

PENNDOT'S WORK ZONE INITIATIVES

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LANE RESERVATION SYSTEM

LANE RESERVATION SYSTEM

Make a reservation

Party Size
4 people

Date: Mar 4, 2022 Time: 5:00 PM

Find a time

Select a time

3:30 PM



Lane Reseration System

MAJOR PENNSYLVANIA

LANE NAME

A map of Pennsylvania showing major highways and several orange location pins indicating reservation points. A sidebar on the left shows a Pennsylvania state shield with the number 49 and a table with columns for 'LANE TIME' and 'TIME'.

LANE TIME	TIME
1 36 30	

LANE RESERVIATIONS

LANE NUMBER	RESERVIATIONS
10	RESERVIATIONS
11	RESERVIATIONS
12	RESERVIATIONS
13	RESERVIATIONS
14	RESERVIATIONS
15	RESERVIATIONS
16	RESERVIATIONS
17	RESERVIATIONS
18	RESERVIATIONS
19	RESERVIATIONS
20	RESERVIATIONS

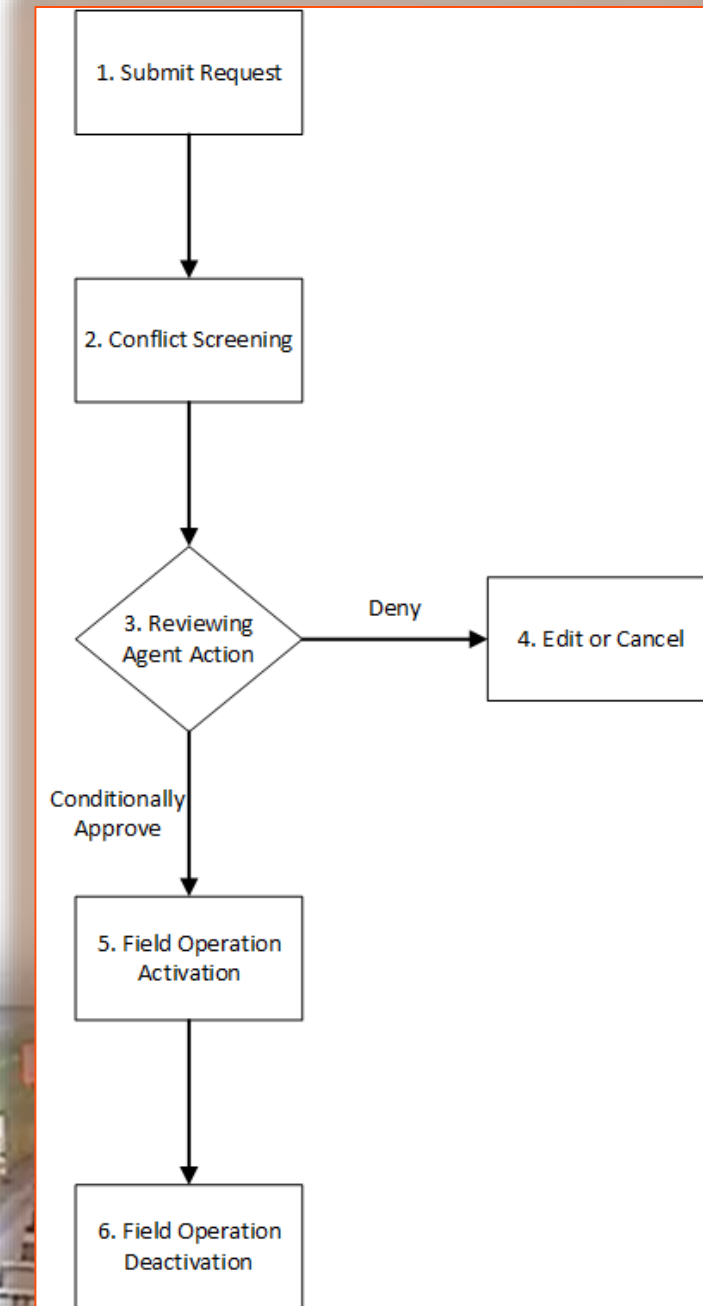


LANE RESERVATION SYSTEM

- LaneRez will be a web-based platform to schedule, coordinate, and track work zone activities on state highways
- Mobile compliant site for field personnel to easily activate/deactivate work zones instead of calling TMC
- LaneRez entries will be required for all lane/shoulder closures on freeways and expressways

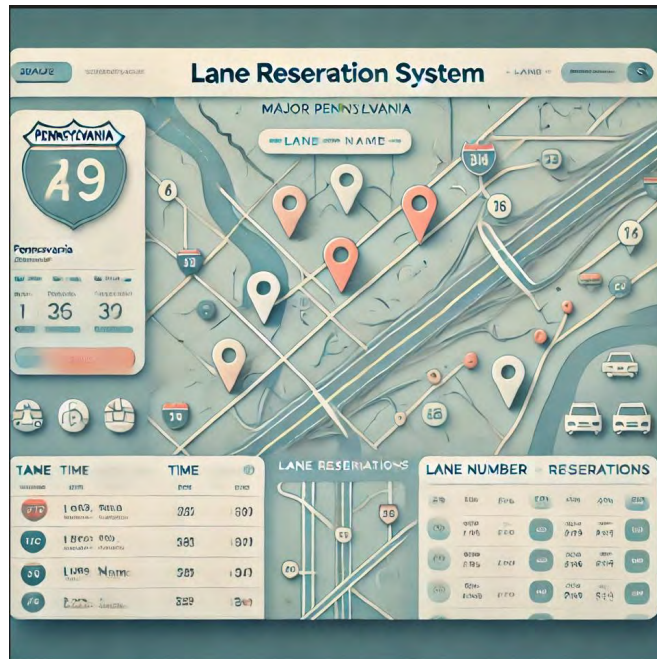
Exhibit 6-15 Planned Work Reporting Timeframes and Requirements

Roadway Type	LaneRez Reporting Type	Reporting Timeframe	TTC Condition		
			Full Road Closure	Lane Closure / Lane Restriction	Shoulder Closure
Freeways and Expressways	Request Submission	14 days before work is activated	REQUIRED		
	Operation Activation	15 minutes			
	Operation Deactivation	Immediately upon conclusion			



LANE RESERVATION SYSTEM

Map landing page to view work zones



LaneRez will screen against conflicts:

- Holidays
- Location to other work zones
- LaneEval
- Special events
- Oversize / overweight restrictions

Entering requests

Recurring Request Schedule:

Detour Information:
Detour via River Rd and Green St. Follow signs for alt...

Associated Lane(s):

+

✓

○

+



LANE RESERVATION GO-LIVE

**LaneRez
Draft Policy**
Winter 23/24

**Event Mgmt
Testing**
Spring/Summer 24

**Event Mgmt
“Go-Live”**
Fall 24

**Construction &
Maintenance
Testing**
Spring/Summer 25

**LaneRez
Limited Access
“Go-Live”**
Spring/Summer 25



**Event Mgmt Design
And Development**
Fall 23
Winter 23/24

**LaneRez Design and
Development**
Fall 24
Winter 24/25

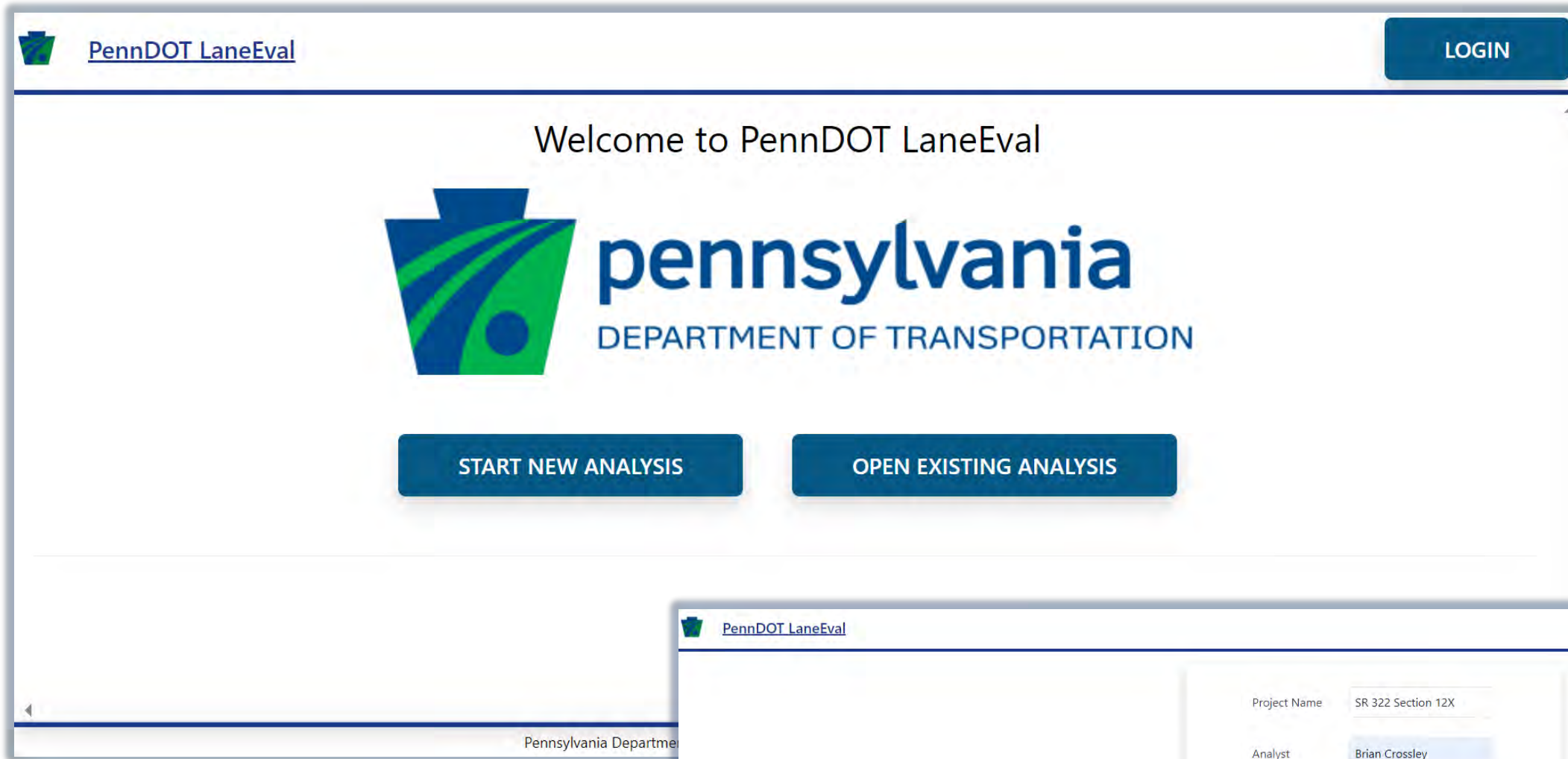
**Policy
Finalized
And Training**
Winter 25

