



Regional Operations Forum Training Program

Module 6: Deep Dive Work Zone TSMO

Courtesy:



U.S. Department of Transportation
Federal Highway Administration

AMERICAN ASSOCIATION
of STATE HIGHWAY AND
TRANSPORTATION OFFICIALS

AASHTO



**ITS Heartland
Chapter**

NEBRASKA
Good Life. Great Journey.
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OKLAHOMA DOT
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U.S. Department
of Transportation
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Session Purpose

- Introduce Work Zone Management as a TSMO strategy
- Provide understanding of:
 - What is Work Zone Management?
 - Why is it important?
 - What are the benefits?
 - Examples of leadership actions





What is Work Zone Management?

- Managing impacts caused by temporary work zones and maintenance activities
 - Reduced roadway capacity that causes congestion and traveler delay
 - Irregular traffic flow and changing lane configurations
 - Worker and traveler safety hazards

Many Types of Work Zones

- Each have different challenges and strategies to mitigate impacts
- Consider differences in planning, coordination, public messaging, and use of ITS for a:
 - Mobile work zone to apply new road striping that moves intermittently or continuously
 - Short-term stationary maintenance activity that closes a lane for 2 hours in a non-peak period
 - Long-term stationary construction on a major freeway with multiple lane closures over a 2-year period



Some Trends in Work Zone Management

- Increased deployment of work zone ITS
- Increased use of more innovative contracting approaches
- Increased engagement with stakeholders for improved project coordination



Why is it Important?

- Construction worker and traveler safety
 - Over 96,000 crashes in work zones in 2015, including over 600 fatal crashes and 25,000 injury crashes
- Roadway capacity and speed reductions cause congestion and delay
 - 482 million vehicle hours of delay
- Night work to reduce mobility impacts can negatively impact worker safety
- Traffic pattern changes and impacts to alternate routes
- Increased challenges to incident management and emergency response



What are the Benefits?

- Improved construction worker and traveler safety with advanced notice to drivers
 - Queue warnings
 - Traveler information
- Less congestion and delay
 - Variable speed limits
 - Traveler information for alternate routes and trip time
- Intra-agency coordination of work zone activities to minimize impacts
- Increased awareness through outreach to law enforcement, businesses, and other stakeholders



Examples of Leadership Actions

- Enhance business processes to manage work zone practices
- Encourage new approaches in TMPs
- Invest in staff to enhance work zone practices and knowledge
- Increase stakeholder collaboration for project coordination
- Establish work zone management goals and measure performance



Enhance business processes to manage work zone practices

- Apply and periodically evaluate effectiveness of work zone management policies
 - Systematic consideration of work zone impacts
 - Consider all stages of project development
 - Address traveler and worker safety and mobility needs
- Institutionalize development and review of TMPs to increase effectiveness
 - Required by Work Zone Safety and Mobility Rule



What is a TMP?

- Transportation Management Plan
- Shows how traffic will be managed in work zone
- Required on ALL federal-aid projects
- Scalable to type of project being considered
- Considered a living document
- Three main components, all required for significant projects:
 - Temporary Traffic Control Plan (TTCP)
 - Transportation Operations (TO) strategies
 - Public Information and Outreach (PI) strategies



Encourage new approaches in TMPs

- Consider innovative contracting methods to make ITS available for work zones that need it most
- Statewide programs to identify work zone impacts that merit ITS deployment
- On-call ITS contracts to readily deploy technologies for shorter-duration work zones at agreed-upon rates





Encourage new approaches in TMPs

- Traffic management systems
 - Dynamic merge systems
 - Queue warning systems
 - Variable speed limit
 - Dynamic travel time and alternate route messaging
- Traveler information systems
- Incident management systems
- Intrusion alarm systems
- Automated speed enforcement/feedback systems

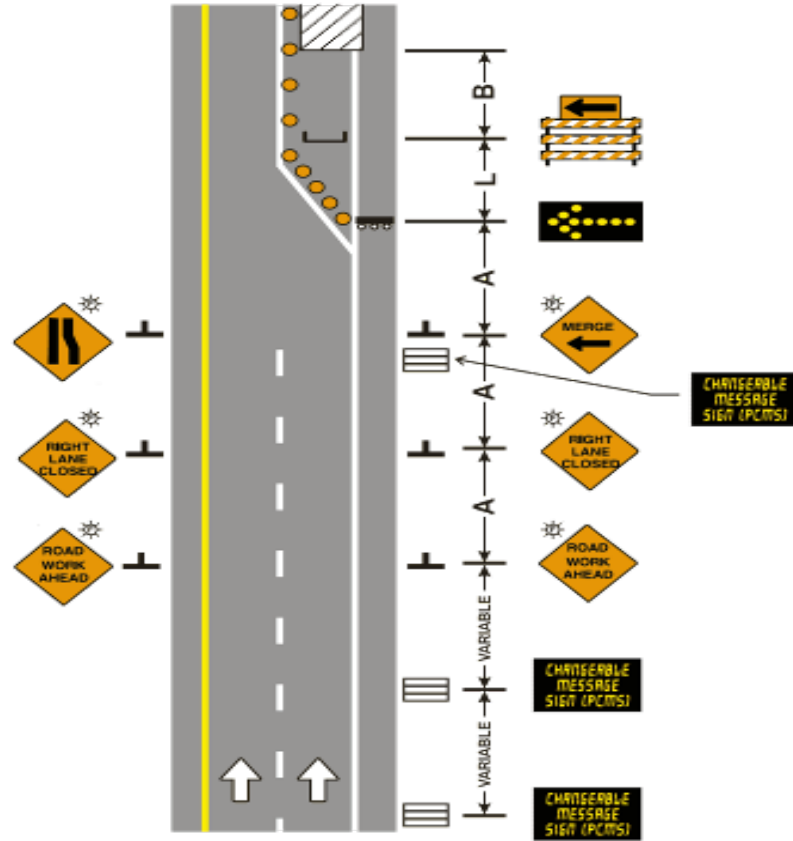
Public Information

- Depending on the project scale the public information strategies may be as simple as posting to Twitter to as involved as airing TV/radio commercials leading up to the project start.
- This component is becoming more essential and easier to do as technology advances.
 - Travel time information
 - Smart phone apps (Waze)
 - Social media



