MINNESOTA’S SAFETY PROGRAM

From “Black Spot” to Systematic

May 20, 2009
Rural Transportation Safety Conference
Past Practice

• Decentralized process based on reactive strategies
• Each district selected projects for their ATIP (Area Transportation Improvement Program)
Needed Changes

• Mainly reactive black spot treatments
• Project selection was not based solely on safety needs
• Projects were already in the program and then designated to have a “safety component”
• Selection should be “data-driven” and directed towards the areas with the greatest number of fatal and serious injury crashes
• Set a goal of selecting projects in a data driven way by FY 2009
New Process

• Development of a Strategic Highway Safety Plan (2007)
• Project selection process became centralized
• Low cost, systematic, proactive projects prioritized over black spot treatments
• Set a goals for proactive projects
  – At least 70% in Greater MN
  – At least 30% in Metro
## Fatalities (2001-2005)

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Percentage</th>
<th>Emphasis Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fatalities</td>
<td>3,008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Vehicle Occupant Fatalities</td>
<td>2,429</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Driver Behavior Based Emphasis Areas</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unbelted (Based on Veh. Occ. Fatalities)</td>
<td>1,271</td>
<td>(52%)</td>
<td>1</td>
</tr>
<tr>
<td>Alcohol-Related</td>
<td>1,068</td>
<td>(36%)</td>
<td>2</td>
</tr>
<tr>
<td>Speeding-Related</td>
<td>850</td>
<td>(28%)</td>
<td>5</td>
</tr>
<tr>
<td>Involved Drivers Under 21</td>
<td>718</td>
<td>(24%)</td>
<td>6</td>
</tr>
<tr>
<td><strong>Infrastructure Based Emphasis Areas</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Vehicle ROR</td>
<td>965</td>
<td>(32%)</td>
<td>4</td>
</tr>
<tr>
<td>Intersection</td>
<td>1,004</td>
<td>(33%)</td>
<td>3</td>
</tr>
<tr>
<td>Head-On and Sideswipe</td>
<td>611</td>
<td>(20%)</td>
<td>7</td>
</tr>
</tbody>
</table>
Funding Sources

• HSIP
  – State Projects
  – Local Projects

• Central Safety Fund
  – Metro Proactive Program
  – Cable Median Barrier
  – Pavement Marking Study
Project Selection

• Ability to meet the intent of the SHSP
• Fatal & A injury crashes per intersection or per mile
• SHSP (critical emphasis areas)
• Cost per intersection or cost per mile
• ADT
• Recommendation of a previous safety audit
• Inclusion on the HRRR list or Top 5% list
# State HSIP Projects

## State-Wide HSIP State Project Summary

<table>
<thead>
<tr>
<th>Project Type</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>4-Year Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn lanes</td>
<td>$270,000</td>
<td>$450,000</td>
<td>$477,000</td>
<td>-</td>
<td>$1,197,000</td>
</tr>
<tr>
<td>Lighting</td>
<td>$820,900</td>
<td>$750,700</td>
<td>-</td>
<td>-</td>
<td>$1,571,600</td>
</tr>
<tr>
<td>Rumble Strips</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>-</td>
</tr>
<tr>
<td>Rumble StripEs</td>
<td>$1,088,006</td>
<td>$548,822</td>
<td>$-</td>
<td>$-</td>
<td>$1,636,828</td>
</tr>
<tr>
<td>Shoulder widening</td>
<td>$535,500</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>$535,500</td>
</tr>
<tr>
<td>Other</td>
<td>$369,000</td>
<td>$2,115,000</td>
<td>$2,621,000</td>
<td>$2,943,000</td>
<td>$8,048,000</td>
</tr>
<tr>
<td>Reactive</td>
<td>$9,174,350</td>
<td>$7,691,230</td>
<td>$3,296,160</td>
<td>$5,352,480</td>
<td>$25,514,220</td>
</tr>
<tr>
<td>Project Subtotal</td>
<td>$12,257,756</td>
<td>$11,555,752</td>
<td>$6,394,160</td>
<td>$8,295,480</td>
<td>$38,503,148</td>
</tr>
<tr>
<td>Set Aside</td>
<td>$1,120,588</td>
<td>$1,651,880</td>
<td>$4,526,469</td>
<td>$4,526,469</td>
<td>$11,825,406</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$13,378,344</td>
<td>$13,207,632</td>
<td>$10,920,629</td>
<td>$12,821,949</td>
<td>$50,328,554</td>
</tr>
<tr>
<td>Proactive</td>
<td>$3,083,406</td>
<td>$3,864,522</td>
<td>$3,098,000</td>
<td>$2,943,000</td>
<td>$12,988,928</td>
</tr>
<tr>
<td>Reactive</td>
<td>$9,174,350</td>
<td>$7,691,230</td>
<td>$3,296,160</td>
<td>$5,352,480</td>
<td>$25,514,220</td>
</tr>
<tr>
<td>% of Proactive goal</td>
<td>46%</td>
<td>58%</td>
<td>47%</td>
<td>44%</td>
<td>49%</td>
</tr>
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</table>

