Smarter Work Zones Webinar Series

Webinar #13: Implementing Work Zone ITS Applications – Procurement

Todd Peterson, Gerald (Jerry) Ullman, and Matthew Daeda

May 11, 2016 1:00-2:30pm EDT

Efficiency through technology and collaboration

innovation ingenuity imagination invention
Every Day Counts

U.S. Department of Transportation
Federal Highway Administration

Smarter Work Zones

Introduction and Today's Speakers

Today's Speakers

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Transportation Specialist
FHWA Office of Operations

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Illinois DOT

Smarter Work Zones (SWZ) Webinar Series

- This is the thirteenth in a series of monthly SWZ webinars
- Topics based on **what matters most to you!**
- Previous Webinar topics include:
  - Corridor-Based and Program-Based Project Coordination
  - Queue Warning Systems
  - Variable Speed Limits
  - Dynamic Lane Merge
  - Work Zone Project Coordination Guide and Examples
  - Integrating Project Coordination & Technology Applications: Iowa DOT
  - Lane Closure and Permitting Systems
  - Integrating Technology Applications: Massachusetts DOT
- Recordings and materials for previous webinars are available on The National Work Zone Safety Information Clearinghouse website: https://www.workzonesafety.org/swz/webinars
- Coming Up:
  - Webinar #14: *Leveraging Traffic Management Center Resources for Work Zone Management*
    Thursday, June 16th, 1:00-2:30pm EDT

Purpose of Today's Webinar

Discuss the procurement of Work Zone Intelligent Transportation Systems (ITS) applications as highlighted in Step 4 of the Work Zone ITS Implementation Guide and real-world examples of procurement of Work Zone ITS applications.

Topics include:

1. SWZ Technology Application Initiative
   - Show how the SWZ Technology Application initiative can be used by agencies to enhance their current work zone management practices
2. Work Zone ITS Implementation Guide Step 4
   - Provide an overview of Step 4 of the Work Zone ITS Implementation Guide and the tasks/activities associated with this step
3. SWZ Real-World Examples
   - Provide real-world examples of how states have approached the procurement of Work Zone ITS applications.

Smarter Work Zones

SWZ Overview & Technology Application Initiative

What are Smarter Work Zones (SWZ)?

Innovative strategies designed to optimize work zone safety and mobility

- Policies and practices used to incrementally and continuously improve WZ operations
- Tools to reduce WZ crashes and delays
- Tools to enhance WZ management strategies

Two Identified SWZ Initiatives:

Project Coordination

Coordination within a single project and/or among multiple projects within a corridor, network, or region, and possibly across agency jurisdictions

Technology Application

Deployment of Intelligent Transportation Systems (ITS) for dynamic management of work zone traffic impacts, such as queue and speed management

Today's Focus of Discussion

Technology Application – What is it?

Deployment of ITS for dynamic management of work zone traffic impacts, such as queue and speed management to **provide actionable information** to drivers and traffic managers.

Capabilities include:

- Improving driver awareness
- Providing dynamic and actionable guidance to drivers
- Enhancing tools for on-site traffic management

Source: FHWA

SWZ Technology Application Goals:

Goal 1A

By December 2016, 35 State DOTs have implemented business processes for work zone ITS technologies as identified in the Work Zone ITS Implementation Guide

- **What does this mean?**
  - Well-documented agency policies and processes to streamline consideration and use of work zone ITS technologies to minimize traffic impacts

SWZ Technology Application Goals:

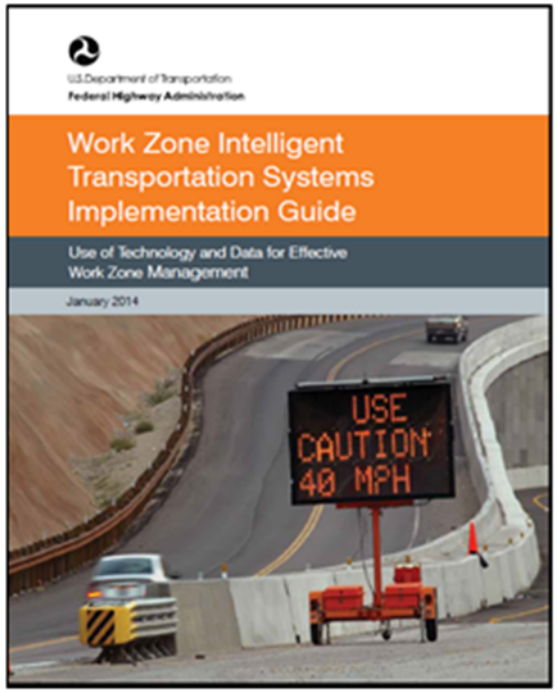
Goal 1B

By December 2016, 35 State DOTs have utilized at least one work zone ITS technology application for dynamic management of work zone impacts

