



1.0 General Policy

A truck mounted attenuator (TMA) is a safety device used for short duration or mobile operation work. A TMA is an energy-absorbing device attached to the rear of a truck (shadow vehicle) used as protective vehicle. It serves as a temporary barrier when placed between live traffic and a work area on highways that must remain open to traffic during repairs or incidents. These devices are designed to protect the motorist, workers, equipment, material, and to protect the vehicle driver upon impact.

A shadow vehicle is a moving truck with an attached attenuator spaced a short distance from a moving operation, giving physical protection to workers from traffic approaching from the rear. Similar to truck mounted devices, trailer mounted attenuators may also be used on the shadow vehicle on a project-specific basis to protect workers. In addition to shadow vehicles, advance warning vehicles, equipped with appropriate signs and warning lights, may be used upstream of the work space to warn motorists users of downstream work activity.

1.1 When to Use

Use a TMA when shown in the Wisconsin [Work Zone Field Manual](#).

Do not use TMAs in place of a crash cushion to protect blunt ends, temporary/permanent concrete barrier, guardrail ends, etc.

2.0 Equipment Requirement

All TMA's manufactured on or prior to December 31, 2019, shall meet or exceed the requirements of National Cooperative Highway Research Program (NCHRP) Report 350 or Manual for Assessing Safety Hardware (MASH) 2009 Test Level 2 or Test Level 3 as described below for work zone traffic control devices. All TMA's manufactured after December 31, 2019, shall meet or exceed the requirements of MASH 2016.

2.1 TMA

A TMA rated for (NCHRP 350/MASH 2009/MASH 2016 – Test Level 2) may be used on non-freeway roadways with a normal posted speed of 45 mph or less. Test Level 2 TMA's are not permitted for use on all freeways and expressways, and work zones with posted speed limits of 45 mph or greater.

Use a TMA rated for (NCHRP 350/MASH 2009/MASH 2016 – Test Level 3) on freeways, non-freeway roadways, and work zones with posted speed limits of 45 mph or greater. Test Level 3 TMA's may be used on all roadways and work zones regardless of the posted speed limit.

Furnish on the face of the TMA, visible to approaching traffic with high-intensity reflectorized alternating yellow and black stripes, sloping downwards in both directions from the center of the attenuator. See the illustrated MUTCD object marker, OM3-C.

2.2 Shadow Vehicle

Use a shadow vehicle for lane closures on all roadways with posted speeds 45 mph or greater and two or more lanes in each direction. The mass of the shadow vehicle should be similar to the mass of the vehicle with which the TMA was crash tested. Follow the manufacturer's recommendations if a significantly lighter or heavier shadow vehicle is used.

A shadow vehicle may be used in other work zones as deemed necessary. Considered the following factors when determining the need:

- Time of day of the closure;
- Seasonal variations in traffic volume;
- Length of lane closure and anticipated duration;
- Traffic speeds;
- Frequency of traffic stopping/turning movements.

The roll-ahead distance is the space between the shadow vehicle and the work area. This additional space is needed only when a shadow vehicle is used.

3.0 Operation and Placement of TMA

Install, use, and maintain TMAs in accordance with the manufacturer's specifications or as directed by the maintenance supervisor.

3.1 Stationary and Mobile Operation

Securely attach to the vehicle all material loaded onto the vehicle to obtain the required gross weight. Hazardous materials will not be allowed on this vehicle. Materials to be off loaded and incorporated into the maintenance activities are not considered part of the vehicle gross weight.

For all operations when operating the vehicle with the attenuator installed, follow all manufacturer recommendations. In addition for stationary operations, do not mount the TMA on a lift vehicle that is used in an aerial maintenance operation.

3.2 Placement

Refer to the Wisconsin Work Zone Field Manual for proper placement of the TMA. In a traffic control operation, the TMA vehicle should be the first vehicle encountered by the motorist. Some operations may require more than one TMA. The number of TMAs required should be based on the number of lanes closed. An additional TMA may be used on the shoulder of urban freeways and expressways.

The use of a TMA does not preclude or minimize the requirement for proper application of the Department traffic control procedures, devices, and work safety protocols. If there is a need to use TMAs in situations not covered in this policy, placement requirements will be as directed by the maintenance supervisor.

3.3 Operator Training

All employees driving a vehicle equipped with a TMA must be trained in the proper methods of installation, transporting, setup, operations and preventative maintenance of the unit. Prior to operating any equipment, employees shall complete the appropriate required training. To ensure an employee understands his or her responsibility, every operator must successfully demonstrate the proper methods of attaching a TMA to a truck and perform operational and preventative checks and maintenance on the unit.

4.0 TMA Spacing

Take into account the roll-ahead distance when determining safe distances between traffic control trucks and from truck-mounted attenuators (TMAs) to workers on foot. Roll-ahead distances vary greatly depending primarily on the size and speed of the moving vehicle. While roll-ahead distances for passenger cars and pickups generally are not significant, single unit trucks traveling at normal highway speeds can displace a parked TMA more than 100 ft. Tractor-trailer combinations traveling at highway speeds can displace TMAs several hundred feet. This shows the inherent danger for workers on foot in the event of a collision, as they generally are working within this range.

Use the heaviest shadow vehicle to optimize protection of maintenance or construction workers. Because roll-ahead is minimized with heavier shadow vehicles, they can be placed closer to the work space to minimize the risk of vehicles cutting in ahead of the shadow vehicle.

5.0 Urban vs. Rural Settings

Urban versus rural settings have a significant effect on traffic characteristics, driver behavior, and consequently on traffic control practices. Urban motorists drive more aggressively than rural motorists. As a result, urban motorists approach the work zone closer before vacating the closed lane and reenter the lane quickly after passing the work area. Schedule work activities to occur during non-peak hours or nighttime hours to minimize congestion and worker exposure. It is recommended to reach out to the WisDOT Regional Work Zone Engineer for the allowable times.