

**Road Construction Worker Safety**  
**(2021 JCR, p. 73)**

**A Report to the Maryland General Assembly**

**September 2021**

Maryland Department of Transportation  
State Highway Administration

## Overview

The Maryland Department of Transportation State Highway Administration (MDOT SHA) submits the following report in response to committee narrative contained in the 2021 Joint Chairman’s Report (JCR). The language states:

*The committees request that the State Highway Administration (SHA) provide a report summarizing the measures utilized to keep workers safe. The report should include a discussion of specific measures used to protect workers working in trenches.*

MDOT SHA is dedicated to keeping every employee and private sector partner safe along Maryland’s Highways and achieving “Vision Zero”.

While the total number of work zone crashes in 2019 is the highest since 2015, the 2019 fatal crashes reflect a downward trend that began in 2017 (refer to Table 1). Construction worker fatalities ranged from zero to two fatalities per year between 2015 and 2019. Preliminary data for 2020 shows six fatal crashes and two construction worker fatalities. This data is available to MDOT SHA on a year delay because it must be processed and analyzed by the Maryland State Police first.

**Table 1. 2015-2019 Construction/Maintenance Zone (Work Zone) Crashes Statewide**

Source: MDOT Maryland Highway Safety Office Crash Database

Category	Year					5 Year Total	5 Year Avg.
	2015	2016	2017	2018	2019		
<i>Fatal Crashes</i>	<u>6</u>	<u>6</u>	<u>14</u>	<u>10</u>	<u>7</u>	<u>43</u>	<u>9</u>
Total of All Fatalities	6	6	14	11	7	44	9
Construction Worker Fatalities	2	1	2	2	0	7	1
Injury Crashes	425	480	474	440	461	2,280	456
Total Number Injured	627	699	707	664	694	3,391	678
Property Damage Only Crashes	996	1,083	1,085	1,049	1,209	5,422	1,084
<b>Total Crashes</b>	<b>1,427</b>	<b>1,569</b>	<b>1,573</b>	<b>1,499</b>	<b>1,677</b>	<b>7,745</b>	<b>1,549</b>

MDOT SHA has a robust work zone safety program to protect both workers and road users that incorporates engineering, enforcement, training, and education. The elements of the work zone safety program outlined below are used to protect workers in trenches as well as a variety of other work zone environments.

## Engineering

MDOT SHA has standards, specifications, and guidelines for temporary traffic control design and implementation to ensure the safe and efficient movement of road users through or around construction activities while protecting construction workers, equipment, and activities.

Traffic Control Plan (TCP): For every construction and maintenance activity, MDOT SHA requires the development and implementation of a Traffic Control Plan (TCP) that guides traffic past, around, and through work zones safely. TCPs must follow MDOT SHA standards and guidance for the layout and placement of traffic control devices, markings, and signs.

MDOT SHA provides standards and guidance on developing TCPs in the Maryland Manual on Uniform Traffic Control Devices (MdMUTCD), the Standard Specifications for Construction and Materials, and in the Book of Standards for Highway and Incidental Structures. Depending on the project's complexity, a TCP may be project specific or may reference a Temporary Traffic Control Typical Application (TTCTA) from the Book of Standards. For significant projects, which are those projects that are anticipated to cause sustained work zone impacts greater than what is considered tolerable, MDOT SHA also requires the development of a Transportation Management Plan (TMP), which involves the development of strategies to manage work zone impacts and public information and outreach, in addition to developing a TCP.

Standards, Specifications and Guidelines: MDOT SHA routinely reviews work zone standards, specifications, and guidelines to ensure they reflect national standards and recommendations, best practices, new technologies, and MDOT SHA policies and practices. Examples of these efforts include:

- In 2016, to provide safer work zones for construction and maintenance workers, MDOT SHA issued new requirements for the increased use of protection vehicles with truck or trailer-truck mounted attenuators on roadways with a posted speed limit of 55 mph or greater.
- In 2021, guidelines were issued on the use of Automated Flagger Assistance Devices (AFADs). AFADs consist of a trailer-mounted, mechanized stop/slow paddle and gate arm which are operated by certified flaggers. AFADs enable the flagger to be positioned out of the lane of traffic, thereby reducing their risk of being struck by a vehicle.

Inspections: MDOT SHA Temporary Traffic Control Inspectors rotate throughout the state conducting randomized work zone inspections. The inspectors help ensure temporary traffic control is set up consistently and safely throughout the state. Each work zone is inspected and rated on its compliance with MDOT SHA standards and guidelines. Inspection reports are provided to the contractors to correct any issues found in the temporary traffic control set-up. If a major flaw is found in the temporary traffic control, the inspector has the authority to stop work immediately until it is corrected. In 2020, MDOT SHA conducted 4,752 work zone inspections. Of those inspections, 97% received a grade of "B" or better.

