Engineering 101

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Trending Topics

- **Enhanced Pavement Markings**
- **Rumble Strips and Stripes**
- **Rural Intersection Conflict Warning System (RICWS)**
- **Reduced Conflict Intersections (RCI)**
  - Restricted Crossing U-Turn Intersection (RCUT)
  - Roundabouts
- **Speed Limits**
What is the correct name for this device?

A. Traffic Light
B. Stop Light
C. Traffic Signal
D. Light
What does “Safety” mean?

Nominal Safety is an Absolute

Substantive Safety is a Continuum

Greater

CRSH RISK

DESIGN DIMENSIONS
(Lane Width, Radius of Curve, Stopping Sight Distance, etc.)

Greater
The Goal: Collapse the Curve

PDO = Property Damage Only
Example—Roadways are the sole contributing factor in 3% of crashes and the roadway and driver interaction is the factor in 27% of crashes.
Enhanced Pavement Markings

• What is it?
  – Grooves or rows of indents in the pavement
  – Designed to alert inattention drivers through noise and vibration

• Where is it installed?

• What does it look like?

• How does it work?

Light rays entering the glass beads are retroreflected back to the driver

Glass Bead

Material Binder

Pavement Surface

Glass Bead Retroreflection
Rumble Strips and Stripes

• What is it?
  – Grooves or rows of indents in the pavement
  – designed to alert inattentive drivers through noise and vibration

• Where is it installed?

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• How does it work?
Rumble Strips and Stripes

**Bench Mark**
- 80 dB – Heavy truck traffic
- 70 dB – Business office
- 60 dB – Conversational speech

**MnDOT Noise Evaluation**
- 50’ away: 82 dB
- 100’ away: 75 dB
- 200’ away: 67 dB
- 300’ away: 62 dB
Rural Intersection Conflict Warning System (RICWS)

• What is it?
  – Provides real-time warnings for entering traffic
• Where is it installed?
• What does it look like?
• How does it work?
Rural Intersection Conflict Warning System (RICWS)

• Where is it installed?
Rural Intersection Conflict Warning System

• What does it look like?
• How does it work?

Cooperative Intersection Collision Avoidance System (CICAS)
Traditional Intersection v. Reduced Conflict Intersections (RCI)

“There must be a mistake now there’s more crashes than before!

<table>
<thead>
<tr>
<th>Conflict Point Comparison</th>
<th>Crossing</th>
<th>Turning</th>
<th>Merge/Diverge</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td>Traditional</td>
<td>4</td>
<td>12</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>Roundabout</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

With roundabouts, head-on and high-speed right angle collisions are virtually eliminated.

Picture Source: FHWA Brochure “Roundabouts A Safer Choice”
Reduced Conflict Intersections (RCI)
Restricted Crossing U-Turn Intersection (RCUT)

• **What is it?**
  - Geometric improvement at an 4 lane intersection
  - Decrease the likelihood of right-angle crash

• **Where is it installed?**

• **What does it look like?**
Reduced Conflict Intersections (RCI) Roundabout

• **What is it?**
  – Geometric improvement at a 2 or 4 lane intersection
  – Decrease the likelihood of right-angle crash

• **Where is it installed?**

• **What does it look like?**

• **How does it work?**
Reduced Conflict Intersections (RCI)
Roundabout

• **What is it?**

  - Geometric improvement at a 2 or 4 lane intersection
  - Decrease the likelihood of right-angle crash

  - Where is it installed?
  - What does it look like?
  - How does it work?
Speed Limits

“Why not just reduce the speed limit? People are driving way too fast. If they cared about safety they would put up a lower speed limit.”

- Most drivers select a speed they perceive is safe and reasonable; Traffic Engineers call this the 85th Percentile Speed
- Goal is to place the speed limit near the 85th Percentile Speed
- Artificially low or high speed limits contribute to a higher risk of crashes
- Lesson: Vehicle speeds are affected by highway design and context NOT static traffic signs
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