Travel Times

I-94 Clearwater to St. Cloud Unbonded Concrete Project

St. Cloud
Aug. 26, 2013
District 3

- 12 Counties
- Central Minnesota
- I-94 - 80 miles
- Baxter – headquarters
- St. Cloud – sub area
I-94 Project
Un-bonded Concrete Overlay

- SP 7380-238
- Concrete overlay
- Clearwater to St. Cloud
- Spring 2013
- 7.5 miles length
- $16.5 M
I-94 Traffic Volumes

• Average Daily Traffic (ADT)
  • 45,500 (M-Thur)
  • 55,000 (Average Weekends)

• Hourly volumes
  • Peak periods – 2,400 – 2,800 VPH

• Single Lane Capacity
  • 1,500 VPH – merge area
  • 1000 vehicles per hour over capacity

❖ Significant Delays/Backups
  • Traffic Management Plan
Traffic Management Plan

• Significant Impact Project
• Traffic Management Plan (TMP)
  • 1 – Traffic Control Plans
  • 2 – Traffic Operations Plan
  • 3 – Public Information Plan
• TMP – revisit scope of project
  • Concrete – due to material life span
Traffic Control Plans
Un-bonded Concrete Project

• One lane traffic
• Crossovers
• Head-to-head traffic
• Ramp closures
• Detours
  – Ramps/loops/TH 24
Construction Staging
Un-bonded Concrete Project

- Prep work Fall of 2012
- April to June 2013 – least impact
  - Stage 1 – EB closed
    - April to Memorial
  - Stage 2 – WB closed
    - Memorial to July 4th
- 4-lane open Memorial Weekend
- 4-lane by July 4th Weekend
ITS Project
SP 8823-260
Traffic Operations

ITS – Separate project

IWZ Tool Box

I. Travel Time Info
II. Stopped Traffic
III. TH 24 Detour -
   • Dynamic
   • I-94 WB traffic
     30% exit TH 24
   • CSAH 75 detour
ESTIMATED TRIP TIME

• The CMS may be replaced with static warning signs equipped with two (2) CMS characters in dynamic mode. The characters would display the real-time travel time in the work zone downstream.

• Consideration should be given to posting an alternate route and travel time for additional driver information.

• The CMS may be supplemented with other informational devices such as Highway Advisory Radio (HAR).

NOTES
• Advance warning signs and other standard temporary traffic control devices have not been shown on this figure. Refer to the MnMUTCD including the 2007 Field Manual or the TTC Layout Templates for typical layout examples.

• All IWZ Guide Signs and CMS should be reviewed by the Mn/DOT Office of Traffic Safety, & Operations for design and message approval.

• Approved CMS messages should be listed in the Special Provisions, and approx CMS locations should shown on the TTC plans. All CMS displays should be blank when messages are not warranted.

• Refer to the Toolbox Definitions Section for graphic symbols and terms.
- The CMS may be replaced with an appropriate warning sign equipped with dynamically automated flashing lights as shown below.
- The static signs are spaced incrementally and the individual flashers are activated in response to queued traffic when the queue is detected within one mile of the sign location.

```
<table>
<thead>
<tr>
<th>BE PREPARED TO STOP</th>
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<tr>
<td>Optional Signing</td>
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<tr>
<td>WHEN FLASHING</td>
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ITS Honor Service Leadership

Your Destination...Our Priority

Map showing project limits, primary alternate route, and secondary alternate route.

Honor Service Leadership
Procurement Methods

1. Request for Proposal (RFP)
2. In-House – State forces
3. Design/Bid/Build – selected
   • Hybrid System/Control – Why???
   • MnDOT – manage I-94 WB
   • Contractor – manage I-94 EB
Design/Bid/Build

- Leverage existing infrastructure
  - St. Cloud east to Metro
    - Fiber network
    - Connected to RTMC
  - Detectors/Cameras/DMS
- St. Cloud west
  - Limited infrastructure
Concerns

• Project costs – 20 detectors
  – I-35 Duluth 6 detectors/$395,000
  – $500,000 - ????
• Integration
• Accuracy of information – length
HONOR Service LEADERSHIP
 ITS Concept Plan Development

1. Travel Time
   - 2 signs each direction
   - 10 and 15 miles prior to project
   - Detector spacing/mile (20 total)

2. Stopped Traffic Advisory
   - CMS every 3 miles (8 total)
   - 2 boards active prior to slow/stop point
   - Common detection
3. TH 24 Dynamic Detour

- 1 CMS prior to Hasty interchange
- Activated when backups started
- Approx. 5 miles before project
- Backups – Hasty interchange
- Hasty exist heavily used
- 1000 vph less on I-94 WB peak times
I-94 EB
ITS contract

• Contractor responsible for EB
• Travel time at 17 & 10 miles
  – Hybrid signs – Static/Dynamic
  – Series 3 signs at 17 mile pt.
  – 1 Hybrid sign -10 mile point
• Stopped traffic Advisory
  • CMS every 3 miles
I-94 EB
17 mile point
I-94 EB
2nd sign

EXPECT LONG BACKUPS ON WEEKENDS
I-94 EB
3rd Hybrid sign (17 mile pt.)
I-94 EB
Hybrid sign (10 mile pt.)
Nonintrusive Detector
1 mile spacing
I-94 WB
Travel time (MnDOT)
I-94 WB
Travel time (MnDOT)
Project Costs

- Much lower than expected
  - $200,000 range
- 2 Bidders
- Safety Signs – awarded contract
  - ASTI subcontractor
Data Collection

• Weekly data collected
  – Speeds
  – Travel times
  – Message content
    • Travel time postings
    • Stopped message posting
  – Compare to field information
## Eastbound Deflector Speeds

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**Legend:**
- Greater than 40 mph
- Less than 40 mph, greater than 30 mph
- Less than 30 mph, greater than 15 mph
- Less than 15 mph
Project Findings

• Integration – smoother than expected
• Contractor - open to improvements
• Backups less the expected
• Diversion of traffic – up to 1000 vph
  – TH 24 detour
  – TH 10 – good parallel route WB
  – CSAH 75 parallels I-94
  – Limited public complaints
Project Findings

• Improvements:
  ▪ Speed variations during hour
  ▪ Contractor’s web site
    ▪ Hybrid signs – Display ???
Questions