



# Work Zone Safety Innovations

April 2026  
Florida Department of Transportation  
Tampa Bay Region


**FDOT**

TARGET  
**ZERO**  
FATALITIES & SERIOUS INJURIES

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## Learning Objectives

- ▶ What and Why?
- ▶ Smart Work Zone Technologies
- ▶ Smart Work Zone Strategies
- ▶ Work Zone Monitoring



**FDOT**

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# What is a Smart Work Zone?

Why should we consider implementing Smart Work Zones (SWZs)?

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## Prioritizing Safety in Florida




**FLORIDA**  
STRATEGIC HIGHWAY SAFETY PLAN

TARGET **ZERO**  
FATALITIES & SERIOUS INJURIES

MARCH 2017


	FATALITIES	2015-2019	SERIOUS INJURIES
<b>ROADWAYS</b>	4,674	LANE DEPARTURES	30,549
	4,127	INTERSECTIONS	35,401
<b>ROAD USERS</b>	4,189	PEDESTRIANS AND BICYCLISTS	12,244
	3,358	AGING ROAD USERS	22,306
	2,890	MOTORCYCLISTS AND MOTOR SCOOTER RIDERS	12,771
	1,442	COMMERCIAL MOTOR VEHICLE OPERATORS	5,554
	1,407	TEEN DRIVERS	12,099
<b>USER BEHAVIOR</b>	4,830	IMPAIRED DRIVING	8,680
	3,376	OCCUPANT PROTECTION	8,393
	2,020	SPEEDING AND AGGRESSIVE DRIVING	4,411
	1,197	DISTRACTED DRIVING	16,059
<b>TRAFFIC RECORDS AND INFORMATION SYSTEMS</b>			
	385	WORK ZONES	2,418
	189	DRIVEWAY ENTRIES	2,514
<b>EVOLVING EMPHASIS AREAS</b>	40	RAIL CROSSINGS	89
	UNKNOWN	ROADWAY TRANSIT	UNKNOWN
	UNKNOWN	MICROMOBILITY	UNKNOWN
	UNKNOWN	CONNECTED AND AUTOMATED VEHICLES	UNKNOWN

Note: Florida's SHSP is undergoing review and updates for a 2026 release




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## Characteristics of a Smart Work Zone




**REAL-TIME**

- Analyzes traffic flow data
- Provides frequent updates to motorists




**PORTABLE**

- Installations at different locations
- Configuration modifications





**AUTOMATED**

- Minimal human supervision



**RELIABLE**

- Accurate + reliable information
- Considers consequences of misinforming motorists in work zones


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## Why implement SWZ Technologies?



**Lane Shifts**

Temporary geometry changes demand driver attention



**Shoulder Closures**

Reduced recovery space increases risk



**Temporary Pavement**

Surface changes affect vehicle handling characteristics





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## SWZ Technologies




**SWZ LOCATION DEVICES**




**SWZ ARROW BOARD**



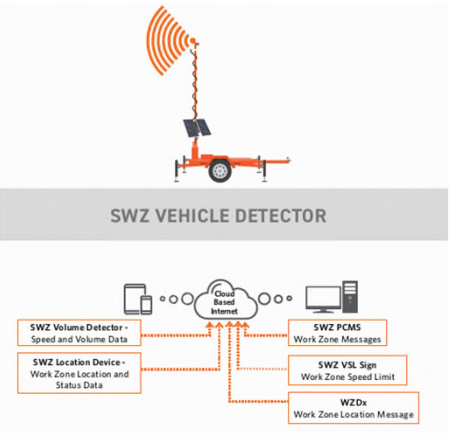
**SWZ VEHICLE DETECTOR**




**SWZ PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)**




**PORTABLE VARIABLE SPEED LIMIT (VSL) SIGN WITH ELECTRONIC SPEED FEEDBACK SIGN (ESFS)**



**SWZ CENTRAL PROCESSOR**



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# Smart Work Zone Strategies

- Work Zone Data Exchange (WZDx) SWZ Location Devices
- Dynamic Lane Merge (DLM)
- Dynamic Speed Harmonization (DSH)
- Dynamic End of Queue/Slow Speed Warning (DQW)

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## Florida Smart Work Zone Standards

