



Shadow Vehicles for Work Zones Training Module

Developed By:



About This Course

- ◆ This material is based upon work supported by the Federal Highway Administration (FHWA) under grant agreement NO. DTFH61-06-G-00004



Also



- ◆ *"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

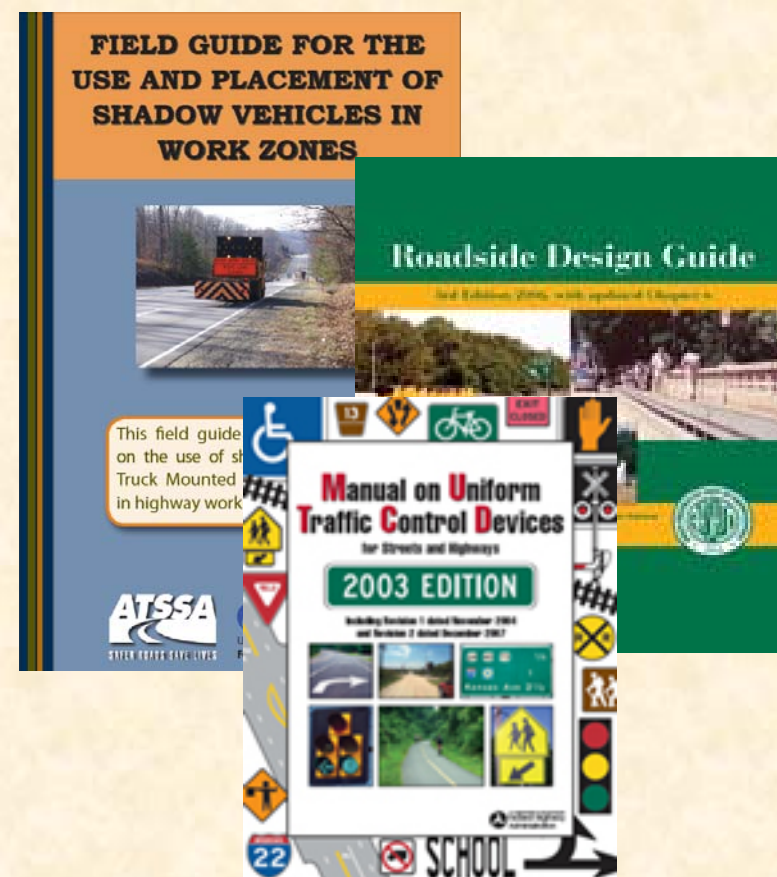
Based on FHWA Grant Product

“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

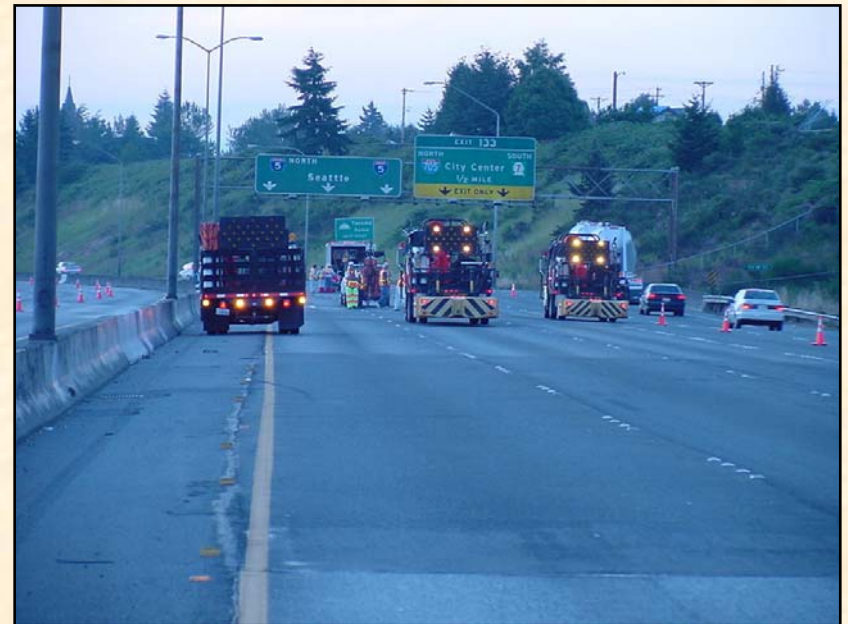
- ◆ Shadow vehicles
- ◆ Barrier vehicles
- ◆ Advance warning vehicles