Dynamic Merge Systems

- Dynamic signs and devices control vehicle merging approaching lane closures
- Changes lane use instructions based on current traffic
- Sensors determine congestion level or queue length



Queue Warning Systems

- A series of sensors upstream of the work zone are used to automatically post messages on portable dynamic message signs to alert drivers about slowed or stopped traffic ahead
- Reduces potential for crashes



Variable Speed Limit

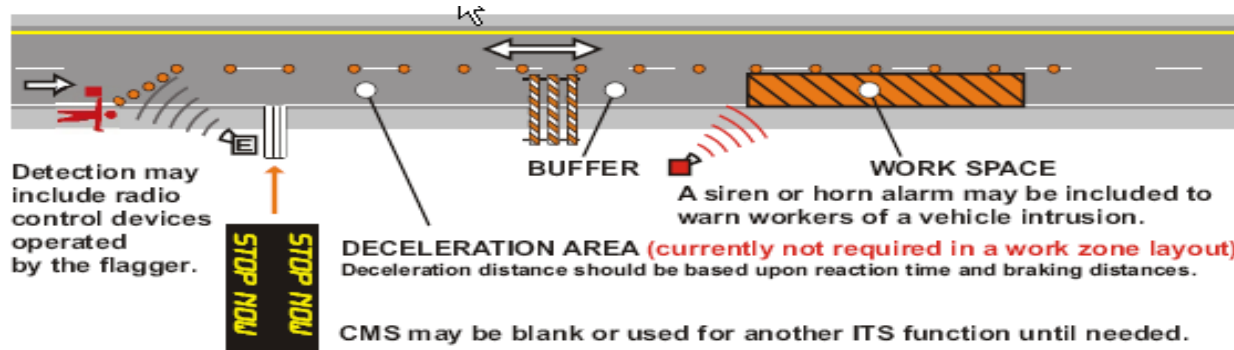


- Provides ability to set speed limit based on work zone conditions
 - Type of work being done
 - Characteristics of work zone



Intrusion Alarm Systems

- Detectors placed at likely intrusion areas (such as taper)
- When intrusion is detected, sirens sound to warn workers
 - Can be supplemented with lights



Invest in staff to enhance work zone practices and knowledge

- Encourage staff training and engagement with national forums to learn about effective practices
 - National Work Zone Safety Information Clearinghouse
 - FHWA Work Zone Management Program
- Practices to watch for
 - Traffic control
 - Contract incentives
 - Contract mechanisms
 - Accelerated construction
 - Contraflow lanes
 - Demand management
 - Traveler information



Increase stakeholder collaboration for project coordination

- Project coordination can reduce mobility and safety impacts
- Internally, coordinate scheduling:
 - Minimize construction on alternate or parallel routes at the same time
 - Combine multiple projects into one work zone
 - For public outreach and traveler information
- Externally, coordinate with law enforcement, businesses, freight, and event venues
 - Particularly for major, long-term work zones



Increase stakeholder collaboration for project coordination – Proof:

WSDOT Project Coordination

- Construction Impact Analysis project coordination tool reduces potential for conflicting lane and road closures
- Formalized mid- to long-term project coordination
 - Including scheduling closures and other activities
- Leadership support was critical for culture shift
- Regular internal and external stakeholder meetings
 - Annual meetings with local road and transit agencies and trucking and port representatives to discuss projects in upcoming construction seasons
 - Additional internal meetings for hot spots



Establish work zone management goals and measure performance

- May differ by agency objectives, types of work zones, and availability of data
 - Leverage data from deployed ITS, historic third-party probe data, and TMC, as available
- Challenging to identify success of strategies given temporal nature of work zones
- Report and track trends for similar work zones and work to improve



Establish work zone management goals and measure performance

Proof:

Iowa DOT Traffic Critical Projects

- Program created in 2014 to identify key work zones for improved mobility and safety
 - One approach deploys devices, communications, and sensors to support technologies like queue warning systems
- Contractor support to identify statewide needs, implement and manage appropriate solutions, monitor, and conduct evaluation
- Standalone, quals-based procurement contract for technology device vendor
- Assess performance data to develop efficiencies and new ideas
- Substantial improvements in traffic safety and mobility on construction projects across the state were identified



Discussion



- What work zone management activities has your agency conducted?
- Does your agency routinely conduct project coordination activities with other stakeholders?
- Does your agency deploy work zone ITS on an ad-hoc or a more systematic basis?
- What ITS and data does your agency use for work zones? What has been most effective?



Work Zone Management Resources

- FHWA Work Zone Management Program
 - <https://ops.fhwa.dot.gov/wz>
- National Work Zone Safety Information Clearinghouse
 - <http://www.workzonesafety.org>
- Work Zone ITS Implementation Guide
 - <https://ops.fhwa.dot.gov/publications/fhwahop14008>
- Guide to Project Coordination for Minimizing Work Zone Mobility Impacts
 - <https://ops.fhwa.dot.gov/publications/fhwahop16013/index.htm>
- FHWA Work Zone Management Capability Maturity Framework
 - https://ops.fhwa.dot.gov/tsmoframeworktool/available_frameworks/work_zone.htm

