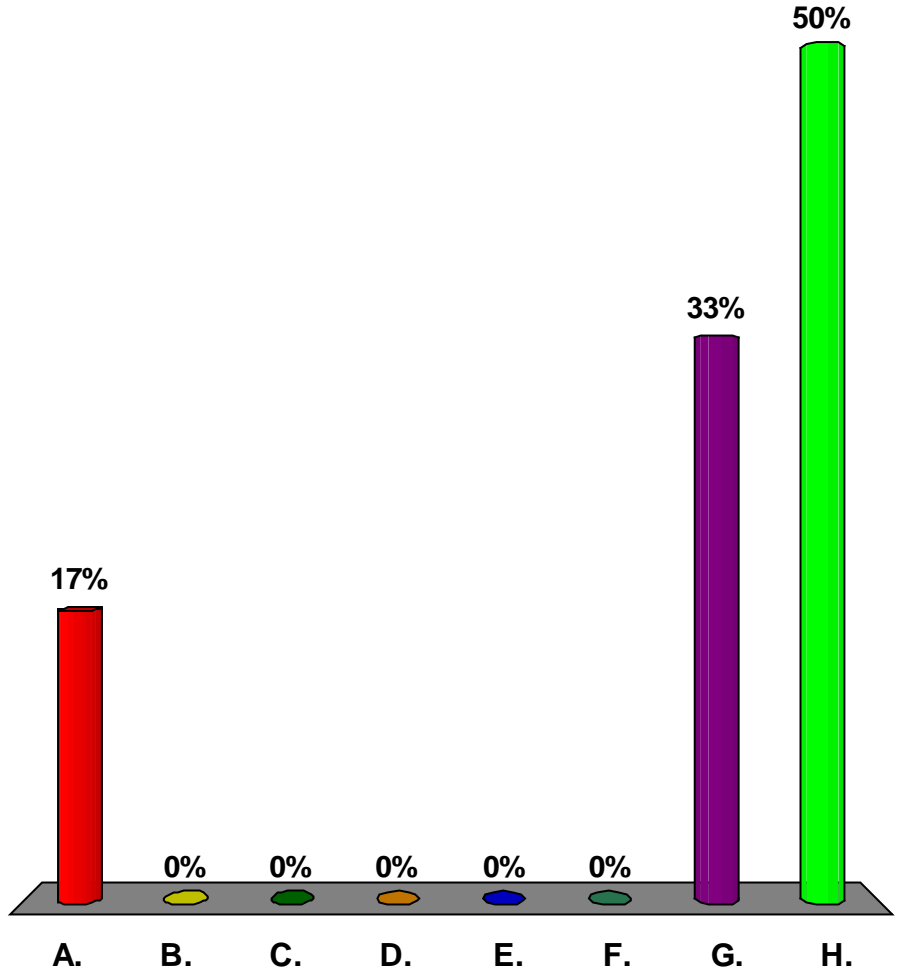
- Identify resources & constraints
- Evaluate alternatives
- Public participation
- Build Consensus

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



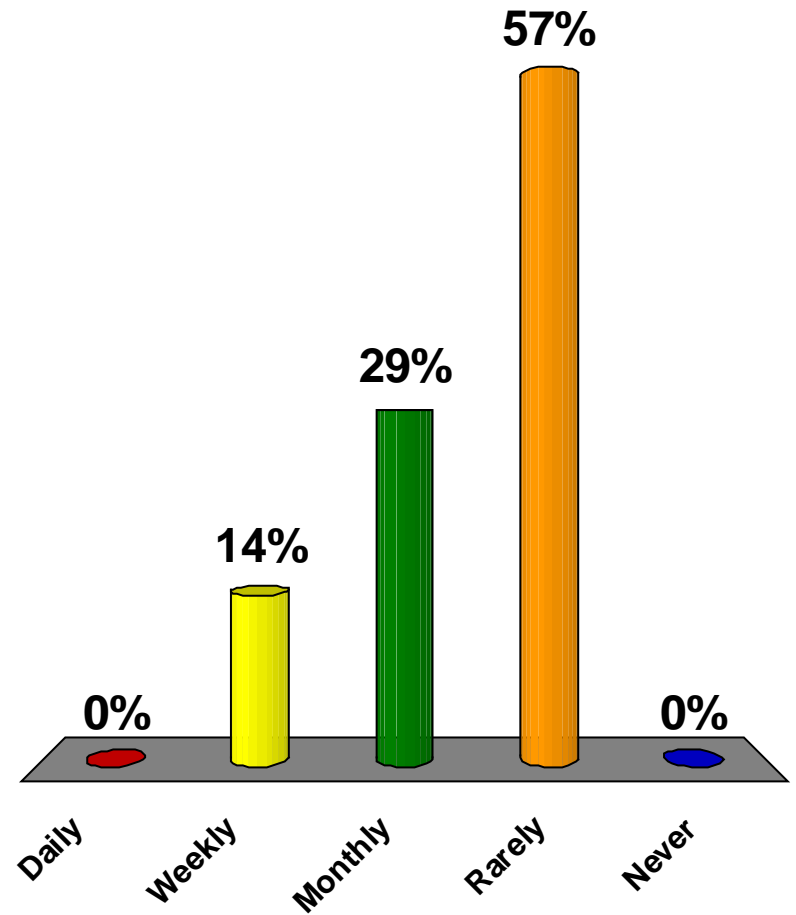
# Who are you representing?

- A. Municipal Official
- B. Resident
- C. Local Business
- D. Trucking Industry
- E. Independent Organization
- F. Local School
- G. Emergency Services
- H. Other



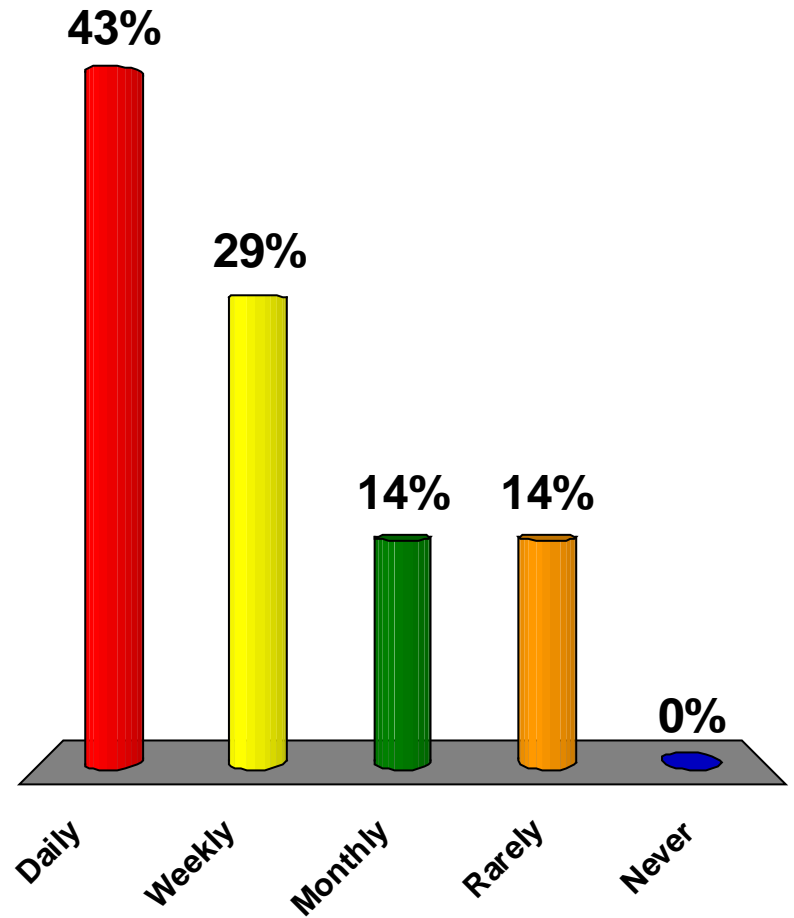
# How often do you use this segment of I-89?

- A. Daily
- B. Weekly
- C. Monthly
- D. Rarely
- E. Never



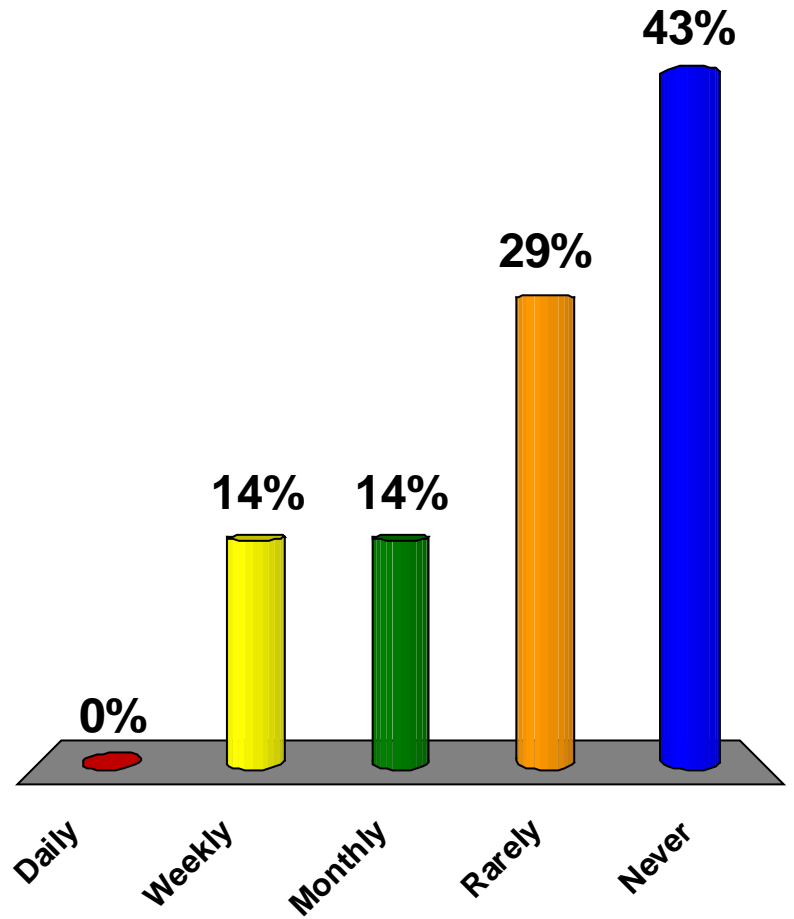
# How often do you use the segment of US Route 7 between exits 16 and 17?

