Module 6: Deep Dive Work Zone TSMO

Courtesy:
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
- FHWA Work Zone Management Capability Maturity Framework
  - https://ops.fhwa.dot.gov/tsx/available_frameworks/work_zone.htm