- **What does this mean?**
  - Consideration of the six step process explained in the WZ ITS implementation guide to plan and implement ITS strategies
  - Identify and use ITS strategies such as speed and/or queue management on at least one project for dynamic management of work zone impacts

Work Zone ITS Implementation Guide

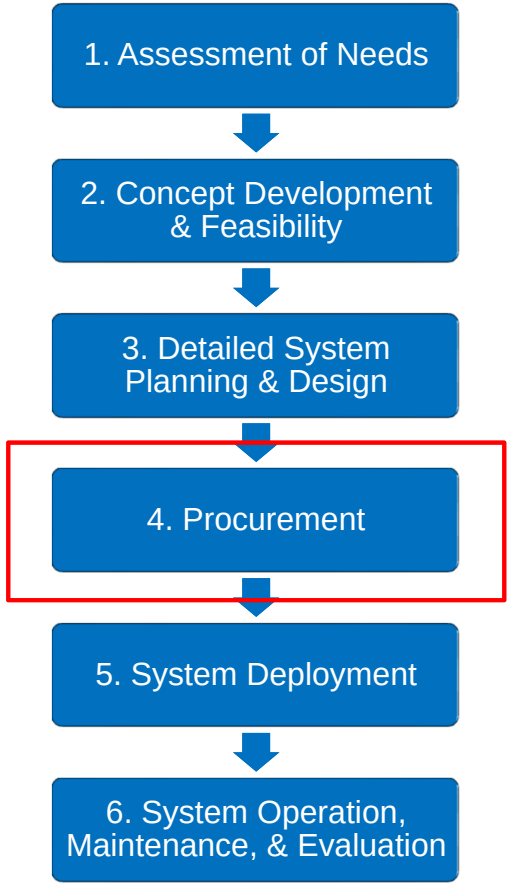
- Provide guidance on implementing ITS in work zones to assist public agencies, design and construction firms, and industry stakeholders
- Presented through a 6-step Systems Engineering Approach to WZ ITS implementation
- Available for download at: **http://ops.fhwa.dot.gov/publications/fhwahop14008/index.htm**