- A. Daily
- B. Weekly
- C. Monthly
- D. Rarely
- E. Never



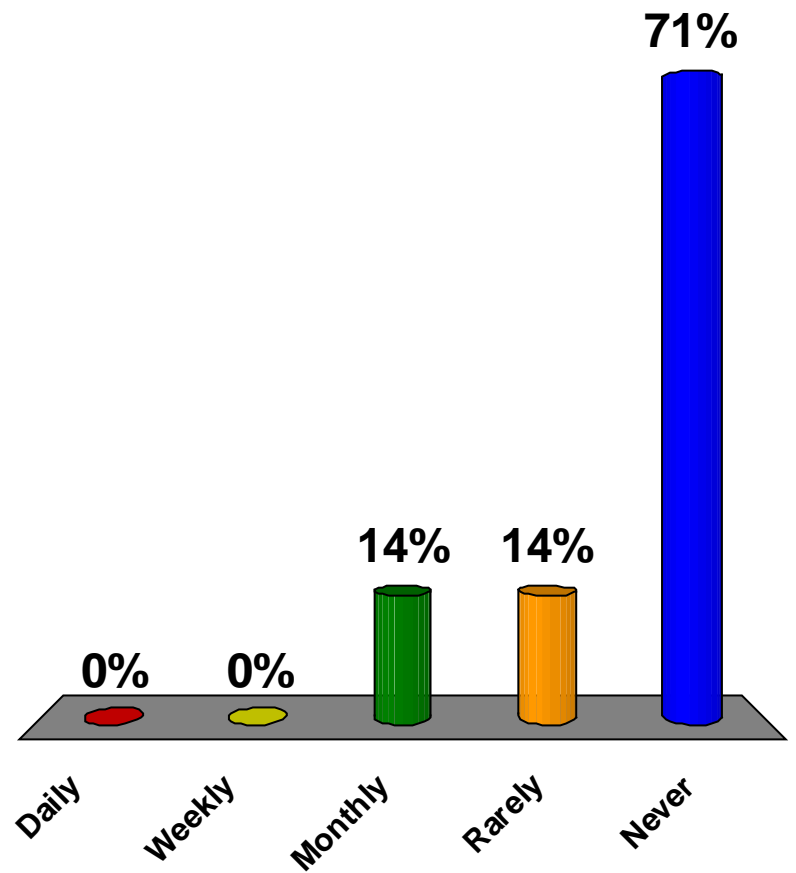
# How often do you walk on Bay Road?

- A. Daily
- B. Weekly
- C. Monthly
- D. Rarely
- E. Never



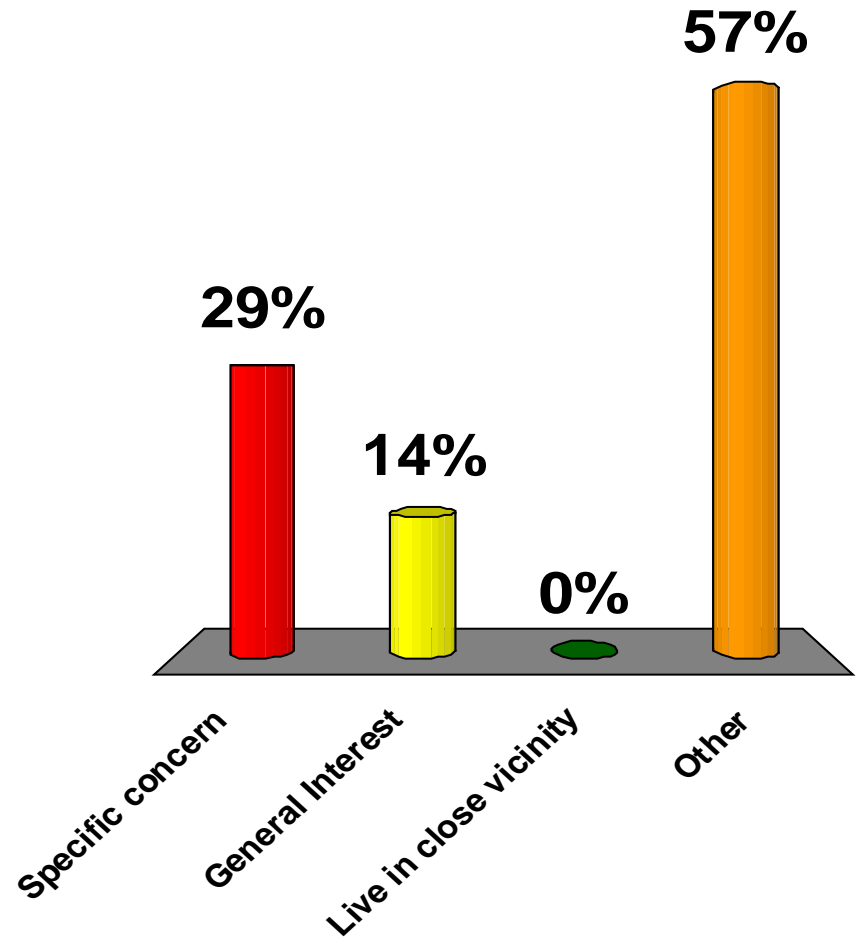
# How often do you bike on Bay Road?

- A. Daily
- B. Weekly
- C. Monthly
- D. Rarely
- E. Never



# What is your reason for attending this meeting?

- A. Specific concern
- B. General Interest
- C. Live in close vicinity
- D. Other

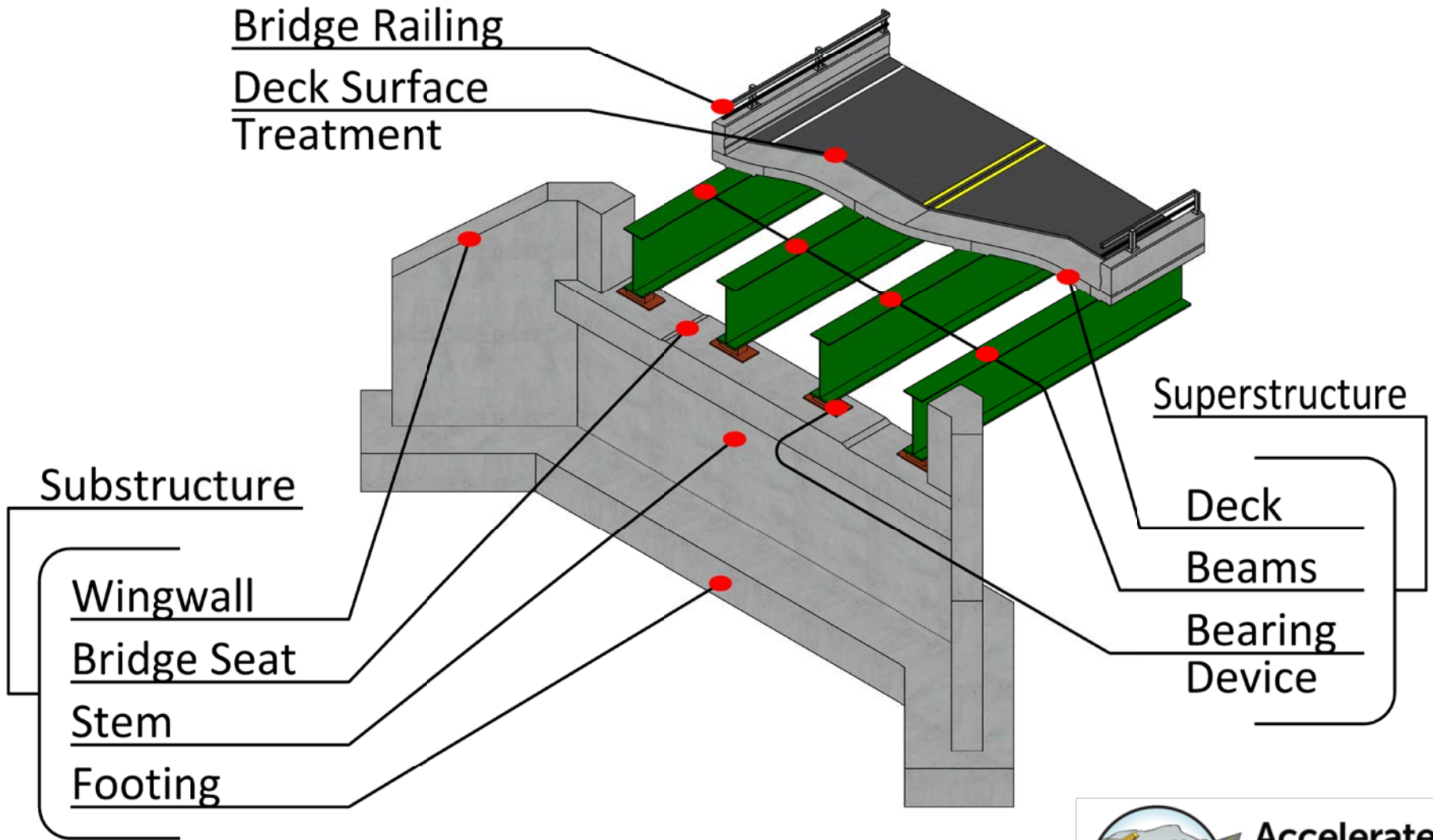


# Project Overview

- Existing Conditions
- Alternatives Considered
- Recommended Alternative



# Description of Terms Used





## Existing Conditions – Bridge #76 N&S

- Superstructure – 157' long, 3 Span Continuous Rolled Beam
- Substructure – Reinforced Concrete Abutments & Pier
- Constructed in 1964



## Existing Conditions – Bridge #77 N&S

- Superstructure – 185' long, 3 Span Continuous Rolled Beam
- Substructure – Reinforced Concrete Abutments & Pier
- Constructed in 1964

# 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 wetlands 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



# Existing Conditions - Bridge #77S

- Concrete Deck
  - Exposed Reinforcing Steel



Heavy Deterioration of Deck

# Design Criteria and Considerations:

- Average Daily Traffic (ADT):
  - 19,600 (Bridges 76 & 77 Northbound)
  - 19,600 (Bridges 76 & 77 Southbound)
  - 5,800 (Bay Road, current)
- Design Hourly Volume (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)
- Design Speed of 70 mph
- Archaeologically sensitive area within Bridges 76 N&S limits
- Wetlands within Bridges 76 and 77 limits



**Accelerated  
Bridge  
Program**  
VTRANS

# 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
  - 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



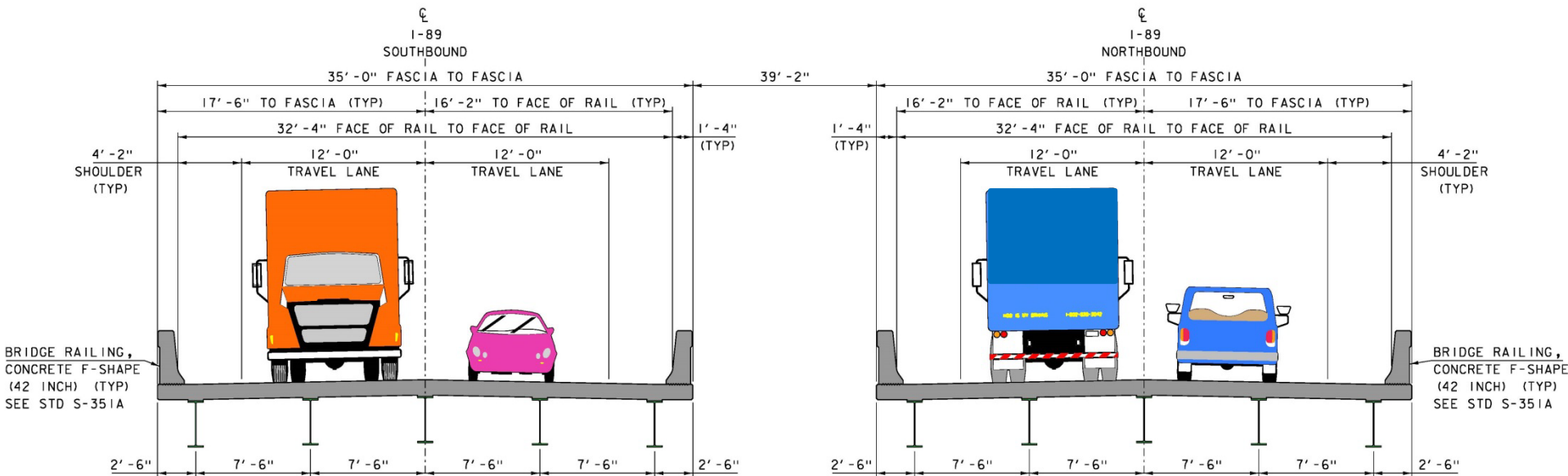
# Selected Alternative - Bridges #76 & 77

