Highway Rail Crossing Safety Program in Indiana

Kevin Knoke
Program Manager, Section 130
Highway Engineer II, INDOT
March 6, 2013
rail highway safety program

- reduced crash risk for all users
- follow indot strategic highway safety plan
Passive w/ Cross buck
Active w/ Gates
Active w/ Flashing Lights
Active w/ 4 Quad Gates

2 Entrance and 2 Exit Gates
Review
Review

= STOP
Review
Section 130 Program

- Section 130 Pays 100% of cost
- No local matching funds needed
- Special Set Aside of HSIP
- Select Group of Worst Crossings
- Improve rail corridors
- $7.2 million per year
- 20-24 Spot Locations
Section 130 Program

- There is no “Call for Projects”!
  - Projects selected by data driven analysis
Systemic Passive Upgrade

- CSX - 593 Locations
- NS - 558 Locations
- INRD - 80 Locations
# Current Status of Public at-Grade Crossings

<table>
<thead>
<tr>
<th>Type</th>
<th>At-Grade Crossings</th>
<th>Grade Separated Crossings</th>
<th>All Crossings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>5,917</td>
<td>897</td>
<td>6,814</td>
</tr>
<tr>
<td>Private</td>
<td>1,949</td>
<td>71</td>
<td>2,020</td>
</tr>
<tr>
<td>Pedestrian</td>
<td>47</td>
<td>15</td>
<td>62</td>
</tr>
<tr>
<td>Totals</td>
<td>7,913</td>
<td>983</td>
<td>8,896</td>
</tr>
</tbody>
</table>
## Public at-Grade Crossings

<table>
<thead>
<tr>
<th>Warning Device</th>
<th>Number</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active — Flashing Lights and Gates</td>
<td>1,954</td>
<td>33.0%</td>
</tr>
<tr>
<td>Active — Flashing Lights Only</td>
<td>1,272</td>
<td>21.5%</td>
</tr>
<tr>
<td>Other</td>
<td>163</td>
<td>2.8%</td>
</tr>
<tr>
<td>Passive — Cross Bucks with stop signs</td>
<td>981</td>
<td>16.6%</td>
</tr>
<tr>
<td>Passive — Cross Bucks Only</td>
<td>1,547</td>
<td>26.1%</td>
</tr>
<tr>
<td>Totals</td>
<td>5,917</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Fiscal Year 2011**
Crash Reduction Factors


- **Passive to FLG**
  - 88% crash reduction

- **FL to FLG**
  - 44% Crash Reduction

- **Intersection Lighting**
  - 52% Reduction in Nighttime crashes

- **Four Quadrant Gates**
  - 82% Reduction in Violations
Hazard Index

- Hazard Index
  - Predicted Number of Crashes per Year
  - Different formulas for Passive, Active with FL, Active with Gates
Crash Reduction

- Crossing Closure
- 100% Reduction in Crashes
- Most Difficult to Achieve
- Goal close 25%
- No more than 4 crossings per mile
Other Factors

Grade Separation—High Cost $$

US 52 Sagamore Parkway in Lafayette

03/18/2009
Other Factors

Amtrak and NICTD Passenger Trains
Other Factors

Core Freight Priority Corridor
Multi-Track Crossings
Other Factors

Geometry such as steep approach grade

Economic Development

Sidings, RR Stations, etc.
Other Factors

Highway Pre-Signal
Highway Parallel to Rail Line.
Other Factors

Skew Angle

Obsolete Equipment
Other Factors

Driver Behavior

RR Operations
Other Factors

Various Train Activated Devices
Safety Toolbox

- Pavement Markings
- Traffic Pre-Signals
- Modernize Traffic Signals
- Advance Pre-emption
- Rail Corridor Improvements
- Median Barriers
- 4 Quadrant Gates
- Constant Warning Time Circuitry
- 8 to 12 Inch Dia. Lenses
- Overhead Cantilever
Section 130- Before
Section 130- Before
Mc Galliard Road - Muncie
Flashing Lights Plus Gates
Overhead Cantilever
RR Constant Warning Time
Median Barriers
Warning Bells
4 Entrance Gates
Advance Warning Time
Modernized Traffic Signals
Single Traffic Signal Controller