

**KANSAS GUIDELINES  
FOR USE OF  
TEMPORARY POSITIVE  
PROTECTION MEASURES**

*December 2025*



## Definitions

**Motorized Traffic:** All publicly operated vehicles with a motor. Includes cars, trucks, motorcycles, scooters, buses, and vans. This term does not include motorized construction or maintenance vehicles and equipment within the work space.

**Federal-aid Highway Project:** Highway construction, maintenance, and utility projects funded in whole or in part with Federal-aid funds.

**Positive Protection Devices:** Devices that contain or redirect vehicles and meet the applicable MASH (Manual for Assessing Safety Hardware) test level(s) for the intended application and have Kansas Department of Transportation (KDOT) approval prior to use.

**Exposure Control Measures:** Traffic management strategies to avoid work zone crashes involving workers and motorized traffic by eliminating or reducing traffic through the work zone or diverting traffic away from the workspace.

**Other Traffic Control Measures:** Strategies and temporary traffic controls other than Positive Protection Devices and Exposure Control Measures. Includes the use of uniformed law enforcement officers, used to reduce the risk of work zone crashes involving motorized traffic.

**High Operating Speed:** Speeds of 50 mph or higher based on AASHTO guidance and consistent with other KDOT manuals and documents.

**No Means of Escape:** A condition where workers are adjacent to a barrier, bridge parapet or drop off and exposed to motorized traffic that can intrude into the work space.

**Engineering Study:** The analysis of available pertinent information, and the application of appropriate principles, provisions, and practices for the purpose of determining the choice and application of work zone positive protection devices, exposure control measures, or other traffic control measures to manage work zones.

**Work Zone:** An area within the public roadway that is closed to allow construction or maintenance operations to be completed. Work zones can include large and small projects and can include mobile, short-term, and long-term activities.

**Utility Work Zone:** An area within the public roadway where typically utility companies (electric, water, gas, and telecom) are installing or repairing utility facilities. These work zones are often shorter in duration and are often mobile, meaning that they can move from location to location.

## **KANSAS GUIDELINES FOR USE OF TEMPORARY POSITIVE PROTECTION MEASURES**

### **Positive Protection Measures**

The Kansas Department of Transportation (KDOT) follows the guidelines in the *American Association of State Highway and Transportation Officials (AASHTO) Roadside Design Guide*, current edition, the *KDOT Roadside Design Guidelines*, the *KDOT Standard Drawings*, and the *KDOT Highway Sign Manual* when developing strategies mitigate exposure in work zones. Both work zones and utility work zones must comply with this document. As a future goal, KDOT will update the *KDOT Roadside Design Guidelines* and *the KDOT Standard Drawings*, to reflect some of the considerations discussed in this section. KDOT has established a decision-tree shown in **Appendix A** for the consideration of the use of positive protection devices in work zones. KDOT will use positive protection devices in work zones with high anticipated operating speeds that provide workers with no means of escape from motorized traffic intruding into the work space unless an engineering study determines otherwise. KDOT will consider the use of positive protection devices in other situations that place workers at increased risk from motorized traffic, and where positive protection devices offer the highest potential for increased safety for workers and road users.

### **Guidelines for Providing Law Enforcement Services**

- Funding for law enforcement services comes out of a flexible pot of Surface Transportation funds 80% and State funds 20%. The payment for law enforcement is provided by direct reimbursement from KDOT to Kansas Highway Patrol (KHP) governed by the “Agreement Between the Secretary of Transportation of the State of Kansas and the Kansas Highway Patrol” dated August 22, 2006.
- Each district is to supply a list of projects and designated routes scheduled for the year’s construction projects to the Bureau of Transportation Safety.
- The Bureau of Transportation Safety submits a compiled list of projects to the Kansas Highway Patrol who then distributes the information to their regional offices.
- KDOT submits a “Project Authorization and Agreement” form to the Federal Highway Administration (FHWA) every year to renew this program.

### **Exposure Control Measures**

KDOT considers the following strategies to mitigate exposure in work zones:

- Construction phasing
- Longitudinal concrete or steel barriers
- Signing for speed reduction
- Law enforcement
- Intrusion alarm systems for work zones
- Automated flagger systems for flagging operations (Typical drawings available upon request)
- Portable temporary traffic control signals with pilot cars for flagging operations (Typical drawings available upon request)
- Median crossovers
- Perform work when traffic volumes are low
- Accelerated construction techniques to reduce project time and exposure to live traffic
- Truck-mounted attenuators and/or shadow vehicles
- Road closures
- Ramp closures

### **Other Traffic Control Measures**

The following additional Traffic Control Measures are considered on all projects:

- Speed feedback devices
- Temporary curb
- Effective, credible signing
- Changeable message signs
- Arrow panels
- Warning flags and lights on signs
- Longitudinal and lateral buffers
- Rumble strips
- Pilot vehicles
- Intelligent Transportation Systems
- Public information and traveler information data feeds

### **Work Vehicles and Equipment**

Entry and exit for work vehicles and equipment to the workspace are based on individual project characteristics. The Contract Documents may have specific work vehicle entry and exit requirements, including the required use of smart work zone devices. Section 805 of the *Standard Specifications for State Road and Bridge Construction* contains the following: "An alternate traffic control plan may be developed. Such plan requires approval from the District Office or the Bureau of Traffic Engineering before installation. Such approval may take up to 10 business days." Any alternate traffic control plan must include provisions for safe means of work vehicle and equipment entry and exit.