- 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

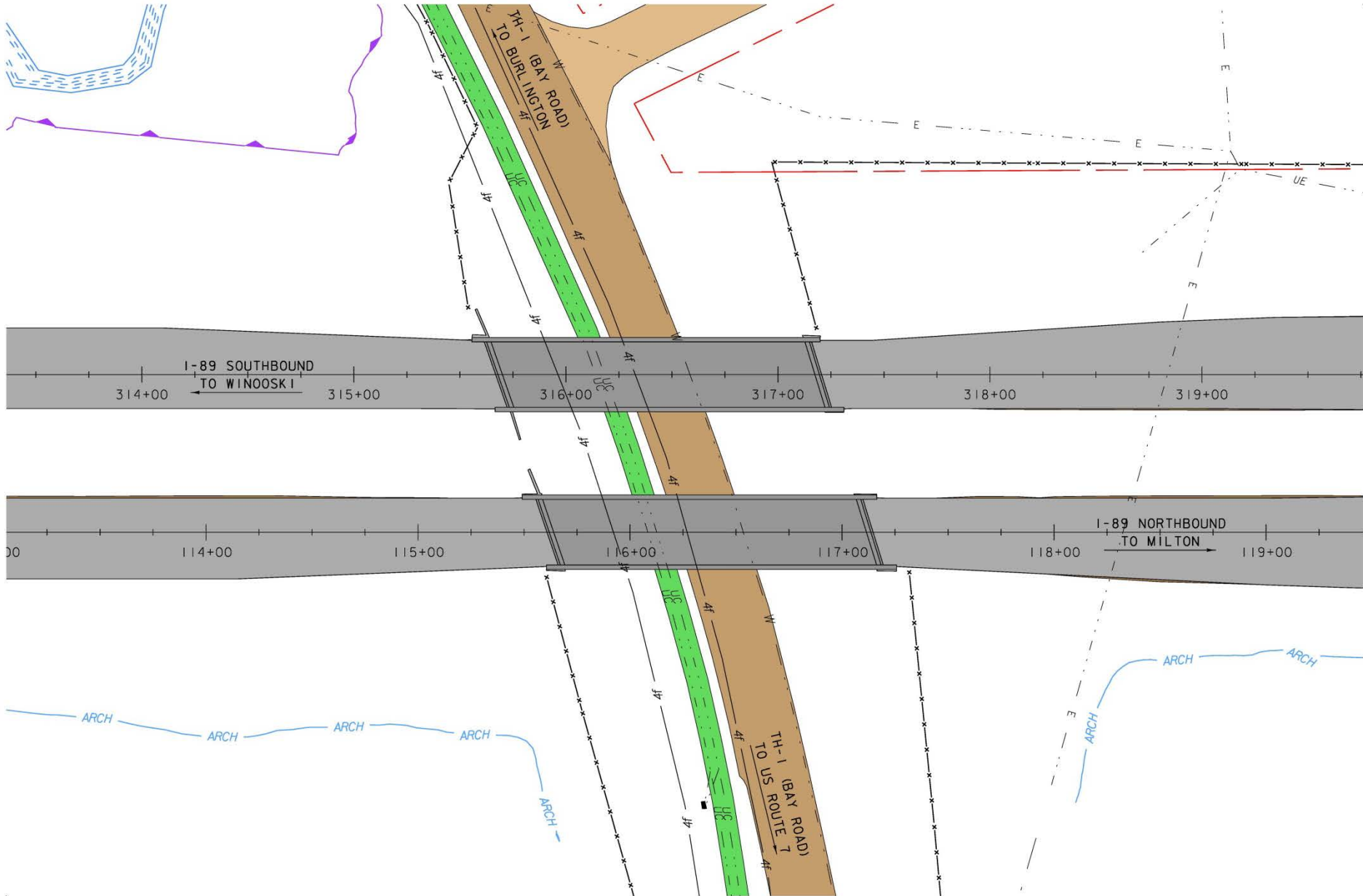


# Proposed Bridge Section

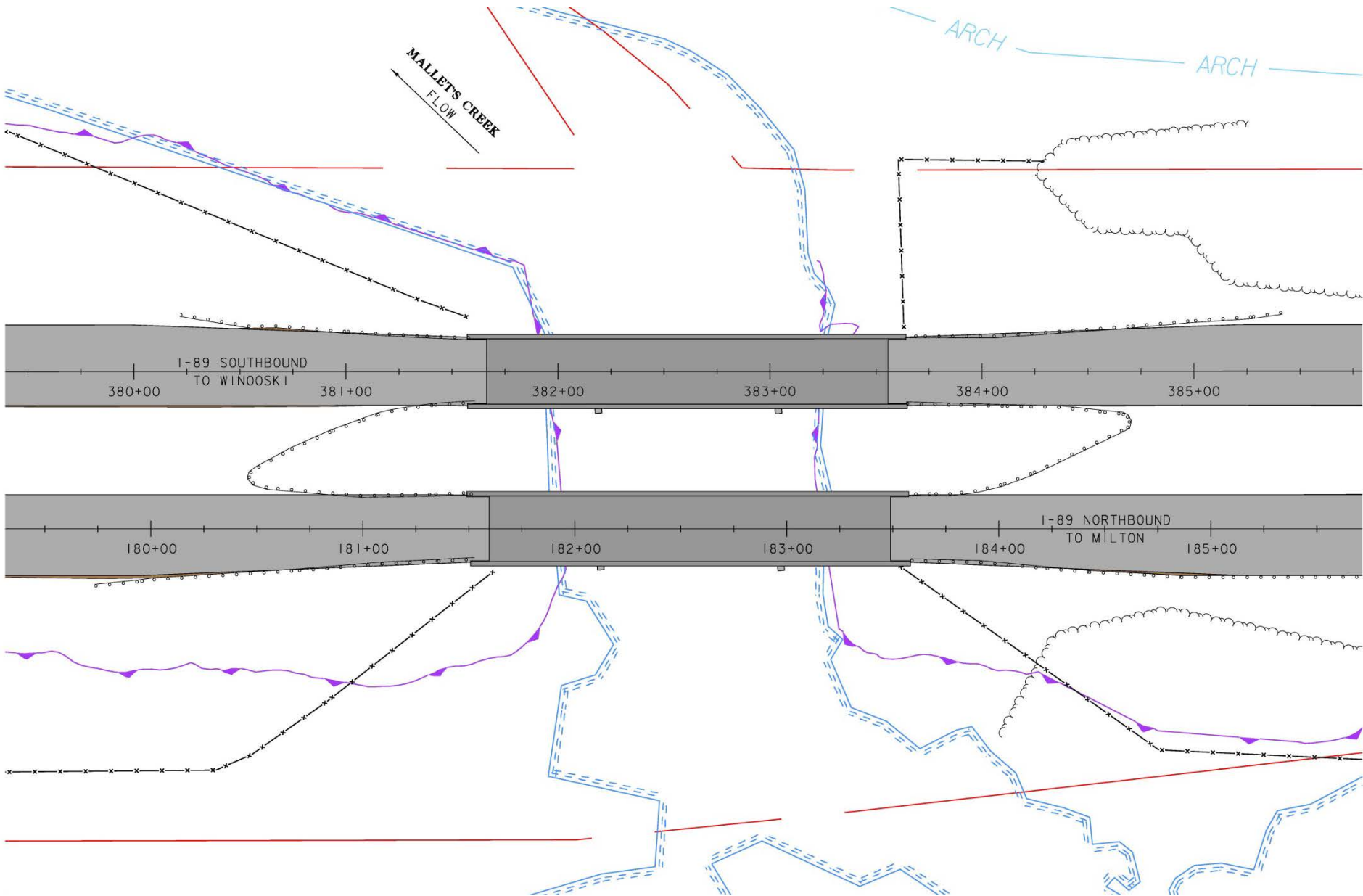
- Proposed Bridge Rail to Rail = 32'-4" (Existing is 30')



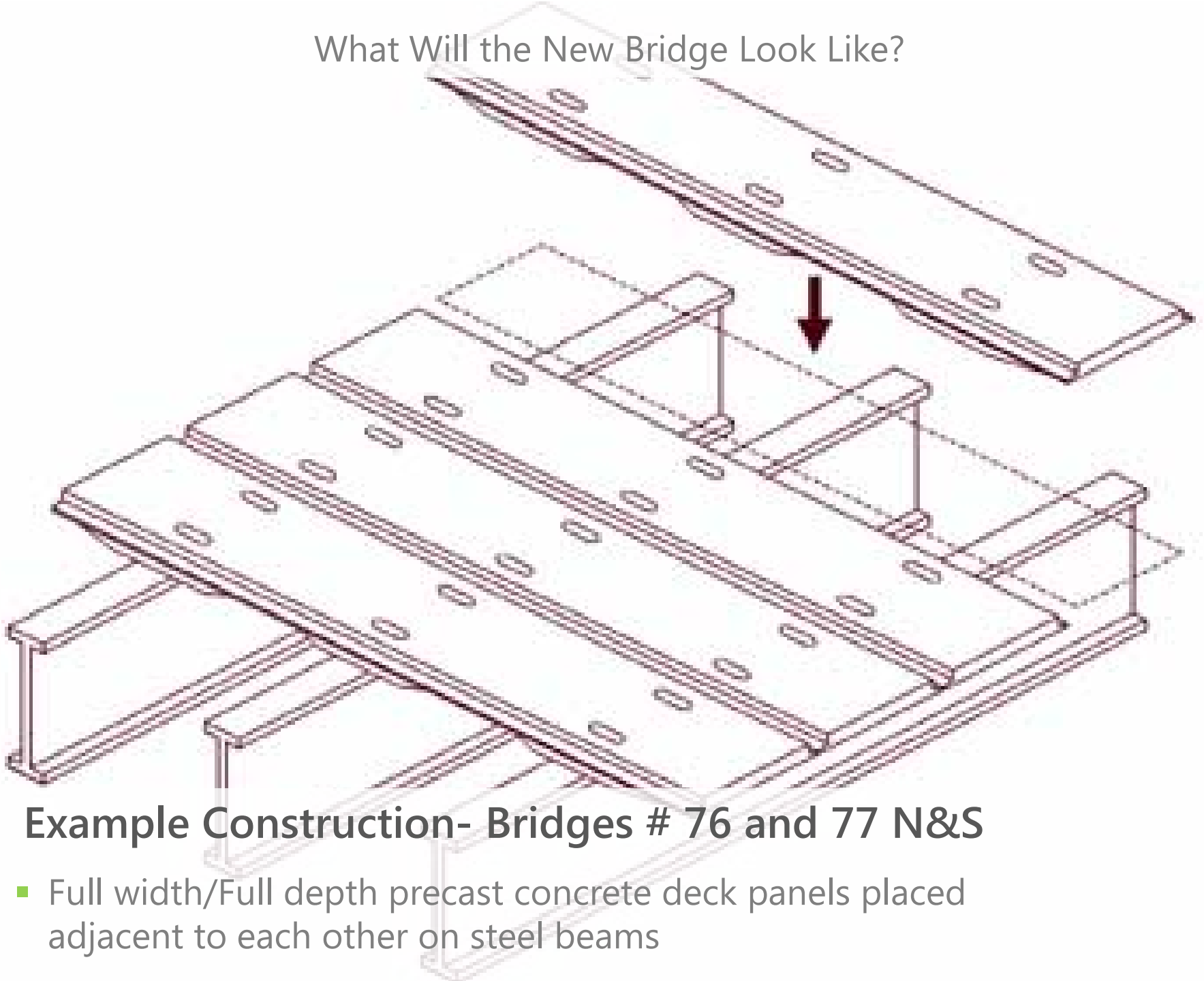
# Proposed Layout Bridges #76 N&S



# Proposed Layout Bridges #77 N&S



What Will the New Bridge Look Like?