Source: FHWA

Focus of Today's Webinar

- Step 4 for the 6-step approach



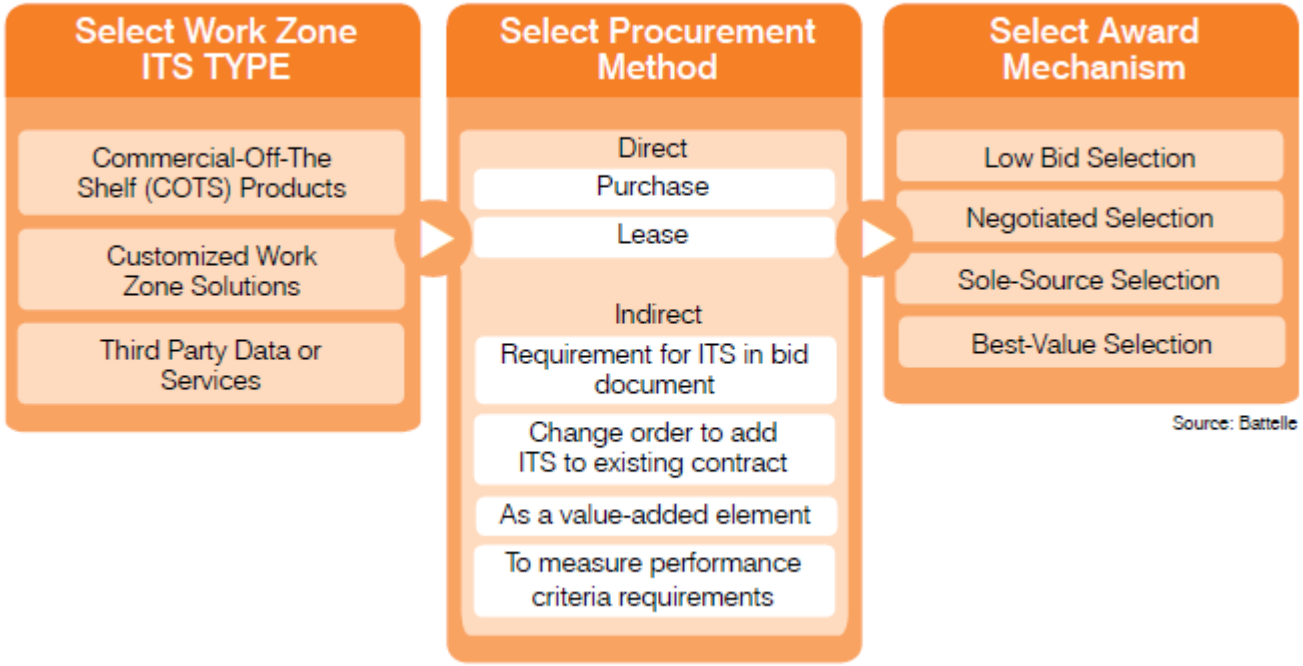
Step 4: Procurement

Procure the work zone ITS by first considering a number of options, based on the type of deployment being procured.

Steps include:

- Assessing procurement options
- Deciding direct or indirect procurement
- Determining the procurement award mechanism
- Issuing a request for proposals
- Selecting the preferred vendor, consultant, or contractor

Procurement Approaches



- Procurement options depend on the characteristics of the ITS
- Traditionally, WZ ITS procurement has primarily been for COTS or customized ITS solutions
- Potential now exists for agencies and contractors to purchase data collected by private-sector data providers for similar purposes

Procurement Considerations

- Direct Procurement
  - Purchase
  - Lease

- Indirect Procurement
  - Special Provision part of Contract
  - Change Order to Contract
  - Best Value or Design Build
  - Part of Performance Requirements

Direct Procurement (1 of 2)

- Purchase
  - Long Duration
  - Multiple Projects
  - Requires Agency Expertise and Control

- Lease
  - Qualified Contractor Required
  - Contractor Equipment Maintenance and Deployment
  - Contractor Risk

Direct Procurement (2 of 2)

- Contractor has ITS focus
- Direct oversight by DOT Traffic Operations
- Improved Contractor Response
- Requires Cooperation Provisions
- Best Value
- Pay for Performance

Source: Minnesota DOT

Indirect Procurement (1 of 2)

- Special provision part of contract
- Change Order to Contract
- Best Value or Design Build
- Part of Performance Requirements

Indirect Procurement (2 of 2)

- Easy – follows traditional contract development and administration
- Employees sub-contractor for ITS deployment
- Typically lump sum payments

Source: Google

Indirect Deployment Issues

- Lower Priority by Prime Contractor
- Startup time delays
- Subcontractor ability to integrate and manage
- Agency Oversight

Source: Minnesota DOT

Indirect Procurement Considerations

- Agency Expertise
- Available Qualified Contractor
- COTS or Customized System Needs
- Deployment Alternatives
  - Single Project
  - Multiple Projects
- Integration into TOC and Use of Existing ATMS
- Agency Needs and Experience
- Maintenance and Operation
- Evaluation

Step 4: Key Takeaways

- In procuring work zone ITS, there are three different perspectives:
  - Contracting agency that desires work zone ITS
  - Contractor responsible for the overall construction project
  - Vendor who supplies work zone ITS

Step 4 Outcome

- Procurement Type and Mechanism Determined
- RFP Issued
- Proposal Selected

Smarter Work Zones

Massachusetts DOT's Procurement Process

Technology Applications: Existing Practices

MassDOT has used Work Zone ITS applications on 12 projects to date

Monitoring traffic conditions and providing real-time feedback helps to lessen driver frustration about travel conditions

MassDOT's Real-Time Traffic Monitoring System specification is a "living document"

Sharing SWZ system access/data with partner agencies improves network mobility and credibility for project delivery