### Design and Operations Guidelines

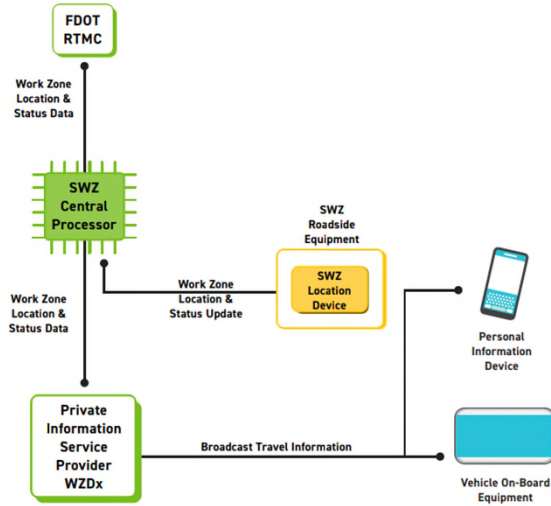
### Developmental Standard Plans

102-613-SWZ	Dev	Dynamic Lane Merge (DLM) - Dynamic Queue Detection and Warning - Dynamic Speed Harmonization - Lane Closure
102-620-SWZ	Dev	Dynamic Lane Merge - Dynamic Queue Detection and Warning - Dynamic Lane Merge - Multilane roadway, Temporary Diversion

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## Work Zone Data Exchange (WZDx)



- ▶ Makes work zone data available for third party use
- ▶ Any project impacting roadway traffic or where workers may be present adjacent to open traffic lanes
- ▶ Uses SWZ Location devices strategically placed in the work zone



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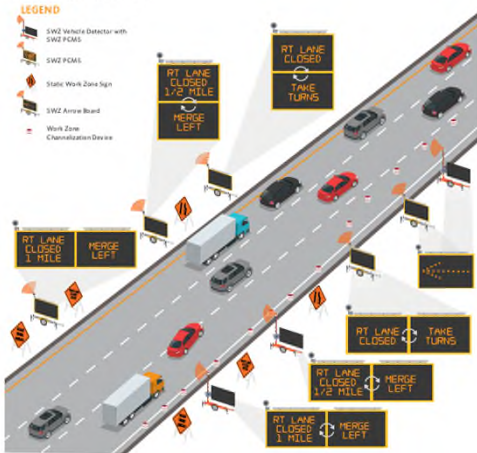
## Dynamic Lane Merge (DLM)



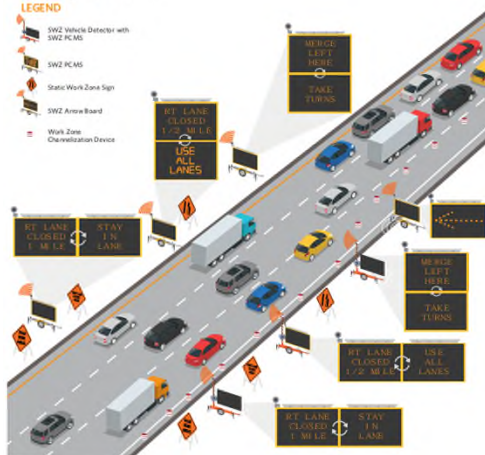
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# Dynamic Lane Merge (DLM)

## Dynamic Lane Merge Early Merge Operations

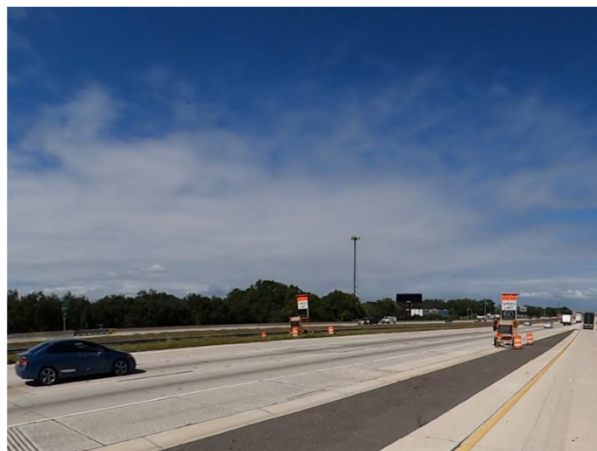


## Dynamic Lane Merge Late Merge Operations



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# Dynamic Speed Harmonization (DSH)



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# Dynamic Speed Harmonization (DSH)

