I-39/90 Technology-Driven Traffic Mitigation Measures

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Outline

- Project Overview
- Mitigation Measures
- Signal System Types
- System Selection
- Traffic Signal Operations
- Lessons Learned
I-39/90 Project

- Dane and Rock Co
- 45 Miles
- 11 Interchanges
- 100+ Bridges
- Construction until end of 2021
I-39/90 Project Overview

Three Lanes in each direction

Four Lanes in each direction – Janesville Area
I-39/90 Project Overview

Why Improve?

1962
I-39/90 Project Overview

Why Improve?
I-39/90 Project Overview
Why Improve?
Mitigation Measures
Alternate Routes
Mitigation Measures
Alternate Routes – Zoo Interchange
Mitigation Measures
Alternate Route Improvements

- Jug Handle Interchange
- Resurface/Reconstruct
- Diamond Interchange/Bridge
- Resurface/Reconstruct
- Adaptive Signals
- New Signal & Improvements
- DDI Interchange
- Resurface/Reconstruct
- New Road/Bridge
- Safety Improvements
Mitigation Measures
Alternate Route Travel Times
Mitigation Measures
Railroad Detection
Mitigation Measures
Queue Warning System
Traffic Operations During Incidents
Rural Alternate Route
Urban Alternate Route

USH 14

WIS 26
Urban Alternate Route
Traffic Signal System

Signalized Intersection
- Interstate Freeway
- Alternate Route Highways
- Other Arterial Highways
Signal System Types
Time-Base Coordinated Operation

Key Parameters:
- Cycle Length (Fixed)
- Split (Semi-Actuated)
- Offset (Fixed)
Signal System Types
Traffic Responsive Operation

Key Parameters:
- Cycle Length (Plan-Selectable)
- Split (Semi-Actuated)
- Offset (Plan-Selectable)
Signal System Types
Adaptive Operation

Key Parameters:
• Cycle Length (Optimized)
• Splits (Optimized)
• Offsets (Optimized)
System Selection

System comprised of two modules:
- Centracs Adaptive (optimizes splits, offsets)
- Centracs Responsive (optimizes cycle length)
System Operation
Centracs Adaptive / Responsive

Pattern Selection
- Detector Data
- Computations
- Pattern Selection

Offset Tuning
- Flow Profile
- Centracs®

Split Tuning
- Westbound Exit Detector
System Operation
Diversion Trigger System
# System Operation

**System Validation - On/Off Study**

## Measures of Effectiveness (MOEs)

<table>
<thead>
<tr>
<th>MOE</th>
<th>Typical Weekday</th>
<th>Friday PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrivals on Green</td>
<td>😞</td>
<td>😊</td>
</tr>
<tr>
<td>Platoon Ratio</td>
<td>😞</td>
<td>😊</td>
</tr>
<tr>
<td>Travel Time</td>
<td>😞</td>
<td>😊</td>
</tr>
<tr>
<td>Operations Worsened</td>
<td>😞</td>
<td>No Change</td>
</tr>
</tbody>
</table>
System Operation

Diversion Event

- May, 2017
- Planned Overnight Closure of I-39/90
Lessons Learned

• Vehicle detection and communications are critical to properly-functioning adaptive signal system.

• Maintenance and operations of adaptive signal systems adjacent to active work zones is time consuming.

• Maintenance and operations of adaptive signal systems within active work zones may be impractical.

• Adaptive signal systems are great at prioritizing mainline traffic. Be prepared for complaints about side-road wait times.
Questions?

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