Office of Traffic, Safety and Technology
Greater MN LOCAL projects

<table>
<thead>
<tr>
<th>Project type</th>
<th>HSIP Funding Awarded</th>
<th>Central Safety Funds Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Warning Systems</td>
<td>$-</td>
<td>$129,600.00</td>
</tr>
<tr>
<td>Lighting</td>
<td>$628,800.00</td>
<td>$-</td>
</tr>
<tr>
<td>Rumble StripEs/Strips</td>
<td>$1,491,938.00</td>
<td>$288,900.00</td>
</tr>
<tr>
<td>Wider markings</td>
<td>$3,518,292.00</td>
<td>$266,181.00</td>
</tr>
<tr>
<td>Guardrail</td>
<td>$427,320.00</td>
<td>$-</td>
</tr>
<tr>
<td>Geometric</td>
<td>$567,000.00</td>
<td>$-</td>
</tr>
<tr>
<td>Striping</td>
<td>$1,960,411.00</td>
<td>$833,550.00</td>
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<tr>
<td>Signing</td>
<td>$759,174.00</td>
<td>$-</td>
</tr>
<tr>
<td>Safety Plan</td>
<td>$95,000.00</td>
<td>$-</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$9,447,935.00</td>
<td>$1,518,231.00</td>
</tr>
</tbody>
</table>

Proactive $10,399,166.00 95%
Reactive $567,000.00 5%

2 year funding available $13,041,176.00

Office of Traffic, Safety and Technology
Edge Treatments

• HSIP
  – Local
    • $1.9M in Enhanced Striping funded in 2009/2010
    • $3.5M in 6” Wide Pavement Markings funded in 2009/2010
    • $1.5M in Rumble StripEs/Strips funded in 2009/2010
  – State
    • $1.6M planned in Rumble StripEs in 2009/2010
    • Pavement Marking Study
      – Over 800 miles of roadways treated
      – Rumble StripEs, 6” wide markings, Wet Reflective markings
**Edge Treatments**

- **Horizontal Curves**
  - Lane departure crashes more frequent
  - Potential countermeasures
    - Chevrons/delineation
    - Rumble Strips
    - Wider markings
    - Dynamic Feedback Signs

- **Safety Edge**
  - Proven strategy

- **Cable Median Barrier**
  - 139 Miles installed
  - 96 Miles planned for 2009-2011
  - First before/after study is very promising

I-94 in Maple Grove
CSAH 13

SE MN ~ Enhancing Your Curves
CSA H 22

SE MN ~ Enhancing Your Curves
Intersections

• Rural Lighting
• Improved signage systems
• Active warning systems
• Sight Distance improvements
• “Black spot” improvements
  – J-turns
  – Roundabouts
Signing for minor leg of intersection

36”, reserve 48” for intersections with documented deficiency and where there are RR grade crossings on the CH approach

½ distance between Stop Ahead and Stop

½ distance between Stop Ahead and Junction sign

450’ (min.) to 750’ back, 1 size larger than Stop (up to 48”)

Add can delineators to Stop sign

Stop Bar, 12” to 24” wide, 8’ to 12’ back from edgeline

Provide three devices indicating upcoming intersection

Prioritized/Phasing

1. Stop bar
2. Stop sign
3. Junction sign
4. Stop Ahead Message
5. Stop Ahead Sign

Add can delineators to Stop sign
SAFETY PROJECT SPECTRUM
STATE PLAN (POLICY AREA 1 – SAFE TRAVEL)

Category A
- Edge Treatment (rumble strips, enhanced pavement markings, improved signage)
- Centerline Rumble Strips
- Rural Intersection Enhancements (lighting, improved signage)
- Turn Lanes (Left + Right that meet warrants)

Category B
- Cable Median Barrier
- Full Standard Shoulders (with edge treatments)
- Geometric Intersection Changes (reduce access, ITS solutions)
- Intersection Control Revisions (new traffic control)
- Passing Lanes (meet ADT warrants)

Category C
- 2-4 Lane Expansion (meet ADT warrants)
- Design Continuity 2-4 Lane Expansion (eliminate gaps)
- Grade Separation (construct overpass and interchanges)

More Systematic
Low Unit Cost

More Black Spot Oriented
High Unit Cost

NOTE: The Safety Spectrum is not all inclusive of all safety strategies. Additional strategies may be appropriate for some roadways.
Minnesota Links

- MN Office of Traffic, Safety, and Technology (OTST)
  - http://www.dot.state.mn.us/otso/
- SHSP
- 2008 HSIP Final Report
  - http://www.dot.state.mn.us/trafficeng/safety/hes
- District Engineer’s Report
- Top 5% Report
- HSIP Worksheet
  - http://www.dot.state.mn.us/trafficeng/safety/hes/HSIP%20worksheet.xls
- Solicitations
  - Greater MN & Metro Announcements & Applications
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