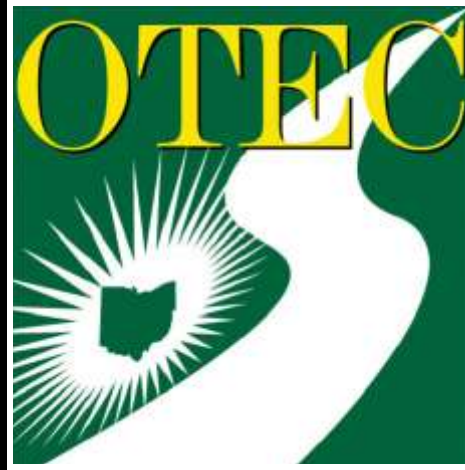




***New FHWA Work Zone Rule
Requires
Positive Protection Devices***

October 28, 2008

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Road Systems, Inc.



Let's Start With a Question...

Positive Barrier Protection Needed For Worker and Motorist Safety



Would you Want to Spend the Day Here?

Positive Barrier Protection Needed For Worker and Motorist Safety



Would you Want to Spend the Day Here?

Positive Barrier Protection Needed For Worker and Motorist Safety



Would you Want to Spend the Day Here?

- Background
- Overview of New Rule
- Barrier Options
- Summary



Final Rule on Temporary Traffic Control Devices

23 CFR 630 Subpart K

Parts of this presentation referenced from:

National WZ Safety Clearinghouse Webinar – June 26, 2008

Chung Eng, FHWA Office of Transportation Operations

Background - FHWA Statistics

- Approximately 20% of NHS is under construction during peak construction season.
- More than 3,000 Work Zones are expected to be present on the NHS during the peak.
- Approximately 12 billion vehicle miles of travel per year will be through active Work Zones.
- Motorists can expect to encounter an active Work Zone 1 out of every 100 miles driven on the NHS.

Background - FHWA Statistics

- Through 2006, over the last 10 years, Work Zone fatalities increased 45% (up to 1,010 in 2006).
- More than 40,000 people are injured each year as a result of crashes in Work Zones.
- This translates to:
 - One WZ fatality every 8.7 hours (almost 3 a day).
 - One WZ injury every 9 minutes (160 a day).
- Good News - WZ fatalities down to 835 in 2007.

New Rule - Regulations

- **Subpart J Work Zone Safety & Mobility Rule**
 - Published September 9, 2004
 - Effective October 12, 2007
 - Established framework for systematic consideration and management of WZ safety & mobility impacts.
(ODOT policies & procedures currently fulfill this)
- **Subpart K Temporary Traffic Control Devices Rule**
 - Published December 5, 2007
 - Effective December 4, 2008
 - Supplements **Subpart J** with additional safety considerations

SAFETEA-LU

Section 1110 Requirements

- Mandates rulemaking to establish conditions for appropriate use of, and expenditure of funds for:
 1. Positive protective measures between workers & traffic.
 2. Uniformed law enforcement officers.
 3. Installation & maintenance of temporary traffic control devices.
- Mandates separate pay items in contracts to ensure projects include costs for these safety measures when the measures are necessary.

Positive Protection - Barriers

The FHWA defines Positive Protection Devices as
“Devices that contain and/or redirect vehicles and meet the crashworthiness evaluation criteria contained in the National Cooperative Highway Research Program (NCHRP) Report 350.”

Positive Protection - Barriers

- Stationary Barriers
- Portable Barriers
- Highly Portable Barriers

Considerations

- *Performance*
- *Deflection*
- *Cost (material & labor)*
- *Portability*
- *Weight*