**LaneRez
Power User
Testing**
Spring 25



LANE EVALUATION (LANEEVAL) AND WORK ZONE BUILDER APPLICATION


LANE EVALUATION SYSTEM



PennDOT LaneEval

LOGIN

Welcome to PennDOT LaneEval

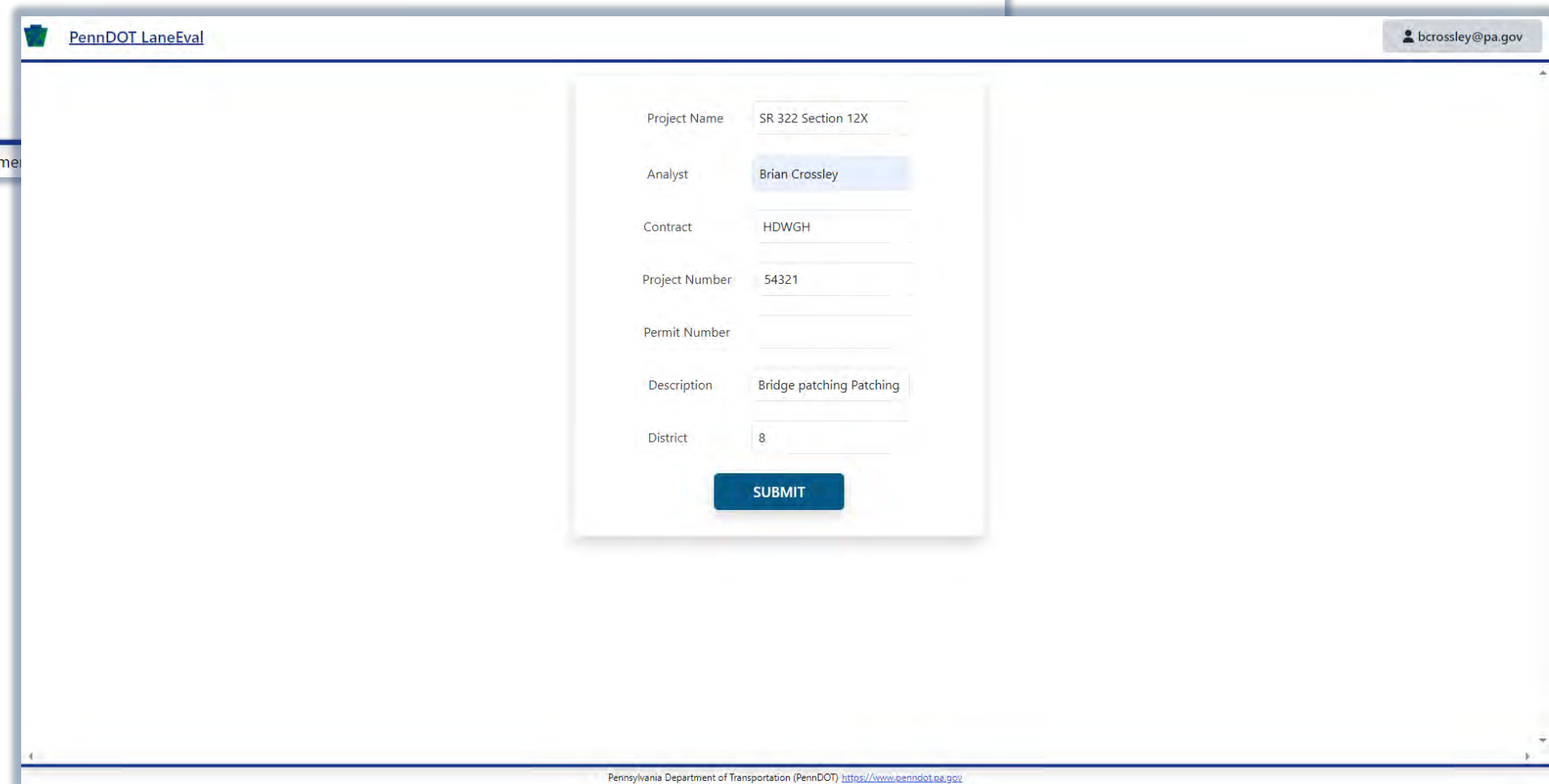


pennsylvania
DEPARTMENT OF TRANSPORTATION

START NEW ANALYSIS

OPEN EXISTING ANALYSIS

Pennsylvania Department



PennDOT LaneEval

bcrossley@pa.gov

Project Name: SR 322 Section 12X

Analyst: Brian Crossley

Contract: HDWGH

Project Number: 54321

Permit Number:

Description: Bridge patching Patching

District: 8

SUBMIT

Pennsylvania Department of Transportation (PennDOT) <https://www.penndot.pa.gov>



LANE EVALUATION SYSTEM

PennDOT LaneEval Analysis Name: SR 322 Section 12X Unpublished brcrossley@pa.gov



Select Project Boundaries

Functional Class: US Route
Route: US 322
Direction: Westbound

CLEAR SELECTION

From: Westbound US 22 @ 32.88
To: Westbound US 22 @ 35.05


Total Segment Num: 6
Total Length: 2 miles

NEXT

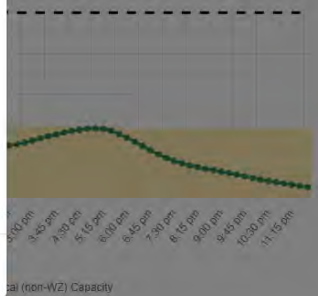
Pennsylvania Department of Transportation (PennDOT) <https://www.penndot.pa.gov>

Analysis Name: SR 322 Section 12X Unpublished brcrossley@pa.gov

Work Zone Conditions: Primary



At or Over Capacity (V/C ≥ 0.95)



Demand Details

Mainline AADT: 16396 veh/day
Facility Truck Percentage: 2.25 %
Mainline Volume Profile: Local Count Station: 1310594610

Facility-wide Volume Multiplier: 1

Capacity Details

Segment Capacity Adjustment Multiplier: 1

Segment Details

Facility Area Type: Urban Area
Base (no WZ) number of lanes: 2 lanes
nonWZ Speed Limit: 50 mph

Work Zone Details

WZ Lateral Distance: 0 ft
WZ Speed Limit: 45 mph
Work Zone Side: Right

Work Zone Crossover or Lane Split: False
Lane Shift: No Lane Shift
Lane Width: 11 ft

Save & Close

Pennsylvania Department of Transportation (PennDOT) <https://www.penndot.pa.gov>



LANE EVALUATION SYSTEM

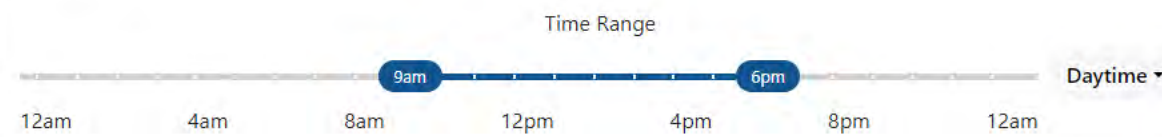


SEG 1 SEG 2 **SEG 3** SEG 4 SEG 5 SEG 6 Summary

Segment Type: **Off-Ramp**
Number of Lanes: **2**
Off Ramp AADT: **0**

[View/Edit Advanced Inputs](#)

Number of Lane Closed: **1 Lane Closure**
Separation Type: **Cones/Barrels**

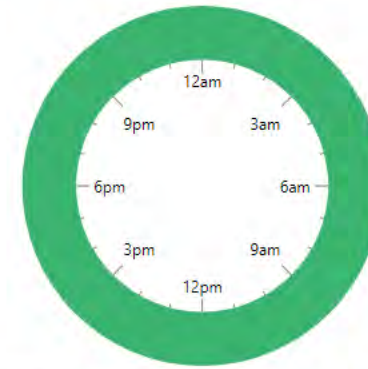


[Apply To All Segments](#)