SWZ Equipment

- Portable Changeable Message Signs (PCMS)
- Portable Camera Trailers

Source: MassDOT

Source: MassDOT

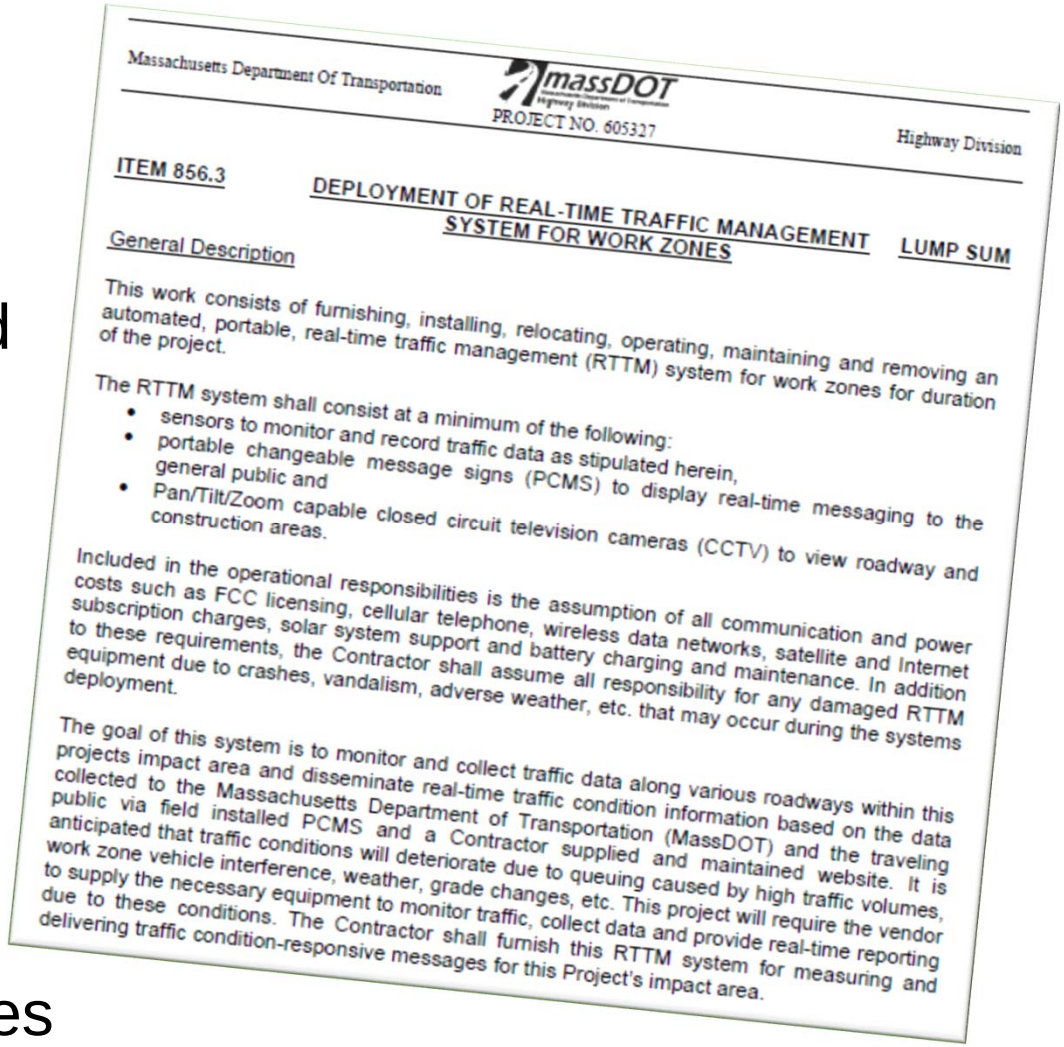
- SWZ Operating System
- Speed Feedback Boards
- Radar/Doppler Sensors
- Bluetooth Sensors
- Probe Data

Source: MassDOT

Step 4: Define SWZ Specifications

Lessons Learned

- Include detailed descriptions of the required equipment and expected functions
- Define expectations for system operations
- Document placement, calibration and testing expectations
- Define expected performance/deliverables



Massachusetts Department Of Transportation — MassDOT — Highway Division

PROJECT NO. 605327

ITEM 856.3 — **DEPLOYMENT OF REAL-TIME TRAFFIC MANAGEMENT SYSTEM FOR WORK ZONES** — **LUMP SUM**

General Description

This work consists of furnishing, installing, relocating, operating, maintaining and removing an automated, portable, real-time traffic management (RTTM) system for work zones for duration of the project.

The RTTM system shall consist at a minimum of the following:

- sensors to monitor and record traffic data as stipulated herein,
- portable changeable message signs (PCMS) to display real-time messaging to the general public and
- Pan/Tilt/Zoom capable closed circuit television cameras (CCTV) to view roadway and construction areas.