## Dynamic Speed Harmonization

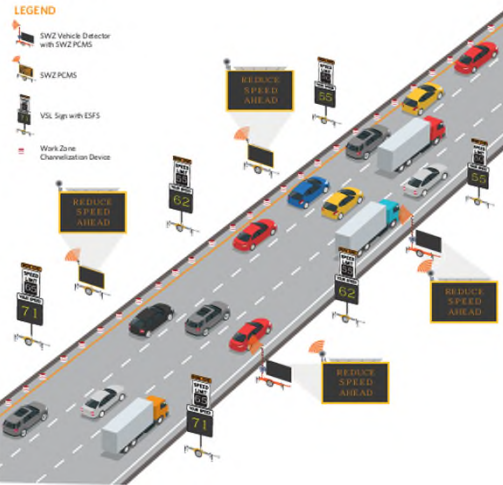
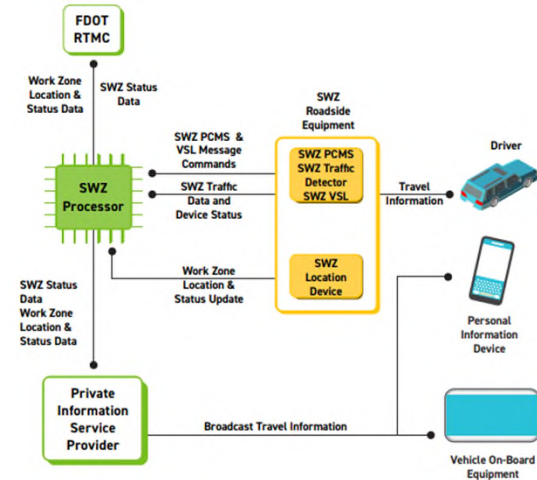
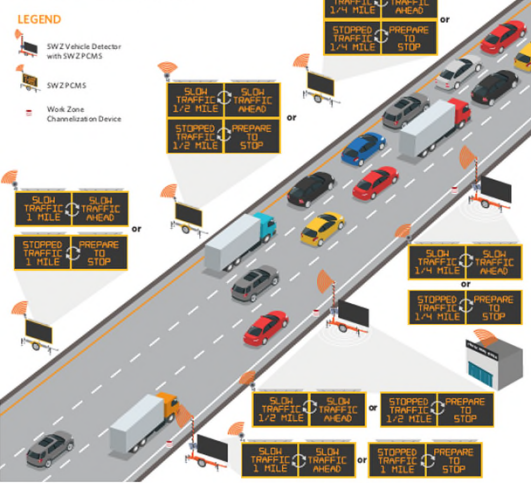


FIGURE 5: DSH BASIC ARCHITECTURE



# Dynamic End of Queue Warning (DQW)

## Dynamic End of Queue/ Slow Speed Warning System



# Work Zone Monitoring

Artificial Intelligence (AI) Applications

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## Camera and Sensor Deployment Types



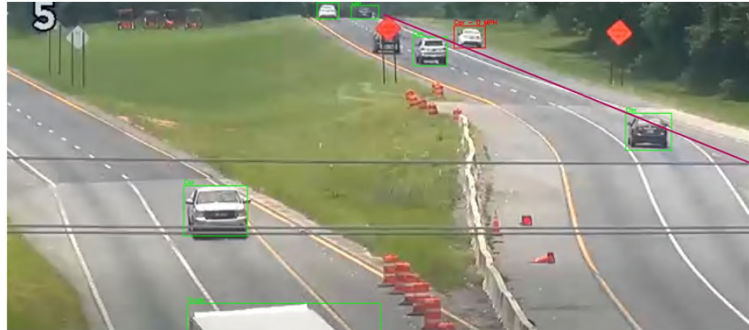
**Static Cameras and Sensors**      **Portable Camera Systems**      **Smart Work Zone Systems**