Positive Protection - Barriers



Movable Concrete



Test Level 4 Steel Barriers



Stationary Concrete



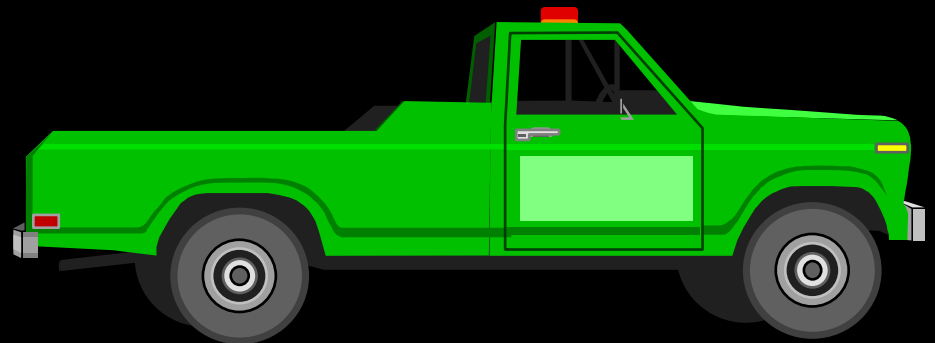
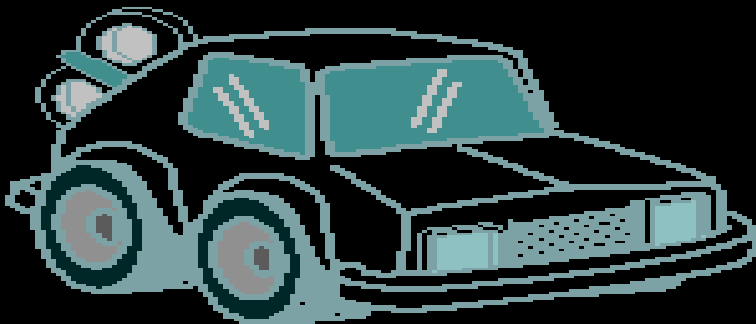
Plastic Water-Filled



Steel Barriers on Wheels

Impact Performance

- Selection of a performance level is typically based on speed and traffic mix.
 - **TL-1, TL-2, TL-3**: crash tests with 1800-lb car and 4400-lb pickup truck, at increasing speeds



Impact Performance

- **TL- 4:** TL-3 + 17,600-lb single-unit truck test
- **TL- 5:** TL-3 + 80,000-lb tractor-trailer van test
- **TL- 6:** TL-3 + 80,000-lb tractor-trailer tanker test



Positive Protection



Workers Exposed

Everyone Protected



Positive Protection



Workers Exposed

Everyone Protected



Overview of Subpart K

- NPRM (Notice of Proposed Rule Making) published Nov 1, 2006
- Comment period closed February 16, 2007
- Final Rule published December 5, 2007
- Implement by December 4, 2008 (That's in 5 weeks!)

Goal:

- Decrease Work Zone fatalities and injuries to workers and to road users.

Approach:

- Build on processes, procedures, and/or guidance which was implemented under **Subpart J**
- Establish minimum requirements & provide guidance

Key Components of New Rule

- Added emphasis on safety in *Work Zone Policy*
- **Positive Protection Devices**
- Exposure control measures
- Other traffic control measures
- Uniformed law enforcement
- Safe entry/exit for work vehicles & equipment
- Payment for traffic control features & operations
- Quality guidelines

Work Zone Policy

*This **Subpart K** policy and related processes, procedures, and/or guidance established under **Subpart J** shall include consideration of road user and worker safety by addressing:*

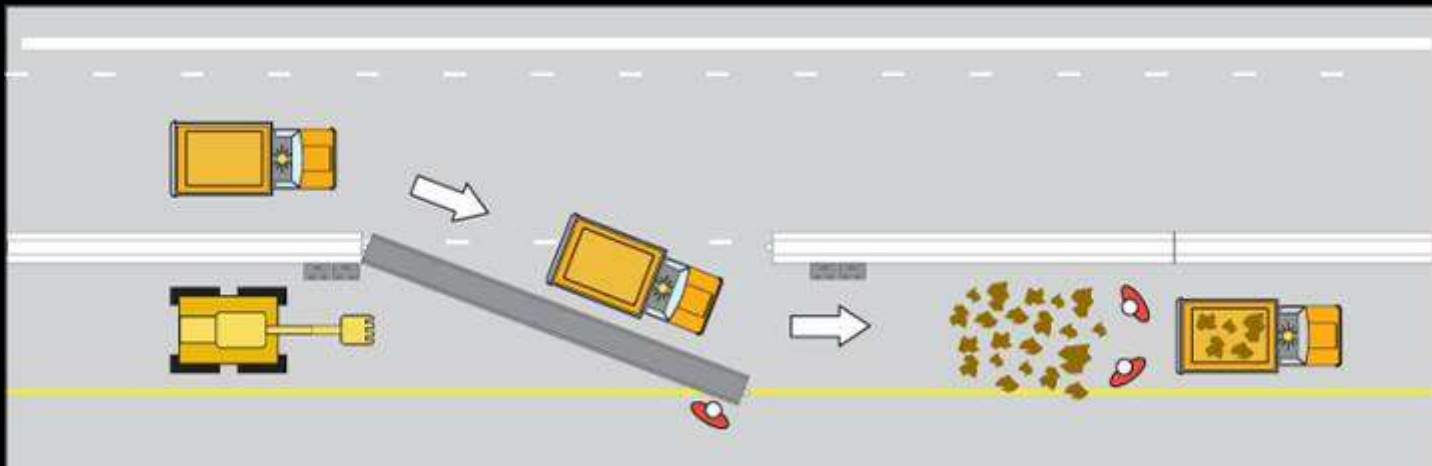
- Use of positive protection devices to prevent intrusions;
- Exposure control measures to minimize exposure;
- Other traffic control measures to minimize crashes;
- Safe entry/exit of *Work Vehicles and Equipment* onto/from the travel lanes.