Included in the operational responsibilities is the assumption of all communication and power costs such as FCC licensing, cellular telephone, wireless data networks, satellite and Internet subscription charges, solar system support and battery charging and maintenance. In addition to these requirements, the Contractor shall assume all responsibility for any damaged RTTM equipment due to crashes, vandalism, adverse weather, etc. that may occur during the systems deployment.

The goal of this system is to monitor and collect traffic data along various roadways within this projects impact area and disseminate real-time traffic condition information based on the data collected to the Massachusetts Department of Transportation (MassDOT) and the traveling public via field installed PCMS and a Contractor supplied and maintained website. It is anticipated that traffic conditions will deteriorate due to queuing caused by high traffic volumes, work zone vehicle interference, weather, grade changes, etc. This project will require the vendor to supply the necessary equipment to monitor traffic, collect data and provide real-time reporting due to these conditions. The Contractor shall furnish this RTTM system for measuring and delivering traffic condition-responsive messages for this Project's impact area.

Step 4: Specifications for System Management

Purpose: Contractor/vendor shall supply the necessary equipment to monitor traffic, collect data, provide real-time reporting and remote messaging via the vendor supplied and maintained website

Required Personnel:

Project Manager – Overall project lead to manage RTTM project

Local Systems Manager – Experienced in managing day-to-day operation & maintenance of SWZ systems and equipment

Local Field Maintenance/Repair Technicians – maintain devices

Software Specialist – Configuration of system logic and calibration of algorithms to deliver real-time information

For More Information:

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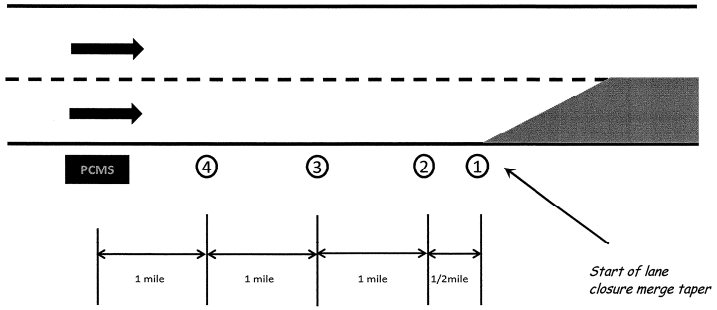
Smarter Work Zones

Texas DOT's Procurement of End-of-Queue Warning Systems

Lane Closure Monitoring System Plan 1

PCMS Operations Rules: Deployment Plan 1 (Max Design Queue ≤ 3.5 Miles)

PCMS Message	Last 5-Minute Average Speed V (mph)			
	④	③	②	①
ROAD WORK AHEAD	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0
SLOW TRAFFIC 3 MILES	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	40 ≤ V < 55
SLOW TRAFFIC 2 MILES	V > 55 OR V = 0.0	V > 55 OR V = 0.0	40≤ V< 55	V > 40 OR V = 0.0
SLOW TRAFFIC 1 MILE	V > 55 OR V = 0.0	40≤ V< 55	V > 40 OR V = 0.0	V > 40 OR V = 0.0
SLOW TRAFFIC AHEAD	40≤ V< 55	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0
STOPPED TRAFFIC 3 MILES	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	0.0 ≤ V < 40
STOPPED TRAFFIC 2 MILES	V > 40 OR V = 0.0	V > 40 OR V = 0.0	0.0 ≤ V < 40	Any value
STOPPED TRAFFIC 1 MILE	V > 40 OR V = 0.0	0.0 ≤ V < 40	Any value	Any value
STOPPED TRAFFIC AHEAD	0.0 ≤ V < 40	Any value	Any value	Any value



① *Non-Intrusive Traffic Speed Detector*

PCMS *Portable Changeable Message Sign*

Note: Location of the sensors and the PCMS can be adjusted slightly based on site conditions (ramp locations, other static signing, overpasses, etc.)