Qualified Products List (QPL): MDOT SHA's Office of Traffic and Safety (OOTS) maintains a Qualified Products List (QPL) for Temporary Traffic Control materials, products, and devices. The materials, products and devices that are approved on the QPL are thoroughly evaluated by OOTS staff in accordance with the latest MDOT SHA, MdMUTCD, American Association of State Highway and Transportation Officials (AASHTO), and Federal Highway Administration (FHWA) specifications, standards, and guidelines for work zones safety. MDOT personnel and contractors must source approved materials, products, and devices from the QPL for temporary

traffic control applications, ensuring that the devices used in work zones meet applicable safety standards.

## **Enforcement**

Coordination with Maryland State Police: MDOT SHA has a memorandum of understanding (MOU) with the Maryland State Police (MSP) to provide law enforcement services in work zones. This MOU establishes a procedure for the use of MSP when additional safety and a more forceful presence is deemed necessary (see attached MSP WZTC Services). The presence of MSP on a construction site has proven to be useful to assure the safety of workers as well as the traveling public.

Situations when MSP should be considered for use include but are not limited to:

- High speed interstate highways
- High traffic volumes
- Intersection work
- Complex traffic switch work

Automated Speed Enforcement: MDOT SHA utilizes Automated Speed Enforcement (ASE) as an enforcement tool in work zones. The Maryland SafeZones ASE program began in 2009 with the goal of encouraging a change in driver behavior in work zones. ASE supplements police enforcement in work zones, where space restrictions often limit traditional speed enforcement activities. In work zones where deployed, ASE has been tremendously effective in slowing traffic down, as evidenced by the drop in the percentage of violations at these work zones from 7 percent when the program first began to a sustained average of less than 1 percent. Since the inception of the program, SafeZones has been deployed at 98 enforcement locations in work zones on Interstates, National Highways and Maryland State Routes.

## **Training**

All MDOT SHA personnel, contractors, and consultants involved in the development, design, implementation, operation, inspection, and enforcement of work zone related transportation management and traffic control are required to be trained commensurate with their level of responsibility. This training is provided by MDOT SHA and outside sources. Examples of training include:

Temporary Traffic Control Managers Course (TTCMC): The Temporary Traffic Control Managers Course (TTCMC) provides instruction on the fundamentals of temporary traffic control, MDOT SHA standards and specifications, and TTCTAs. The TTCMC training is provided by MDOT SHA in collaboration with the Maryland Transportation Builders and Materials Association (MTBMA) can be accessed [online](#). This training is required for all Traffic Control Managers and is recommended for field supervisors and crew leaders. The TTCMC must be successfully completed every 4 years to maintain certification. In December 2020, MDOT SHA released an online version of the TTCMC to expand accessibility to the course. In the first 6 months the online course was available, over 1,400 people enrolled in the course.

Flagger Training: MDOT SHA requires that flaggers be certified through the American Traffic Safety Services Association (ATSSA) flagger certification training course every 4 years. This course provides instruction on standard flagger control reference, proper flagging signal procedures, and standard flagger practices for various situations.

Law Enforcement Officer Training: All law enforcement personnel who may be assigned to provide services in a work zone are required to complete MDOT SHA's Work Zone Law Enforcement Training Course. This training course is valid for a period of 4 years and teaches law enforcement how to safely operate within a work zone.

## **General Operations and Policies**

### *General Lane Closures*

The general procedure for performing work on any MDOT SHA roadway begins with the entity which needs to access the roadway filing a "Lane Closure Request Permit". MDOT SHA District offices have a procedure in place for approval and tracking of lane closure requests which operates in conjunction with MDOT SHA's Statewide Traffic Operations Center (SOC). Upon approval of the permit, a tracking number is assigned to that permit. When work requires a lane closure, the onsite Traffic Control Manager is required to call SOC to activate the permit and again call to SOC to deactivate the permit when the roadway is clear. Between 2018 and 2020, MDOT SHA and the Maryland Transportation Authority (MDTA) activated roughly 46,000 lane closure permits per year, averaging 126 daily. The majority of the permit activations were from MDOT SHA (about 75 percent).

### *Traffic Control Manager*

MDOT SHA requires that whenever work requires a lane or shoulder closure an approved Traffic Control Manager (TCM) must be on site. The TCM is to be fully trained and certified to supervise and implement all Maintenance of Traffic (MOT) within the work zone. The TCM is responsible for deciding what type of lane closure is required and which typical standard from the MDOT SHA Book of Standards best meets the needs of a given situation. The TCM should also be versed enough in MOT work that he/she would be capable of making reasonable decisions regarding situations not specifically noted in the standards and plans, such as driveways, intersections, etc.

