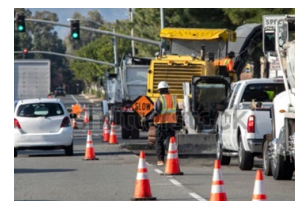# Protective Vehicles

Protective vehicles, including barrier and shadow vehicles equipped with truck-mounted attenuators (TMAs), are essential for maintaining safety in work zones. TMAs are designed to absorb the impact of a collision. Shadow vehicles are typically large and equipped with bright, reflective markings and lights, making the work zone more visible to drivers from a distance. By providing a physical barrier and enhancing visibility, protective vehicles significantly reduce the risk of accidents and injuries in work zones or while moving equipment, making them an essential component of road safety measures. This TIPS provides guidelines on the proper placement and use of these vehicles during various types of operations.

1 **Vehicle Types and Purposes:** Barrier vehicles are used for stationary work operations to protect workers from wayward vehicles and should have a gross weight of at least 24,000 pounds. Shadow vehicles, similar to barrier vehicles, are actively adjusted during operations to maintain safety distances. Advance warning vehicles alert motorists about upcoming work zones and can be occupied or unoccupied.
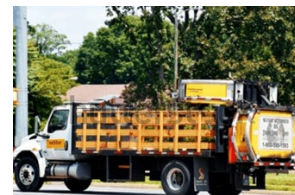
2 **Proper Placement and Spacing:** Roll-ahead distance is needed to prevent the protective vehicle from being pushed into the workspace if hit. This is influenced by the vehicle's weight and traffic speed. To decrease roll-ahead distance and enhance safety, ballast such as sand or gravel to increase the vehicle's gross weight is recommended.

3 **Usage of Impact Attenuators:** Truck mounted attenuators (TMAs) are designed to absorb the impact of vehicles, protecting both work crews and work areas. Factors that determine TMA usage might include traffic volume and speed, the type and duration of work, the presence of heavy machinery for protection, and current crash history data.

4 **Operational Guidelines:** Positioning vehicles should be positioned parallel to traffic with wheels aligned with the lane striping. For mobile operations, maintain appropriate roll-ahead distances, and ensure vehicles are equipped with functional parking brakes. Stationary vehicles should be unoccupied with the parking brake set.

5 **Safety and Compliance:** All work vehicles should be equipped with approved flashing warning beacons that meet or exceed SAE Class 2 Warning Lights standards. Follow local and national guidelines, such as the AASHTO / FHWA Joint Implementation Agreement for Manual for Assessing Safety Hardware (MASH).

LEARN MORE WITH THESE ADDITIONAL RESOURCES:

- Field Guide for the Use and Placement of Shadow Vehicles in Work Zones
- Manual on Uniform Traffic Control Devices – 11th Edition - MUTCD 11th Edition - 2023 (dot.gov)
- Shadow Vehicles for Work Zones