## 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?



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

- Full width deck panels lifted into place with a crane
- Nighttime construction with lighting

# What Will the New Bridge Look Like?



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

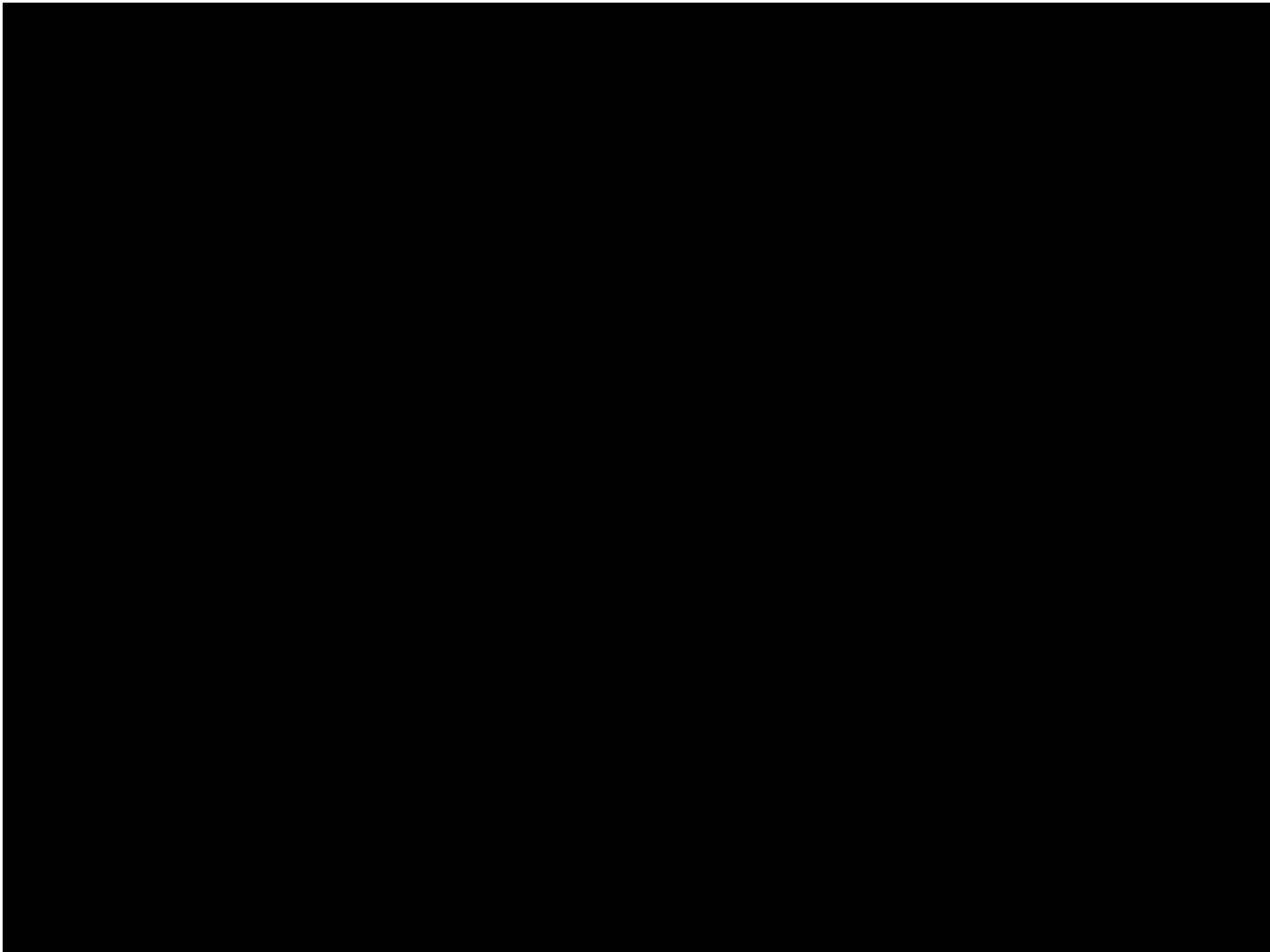
- Longitudinal post tensioning ducts
- Shear stud pockets over girders for composite construction

2013.05.22 01:13

## What Will the New Bridge Look Like?



Example Construction- Bridges # 76 and 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



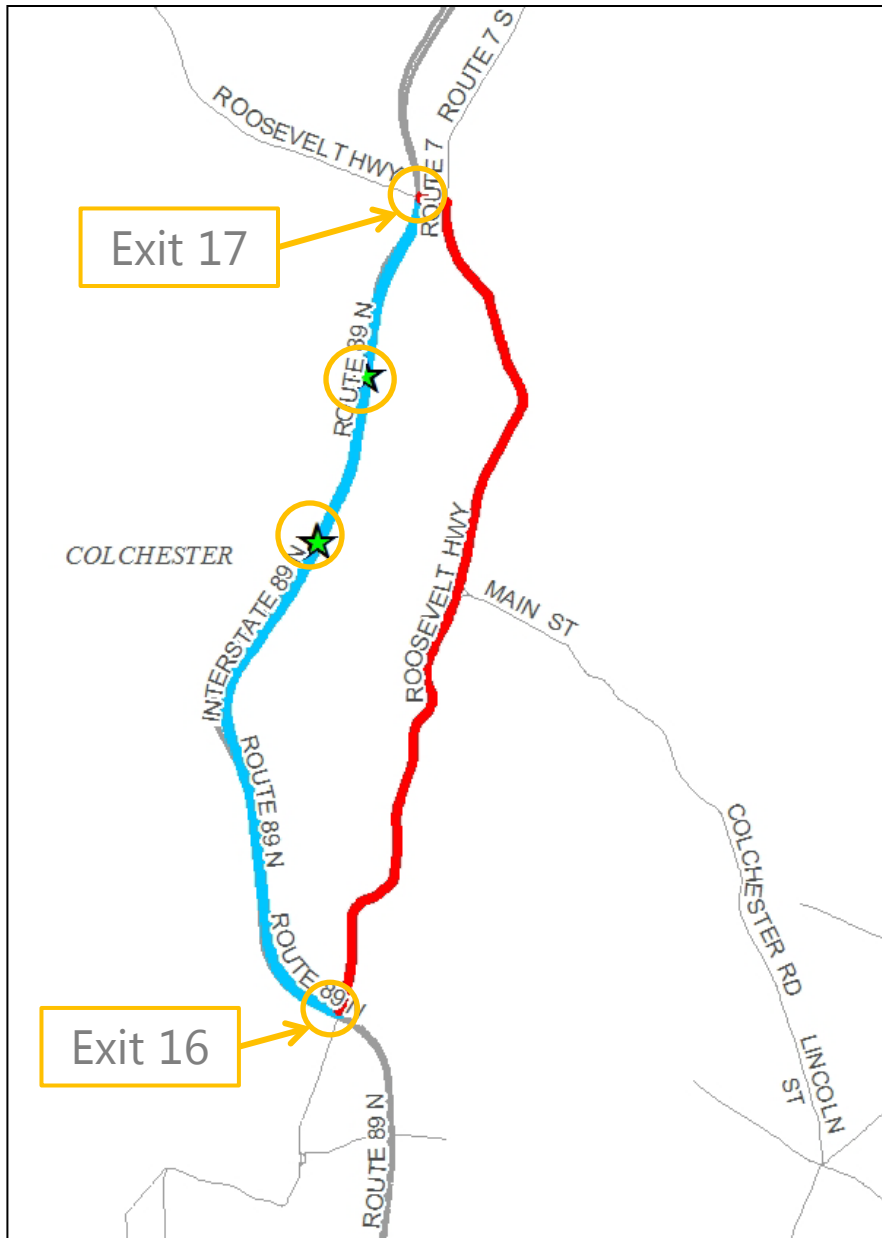


ROAD  
CLOSED

## Off Site Detour

- 12 nighttime closures during offpeak hours for each direction of travel
  - 8pm to 5am
- 2 panels installed each night per bridge

# 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

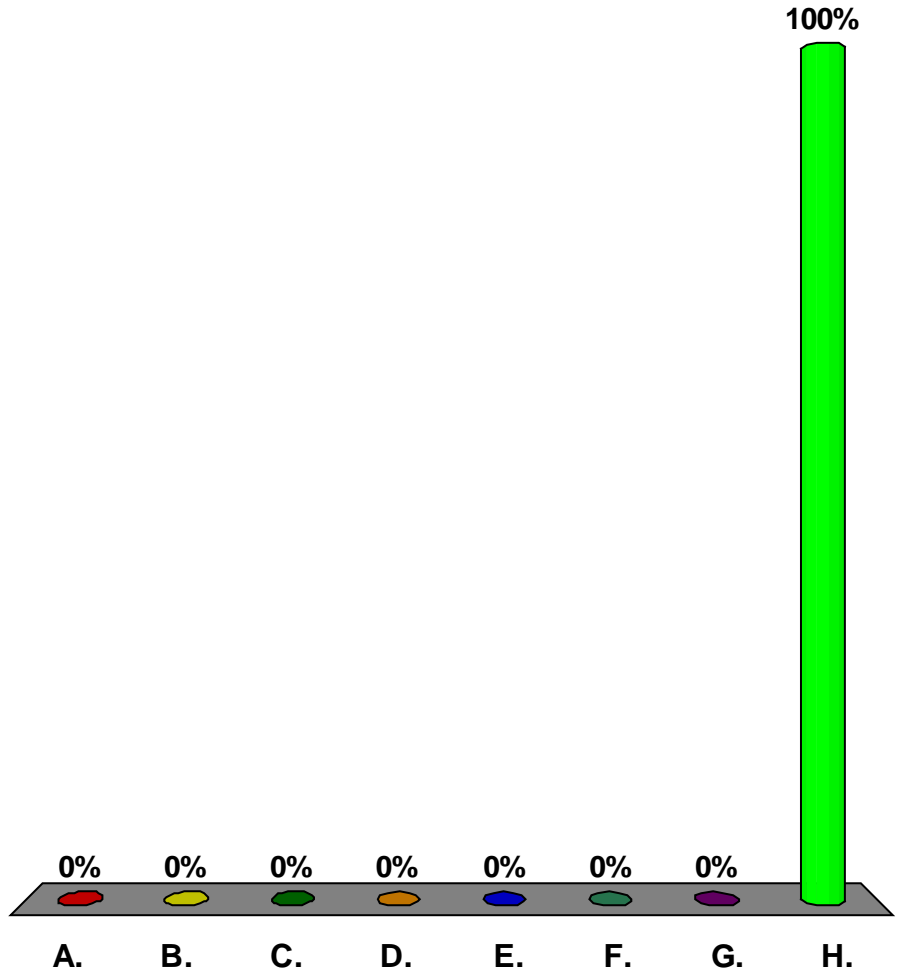
- I-89 to US Route 2/US Route 7, back to I-89