### **Payment for Traffic Control**

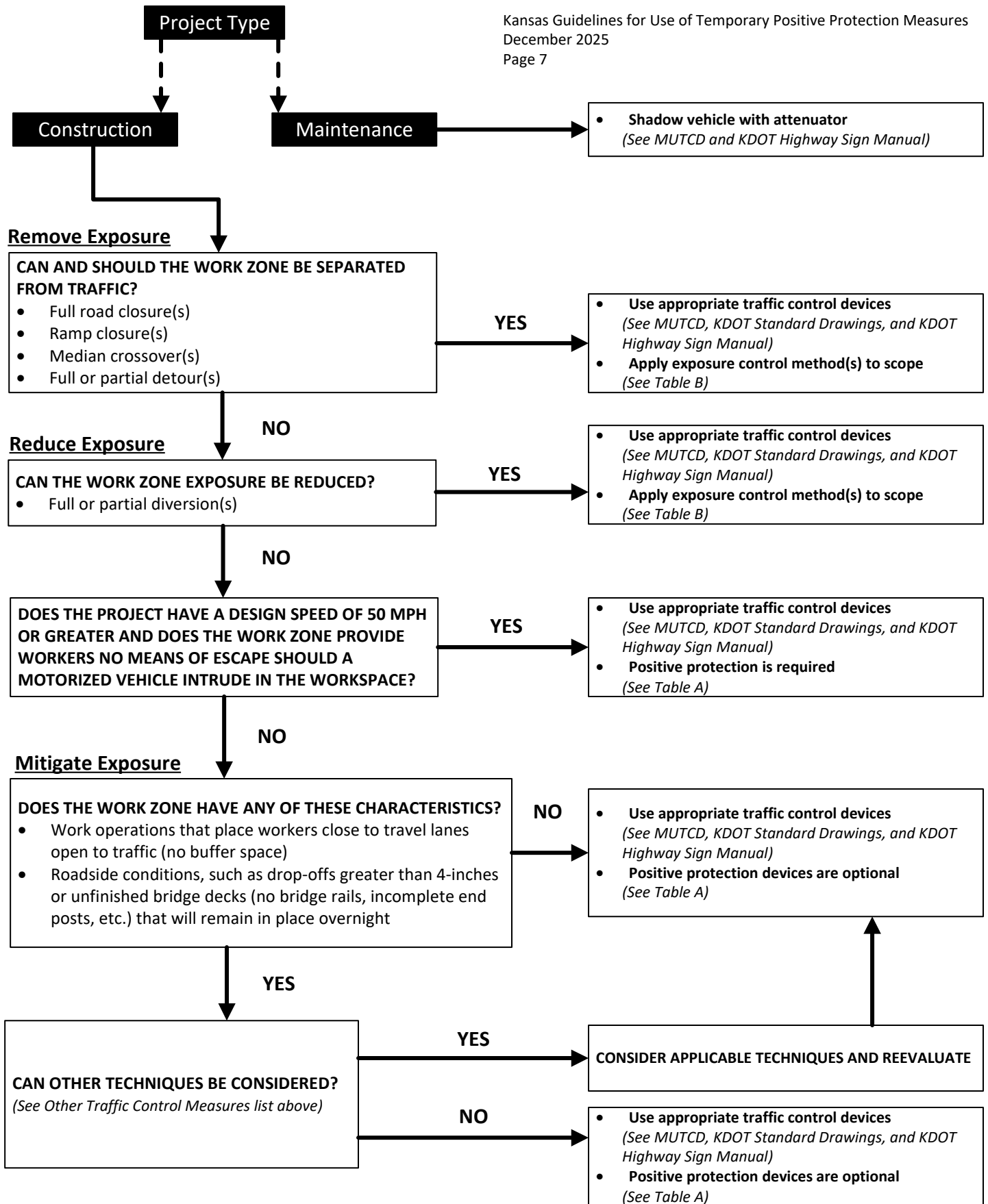
The Kansas Department of Transportation uses appropriate pay item provisions for work zone traffic features and operations. Pay items are provided for major categories of traffic control devices.

### **Maintenance of Temporary Traffic Control Devices**

KDOT has adopted the quality guidelines developed by the American Traffic Safety Services Association (ATSSA). KDOT inspectors perform routine inspections of the temporary traffic control devices during the life of the project.

