Identification of Locations for Rural ITS Safety Solutions

Jon Jackels – Mn/DOT ITS Program Engineer
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• Minnesota has a Toward Zero Deaths highway traffic safety program

• Focus is on Fatal and Life Changing Injury crashes
# Minnesota’s SHSP

## Critical Emphasis Areas in the Minnesota SHSP

<table>
<thead>
<tr>
<th>Area</th>
<th>Fatalities</th>
<th>AASHTO's Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing Seat Belt Usage</td>
<td>1,271</td>
<td>1</td>
</tr>
<tr>
<td>Reducing Impaired Driving</td>
<td>1,068</td>
<td>2</td>
</tr>
<tr>
<td>Improving the Design and Operation of Highway Intersections</td>
<td>1,004</td>
<td>3</td>
</tr>
<tr>
<td>Keeping Vehicles on the Roadway</td>
<td>965</td>
<td>4</td>
</tr>
<tr>
<td>Curbing Aggressive Driving</td>
<td>850</td>
<td>5</td>
</tr>
<tr>
<td>Instituting Graduated Licensing for Young Drivers</td>
<td>718</td>
<td>6</td>
</tr>
<tr>
<td>Reducing Head-On and Across-Median Crashes</td>
<td>611</td>
<td>7</td>
</tr>
<tr>
<td>Increasing Driver Safety Awareness</td>
<td></td>
<td></td>
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<tr>
<td>Improving Information and Decision Support Systems</td>
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</tbody>
</table>
Fatalities

- Intersection
- All Others
- Run-Off-Road
Minnesota ITS Safety Plan

ITS Critical Strategy 5:
Use Intersection Collision Warning Systems
• Can factors other than crashes be used to identify risk?

• Can methods be developed to screen rural intersections and curves to identify candidates for proactive low-cost safety improvements?

• Can criteria be developed to allow these improvements to be evaluated?
Identification of Candidates for Safety Investment

Primary Analytical Methods

- Black Spot
- Systematic
Black Spot Method

- Unusually high frequencies or rates of crashes
- Needed in a comprehensive program
- Commonly used in urban areas
- Often times black spot intersections are signalized
- Typically used for higher cost applications
Systematic Method

• Absence of crashes does not equate to no risk

• Risk based on crashes AND other surrogate measures

• Best for low crash frequencies in rural areas

• Leads to development and use of surrogates
Intersection Safety Analysis Update

- Skewed minor leg approaches
- In or near horizontal curves
- ADT ratio
- Commercial development
- RR-Xing on Minor leg
- Distance from previous STOP sign on minor leg
- Crash history
50% are right angle crashes
Right Angle Crashes

2008-12-04 13:45:45 UTC
Typical Intersection Strategies

• Geometric Improvements to reduce conflicts
• Street Lighting
• Enhanced Signing and Delineation
• **Dynamic Warning Systems**
• Improve Sight Distance
Lane Departure Crashes

• 32% of fatalities are lane departure
• Between 40 and 80% of these are on curves
• Curves account for 5 to 20% of road length
Lane Departure Crashes on Curves

- Curve Radius
- Traffic volume
- Intersection in curve
- Visual trap
- Crash experience
None of these Road Departure Strategies include dynamic curve warning systems.
• Can factors other than crashes be used to identify risk?

• Can methods be developed to screen rural intersections and curves to identify candidates for proactive low-cost safety improvements?

• Can criteria be developed to allow these improvements to be evaluated?
Other Considerations

• ITS is only part of the solution
• There are many low cost proven safety solutions
• Need warrants for proper applications
• Need MUTCD standards and guidelines
• May need different surrogates
Challenges

• We need to develop effective low-cost intersection warning and curve warning systems.

• We need to develop a methodology to screen rural area curves and intersections for risk.
Questions

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