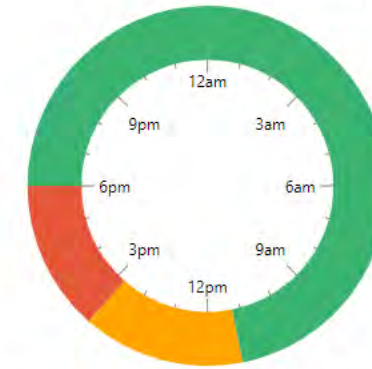
[BACK](#)

Demand to Capacity Ratio

Existing Conditions

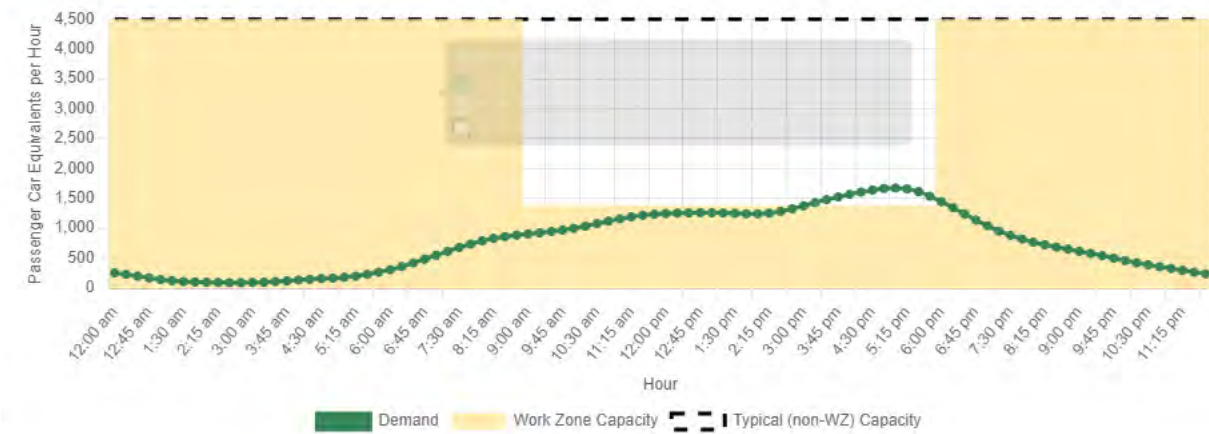


Work Zone Conditions: Primary

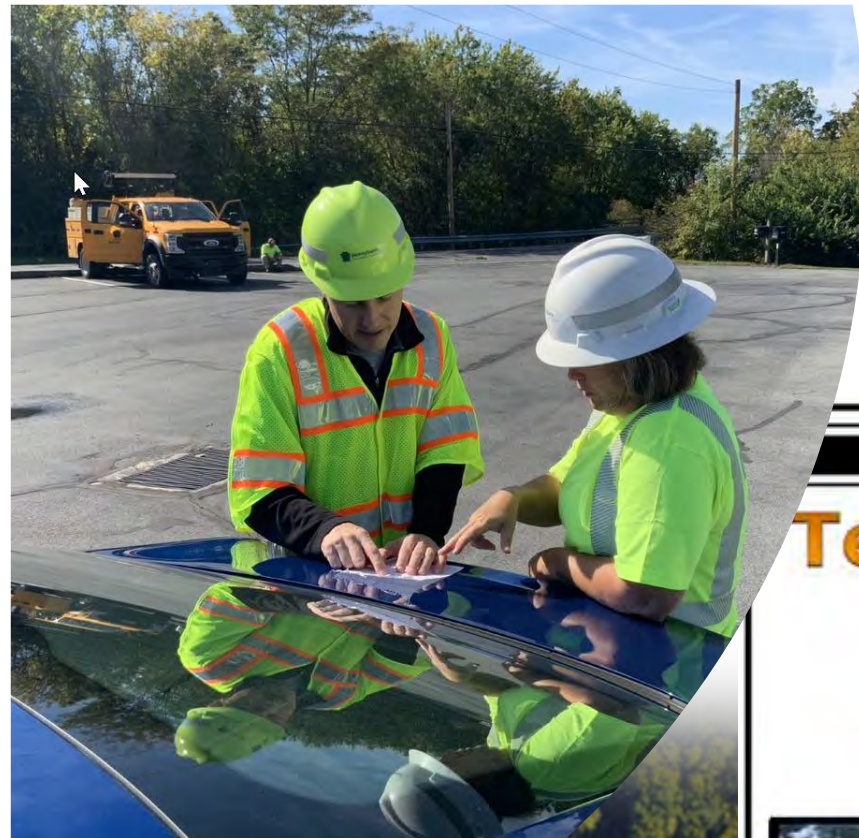


● Under Capacity (V/C < 0.85) ● Near Capacity (0.85 ≤ V/C < 0.95) ● At or Over Capacity (V/C ≥ 0.95)

Demand & Capacity Chart



WORK ZONE BUILDER APPLICATION



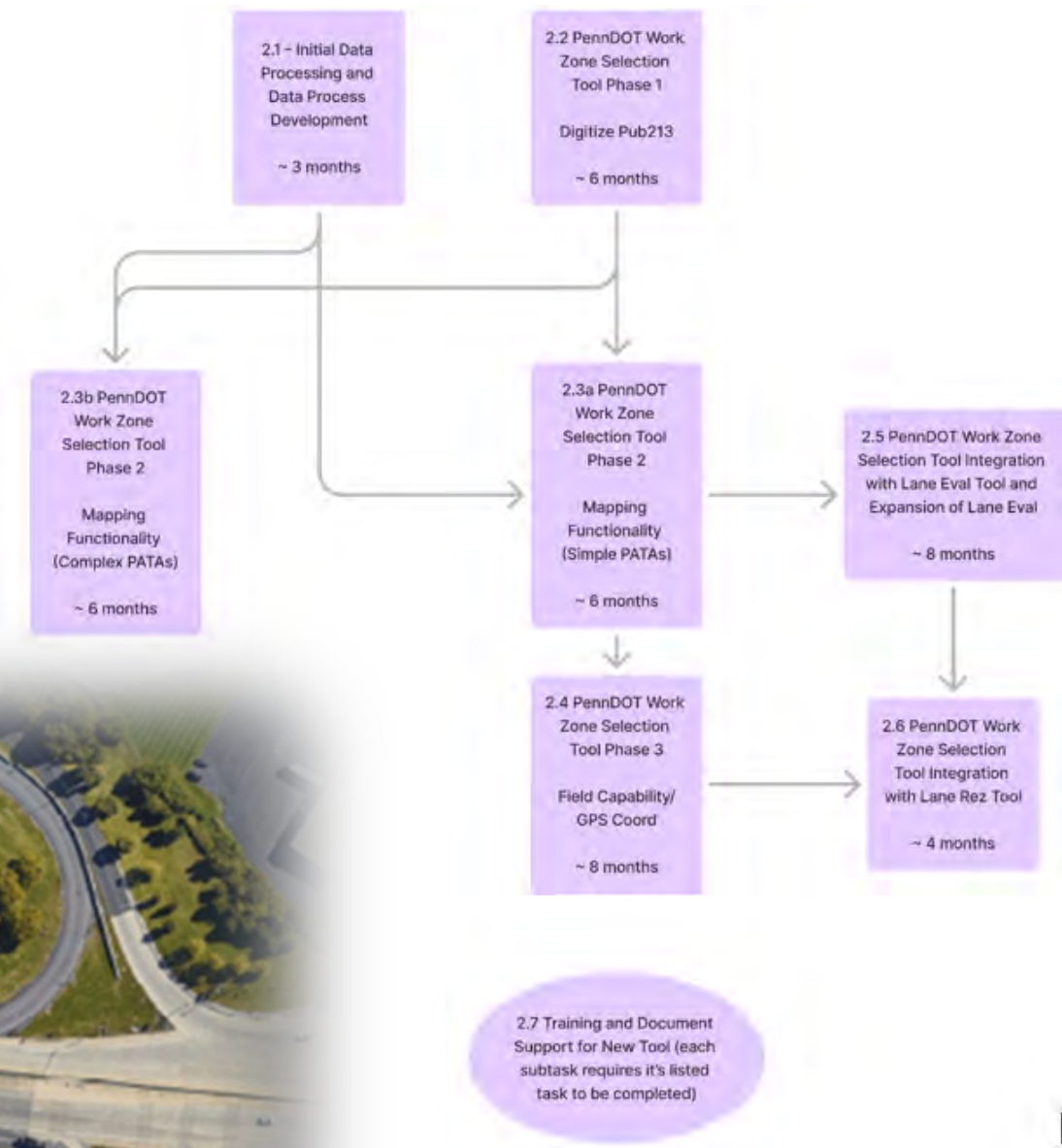
Bureau of Maintenance and Operations

Temporary Traffic Control Guidelines

Publication 213

pennsylvania
DEPARTMENT OF TRANSPORTATION

PUB 213 (03/21)