Work Vehicles and Equipment

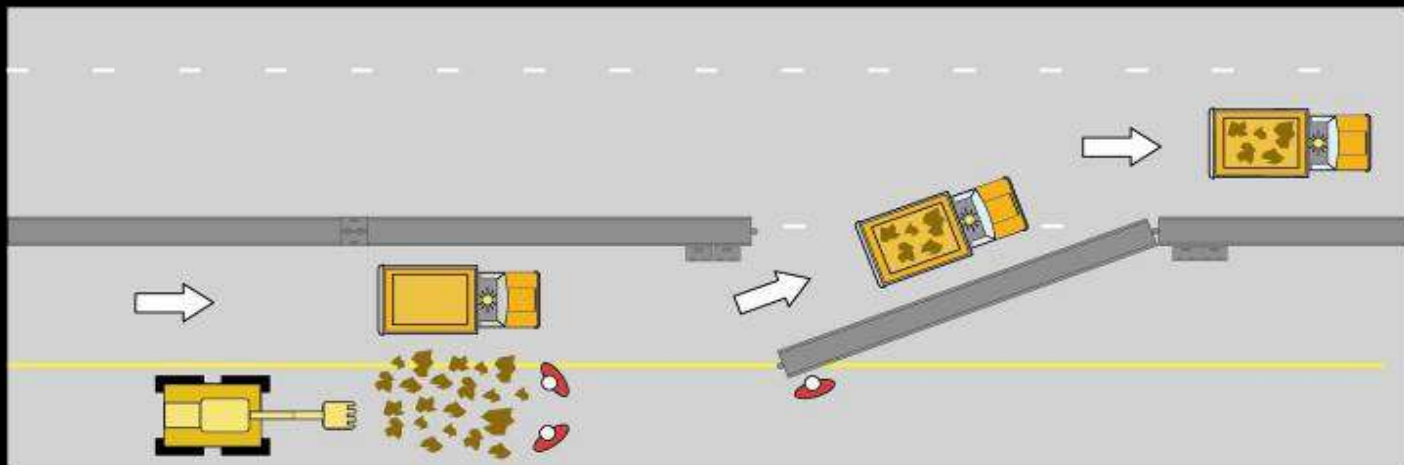
*The agency processes, procedures, and/or guidance established under **Subpart J** should also address:*

- Safe means for work vehicles & equipment to enter/exit traffic lanes.
- Delivery of construction materials to the work space, based on individual project characteristics and factors.