— Through Route: 6.7 Miles  
— Detour Route: 6.3 Miles  
Added Miles: 0 Miles

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

# What AM time do you normally drive over Bridges 76 and 77?

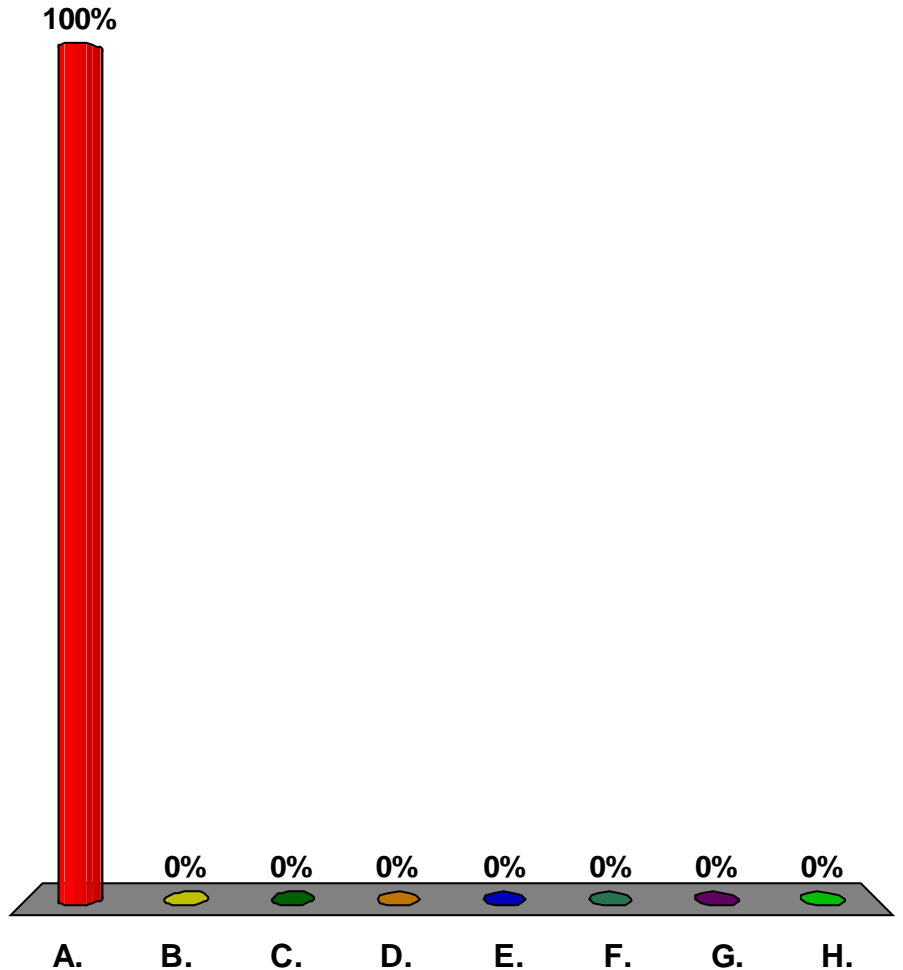
- A. Before 4 am
- B. 4:00 – 4:30
- C. 4:30 – 5:00
- D. 5:00 – 5:30
- E. 5:30 – 6:00
- F. 6:00 – 6:30
- G. 6:30 – 7:00
- H. After 7 am





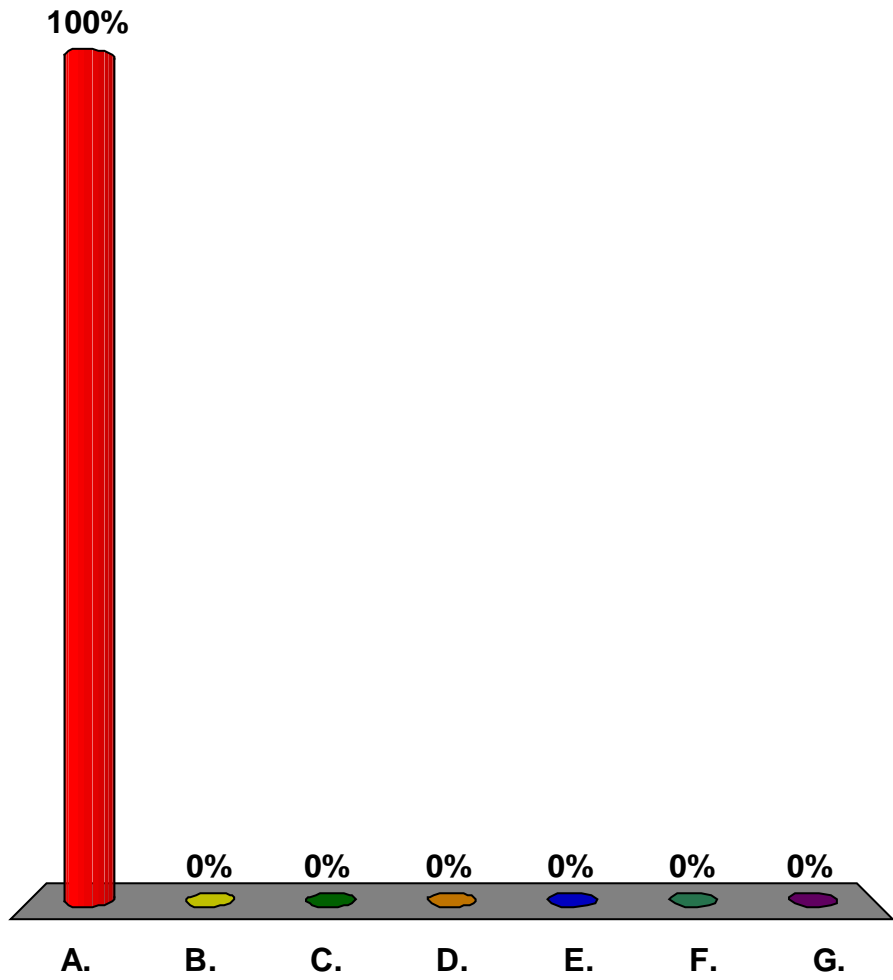
# What PM time do you normally drive over Bridges 76 and 77?

- A. Before 4 pm
- B. 4:00 – 4:30
- C. 4:30 – 5:00
- D. 5:00 – 5:30
- E. 5:30 – 6:00
- F. 6:00 – 6:30
- G. 6:30 – 7:00
- H. After 7 pm