TMA



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***

Shadow Vehicle Operation



- ◆ 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

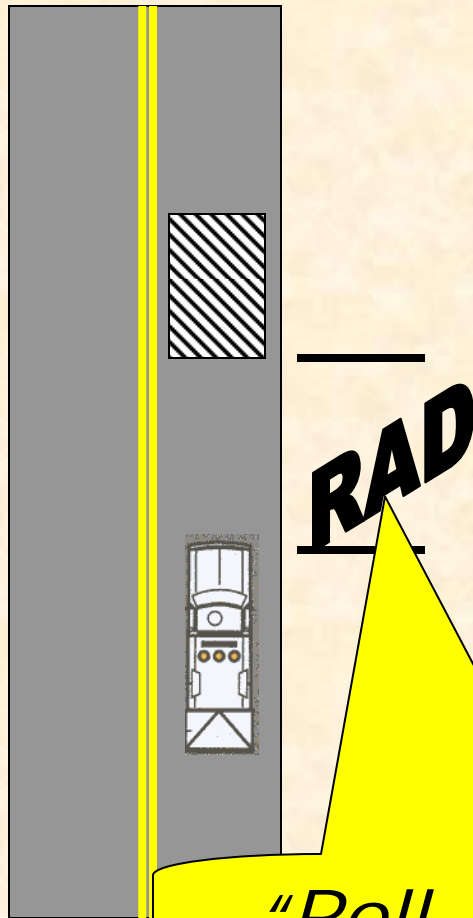
If the type of activity involves:	The priority for use of shadow vehicles is:	The priority for use of a TMA on the vehicle is:
Exposed personnel – crack pouring, patching, utility work, striping, coning (no lane closure)	Very highly recommended	Very highly recommended

Shadow Vehicle Location

- ◆ Located in advance of the work area
- ◆ Shall be designed for the specific application intended
 - ◆ Impact speed



Layout of Shadow Vehicles



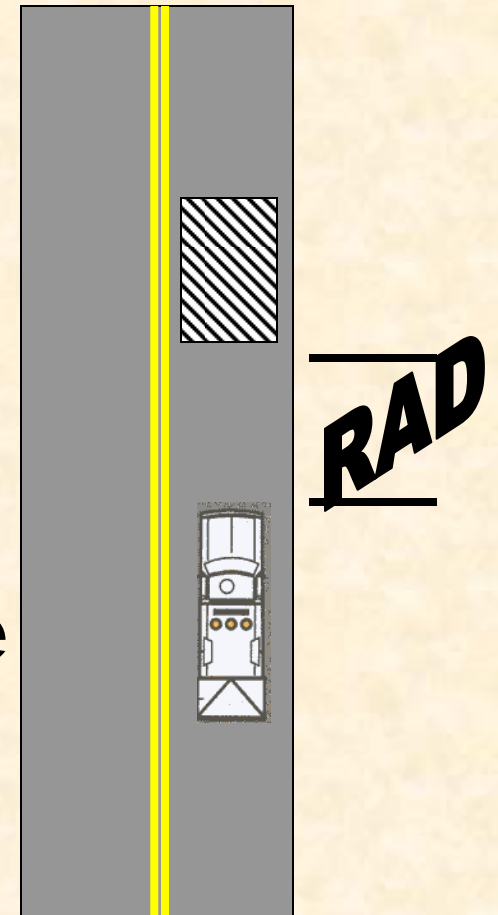
- ◆ *“The shadow truck should be positioned a **sufficient distance in advance of the workers** or equipment being protected....but not so much that the errant vehicle will travel around....”*

“Roll-ahead distance”

“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

Weight of TMA (lbs)	Weight of Impacting Vehicle (lbs)*		
	4,500	10,000	15,000
10,000 (moving)	100'	150'	175'
15,000 (moving)	75'	125'	150'
10,000 (stationary)	25'	75'	100'
15,000 (stationary)	25'	50'	75'

*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

Operating Speed (Traffic)	Recommended Spacing for Vehicles Weighing >22,000 lbs	
	Stationary	Moving
Greater than 55mph	150	172
45mph to 55mph	100	150
Less than 45mph	74	100

**Source: AASHTO
Roadside Design Guide**

Sample Recommended Spacing Guidelines

Operating Speed (Traffic)	Recommended Spacing for Vehicles Weighing <22,000 lbs and > 9900 lbs	
	Stationary	Moving
Greater than 55mph	172	222
45mph to 55mph	123	172
Less than 45mph	100	100