### *Pre-traffic Switch Meetings*

On projects requiring realignment of traffic ("traffic switch"), a Pre-Traffic Switch Meeting should be held to discuss the upcoming events (see attached 07220.100.04). Often, traffic switch work is very complex and may involve several entities working together simultaneously to complete a successful traffic switch. Once work begins on a traffic switch it must be completed in its entirety, since an incomplete traffic switch will lead to hazardous conditions for the drivers and road workers. Therefore, it is imperative that a holistic approach to implementing the upcoming switch be discussed at the Pre-Traffic Switch Meeting.

Items of work that may need discussion are:

- Start stop/times
- Lane closure requirements
- Removal and reset of temporary barrier wall
- Paving for grade adjustments between construction phases
- Adjustment of traffic signals

### *Removal of Lane Closures (Tear Down)*

Procedures are in place for the safe removal of daily lane closures at the end of the work shift and are just as critical to safety as original setup. If warranted by speed and/or traffic volume an attenuator truck should be used between oncoming traffic and the take down crew (see attached 104.23 specification and standard 104.01-19D). In general, MOT devices are removed in the opposite order as they were installed (i.e. cones then arrow panel and lastly signs). This procedure is incorporated into the TTCMC training.

### *Technology Innovations*

MDOT SHA is using innovative new technology to provide real-time information about construction and maintenance events, which can help automated driving systems and humans navigate safely and efficiently through construction work zones. Examples of these technology innovations include:

- In January 2021, Maryland was one of 13 states awarded funds from the USDOT FHWA Work Zone Data Exchange (WZDx) Demonstration Grant to go towards MDOT SHA. Funds are being used to convert Maryland's work zone data feeds to a national best practice to accelerate the adoption of a single feed format that Original Equipment Manufacturers (OEMs) can track in [real-time](#).
- MDTA is piloting a connected arrow panel, which will provide a real time data feed for third party use that communicates the location and message on the arrow panel.
- MDOT SHA piloted the use of technology that communicates to Waze in real-time of our presence in the roadway. MDOT SHA may incorporate reporting to Waze in specifications for work zones in the near future.
- MSP uses [Drivewyze](#) to notify truck drivers of significant safety concerns locations, which can include work zones.

### **Education**

MDOT SHA is, and will continue to be, committed to protecting roadside workers by proactively educating the public and motorists year-round on the importance of driving safely in work zones and moving over when approaching first responders assisting other motorists. MDOT SHA does this by utilizing partnerships with other government agencies, non-profit organizations, and industry members; leveraging relationships with members of the media; and using owned resources including our website and social media platforms. MDOT SHA's Office of Communications actively and regularly communicate safe driving messages with our more than 72K followers on Facebook and more than 61K followers on Twitter and Instagram using factual data, engaging videography, and emotional testimony. Work Zone Safety Month and the

anniversary of Maryland’s “Move Over” law provides additional opportunities to reach motorists and change behaviors.

#### *Work Zone Safety Month*

- National Work Zone Awareness Month takes place in April. To reach motorists MDOT SHA’s Office of Communications issued a press release, secured a proclamation from Maryland Governor Larry Hogan and pitched stories to the news media.
- Social media toolkits were created for other MDOT Transportation Business Units (TBU’s) and our partners to use that featured safety messages and graphics. Messages included: Focus in Work Zones, Drive Like You Work Here, Work Zone Safety is in Your Hands, Slow Down and Stay Alert in Work Zones, Move Over. Social media was scheduled for every day in April.
- MDOT SHA promoted “Go Orange Day”, a day devoted to flooding social media with photos of our staff, their family members and even their pets wearing orange in support of work zone safety. Local news reporters also wore orange on this day.
- Banners were provided to MDOT SHA locations and MDOT MVA facilities.
- MDOT SHA Administrator Tim Smith and MDOT Motor Vehicle Administrator Chrissy Nizer participated in a Facebook video discussing work zone safety.

#### *Move Over*

- October 1 is the anniversary of Maryland’s “Move Over” law. Each year, MDOT SHA leverages this day and the entire month of October to remind motorists via social media and overhead message boards to move over when they approach a first responder on the roadside.
- MDOT SHA also created in-house videos interviewing CHART drivers and their families on the dangers our employees face and the fears family members have because motorists are not moving over or slowing down when they approach first responders on the side of the road.

#### **Conclusion**

MDOT SHA maintains a robust work zone safety program. Every day, hundreds of MDOT SHA employees and contractors work in hazardous conditions on the sides of busy interstates and suburban arterials alike. MDOT SHA takes this responsibility seriously and values the hard work of each of these dedicated public servants. As we look toward the future, it is our hope that Maryland can truly become a “Vision Zero” state, in part by diligently employing the strategies discussed here and continuing to update and improve these practices over time.