Grade Crossing Safety Alternatives

Ohio Rail Development Commission
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Grade Crossing Safety Programs
OTEC 2017
Traditional safety options

- Lights and gates
  - New installations
  - Modifications to existing devices
- Surface reconstructions (limited situations)
- Consolidations
- Grade separations – not part of ORDC programs
Alternative safety options

• Queue Management
  • Railroad preempted traffic signals
  • Queue cutters
  • Traffic signal timing changes
  • Vehicle detection
  • Signage and/or roadway changes
• Blocked crossing mitigation
• Striping – edge lines, dynamic envelope
• Median barriers and supplemental safety improvements
Queue management

- Preemption
- Queue cutters
- Traffic signal timing changes
- Vehicle detection
- Traffic changes
  - Turn restrictions
  - One-way streets
Railroad preempted traffic signals

‘50 second rule’
For grade crossing warning systems interconnected with highway traffic signals, System Design time minus Equipment Response Time shall not exceed 50 seconds.
Railroad preempted traffic signal

What the 50 second rule means to traffic signal designers:

• Advance Preemption Time (APT) is effectively limited to a maximum of 20 seconds.
• Time may be less than 20 seconds if the crossings requires longer warning times for railroad design purposes; e.g. skewed crossing, distance between tracks, etc.
Railroad preempted traffic signal

Why?
- Time = distance
- Railroad signal equipment manufacturers cannot vouch for the accuracy of the equipment beyond 50 seconds.
Railroad preempted traffic signal

What to do about it?

• Look for ways to reduce the amount of APT time:
  • Timing adjustments
  • Reduce/eliminate pedestrian time (relocate/shorten crosswalk)
  • Relocate stop line – include crossing as part of intersection
• Alternatives
  • Presignals
  • Loops
  • Traffic pattern / roadway changes
Preemption: Joint testing

FRA Safety Advisory 2010-02:
• When placed in service
• Joint testing at least annually

And:
• After timing changes, TS controller or cabinet change; joint test within 24 hours if possible.
• After a trouble call
• After receiving complaints from motorists or railroad
Preemption: Trouble shooting

CALL RAILROAD EMERGENCY NUMBER TO REPORT THE PROBLEM
Preemption: Trouble shooting

What information to get:
• Person’s Name and Phone number
• Log the date, time and person you notified

Then correct the problem
Preemption: Trouble shooting

Preemption repaired and tested:

• Notify Railroad that issue is resolved

• Log the date, time, and person you talked to when reporting the issue resolved.

• Schedule joint test to confirm preemption is working properly.
‘Extra mile’ program

- The majority of crashes occur at crossings with active (train activated) warning systems.
- 6 fatal crashes in 2016 – ALL at gated crossings.

<table>
<thead>
<tr>
<th>Year</th>
<th>Crossbucks</th>
<th>Flashing Lights</th>
<th>Gates</th>
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<tbody>
<tr>
<td>2012</td>
<td>17%</td>
<td>10%</td>
<td>73%</td>
</tr>
<tr>
<td>2013</td>
<td>30%</td>
<td>13%</td>
<td>57%</td>
</tr>
<tr>
<td>2014</td>
<td>18%</td>
<td>7%</td>
<td>75%</td>
</tr>
<tr>
<td>2015</td>
<td>16%</td>
<td>3%</td>
<td>81%</td>
</tr>
<tr>
<td>2016</td>
<td>27%</td>
<td>4%</td>
<td>70%</td>
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</tbody>
</table>
‘Extra mile’ program

Crossings that are currently equipped with lights and gates that:
• Rank highly
• Have experienced multiple crashes

Options considered:
• Roadway changes
• Railroad circuitry improvements
• Striping
• LED upgrades
• 4-quadrant gates
Striping
Median barriers
Median barriers and other combinations

Cuyahoga Falls - Multi-faceted approach:
- Traffic signal timing changes
- Vehicle detection
- Striping
- Raised pavement markers
- Median barriers

Avoided costly advance preemption.
Median barriers and other combinations
Traffic pattern changes

Left turns can cause queuing over the tracks.

Where possible, prohibit left turns immediately following tracks.
Don’t overlook the obvious...

Advance warning signs and pavement markings
Don’t overlook the obvious...

Dynamic envelop markings (8B.29)

Do not block intersection markings (3B.17)

With, Do Not Stop On Track sign R8-8
Don’t overlook the obvious...

Does your passive (crossbuck) crossing need additional advance warning signs?

Is queuing likely or is there an interconnected traffic signal?
Don’t overlook the obvious...

There’s a crossing up there?
What can stop a train?
Questions?

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