# Which time of year would be most acceptable for nighttime closures between exits 16 and 17 on I-89?

- A. April
- B. May
- C. June
- D. July
- E. August
- F. September
- G. Other



# 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 Right-of-Way needed



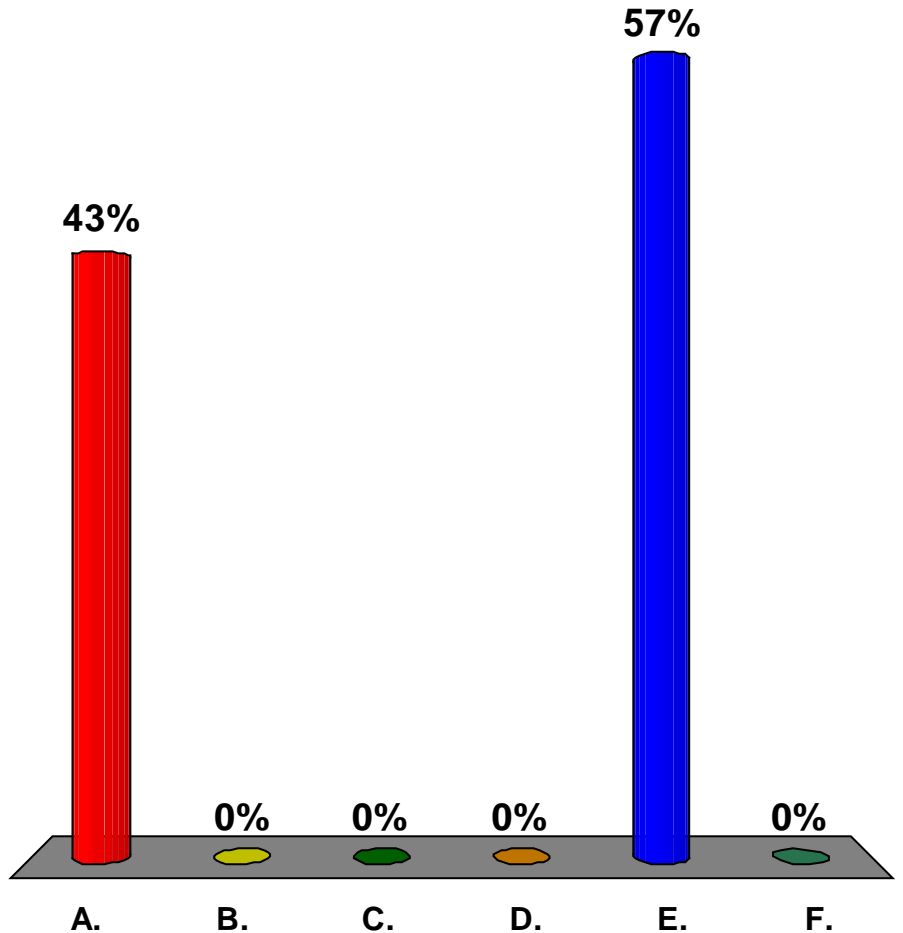
# Preliminary Project Schedule

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



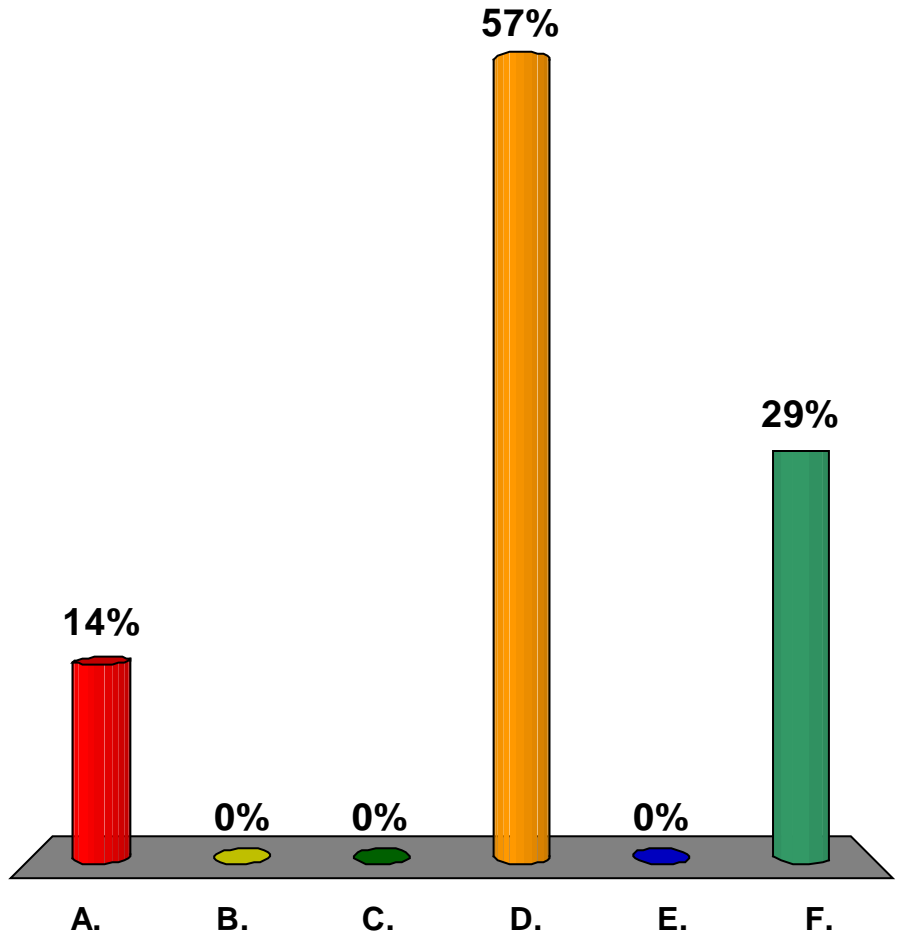
# Which would you be most concerned about?

- A. Closure Duration
- B. Bridge Aesthetics
- C. Environmental Impacts
- D. Recreational Impacts
- E. Other
- F. Not really concerned



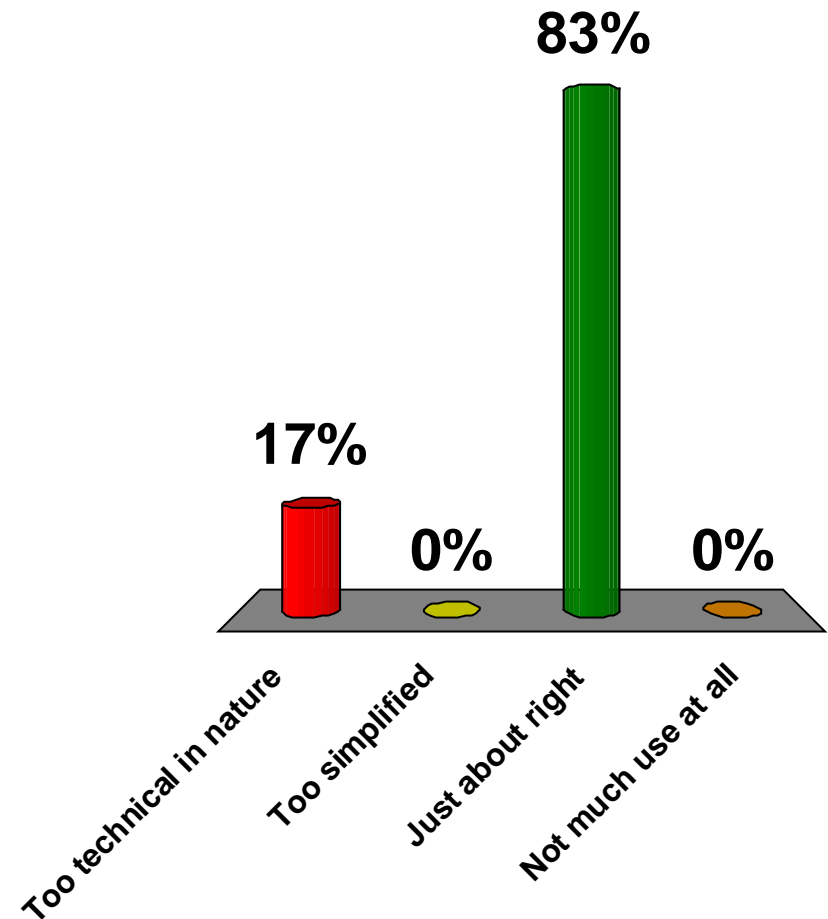
# Which design aspect is the most important to you?

- A. Shoulder width/bicycle accommodations
- B. Aesthetics - Bridge Railing
- C. Construction year
- D. Construction Duration
- E. Cost
- F. Other



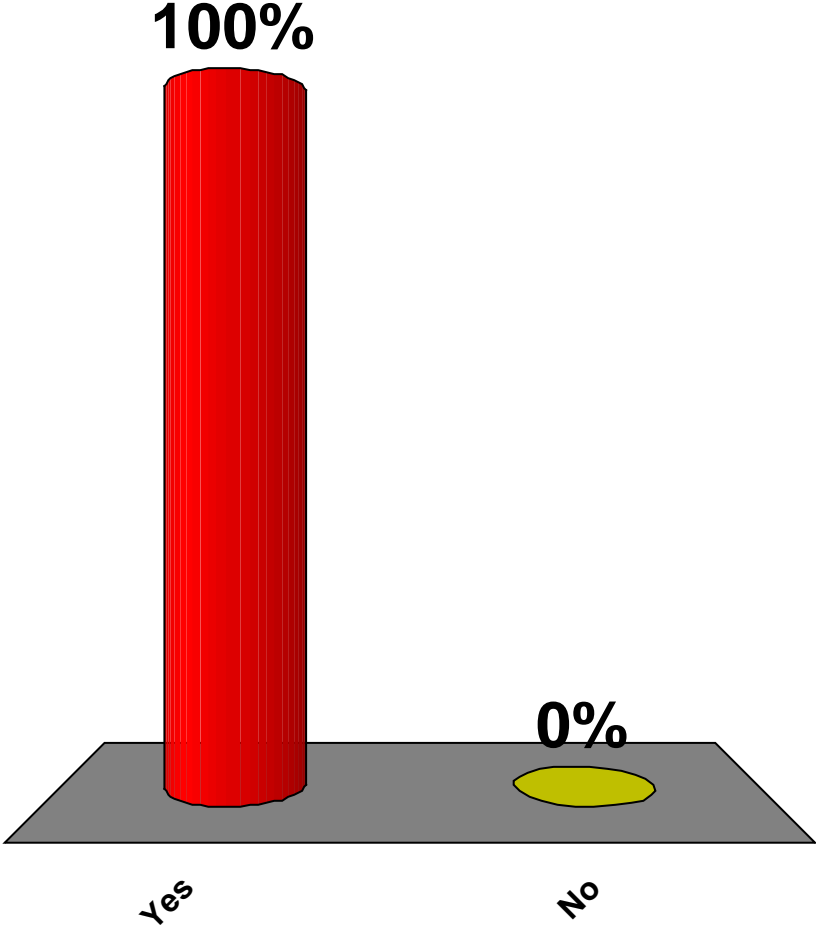
# Did you find this presentation to be?

- A. Too technical in nature
- B. Too simplified
- C. Just about right
- D. Not much use at all



# Do you find the recommended scope of work satisfactory?

- A. Yes
- B. No





# For more information:

- [www.i89colchester.vtransprojects.vermont.gov](http://www.i89colchester.vtransprojects.vermont.gov)

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

February 17, 2015



# Traffic Data – US Route 7

## US Route 7 between Exits 16 and 17

| Month        | Jun     |         | Month        | July    |         | Month        | Aug     |         | Month        | Sept    |         |
|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|
| Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         |
| Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun |
| 12:00 AM     | 53      | 105     | 12:00 AM     | 60      | 97      | 12:00 AM     | 57      | 97      | 12:00 AM     | 45      | 92      |
| 1:00 AM      | 36      | 78      | 1:00 AM      | 37      | 68      | 1:00 AM      | 33      | 63      | 1:00 AM      | 28      | 50      |
| 2:00 AM      | 41      | 69      | 2:00 AM      | 41      | 61      | 2:00 AM      | 42      | 59      | 2:00 AM      | 35      | 55      |
| 3:00 AM      | 46      | 38      | 3:00 AM      | 45      | 42      | 3:00 AM      | 46      | 43      | 3:00 AM      | 43      | 43      |
| 4:00 AM      | 111     | 61      | 4:00 AM      | 111     | 51      | 4:00 AM      | 109     | 49      | 4:00 AM      | 107     | 47      |
| 5:00 AM      | 282     | 107     | 5:00 AM      | 253     | 101     | 5:00 AM      | 248     | 94      | 5:00 AM      | 245     | 98      |
| 6:00 AM      | 713     | 206     | 6:00 AM      | 662     | 182     | 6:00 AM      | 679     | 170     | 6:00 AM      | 664     | 181     |
| 7:00 AM      | 1370    | 366     | 7:00 AM      | 1154    | 310     | 7:00 AM      | 1217    | 304     | 7:00 AM      | 1344    | 306     |
| 8:00 AM      | 1220    | 537     | 8:00 AM      | 1138    | 470     | 8:00 AM      | 1151    | 470     | 8:00 AM      | 1188    | 489     |
| 9:00 AM      | 896     | 746     | 9:00 AM      | 909     | 720     | 9:00 AM      | 884     | 730     | 9:00 AM      | 855     | 735     |
| 10:00 AM     | 982     | 1045    | 10:00 AM     | 1001    | 1038    | 10:00 AM     | 981     | 977     | 10:00 AM     | 913     | 1000    |
| 11:00 AM     | 1081    | 1133    | 11:00 AM     | 1134    | 1113    | 11:00 AM     | 1113    | 1127    | 11:00 AM     | 998     | 1133    |
| 12:00 PM     | 1172    | 1228    | 12:00 PM     | 1230    | 1153    | 12:00 PM     | 1222    | 1177    | 12:00 PM     | 1110    | 1157    |
| 1:00 PM      | 1127    | 1151    | 1:00 PM      | 1175    | 1077    | 1:00 PM      | 1145    | 1096    | 1:00 PM      | 1078    | 1072    |
| 2:00 PM      | 1264    | 1108    | 2:00 PM      | 1220    | 1053    | 2:00 PM      | 1215    | 1075    | 2:00 PM      | 1177    | 1052    |
| 3:00 PM      | 1511    | 1106    | 3:00 PM      | 1407    | 1032    | 3:00 PM      | 1436    | 1079    | 3:00 PM      | 1439    | 1033    |
| 4:00 PM      | 1715    | 1051    | 4:00 PM      | 1652    | 979     | 4:00 PM      | 1654    | 1010    | 4:00 PM      | 1630    | 1017    |
| 5:00 PM      | 1765    | 950     | 5:00 PM      | 1620    | 910     | 5:00 PM      | 1685    | 946     | 5:00 PM      | 1694    | 919     |
| 6:00 PM      | 1090    | 745     | 6:00 PM      | 1031    | 723     | 6:00 PM      | 1072    | 724     | 6:00 PM      | 1078    | 727     |
| 7:00 PM      | 750     | 609     | 7:00 PM      | 717     | 573     | 7:00 PM      | 758     | 579     | 7:00 PM      | 715     | 527     |
| 8:00 PM      | 571     | 533     | 8:00 PM      | 565     | 478     | 8:00 PM      | 551     | 464     | 8:00 PM      | 481     | 383     |
| 9:00 PM      | 367     | 380     | 9:00 PM      | 399     | 343     | 9:00 PM      | 354     | 305     | 9:00 PM      | 329     | 252     |
| 10:00 PM     | 219     | 226     | 10:00 PM     | 263     | 230     | 10:00 PM     | 226     | 223     | 10:00 PM     | 189     | 182     |
| 11:00 PM     | 126     | 129     | 11:00 PM     | 144     | 131     | 11:00 PM     | 128     | 136     | 11:00 PM     | 115     | 116     |



