FHWA Roadway Departure Technology Transfer

Roadside Safety Systems Installer Training

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January 19-20, 2012
Housekeeping

- No Smoking
- Cell phones/Pagers/other noise makers, OFF, Please
- Restrooms/Public Phones
- Breaks, as needed, or about every hour or so, as time allows: TEN MINUTES.
- Lunch at noon, one hour (adjustable)
Scope

This course addresses:

- The need for guardrail systems.
- Their performance capabilities.
- The pre-installation field reviews, temporary traffic control, installation, inspection.
- The maintenance, repair and/or removal of these systems.
Objectives of Course

Course participants will receive information in:

- Determining when a traffic barrier is the best treatment to use at a specific site.
- Ensuring that the barrier selected will adequately shield the identified hazard.
- Assessing the topography of the worksite to ensure an optimal installation.
Objectives of Course

- Laying out a worksite
- Installing and maintaining various guardrail and terminal systems
- Documenting any deviations from the original plans and specifications
Course Topics

- Session One – Introduction
- Session Two – Testing Requirements and Performance Characteristics of Common Barrier Systems, Terminals, and Crash Cushions
- Session Three – Guardrail Design and Site-specific Installation Considerations
- Session Four – Pre-Installation Considerations
Course Topics (cont’d)

- Session Five – Temporary Traffic Control Through the Work Area
- Session Six – Guardrail/Terminal Installation and Common Errors
- Session Seven – Inspection of Completed Work and Liability Issues
- Session Eight – Maintenance of Systems
Session 1 Objectives

- Describe the Roadside Safety Concerns in Delaware
- Define Clear Zone
- Explain Warrants
Session 1 Outline

- Roadway Departure Problem
- Clear Zone
- Barrier Warrants
- Need for Training
Crash Data

2009 National Fatalities
33,808 Total

Delaware Roadway Departure: 52%

Number of Fatalities: Approx. 116 (60)

Ref: FARS Data – 2009
Crash Data

National Roadside Fatalities
(Single Vehicle Crashes 2009)

- Rollover, 33%
- Trees, 20%
- Utility Poles, 5%
- Sign and Signal Poles, 2%
- Embankment Ditches, 3%
- Barrier, 3%
- Other, 33%

Ref: FARS Data – 2009
### Delaware Single Vehicle Fatalities by Most Harmful Event

<table>
<thead>
<tr>
<th>Event</th>
<th>Count</th>
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<tbody>
<tr>
<td>Rollover</td>
<td>19</td>
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<tr>
<td>Trees</td>
<td>21</td>
</tr>
<tr>
<td>Utility Poles</td>
<td>9</td>
</tr>
<tr>
<td>Embankment and Ditches</td>
<td>1</td>
</tr>
<tr>
<td>Barrier</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
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</table>

Ref: FARS Data – 2009
Emphasis Area #1: Reducing the frequency and severity of Roadway Departure Crashes

Strategies include:

- Design safer slopes and ditches to prevent rollovers.
- Improve the design of roadside hardware.
- Develop guidelines for barrier repair/maintenance.
Clear Zone: A Definition

A traversable area that starts at the edge of the through travelled way, including shoulders, bike lanes, and certain auxiliary lanes.
## Design Clear Zone Determination Table

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>Design ADT</th>
<th>Foreslopes</th>
<th>Backslopes</th>
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<tr>
<td></td>
<td></td>
<td>1V:6H or flatter</td>
<td>1V:5H to 1V:4V</td>
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<tr>
<td>≤40</td>
<td>UNDER 750&lt;sup&gt;c&lt;/sup&gt;</td>
<td>7-10</td>
<td>7-10</td>
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<tr>
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<td>30-34&lt;sup&gt;a&lt;/sup&gt;</td>
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</table>

Ref: AASHTO ROADSIDE DESIGN GUIDE, 4<sup>th</sup> EDITION – TABLE 3.1, Pg. 3-3
Barrier Warrants
Order of Preference

- REMOVE hazard.
- REDESIGN the obstacle so it can be traversed.
- RELOCATE hazard (i.e. move away from traffic).
- REDUCE impact severity (i.e. use breakaway design).
- SHIELD the obstacle w/traffic barrier or crash cushion.
- DELINEATE hazard so motorist can avoid.
Potential Hazards

- Bridge Piers / Abutments / Railing Ends
- Drainage Structures / Ditches
- Rigid Sign and Luminaire Supports
- Permanent Bodies of Water
- Steep Embankments
- Opposing traffic on divided roadways
Need for Training

Potential consequences of poorly designed, installed, maintained, or repaired barrier systems include:

- Crash severities may be increased.
- Installer/agency may be liable for damages and injuries due to negligence.
Need for Training

Examples of improper installation of systems:
Need for Training

Examples of improper installation of systems:
Need for Training

Examples of improper installation of systems:
Need for Training

Examples of improper installation of systems:
Session 1 Outcomes

- Understand the single vehicle, run off the road crash situation nationwide and how it pertains to Delaware.
- Know the benefits of providing an appropriate clear zone adjacent to a road or street.
- Know when a traffic barrier may be the most effective solution to a roadside hazard.