FDOT      TARGET ZER0

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# Work Zone Monitoring

## Encroachment & Intrusion Alerts



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# Work Zone Monitoring

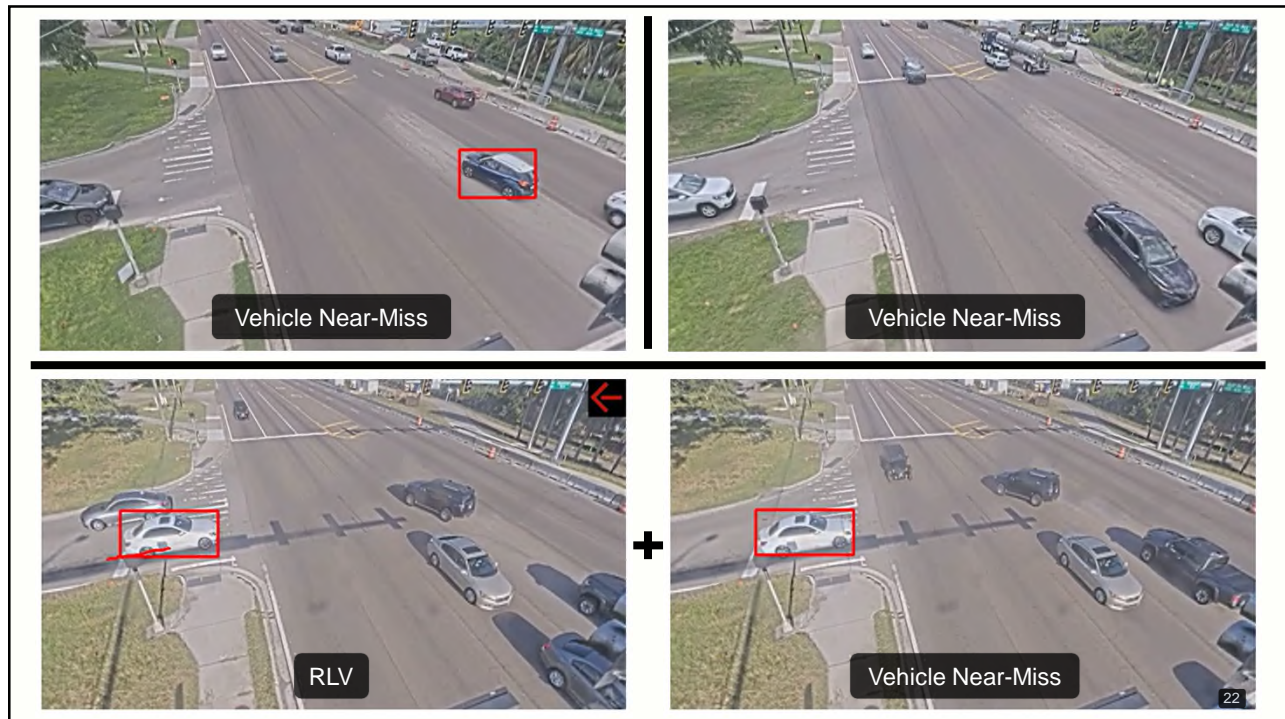
## Driver Behavior Monitoring in Temporary Configurations