VIRTUAL QUEUE PROTECTION

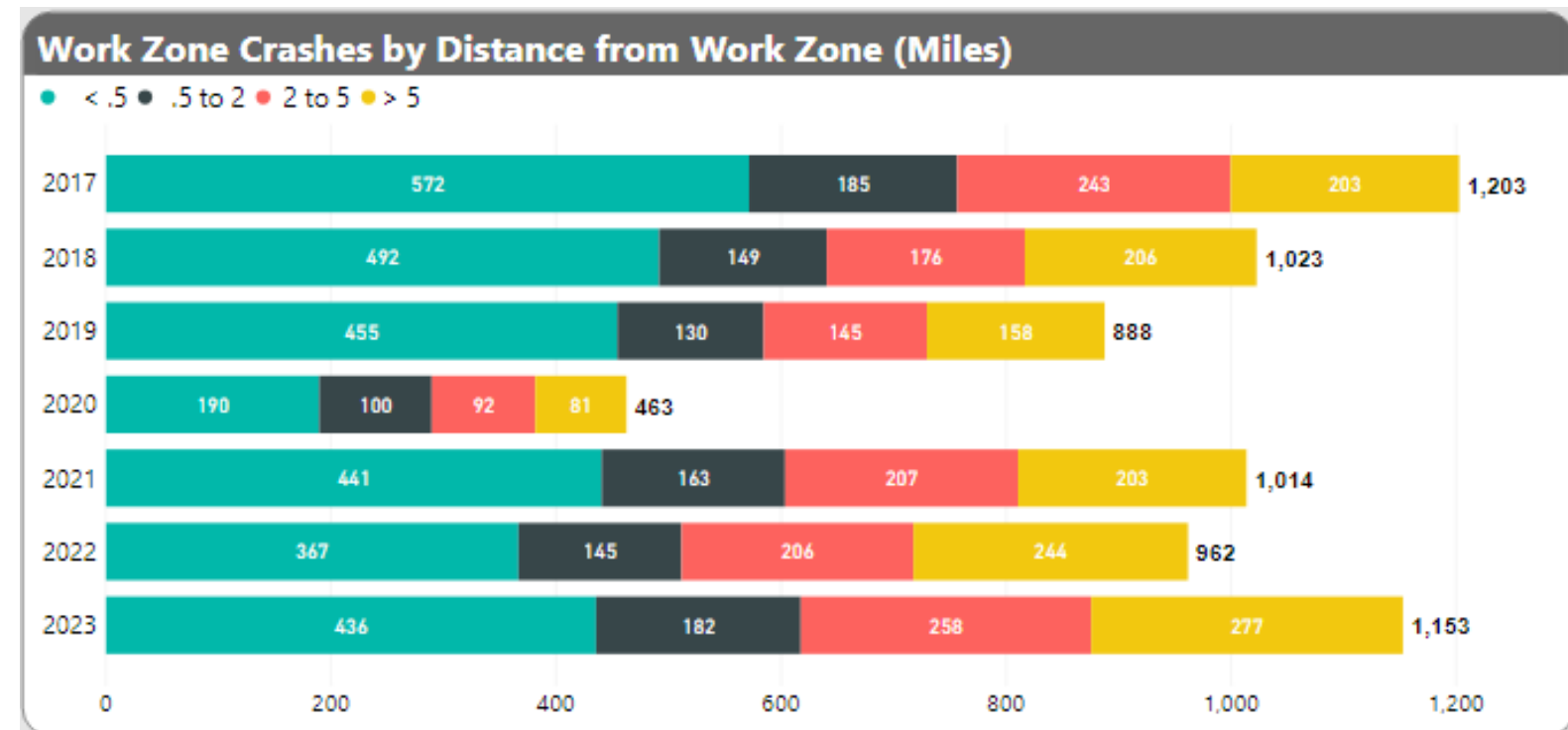
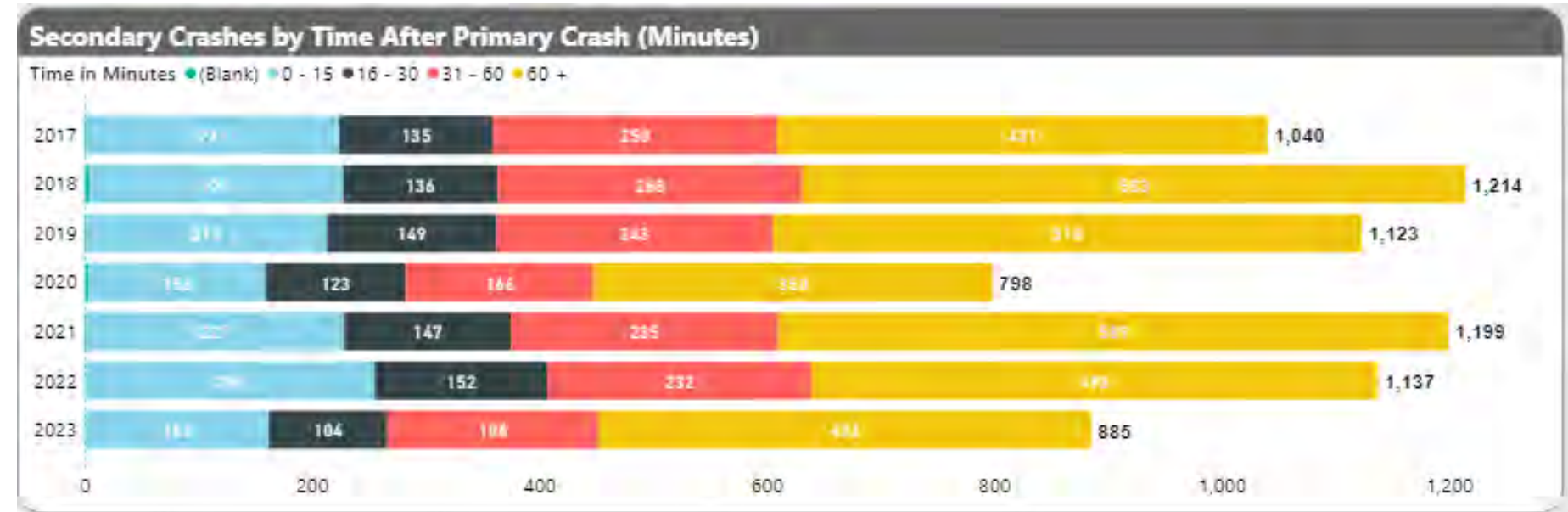
THE CASE FOR QUEUE PROTECTION

~7000 crashes annually
in existing congestion

~1000 work zone
congestion crashes

~1000 secondary
crashes

CMS available to warn in
90%+



WHAT IS VIRTUAL QUEUE PROTECTION?

Automated messaging on CMS

- Alerts motorist to traffic queuing

Powered by INRIX speed data

- Data is available statewide
- No need for equipment deployment

Can be implemented anywhere CMS are present

- Must be connected to ATMS



2024 DEPLOYMENTS



~ 600 miles of roadway covered

5700+ work zone events and 4400+ incidents occurred in corridors (As of April 2024)



ANALYSIS BACKGROUND

11 Corridors with at least 1 year before/after data

- Before: From 1/1/2021 to activation
- After: From activation to 12/31/2023

Convert data to annual averages



RESULTS - SAFETY

10% annual reduction in total crashes

14% annual reduction in rear end crash

35% annual reduction in fatal crashes

- 46% reduction in fatal truck crashes

12% annual reduction in injury crashes

- 15% reduction in injury truck crashes

\$53 million annual reduction in crash costs to society

Overall Reductions per Year			
Category	Passenger Vehicle Crashes	Truck Crashes	Total
Total Crashes	119	64	183
Rear End Crashes	58	38	96
Fatal Crashes	1	6	7
Injury Crashes	43	43	86
Crash Cost	\$25,187,703	\$28,252,664	\$53,440,367