## **Appendix A**

### **KDOT Positive Protection Flowchart for Temporary Work Zones**



Exposure is a function of the following: Distance from traffic, volume, number of workers, presence of positive protection device, speed, time workers/work zone is in place, roadway work zone geometry, preexisting roadway crash experience

**Kansas Department of Transportation**

**Table A**

***Positive Protection Devices***

Positive Protection Device	Uses	Requirements and Limitations
<b>Temporary Concrete Safety Barrier</b>	Separates the work area from open traffic	Recommended for use on all roadways. Deflection of barrier is up to 2 feet. Pinning barriers to pavement will lessen deflection if anticipated to be over 2 feet.
<b>Ballast-Filled Portable Barriers</b>	Separates the work area from open traffic	Recommended for use on low-speed (design speed of 45 mph or lower) roadways only. High deflection requires large longitudinal buffer area behind barrier.
<b>Steel Barriers</b>	Separates the work area from open traffic	Recommended for use on all roadways. Deflection of barrier is usually less than 3 feet upon errant vehicle impact if anchored.
<b>Moveable Barriers</b>	Separates the work area from open traffic	Recommended for use on all paved roadways. Ideal for dynamic work areas that require shielding for varying widths. Initial costs and on-going operation costs are higher than other barrier types.
<b>Mobile Barriers</b>	Provides longitudinal protection and portable crash cushion for mobile or short-term work zones	Recommended for mobile operations and smaller work areas where a tractor and modified trailer can be used as a longitudinal shield. Work area lateral distance and material/equipment delivery may be limited depending on the location of the project.
<b>Truck/Trailer Mounted Attenuators</b>	Provides a portable cushion to shield the mobile or short-term work area	Recommended for mobile operations and smaller work areas where a truck and trailer can be used as a shield. Roll forward distance is necessary to allow system to perform as intended.
<b>Vehicle Arresting Systems</b>	Captures an errant vehicle prior to entering the work area	Recommended at the entrance of work areas where a flare cannot be created using a longitudinal barrier system. Arresting systems require attachment to a longitudinal barrier system and a backup arresting net in the event that a vehicle is captured.

Note 1: All barriers listed as Positive Protection Devices, except truck mounted attenuators, require the use of a crashworthy end treatment.

Note 2: All devices listed, including their end treatments, shall be approved by KDOT prior to use.

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**Table B**

***Exposure Control Measures***

Measure to Remove / Reduce Exposure	Definition	KDOT Policy, Guidance, Standards, or Specifications
<b>Full road closure(s) / detour(s)</b>	Complete closure of the roadway. Only work vehicles and local traffic (where available) are allowed access.	TE 704, TE 705, TE 780, KDOT Detours, Highway Sign Manual, SOM 1.11.4
<b>Highway ramp closure(s)</b>	Similar to "full road closure(s)" except for either an on- ramp or off-ramp of a highway.	Project specific layouts are developed when this is necessary. No standard drawings are available.
<b>Median crossover(s)</b>	A "break" in the median to access contra-flowed lane(s).	TE 740 and TE 742
<b>Full or partial diversion(s)</b>	Use of a temporary road to divert traffic around the work area.	TE 736 and TE 737 See shoofly guidance in the KDOT Road Design Manual
<b>Performing work when traffic volumes are low</b>	Night closures and rescheduling the work hours when errant vehicle occurrences are less likely to occur.	Lane Closure Chart
<b>Accelerated construction to reduce project time</b>	Reducing the project time to minimize worker exposure to traffic.	
<b>Speed feedback devices</b>	Electronic signs that display a driver's current speed to promote adherence to speed limits and enhance road safety.	Project special provisions
<b>Temporary Curb</b>	A removable barrier used to control traffic flow and enhance pedestrian safety during roadworks or temporary events.	Project special provisions
<b>Effective, credible signing</b>	The use of clear, visible, and accurate traffic signs that are trusted by drivers and encourage compliance with traffic regulations.	TE 704, TE 710, TE 780, and Section 805 of the Specifications
<b>Changeable message signs</b>	Electronic displays used to convey real-time information to drivers about traffic conditions, roadwork, or emergencies.	Section 805 of the Specifications
<b>Arrow panels</b>	Portable, mounted signs that direct traffic by indicating lane closures or detours with illuminated arrow signals.	Section 805 of the Specifications
<b>Warning flags and lights on signs</b>	Supplemental devices used to enhance the visibility of signs and draw attention to critical road conditions or hazards.	TE 710

Measure to Remove / Reduce Exposure	Definition	KDOT Policy, Guidance, Standards, or Specifications
<p><b>Longitudinal and lateral buffers</b></p>	<p>Designated areas used to separate moving traffic from road work zones to protect workers and drivers.</p>	
<p><b>Rumble strips</b></p>	<p>Portable, grooved or raised strips placed on road surfaces to alert drivers with noise and vibration changes, typically used in work zones or temporary traffic control areas to enhance safety.</p>	<p>TE 732</p>
<p><b>Pilot vehicles</b></p>	<p>Lead vehicles that guide traffic through construction zones or other areas where normal navigation is disrupted, ensuring safe passage.</p>	<p>Section 805 of the Specifications</p>
<p><b>Intelligent Transportation Systems</b></p>	<p>Advanced applications that provide innovative services for traffic management and information to improve the efficiency, safety, and overall performance of transportation networks.</p>	
<p><b>Public information and traveler information data feeds</b></p>	<p>Data feeds that deliver real-time updates and essential travel-related information to the public through various platforms, such as websites, apps, and broadcast media.</p>	<p>KanDrive, WICHway, Kansas City SCOUT</p>