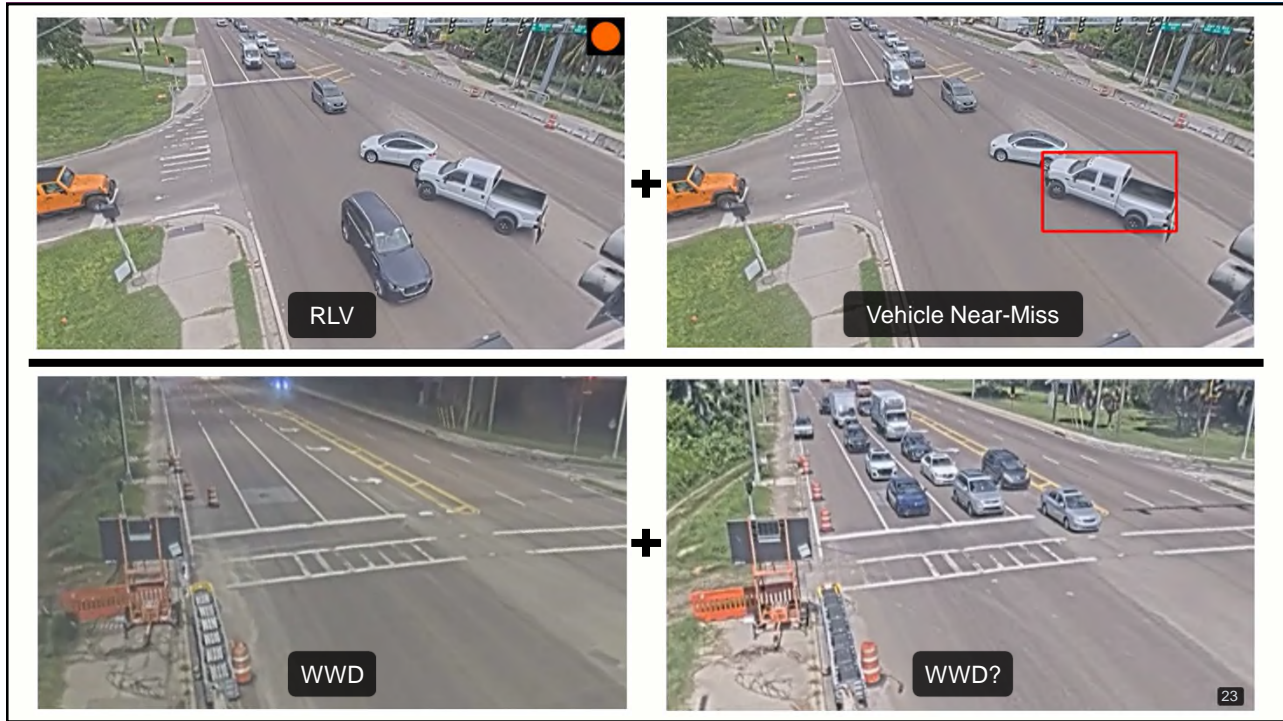
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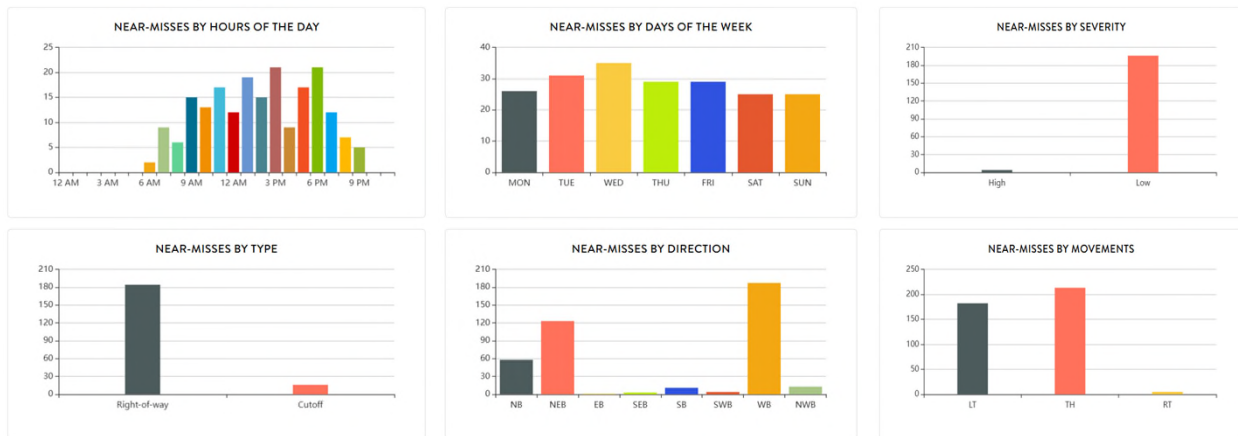


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## Intersection Work Zones – VRU Near-Miss



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# Smart Work Zone Cost Implications

## How is Construction Cost impacted by adding SWZ Technology?

- **SWZ – Two Lane Undivided: Approx \$600/day\***
  - Increase of approx. **23%** over standard devices
- **SWZ – Multi-Lane Undivided: Approx \$760/day\***
  - Increase of approx. **15%** over standard devices
- Cost would have to be considered early in the planning process to ensure adequately funded
- Would benefit from strategically utilizing on mid-size projects rather than one-size-fits-all approach
- SWZ technology can decrease crashes by up to 35%\*\* leading to a societal cost savings



- Utilizing FDOT Historical Prices and utilizing a 10% MOT and MOB percentage
- \*\* Ohio DOT, 2017



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Distracted driving is one of the leading causes of work zone crashes.

### Tips to avoid work zone crashes:

- Stay Alert
- Slow Down
- Merge Early
- No Phone Zone
- Follow Signs and Flaggers



## *DRIVING SAFE IN WORK ZONES*



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# Thank you!






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## Call to Action for Work Zone Safety

[Koda Learns to Respect the Zone](#)



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