Access in & out of a Work Zone



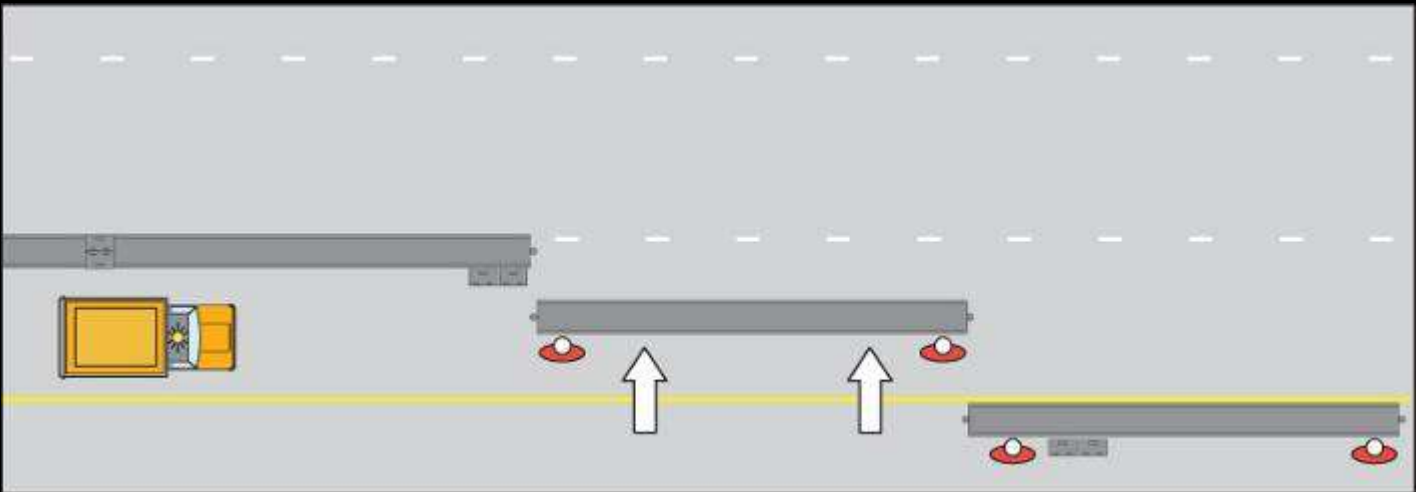
Access in & out of a Work Zone



Access in & out of a Work Zone



Access in & out of a Work Zone



Access in & out of a Work Zone



Test Level 3 Crash Testing



63 mph / 25 degrees / 6-ft deflection

Test Level 3 Crash Testing



63 mph / 25 degrees / 6-ft deflection

Positive Protection Devices

Subpart K states the use of positive protection *shall* be considered:

- Where workers are at increased risk from traffic.
- Where positive protection devices offer the highest potential for increased safety for workers and road users.