# Traffic Data – I 89 NB

## I 89 NB between Exits 16 and 17

| Month        | Jun     |         | Month        | July    |         | Month        | Aug     |         | Month        | Sept    |         |
|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|
| Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         |
| Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun |
| 12:00 AM     | 129     | 193     | 12:00 AM     | 128     | 146     | 12:00 AM     | 134     | 218     | 12:00 AM     | 119     | 169     |
| 1:00 AM      | 66      | 88      | 1:00 AM      | 82      | 93      | 1:00 AM      | 77      | 95      | 1:00 AM      | 67      | 80      |
| 2:00 AM      | 53      | 68      | 2:00 AM      | 56      | 59      | 2:00 AM      | 64      | 70      | 2:00 AM      | 51      | 66      |
| 3:00 AM      | 47      | 45      | 3:00 AM      | 47      | 47      | 3:00 AM      | 50      | 54      | 3:00 AM      | 49      | 50      |
| 4:00 AM      | 57      | 44      | 4:00 AM      | 59      | 57      | 4:00 AM      | 57      | 40      | 4:00 AM      | 56      | 42      |
| 5:00 AM      | 151     | 78      | 5:00 AM      | 147     | 138     | 5:00 AM      | 168     | 80      | 5:00 AM      | 172     | 71      |
| 6:00 AM      | 405     | 137     | 6:00 AM      | 354     | 326     | 6:00 AM      | 405     | 165     | 6:00 AM      | 488     | 141     |
| 7:00 AM      | 670     | 284     | 7:00 AM      | 616     | 591     | 7:00 AM      | 684     | 315     | 7:00 AM      | 726     | 264     |
| 8:00 AM      | 598     | 361     | 8:00 AM      | 600     | 609     | 8:00 AM      | 617     | 399     | 8:00 AM      | 585     | 339     |
| 9:00 AM      | 600     | 479     | 9:00 AM      | 637     | 974     | 9:00 AM      | 632     | 556     | 9:00 AM      | 573     | 449     |
| 10:00 AM     | 672     | 652     | 10:00 AM     | 736     | 796     | 10:00 AM     | 735     | 759     | 10:00 AM     | 653     | 626     |
| 11:00 AM     | 790     | 848     | 11:00 AM     | 887     | 989     | 11:00 AM     | 871     | 971     | 11:00 AM     | 736     | 774     |
| 12:00 PM     | 909     | 994     | 12:00 PM     | 1017    | 1154    | 12:00 PM     | 1008    | 1129    | 12:00 PM     | 854     | 981     |
| 1:00 PM      | 1054    | 1084    | 1:00 PM      | 1142    | 1308    | 1:00 PM      | 1143    | 1197    | 1:00 PM      | 952     | 1005    |
| 2:00 PM      | 1326    | 1105    | 2:00 PM      | 1396    | 1552    | 2:00 PM      | 1470    | 1280    | 2:00 PM      | 1288    | 1087    |
| 3:00 PM      | 1775    | 1163    | 3:00 PM      | 1819    | 1891    | 3:00 PM      | 1925    | 1356    | 3:00 PM      | 1799    | 1136    |
| 4:00 PM      | 2330    | 1130    | 4:00 PM      | 2299    | 2271    | 4:00 PM      | 2471    | 1332    | 4:00 PM      | 2340    | 1159    |
| 5:00 PM      | 2246    | 1031    | 5:00 PM      | 2271    | 2201    | 5:00 PM      | 2387    | 1212    | 5:00 PM      | 2286    | 1066    |
| 6:00 PM      | 1307    | 862     | 6:00 PM      | 1385    | 1412    | 6:00 PM      | 1451    | 1011    | 6:00 PM      | 1360    | 885     |
| 7:00 PM      | 924     | 717     | 7:00 PM      | 952     | 1025    | 7:00 PM      | 1037    | 855     | 7:00 PM      | 936     | 765     |
| 8:00 PM      | 768     | 592     | 8:00 PM      | 792     | 848     | 8:00 PM      | 861     | 767     | 8:00 PM      | 740     | 632     |
| 9:00 PM      | 633     | 524     | 9:00 PM      | 712     | 832     | 9:00 PM      | 715     | 581     | 9:00 PM      | 609     | 490     |
| 10:00 PM     | 411     | 349     | 10:00 PM     | 482     | 563     | 10:00 PM     | 463     | 412     | 10:00 PM     | 373     | 339     |
| 11:00 PM     | 307     | 245     | 11:00 PM     | 317     | 363     | 11:00 PM     | 313     | 279     | 11:00 PM     | 265     | 228     |



# Traffic Data – I 89 SB

## I 89 SB between Exits 16 and 17

| Month        | Jun     |         | Month        | July    |         | Month        | Aug     |         | Month        | Sept    |         |
|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|
| Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         |
| Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun |
| 12:00 AM     | 60      | 87      | 12:00 AM     | 70      | 86      | 12:00 AM     | 64      | 87      | 12:00 AM     | 55      | 74      |
| 1:00 AM      | 45      | 41      | 1:00 AM      | 44      | 53      | 1:00 AM      | 43      | 53      | 1:00 AM      | 42      | 39      |
| 2:00 AM      | 46      | 35      | 2:00 AM      | 52      | 48      | 2:00 AM      | 54      | 43      | 2:00 AM      | 50      | 37      |
| 3:00 AM      | 102     | 66      | 3:00 AM      | 105     | 72      | 3:00 AM      | 112     | 74      | 3:00 AM      | 112     | 71      |
| 4:00 AM      | 251     | 95      | 4:00 AM      | 257     | 107     | 4:00 AM      | 261     | 109     | 4:00 AM      | 265     | 98      |
| 5:00 AM      | 705     | 204     | 5:00 AM      | 668     | 224     | 5:00 AM      | 697     | 230     | 5:00 AM      | 703     | 205     |
| 6:00 AM      | 1660    | 415     | 6:00 AM      | 1609    | 409     | 6:00 AM      | 1669    | 435     | 6:00 AM      | 1712    | 384     |
| 7:00 AM      | 2527    | 510     | 7:00 AM      | 2344    | 534     | 7:00 AM      | 2558    | 574     | 7:00 AM      | 2781    | 496     |
| 8:00 AM      | 1800    | 726     | 8:00 AM      | 1718    | 745     | 8:00 AM      | 1812    | 797     | 8:00 AM      | 1820    | 696     |
| 9:00 AM      | 1216    | 953     | 9:00 AM      | 1267    | 1057    | 9:00 AM      | 1308    | 1132    | 9:00 AM      | 1151    | 933     |
| 10:00 AM     | 1094    | 1133    | 10:00 AM     | 1196    | 1245    | 10:00 AM     | 1254    | 1335    | 10:00 AM     | 1040    | 1146    |
| 11:00 AM     | 1042    | 1189    | 11:00 AM     | 1168    | 1324    | 11:00 AM     | 1224    | 1400    | 11:00 AM     | 991     | 1197    |
| 12:00 PM     | 1028    | 1173    | 12:00 PM     | 1137    | 1213    | 12:00 PM     | 1181    | 1293    | 12:00 PM     | 960     | 1154    |
| 1:00 PM      | 970     | 1088    | 1:00 PM      | 1069    | 1159    | 1:00 PM      | 1100    | 1212    | 1:00 PM      | 914     | 1035    |
| 2:00 PM      | 991     | 1030    | 2:00 PM      | 1046    | 1091    | 2:00 PM      | 1094    | 1152    | 2:00 PM      | 926     | 963     |
| 3:00 PM      | 1028    | 1003    | 3:00 PM      | 1039    | 1100    | 3:00 PM      | 1091    | 1119    | 3:00 PM      | 992     | 921     |
| 4:00 PM      | 1033    | 923     | 4:00 PM      | 1082    | 1048    | 4:00 PM      | 1111    | 1024    | 4:00 PM      | 1058    | 870     |
| 5:00 PM      | 992     | 782     | 5:00 PM      | 1047    | 903     | 5:00 PM      | 1077    | 919     | 5:00 PM      | 1041    | 773     |
| 6:00 PM      | 742     | 633     | 6:00 PM      | 788     | 748     | 6:00 PM      | 804     | 724     | 6:00 PM      | 784     | 636     |
| 7:00 PM      | 485     | 487     | 7:00 PM      | 533     | 566     | 7:00 PM      | 538     | 546     | 7:00 PM      | 485     | 451     |
| 8:00 PM      | 374     | 390     | 8:00 PM      | 440     | 455     | 8:00 PM      | 433     | 479     | 8:00 PM      | 340     | 342     |
| 9:00 PM      | 307     | 320     | 9:00 PM      | 341     | 381     | 9:00 PM      | 341     | 365     | 9:00 PM      | 254     | 247     |
| 10:00 PM     | 214     | 216     | 10:00 PM     | 240     | 284     | 10:00 PM     | 238     | 259     | 10:00 PM     | 202     | 200     |
| 11:00 PM     | 113     | 112     | 11:00 PM     | 126     | 144     | 11:00 PM     | 131     | 144     | 11:00 PM     | 99      | 93      |