RESULTS - MOBILITY

72K+ annual reduction in vehicle travel times

- 109K reduction in person travel times

\$2.2 million annual travel time cost savings

\$300K annual vehicle operation cost savings



RECOGNITION

2024 AASHTO Regional
America's Transportation
Award

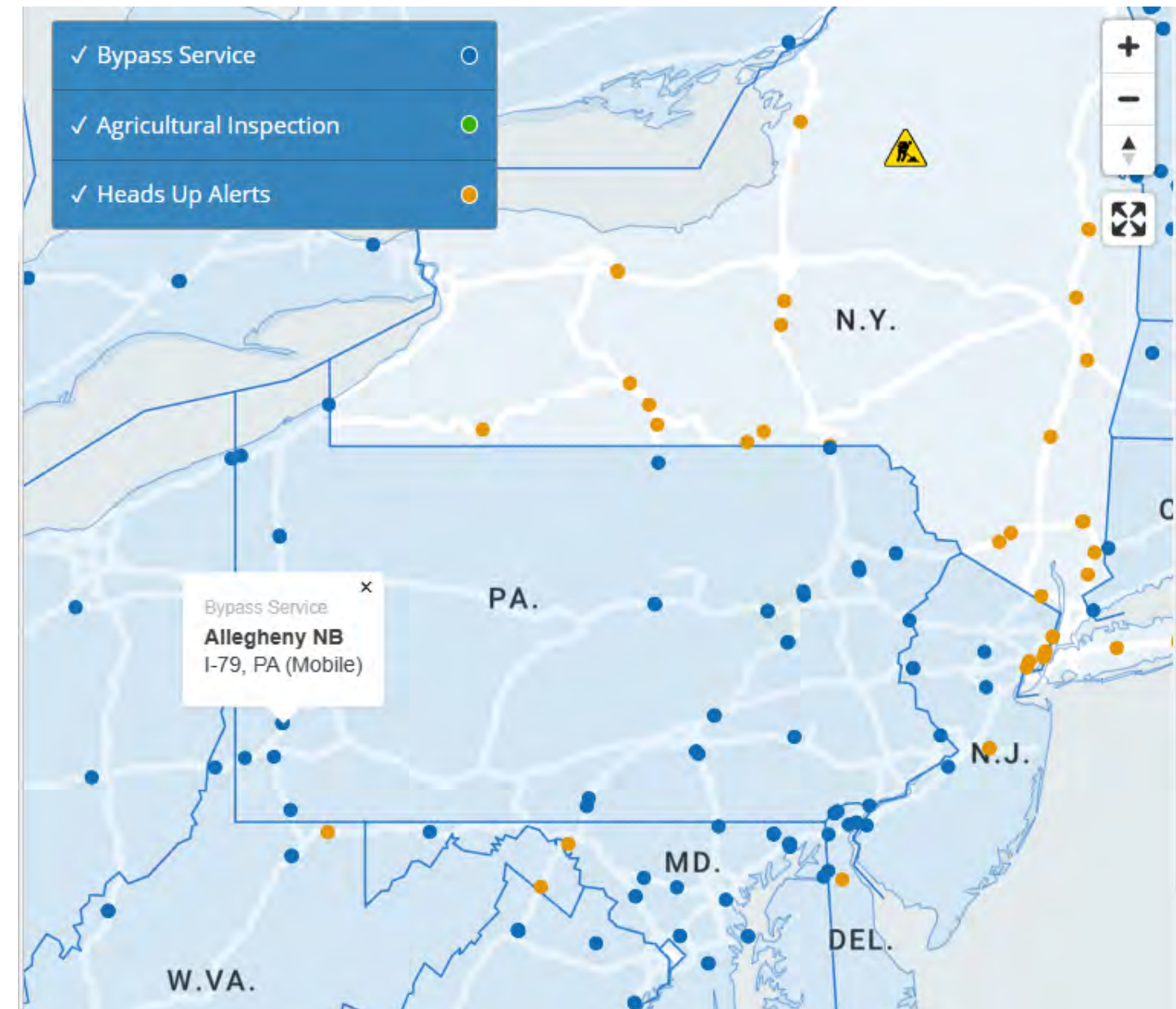
2024 National Operations
Center of Excellence TSMO
Award for Best TSMO
Project, Overall Winner



DRIVEWYZE VIRTUAL SIGN NETWORK IN PA

- Updating Drivewyze's under legal bridge height database
- Setting up 25 geofenced virtual sign gates
 - Commercial vehicle movement restrictions
 - Winter operations, work zones (i.e. left lane only applications)

Drivewyze[®]



NEW DRIVER WORK ZONE SAFETY COURSE



BROUGHT TO
YOU BY:



pennsylvania
DEPARTMENT OF TRANSPORTATION



WORK ZONE SIGNS (WORK AREA AND CONSTRUCTION ZONE SIGNS)

Work Zone Signs are normally diamond shaped, like warning signs, but they are orange with black lettering instead of yellow with black lettering. These signs identify maintenance, construction or utility areas where workers or equipment may be on or near the roadway. Stay alert and slow down when you see these signs.



Turn on your headlights when traveling through a work zone, no matter what time of day. This is the law for all posted work zones, not just for active ones. Using your headlights makes your vehicle more visible to other traffic as well as to highway workers. If you are pulled over by police for a traffic violation in a work zone and your vehicle's headlights are not turned on, you will be fined an additional \$25.



These WORK ZONE signs are placed at the beginning and end of an active work zone. An active work zone is the portion of a work zone where construction, maintenance or utility workers are on the roadway, or on the shoulder of the highway next to an open travel lane.



ROAD WORK AHEAD
This sign informs you there is road work ahead and also cautions you to slow down.



LANE CLOSED AHEAD
This sign tells you a particular lane will be closed at a specified distance ahead.



WORKERS AHEAD
Workers may be on or are very close to the roadway, so take special care when traveling through the area.



FLAGGER AHEAD (ROAD CONSTRUCTION AHEAD)
The sign to the left shows a flagger is controlling traffic ahead. As shown to the right, flaggers use STOP and SLOW paddles or a red flag to signal you to stop or slow down. Pay special attention to flaggers when approaching and traveling through a work zone.



TRAFFIC MUST STOP AND WAIT



TRAFFIC MUST MOVE SLOWLY



ROAD CLOSED FLOODING
This sign informs you that the road ahead is closed due to flooding. You must use an alternate route. Refer to Chapter 3 about what to do if you encounter a flooded roadway.



DID YOU KNOW?

Highway workers have forms to report motorists who speed or drive unsafely in work zones to the police, who may then issue a ticket, resulting in fines and points.

ELECTRIC ARROW PANELS

Large electronic flashing arrow panels (move/merge right or left) placed in the roadway or mounted on vehicles advise approaching motorists of lane closures. Begin your merge well in advance of the sign. An arrow panel displaying either of the messages shown in the figure to the far right (caution) indicates there is a work area ahead next to the travel lane. Drive with extra caution.



CHANNELING DEVICES

Barrels, tubes, cones and vertical panels are all devices used in work zones to guide you through changing traffic patterns and keep you away from hazards associated with road work.



GUIDE SIGNS

Guide signs provide information about intersecting roads, help direct you to cities and towns, and show points of interest along the highway. Guide signs also help you find hospitals, service stations, restaurants and motels. Usually these signs are horizontal rectangles.

HIGHWAY/EXPRESSWAY GUIDE SIGNS

The following three signs are examples of highway and expressway guide signs. They are green with white letters. Most highway and expressway signs are posted the same way. For example, there is usually one advance sign which is followed by another advance sign. The third sign then is posted at the exit. Several signs are necessary because the high speed and heavy traffic on highways can cause drivers to miss seeing a single sign. Also, motorists may need to make one or more lane changes to exit.



EXIT NUMBERS

Exit numbers correspond with the mile markers. This change allows motorists to quickly calculate distances between exits, e.g., the distance between Exit 95 and Exit 20 is 75 miles.

If a yellow panel with the message EXIT ONLY is on a highway sign, the lane below the sign will not continue through the interchange; instead, the lane will go off of the road to form a ramp. If you are in a lane posted with an EXIT ONLY, you may change lanes, or you must exit the highway if you stay in this lane.



SPECIAL CIRCUMSTANCES AND EMERGENCIES

The following pages give you information about how to drive safely and reduce your risk of crashing in these special circumstances – in highway work zones, at railroad crossings, and when you encounter pedestrians, cyclists, trucks, buses or emergency vehicles – and when you must deal with road rage and various driving emergencies.

Information about special events and emergencies is useful for motorists to plan their trip. A motorist may choose to avoid undesirable delays, or even potentially unsafe roadway conditions, by checking media, such as www.511PA.com to see if their trip route is clear before they depart.

WORK ZONES

Work zones are areas with construction, maintenance or utility work activities and are identified with orange channelizing devices, such as cones, or other temporary traffic control devices. You may encounter a flagger directing traffic and wearing reflective clothing. Warning signs, advance warning vehicles, or variable message boards may be placed a minimum of 200 feet approaching a work zone. When you see the first sign, pay strict attention to the road, vehicles, equipment and people you could encounter. Some work zones are accompanied by the Pennsylvania State Police.

Moving operations, such as line painting, crack sealing and mowing sometimes use shadow vehicles at the back of the operation to warn motorists that there is a work zone ahead and also serve as protection to the crew. Do not pass a moving operation unless directed to.

An active work zone is where workers are located on or near the roadway. Always watch out for construction workers and be prepared for abnormal conditions such as narrow lanes, rough pavement, uneven lanes and abrupt lane shifts.

Drivers must yield the right-of-way to workers and construction vehicles in work zones. By law, you must turn on your vehicle's headlights, not just the daytime running lights, when driving through these areas. You may be fined for failure to use your headlights in an active work zone. Also, fines are doubled for certain violations in active work zones, including speeding. In addition, certain violations will result in a driver's license suspension.

A new video about safely driving in and near work zones is available at: <https://www.penndot.gov/TravelInPA/Safety/TrafficSafetyAndDriverTopics/WorkZone>. This video is also available to school based Driver Education courses.

Be prepared for slow or stopped traffic as you approach a work zone, and follow these safety rules:

- Plan your trip. You may avoid travel delays if you choose an alternate route around the work zone.
- Do not use your cruise control in work zones.
- Double your following distance; the most common crash type in work zones is the rear-end collision.
- Prepare to change lanes as soon as you see a message telling you your lane is closed ahead.
- DO NOT CROSS a solid white line in a work zone; stay in your lane.
- Proceed cautiously and keep moving at a safe speed as you drive through the work zone; do not slow or stop to watch roadwork.
- Do not stop within a work zone to ask directions from the workers.
- Obey flaggers – their authority overrides conventional traffic control devices.

Remember: Work Zone Flaggers can report unsafe motorists, speeders, and aggressive drivers to the police using a Police Arrest Form!

