Shadow Vehicles for Work Zones Training Module

Developed By: ATSSA
About This Course

- This material is based upon work supported by the Federal Highway Administration (FHWA) under grant agreement NO. DTFH61-06-G-00004
"Any opinions or recommendations expressed in this course are those of the instructor and do not necessarily reflect the view of the FHWA or ATSSA".
Learning Objectives

- Define the Different Types of Protective Vehicles
- Describe Shadow Vehicles and Their Applications
- Define TMA
- Identify the Priority for Use of a Shadow Vehicle and TMA
- Find Appropriate Spacing Guidelines and Determine Placement
- Understand Appropriate Typical Applications that May Include Shadow Vehicles
"Field Guide for the Use and Placement of Shadow Vehicles in Work Zones"

- ATSSA developed this guide for FHWA under the Work Zone Safety Grant DTFH61-06-C-00004
- Course materials are based on this product
- The product is based on the MUTCD and AASHTO Roadside Design Guide
FHWA Grant Product (cont.)

- Provides information from MUTCD and RDG in one easy to use field manual
- Summarizes available guidance
- Always check your local requirements
Three Types of Protective Vehicles

- Shadow vehicles
- Barrier vehicles
- Advance warning vehicles
What is a Shadow Vehicle?

- A stand alone truck
- May be occupied and moving
- Used to protect:
  - Workers
  - Motorists

See MUTCD and RDG
Shadow Vehicles with TMAs

- Follow manufacturer’s recommendations and local agency specifications – they are based on specific criteria

Refer to *Roadside Design Guide*
Truck-Mounted Attenuators

- Energy-absorbing devices attached to the rear of shadow trailers or trucks

The modules within a TMA
Typically:
- Parking brake set
- Transmission in gear
- Allow for roll-ahead distance
Shadow Vehicle Priority Guidelines

Based on:
- Facility Type (freeway/other)
- Activity Type (stationary/mobile)
- Type of Closure (lane closure/shoulder closure)

See Grant Product and RDG
### Example Priority Guidelines

<table>
<thead>
<tr>
<th>If the type of activity involves:</th>
<th>The priority for use of shadow vehicles is:</th>
<th>The priority for use of a TMA on the vehicle is:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposed personnel – crack pouring, patching, utility work, striping, coning (no lane closure)</td>
<td>Very highly recommended</td>
<td>Very highly recommended</td>
</tr>
</tbody>
</table>
Shadow Vehicle Location

- Located in advance of the work area
- Shall be designed for the specific application intended
  - Impact speed
"The shadow truck should be positioned a sufficient distance in advance of the workers or equipment being protected....but not so much that the errant vehicle will travel around...."
“Roll-Ahead Distance”

- The distance a TMA will displace when impacted
- It depends on
  - Weight of TMA
  - Speed of impact
  - Weight of impacting vehicle

Check with the manufacturer!
**Sample TMA “Roll-Ahead Distances” for 50-55 mph Impact**

<table>
<thead>
<tr>
<th>Weight of TMA (lbs)</th>
<th>Weight of Impacting Vehicle (lbs)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4,500</td>
</tr>
<tr>
<td>10,000 (moving)</td>
<td>100’</td>
</tr>
<tr>
<td>15,000 (moving)</td>
<td>75’</td>
</tr>
<tr>
<td>10,000 (stationary)</td>
<td>25’</td>
</tr>
<tr>
<td>15,000 (stationary)</td>
<td>25’</td>
</tr>
</tbody>
</table>

*Mid-size auto = 2,250 lbs  
Full-size auto = 3,500 lbs  
Loaded cargo truck = 10,000 lbs

*Source: Humphreys and Sullivan, “Guidelines for the Use of TMA’s”*
### Sample Recommended Spacing Guidelines

<table>
<thead>
<tr>
<th>Operating Speed (Traffic)</th>
<th>Recommended Spacing for Vehicles Weighing &gt;22,000 lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stationary</td>
</tr>
<tr>
<td>Greater than 55mph</td>
<td>150</td>
</tr>
<tr>
<td>45mph to 55mph</td>
<td>100</td>
</tr>
<tr>
<td>Less than 45mph</td>
<td>74</td>
</tr>
</tbody>
</table>

*Source: AASHTO Roadside Design Guide*
# Sample Recommended Spacing Guidelines

<table>
<thead>
<tr>
<th>Operating Speed (Traffic)</th>
<th>Recommended Spacing for Vehicles Weighing &lt; 22,000 lbs and &gt; 9900 lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stationary</td>
</tr>
<tr>
<td>Greater than 55mph</td>
<td>172</td>
</tr>
<tr>
<td>45mph to 55mph</td>
<td>123</td>
</tr>
<tr>
<td>Less than 45mph</td>
<td>100</td>
</tr>
</tbody>
</table>

*Source: AASHTO Roadside Design Guide*
SV Considerations

- Use operating speed for more conservative spacing
- Consider the application to determine priority for use
- Use will be addressed in contract documents or traffic control plans
- Use to protect workers during installation and removal of devices

Position SV in the Work Space Only!
Typical Application

- Mobile or Short Duration Operation on Shoulder
- Arrow Panel **Shall** Be in Caution Mode
**Typical Application**

- Mobile Operations on a Two Lane Road
- May pull over periodically to allow traffic to pass through
Review Learning Objectives

- What are the three different types of protective vehicles?
- What is a shadow vehicle and when might it be used?
- What does TMA stand for?
- How do we determine the priority for Use of a Shadow Vehicle and TMA?
Review Learning Objectives (cont.)

- Where would use of shadow vehicles be specified?
- What are some typical work activities that may include shadow vehicles?