# Traffic Data – Combined NB

COMBINED NB

| Month Jun    |         |         | Month July   |         |         | Month Aug    |         |         | Month Sept   |         |         |
|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|
| Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         |
| Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun |
| 12:00 AM     | 182     | 298     | 12:00 AM     | 188     | 243     | 12:00 AM     | 191     | 315     | 12:00 AM     | 164     | 261     |
| 1:00 AM      | 102     | 166     | 1:00 AM      | 119     | 161     | 1:00 AM      | 110     | 158     | 1:00 AM      | 95      | 130     |
| 2:00 AM      | 94      | 137     | 2:00 AM      | 97      | 120     | 2:00 AM      | 106     | 129     | 2:00 AM      | 86      | 121     |
| 3:00 AM      | 93      | 83      | 3:00 AM      | 92      | 89      | 3:00 AM      | 96      | 97      | 3:00 AM      | 92      | 93      |
| 4:00 AM      | 168     | 105     | 4:00 AM      | 170     | 108     | 4:00 AM      | 166     | 89      | 4:00 AM      | 163     | 89      |
| 5:00 AM      | 433     | 185     | 5:00 AM      | 400     | 239     | 5:00 AM      | 416     | 174     | 5:00 AM      | 417     | 169     |
| 6:00 AM      | 1118    | 343     | 6:00 AM      | 1016    | 508     | 6:00 AM      | 1084    | 335     | 6:00 AM      | 1152    | 322     |
| 7:00 AM      | 2040    | 650     | 7:00 AM      | 1770    | 901     | 7:00 AM      | 1901    | 619     | 7:00 AM      | 2070    | 570     |
| 8:00 AM      | 1818    | 898     | 8:00 AM      | 1738    | 1079    | 8:00 AM      | 1768    | 869     | 8:00 AM      | 1773    | 828     |
| 9:00 AM      | 1496    | 1225    | 9:00 AM      | 1546    | 1694    | 9:00 AM      | 1516    | 1286    | 9:00 AM      | 1428    | 1184    |
| 10:00 AM     | 1654    | 1697    | 10:00 AM     | 1737    | 1834    | 10:00 AM     | 1716    | 1736    | 10:00 AM     | 1566    | 1626    |
| 11:00 AM     | 1871    | 1981    | 11:00 AM     | 2021    | 2102    | 11:00 AM     | 1984    | 2098    | 11:00 AM     | 1734    | 1907    |
| 12:00 PM     | 2081    | 2222    | 12:00 PM     | 2247    | 2307    | 12:00 PM     | 2230    | 2306    | 12:00 PM     | 1964    | 2138    |
| 1:00 PM      | 2181    | 2235    | 1:00 PM      | 2317    | 2385    | 1:00 PM      | 2288    | 2293    | 1:00 PM      | 2030    | 2077    |
| 2:00 PM      | 2590    | 2213    | 2:00 PM      | 2616    | 2605    | 2:00 PM      | 2685    | 2355    | 2:00 PM      | 2465    | 2139    |
| 3:00 PM      | 3286    | 2269    | 3:00 PM      | 3226    | 2923    | 3:00 PM      | 3361    | 2435    | 3:00 PM      | 3238    | 2169    |
| 4:00 PM      | 4045    | 2181    | 4:00 PM      | 3951    | 3250    | 4:00 PM      | 4125    | 2342    | 4:00 PM      | 3970    | 2176    |
| 5:00 PM      | 4011    | 1981    | 5:00 PM      | 3891    | 3111    | 5:00 PM      | 4072    | 2158    | 5:00 PM      | 3980    | 1985    |
| 6:00 PM      | 2397    | 1607    | 6:00 PM      | 2416    | 2135    | 6:00 PM      | 2523    | 1735    | 6:00 PM      | 2438    | 1612    |
| 7:00 PM      | 1674    | 1326    | 7:00 PM      | 1669    | 1598    | 7:00 PM      | 1795    | 1434    | 7:00 PM      | 1651    | 1292    |
| 8:00 PM      | 1339    | 1125    | 8:00 PM      | 1357    | 1326    | 8:00 PM      | 1412    | 1231    | 8:00 PM      | 1221    | 1015    |
| 9:00 PM      | 1000    | 904     | 9:00 PM      | 1111    | 1175    | 9:00 PM      | 1069    | 886     | 9:00 PM      | 938     | 742     |
| 10:00 PM     | 630     | 575     | 10:00 PM     | 745     | 793     | 10:00 PM     | 689     | 635     | 10:00 PM     | 562     | 521     |
| 11:00 PM     | 433     | 374     | 11:00 PM     | 461     | 494     | 11:00 PM     | 441     | 415     | 11:00 PM     | 380     | 344     |



# Traffic Data – Combined SB

COMBINED SB

| Month        | Jun     |         | Month        | July    |         | Month        | Aug     |         | Month        | Sept    |         |
|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|
| Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         | Avg Vol 2014 | Day     |         |
| Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun | Begin Hour   | Mon-Fri | Sat-Sun |
| 12:00 AM     | 113     | 192     | 12:00 AM     | 130     | 183     | 12:00 AM     | 121     | 184     | 12:00 AM     | 100     | 166     |
| 1:00 AM      | 81      | 119     | 1:00 AM      | 81      | 121     | 1:00 AM      | 76      | 116     | 1:00 AM      | 70      | 89      |
| 2:00 AM      | 87      | 104     | 2:00 AM      | 93      | 109     | 2:00 AM      | 96      | 102     | 2:00 AM      | 85      | 92      |
| 3:00 AM      | 148     | 104     | 3:00 AM      | 150     | 114     | 3:00 AM      | 158     | 117     | 3:00 AM      | 155     | 114     |
| 4:00 AM      | 362     | 156     | 4:00 AM      | 368     | 158     | 4:00 AM      | 370     | 158     | 4:00 AM      | 372     | 145     |
| 5:00 AM      | 987     | 311     | 5:00 AM      | 921     | 325     | 5:00 AM      | 945     | 324     | 5:00 AM      | 948     | 303     |
| 6:00 AM      | 2373    | 621     | 6:00 AM      | 2271    | 591     | 6:00 AM      | 2348    | 605     | 6:00 AM      | 2376    | 565     |
| 7:00 AM      | 3897    | 876     | 7:00 AM      | 3498    | 844     | 7:00 AM      | 3775    | 878     | 7:00 AM      | 4125    | 802     |
| 8:00 AM      | 3020    | 1263    | 8:00 AM      | 2856    | 1215    | 8:00 AM      | 2963    | 1267    | 8:00 AM      | 3008    | 1185    |
| 9:00 AM      | 2112    | 1699    | 9:00 AM      | 2176    | 1777    | 9:00 AM      | 2192    | 1862    | 9:00 AM      | 2006    | 1668    |
| 10:00 AM     | 2076    | 2178    | 10:00 AM     | 2197    | 2283    | 10:00 AM     | 2235    | 2312    | 10:00 AM     | 1953    | 2146    |
| 11:00 AM     | 2123    | 2322    | 11:00 AM     | 2302    | 2437    | 11:00 AM     | 2337    | 2527    | 11:00 AM     | 1989    | 2330    |
| 12:00 PM     | 2200    | 2401    | 12:00 PM     | 2367    | 2366    | 12:00 PM     | 2403    | 2470    | 12:00 PM     | 2070    | 2311    |
| 1:00 PM      | 2097    | 2239    | 1:00 PM      | 2244    | 2236    | 1:00 PM      | 2245    | 2308    | 1:00 PM      | 1992    | 2107    |
| 2:00 PM      | 2255    | 2138    | 2:00 PM      | 2266    | 2144    | 2:00 PM      | 2309    | 2227    | 2:00 PM      | 2103    | 2015    |
| 3:00 PM      | 2539    | 2109    | 3:00 PM      | 2446    | 2132    | 3:00 PM      | 2527    | 2198    | 3:00 PM      | 2431    | 1954    |
| 4:00 PM      | 2748    | 1974    | 4:00 PM      | 2734    | 2027    | 4:00 PM      | 2765    | 2034    | 4:00 PM      | 2688    | 1887    |
| 5:00 PM      | 2757    | 1732    | 5:00 PM      | 2667    | 1813    | 5:00 PM      | 2762    | 1865    | 5:00 PM      | 2735    | 1692    |
| 6:00 PM      | 1832    | 1378    | 6:00 PM      | 1819    | 1471    | 6:00 PM      | 1876    | 1448    | 6:00 PM      | 1862    | 1363    |
| 7:00 PM      | 1235    | 1096    | 7:00 PM      | 1250    | 1139    | 7:00 PM      | 1296    | 1125    | 7:00 PM      | 1200    | 978     |
| 8:00 PM      | 945     | 923     | 8:00 PM      | 1005    | 933     | 8:00 PM      | 984     | 943     | 8:00 PM      | 821     | 725     |
| 9:00 PM      | 674     | 700     | 9:00 PM      | 740     | 724     | 9:00 PM      | 695     | 670     | 9:00 PM      | 583     | 499     |
| 10:00 PM     | 433     | 442     | 10:00 PM     | 503     | 514     | 10:00 PM     | 464     | 482     | 10:00 PM     | 391     | 382     |
| 11:00 PM     | 239     | 241     | 11:00 PM     | 270     | 275     | 11:00 PM     | 259     | 280     | 11:00 PM     | 214     | 209     |



# Alternatives Matrix – Bridges 76 N&S



|  | Alt 1a            | Alt 1b            | Alt 2a            | Alt 2b            | Alt 3a                     | Alt 3b            | Alt 4                |
|--|-------------------|-------------------|-------------------|-------------------|----------------------------|-------------------|----------------------|
| Colchester<br>IM 089-3(69)<br>Bridges 76 N&S                     | Rehabilitation    |                   | Deck Replacement  |                   | Superstructure Replacement |                   | Complete Replacement |
|  | Offsite Detour    | Temporary Bridge  | Offsite Detour    | Temporary Bridge  | Offsite Detour             | Temporary Bridge  | Phasing              |
| Total Project Costs<br>(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                |
|--|--|------------------|-------------------|-------------------|----------------------------|-------------------|----------------------|
| <b>Colchester<br/>IM 089-3(69)<br/>Bridges 77 N&amp;S</b>                | Rehabilitation   |                  | Deck Replacement  |                   | Superstructure Replacement |                   | Complete Replacement |
|  | Phasing  | Temporary Bridge | Offsite Detour    | Temporary Bridge  | Offsite Detour             | Temporary Bridge  | Phasing              |
| <b>Total Project Costs<br/>(including Engineering and Contingencies)</b> | Rehabilitation option was not considered for Bridges 77 N&S due to the poor deck condition of Bridge 77S |                  | \$5,738,100       | \$6,519,300       | \$6,675,900                | \$7,875,600       | \$14,107,400         |
| <b>Project Development Duration</b>                                      |  |                  | 2 years           | 2 years           | 2 years                    | 2 years           | 4 years              |
| <b>Construction Duration</b>   |  |                  | 9 months          | 18 months         | 18 months                  | 24 months         | 30 months            |
| <b>Closure Duration (If Applicable)</b>                                  |  |                  | 12 ~ nights       | N/A               | 4 ~ 3 day periods          | N/A               | N/A                  |
| <b>Geometric Design Criteria</b>   |  |                  | Substandard Width | Substandard Width | Substandard Width          | Substandard Width | Meets Criteria       |
| <b>Alignment Change</b>  |  |                  | No                | No                | No                         | No                | No                   |
| <b>Utilities</b>   |  |                  | No                | No                | No                         | No                | Yes                  |
| <b>ROW</b>   |  |                  | No                | No                | No                         | No                | No                   |
| <b>Design Life</b>   |  |                  | 40 years          | 40 years          | 40 years                   | 40 years          | 100 years            |