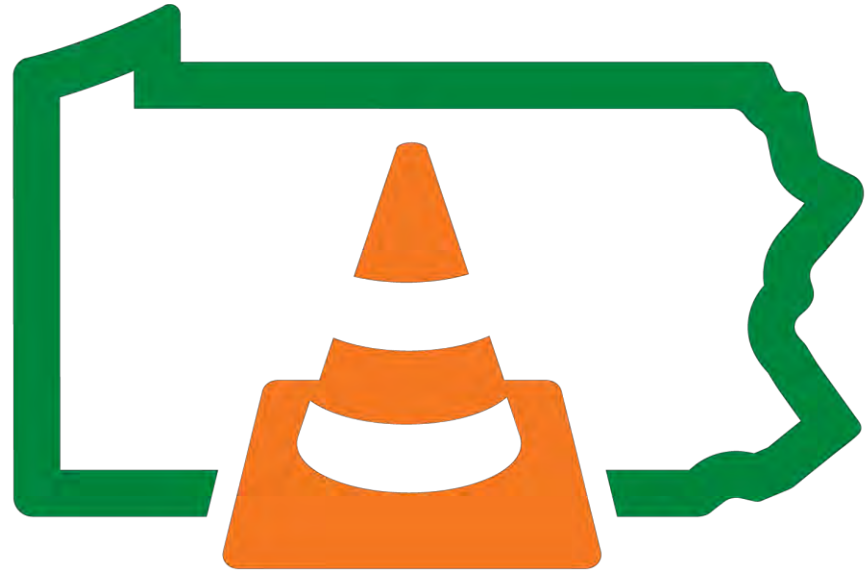
DID YOU KNOW?
Every year in the U.S., about 40,000 people, including highway workers and motorists, are injured or killed as a result of vehicle crashes in work zones. Carelessness and speeding are the main causes of traffic fatalities in work zones.

**What
should you
do if you
break down
in a work
zone?**

- 1
- 2
- 3
- 4
- 5



NEW DRIVER WORK ZONE COURSE



NEW DRIVER

WORK ZONE SAFETY PROGRAM



Pennsylvania
Department of Transportation



VISIT:

PennDOT.pa.gov/WorkZoneSafety

Click New Driver Training
in the blue box.

**New Driver Work
Zone Safety Training**



GREEN LIGHTS LEGISLATION

“GREEN LIGHTS” ON WORK VEHICLES



Tiered roll-out based on District/County priorities (i.e. Interstates, major arterials)

- **Phase 1:** Winter Operations Field Staff – Dump Trucks and Foreman Crew Cabs
- **Phase 2:** Winter/Spring 2024-25 focus on Truck Mounted Attenuators (TMAs) and Additional Field Response Equipment (Assistant Manager Vehicles)
- **Phase 3:** Spring 2025 focus on key Mobile pieces (line painting trucks, vac trucks, etc...)
- Spring 2025 revisit other pieces of equipment at the Equipment Managers Meeting



MOBILE WORK ZONE PROTECTION (AVL FLEET EXPANSION)

MOBILE WORK ZONES



Box truck struck the construction workers in work zone

State police say the crash happened around 3:25 a.m. Wednesday in an active work zone at mile marker 35.5 in Fairview Township.



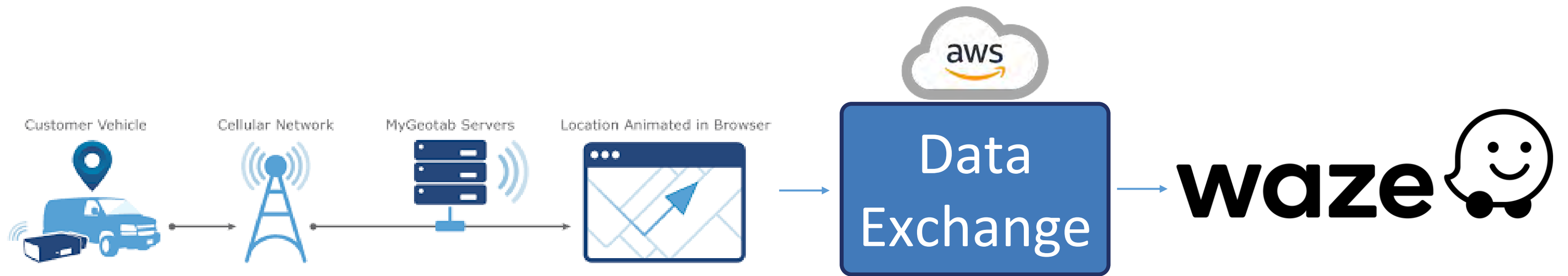
AVL FLEET INTEGRATION



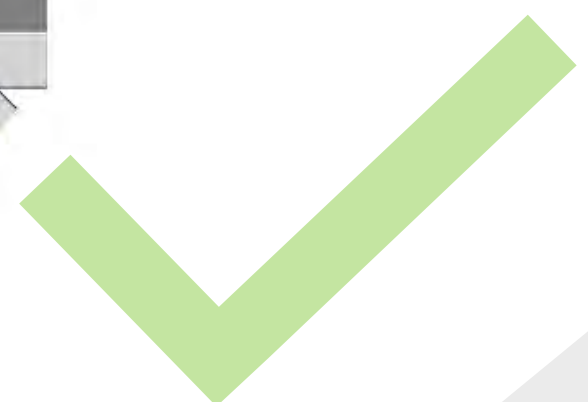
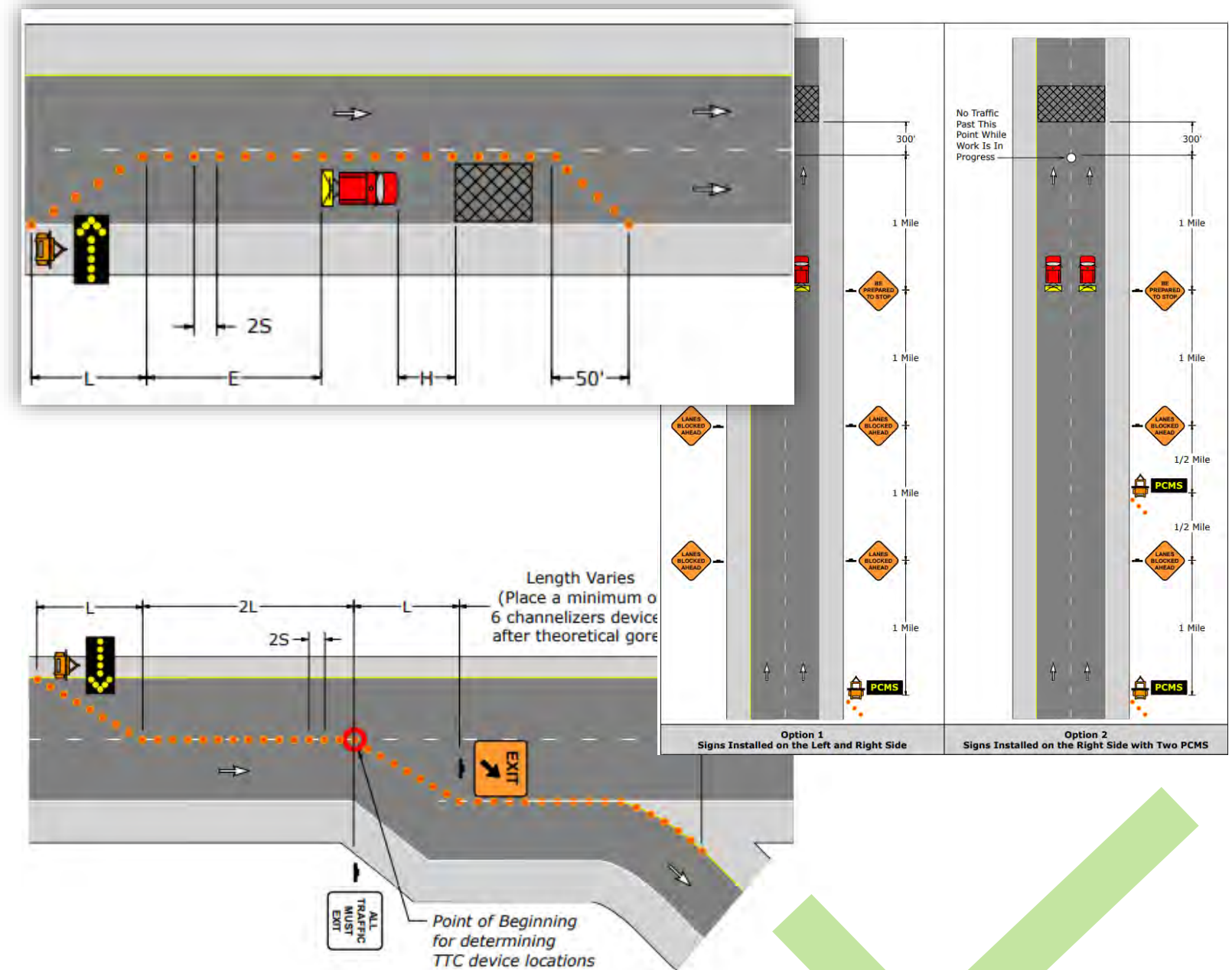
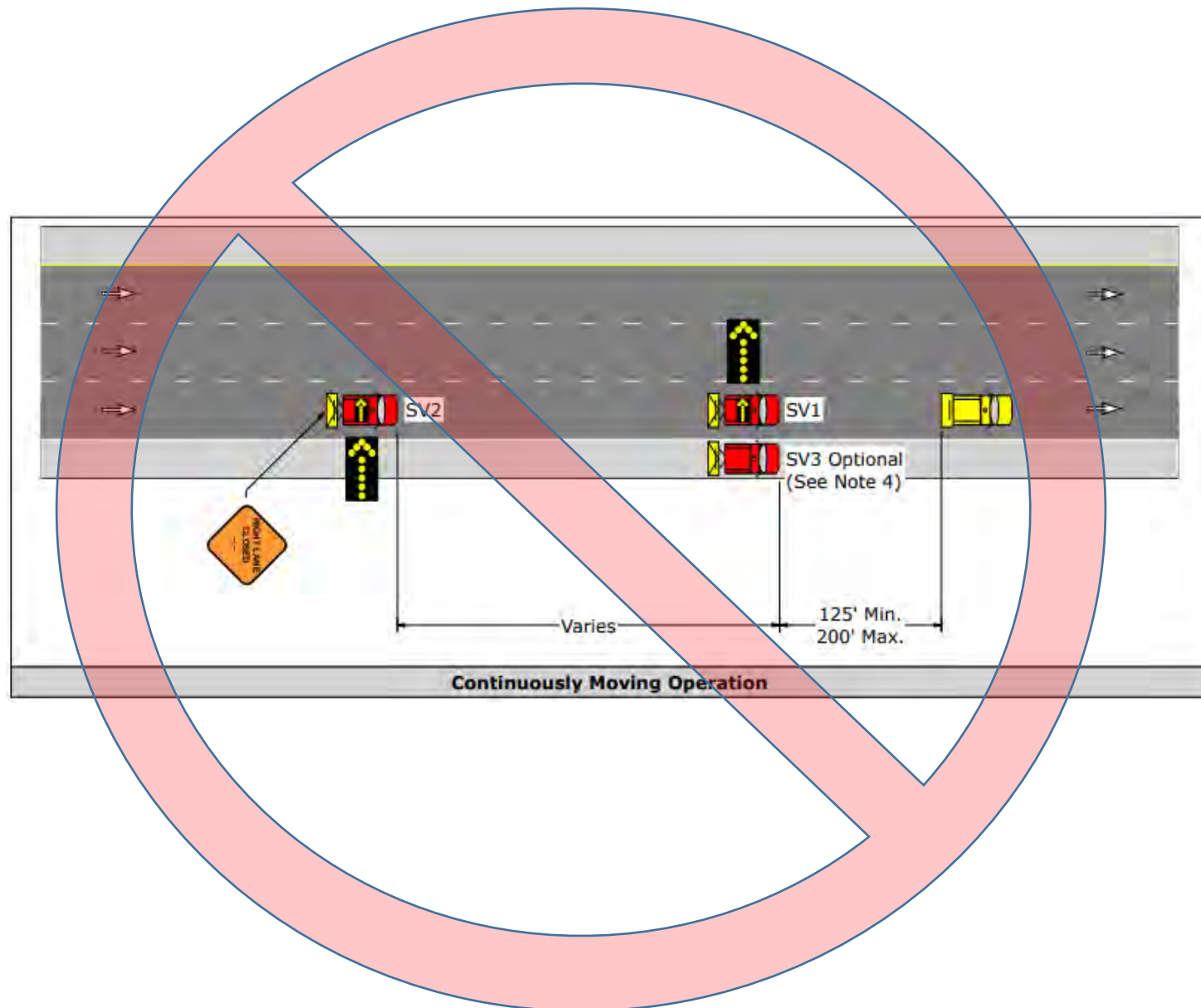
Developing Mobile Work Zone Protection Solutions