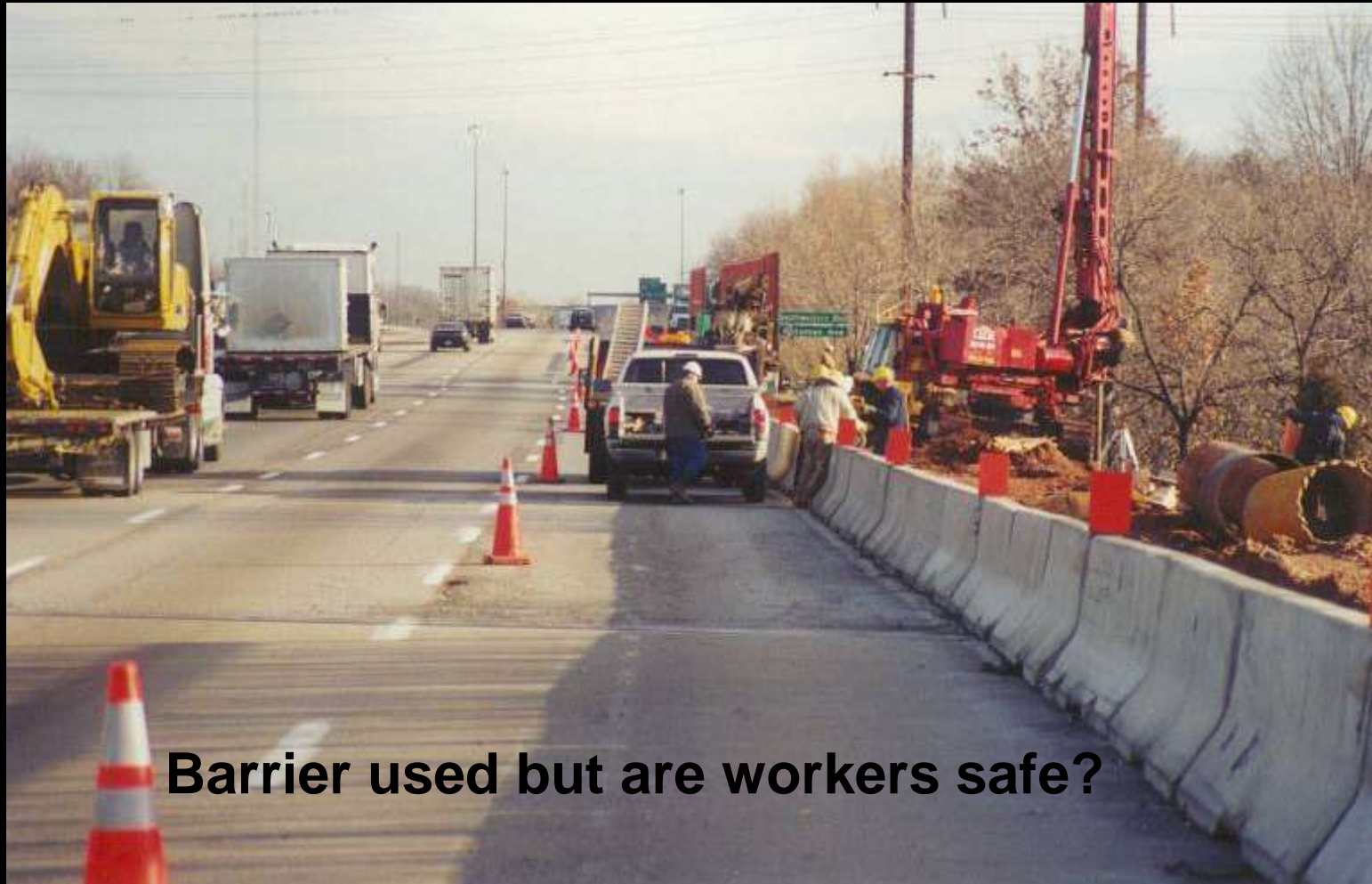
Positive Protection Devices

- The use of Positive Protection Devices shall be based on an engineering study.
- An engineering study may be used to develop positive protection guidelines, or to determine appropriate measures for an individual project.
- The engineering study should be based on consideration of factors and characteristics such as:

Example Factors / Characteristics to Consider:

1. *Project scope and duration;*
2. *Anticipated traffic speeds through the work zone;*
3. *Anticipated traffic volume;*
4. *Vehicle mix;*
5. *Type of work (as related to worker exposure and crash risks);*
6. *Distance between traffic and workers, and extent of worker exposure;*
7. *Escape paths available for workers to avoid a vehicle intrusion into the work space;*
8. *Time of day (e.g., night work);*
9. *Work area restrictions (including impact on worker exposure);*
10. *Consequences from / to road users resulting from roadway departure;*
11. *Potential hazard to workers and road users presented by the device itself and during device placement and removal;*
12. *Geometrics that may increase crash risks (e.g., poor sight distance, sharp curves);*
13. *Access to / from work space;*
14. *Roadway classification;*
15. *Impacts on project cost & duration.*

Positive Barrier Protection Needed For Worker and Motorist Safety



Barrier used but are workers safe?

Positive Barrier Protection Needed For Worker and Motorist Safety



Barrier used but are motorists safe?

Protecting the Ends of Barriers



Examples of Conditions that may Warrant use of Positive Protection:

- *Work Zones that provide workers no means of escape from motorized traffic;*
- *Long duration Work Zones that result in substantial worker exposure to traffic;*
- *Projects with high anticipated operation speeds;*
- *Work operations that place workers close to travel lanes open to traffic;*
- *Roadside hazards remaining in place overnight or longer.*

MUTCD and Movable Barriers

MUTCD Typical Application 45 shows a Movable Barrier. The MUTCD says:

“If the work activity permits, a movable barrier may be used and relocated to the shoulder during non-work periods or peak-period vehicular traffic conditions.”