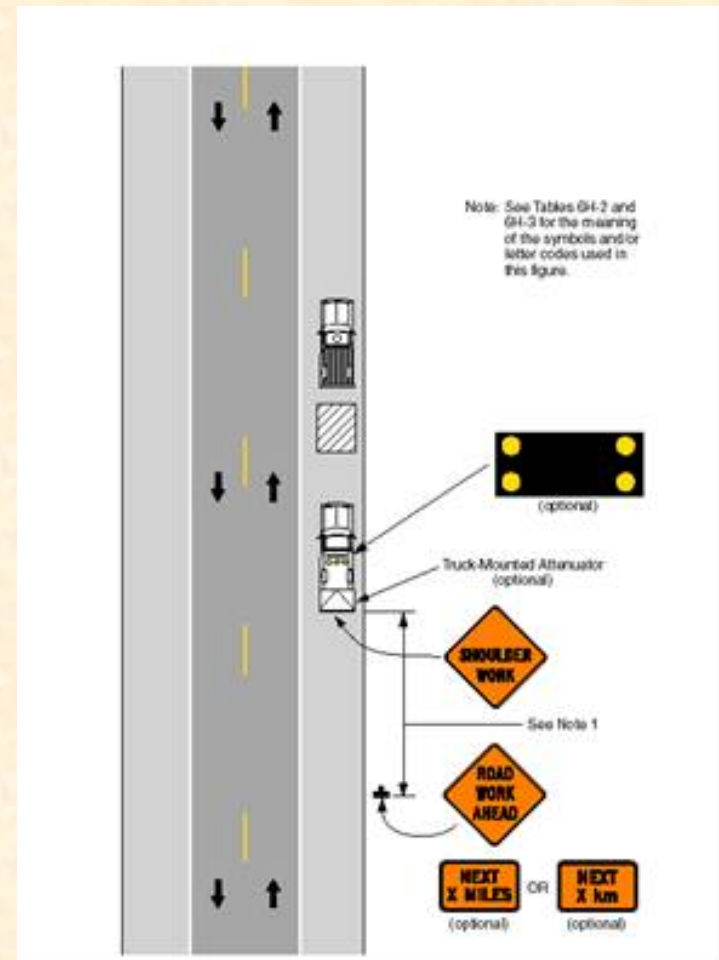
**Source: AASHTO
Roadside Design Guide**

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

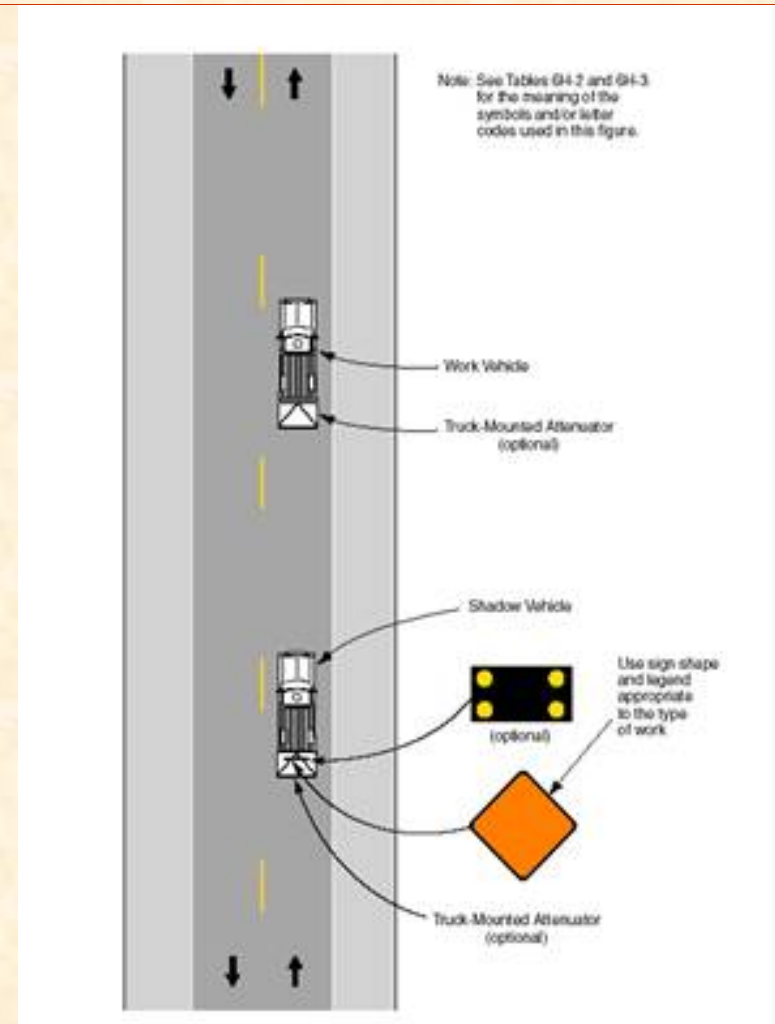
Typical Application

- ◆ 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?