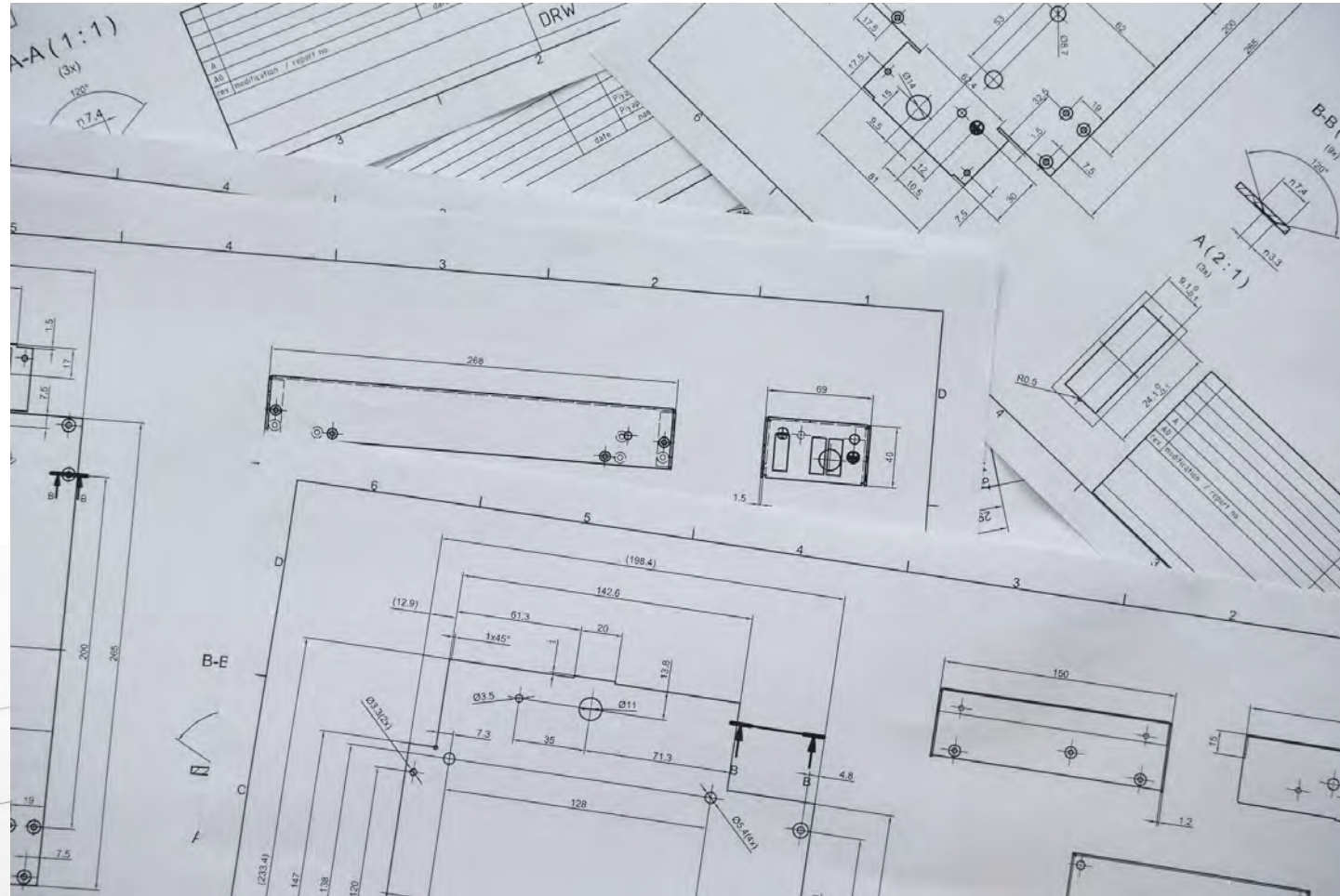
UTILIZING PENNDOT'S VEHICLE TELEMATICS DATA