Pavement Widening Opening & Closing the Work Zone



Barrier Transfer a Full Lane - Transfer Speed 5-10 mph

Positive Protection and Adjustable Flow



Positive Protection and Adjustable Flow

Close Lane During Construction



Barrier Being Transferred,
Closes 3rd Lane Northbound

Open Lane Non-Construction



Barrier Has Been Transferred Back,
Creates New Southbound Lane

Positive Protection for Work Area Widening

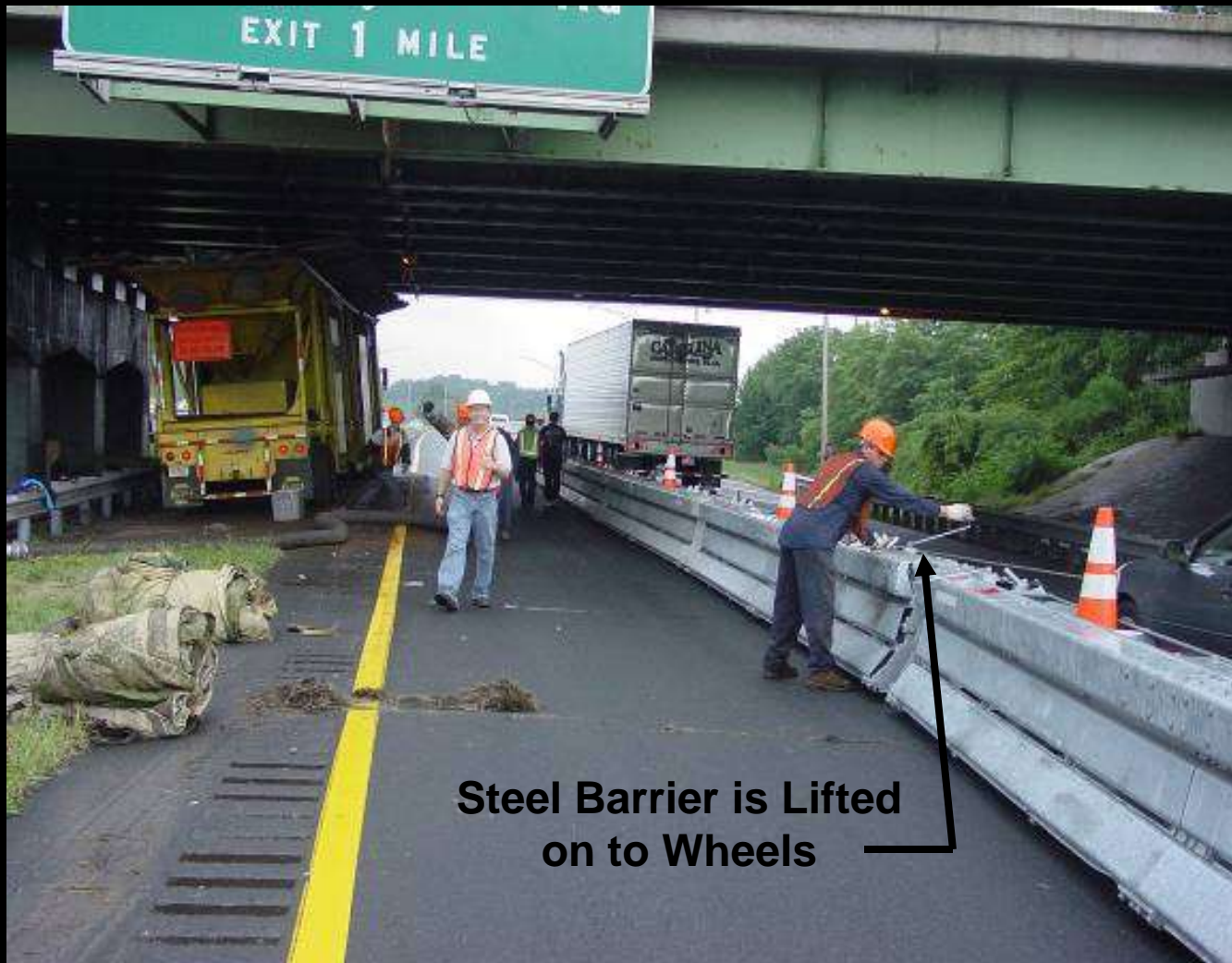


**Expand WZ for Equipment or
For Non Peak Travel Times**

Positive Protection for Work Area Widening



Movable Barrier and Positive Protection



**Steel Barrier is Lifted
on to Wheels**

Movable Barrier and Positive Protection



Movable Barrier and Positive Protection



Movable Barrier and Positive Protection



Movable Barrier and Positive Protection

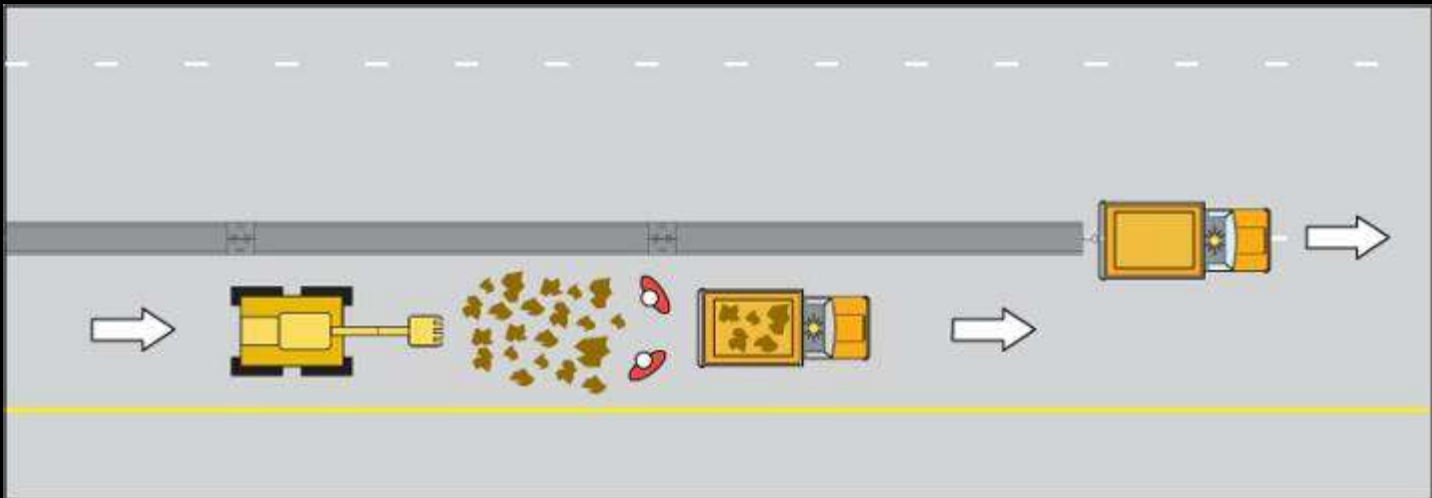


Manually Move the Barrier



Barrier Moves in all Directions

Tow Barrier With Truck



Tow Barrier With Truck



Tow Barrier With Truck



The MUTCD states that *“In the case of mobile and constantly moving operations, such as pot hole patching and striping operations, a shadow vehicle, equipped with appropriate lights and warning signs, may be used to protect the workers from impacts by errant vehicles. The shadow vehicle may be equipped with a rear-mounted impact attenuator.”*

Protect Equipment



In Summary

- New Rule **Subpart K** provides for supplementing the WZ “processes and procedures” developed under **Subpart J** to **specifically address appropriate consideration of positive protection devices**, exposure control measures, and other traffic control measures in order to help reduce Work Zone fatalities and injuries.
- A policy addressing the use of **uniformed law enforcement** on Federal-aid projects is required.
- Specific provisions are included that address appropriate **payment and quality assurance** for necessary safety features.
- **Quality guidelines** are implemented along with appropriate level of inspection.

In Summary

Some sites warrant considerations for improved safety in short term Work Zones

- Provides Positive Barrier Separation
 - *Protect motorists*
 - *Protect Work Zone personnel*
- Provides Flexibility for Contractors
 - *Improved access*
 - *Ability to easily reconfigure Work Zone*
 - *Some barriers reduce heavy equipment requirements*

What We Expect to See...

- Increased consideration and management of worker and motorist safety in Work Zones.
- More clarity on and better provisions for safety features needed on projects.
- Better quality devices & improved use of devices.
- More strategic and effective use of uniformed law enforcement in Work Zones
- ***Safer Work Zones!!***

Sometimes...
Positive Protection is NEEDED!





Questions???