MOBILE WORK ZONE ALTERNATIVES



PLANNING NIGHT WORK



OFF-THE-SHELF STRATEGIES

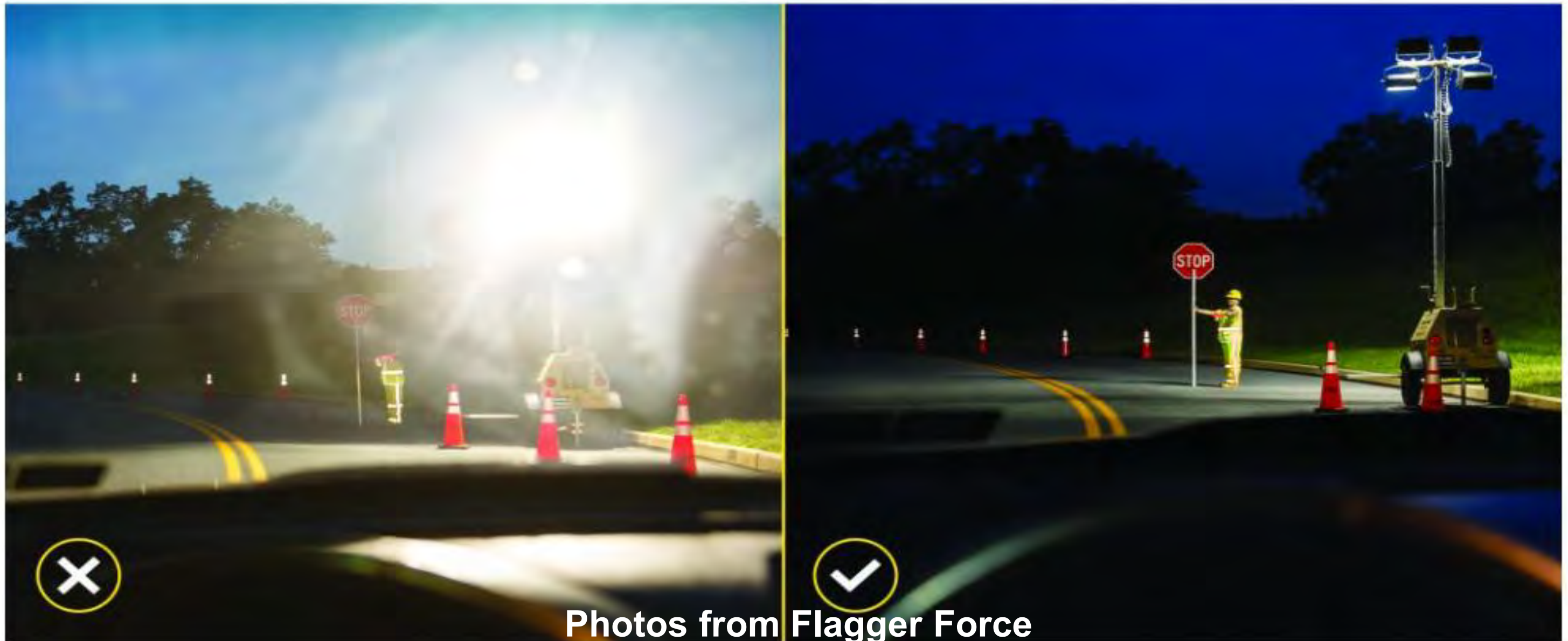
WORKER VISIBILITY

Properly Illuminating to Ensure Effectiveness

INCORRECT LIGHT ANGLE ◀

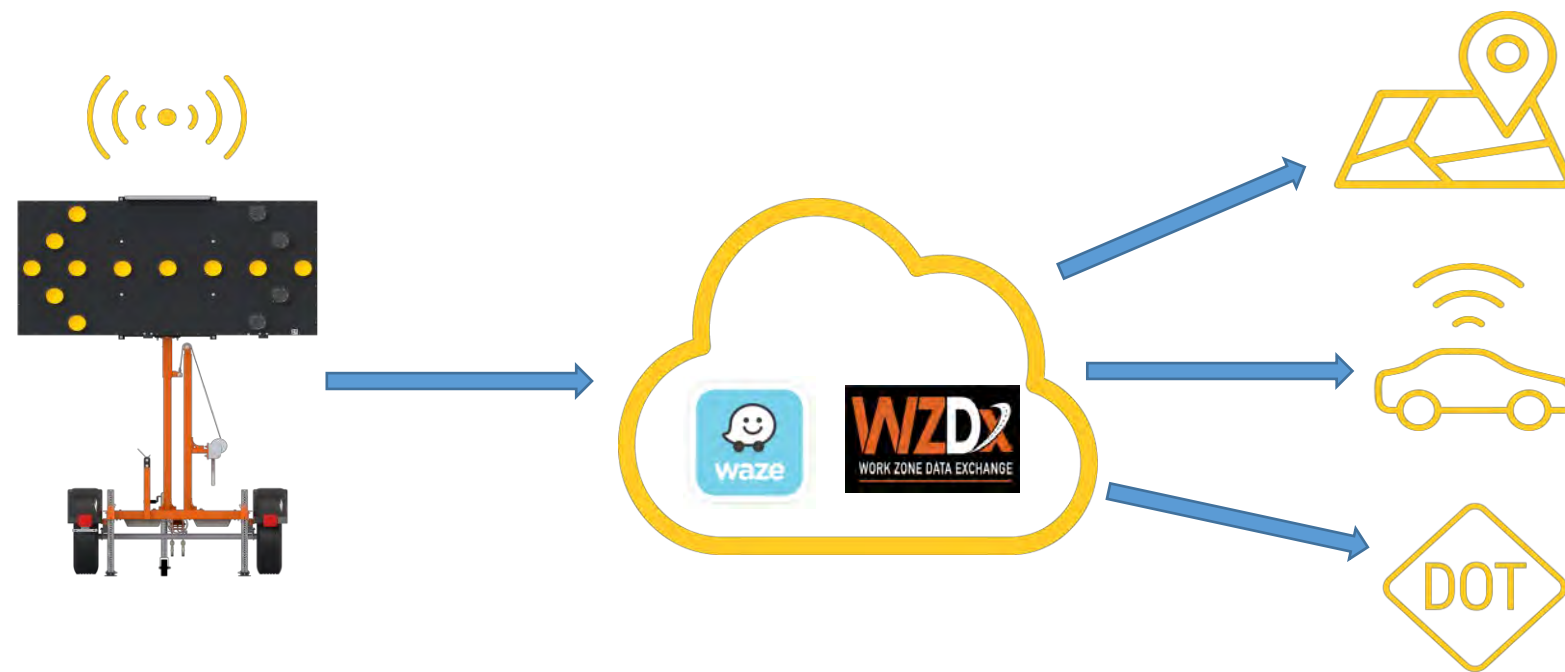


▶ CORRECT LIGHT ANGLE



Photos from Flagger Force

SMART ARROW BOARD



Smart Arrow board: The smart arrow board can report GPS field locations and communicate active lane closures to third party data and government agencies.

Position	Arrow Mode	Board Status
<ul style="list-style-type: none">Once activated, Transmits GPS location and 'ON' status of the Board.Once deactivated, Transmits GPS location and 'OFF' status of the Board. Updates location and 'OFF' status at 4 hour intervals.Information is transferred to Navigation Systems (e.g. Waze) and available for automobile in-dash systems.	<ul style="list-style-type: none">Determines if the arrows are in the following modes:<ul style="list-style-type: none">LEFT/RIGHT/DOUBLE (Static Arrow, Moving Arrow, Sequential Arrow, Sequential Chevrons)CAUTION (Flashing Corners, Flashing Line, Alternating Diamond)	<ul style="list-style-type: none">Once activated Status of your arrow board is posted to XML within 2 minutes.Upon deactivation, Status posted to XML within 60 seconds.Transmits Arrow Panel status every 15 minutes.Re-transmits location and status if the Arrow Panel moves more than 300 ft.



MOVEABLE BARRIER



1

Flexible barrier wall

One-meter sections of highly reinforced concrete barriers are pinned together to form a continuous barrier wall.

2

The Road Zipper Machine

The "T-top" barriers are lifted (not dragged) and transferred by the Road Zipper Barrier Transfer Machine through a conveyor system.

3

New dedicated lanes

The machine transfers the barrier up to 9.1 m (30') in one pass and gently sets it down without damaging the road. It operates at speeds up to 15 km/h (10 mph).

[Lycoming County SR 220-193 Movable Barrier System \(youtube.com\)](https://www.youtube.com/watch?v=...)



MODULAR WORK ZONE BARRIERS



QUALITY MATTERS

COMMANDING RESPECT

Personal Protective Equipment (Safety Vests)



ACCEPTABLE

New or like-new high-visibility safety apparel meeting Class 2 or 3 performance requirements found in the ANSI/ISEA 107-2004 or current publication. Safety apparel is not faded or soiled, has excellent color contrast and retroreflectivity.



MARGINAL

Safety apparel has slightly faded colors or is slightly soiled. Retroreflective material is in good condition.



UNACCEPTABLE

Safety apparel is significantly soiled and/or material is badly faded with poor color contrast. Retroreflective material is deteriorated and has little to no retroreflective qualities.



Channelizing Devices - Drums



ACCEPTABLE

Drum is new or in like new condition. Surface has no punctures or abrasions and has minimal asphalt splatter or other foreign material. Four retroreflective bands (two alternating white and orange) provide high-visibility.



MARGINAL

Drum maintains the original shape. It may be dented if dent is repairable or it may be evident that drum was previously dented. A minor percentage of surface area has asphalt splattering or other foreign matter. Four retroreflective bands are mainly clear, but may have slight tears or scratches.



UNACCEPTABLE

Drums do not give the appearance of a well maintained TTC device. At least one retroreflective band is missing or badly damaged. Large areas of the surface are marred with the presence of tar or other splatter. Drum does not have the same shape or color during both daylight and nighttime.



ACCEPTABLE

New cones have the conical shape and must be upright in its normal position. Cones have no punctures or abrasions and has minimal asphalt splatter or other foreign material. Two retroreflective bands provide high-visibility.



MARGINAL

Cones maintain the conical shape, however the surface has some asphalt splattering or otherwise shows some wear from use. Two retroreflective bands are mainly clear, but may have slight tears or scratches while still providing good visibility.



UNACCEPTABLE

Cones do not give the appearance of a well maintained TTC device. Punctures or a large portion of the cone surface is marred with the presence of asphalt splatter or other foreign material. At least one retroreflective band is missing or badly damaged. Cone may not be able to remain completely upright.



ADDITIONAL RESOURCES

WORK ZONE RESOURCES

PennDOT Work Zone Safety Page:

<https://www.penndot.pa.gov/TravelInPA/Safety/TrafficSafetyAndDriverTopics/WorkZone/Pages/default.aspx>

National Work Zone Safety Information Clearinghouse:

[Home — Work Zone Safety Information Clearinghouse](#)

National Work Zone Awareness Week:

[NATIONAL WORK ZONE AWARENESS WEEK - Home \(nwzaw.org\)](#)



THANK YOU

Ryan McNary

Chief, Operations and TSMO Performance

Brian Crossley

Manager, Temporary Traffic Control Unit