STATE OF TEXAS
LARRY J. COLCLASURE
65936
REGISTERED PROFESSIONAL ENGINEER

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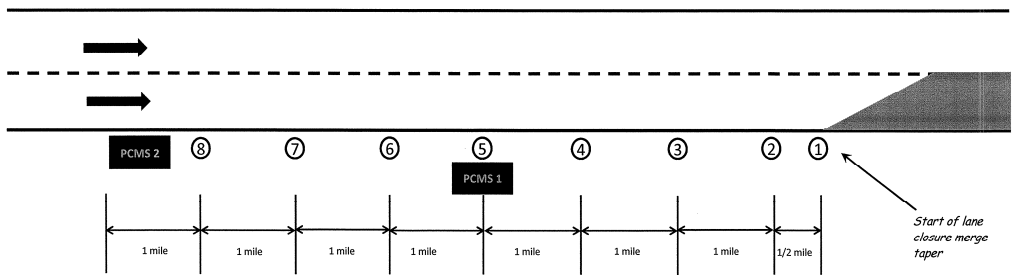
LANE CLOSURE MONITORING SYSTEM PLAN 1

© TxDOT May 1987

DN.: - LR/MT		SHEET 1 of 2			
CK.: -					
DW.: - DN					
STATE DIST.	FED. REGION	FEDERAL AID PROJECT			SHEET
WAC	6				276A
COUNTY		CONTROL	SEC	JOB	HIGHWAY
Bell		0015	14	091	IH 35

Lane Closure Monitoring System Plan 2



PCMS Operations Rules: Deployment Plan 2 (Max Design Queue ≤ 7.5 Miles)

PCMS 2 Message	PCMS 1 Message	Last 5-Minute Average Speed V (mph)							
		⑧	⑦	⑥	⑤	④	③	②	①
WATCH YOUR SPEED	ROAD WORK AHEAD	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0
WATCH YOUR SPEED	SLOW TRAFFIC 3 MILES	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	40 ≤ V < 55
WATCH YOUR SPEED	SLOW TRAFFIC 2 MILES	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	40≤ V< 55	V > 40 OR V = 0.0
WATCH YOUR SPEED	SLOW TRAFFIC 1 MILE	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	40≤ V< 55	V > 40 OR V = 0.0	V > 40 OR V = 0.0
WATCH YOUR SPEED	SLOW TRAFFIC AHEAD	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	40≤ V< 55	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0
WATCH YOUR SPEED	STOPPED TRAFFIC 3 MILES	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	0.0 ≤ V < 40
WATCH YOUR SPEED	STOPPED TRAFFIC 2 MILES	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	0.0 ≤ V < 40	Any value
WATCH YOUR SPEED	STOPPED TRAFFIC 1 MILE	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	0.0 ≤ V < 40	Any value	Any value
WATCH YOUR SPEED	STOPPED TRAFFIC AHEAD	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	0.0 ≤ V < 40	Any value	Any value	Any value

PCMS 2 Message	PCMS 1 Message	Last 5-Minute Average Speed V (mph)							
		⑧	⑦	⑥	⑤	④	③	②	①
SLOW TRAFFIC 3 MILES	LANE CLOSED 3 MILES	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	40 ≤ V < 55	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0
SLOW TRAFFIC 2 MILES	LANE CLOSED 3 MILES	V > 55 OR V = 0.0	V > 55 OR V = 0.0	40 ≤ V < 55	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0
SLOW TRAFFIC 1 MILE	LANE CLOSED 3 MILES	V > 55 OR V = 0.0	40 ≤ V < 55	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0
SLOW TRAFFIC AHEAD	LANE CLOSED 3 MILES	40 ≤ V < 55	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0
STOPPED TRAFFIC 3 MILES	LANE CLOSED 3 MILES	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	0.0 ≤ V < 40	Any value	Any value	Any value	Any value
STOPPED TRAFFIC 2 MILES	LANE CLOSED 3 MILES	V > 40 OR V = 0.0	V > 40 OR V = 0.0	0.0 ≤ V < 40	Any value	Any value	Any value	Any value	Any value
STOPPED TRAFFIC 1 MILE	LANE CLOSED 3 MILES	V > 40 OR V = 0.0	0.0 ≤ V < 40	Any value	Any value	Any value	Any value	Any value	Any value
STOPPED TRAFFIC AHEAD	LANE CLOSED 3 MILES	0.0 ≤ V < 40	Any value	Any value	Any value	Any value	Any value	Any value	Any value

Note: Location of the sensors and the PCMS can be adjusted slightly based on site conditions (ramp locations, other static signing, overpasses, etc.)

① *Non-Intrusive Traffic Speed Detector*

PCMS *Portable Changeable Message Sign*

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Larry J. Colclasure P.E.

LANE CLOSURE MONITORING SYSTEM PLAN 2

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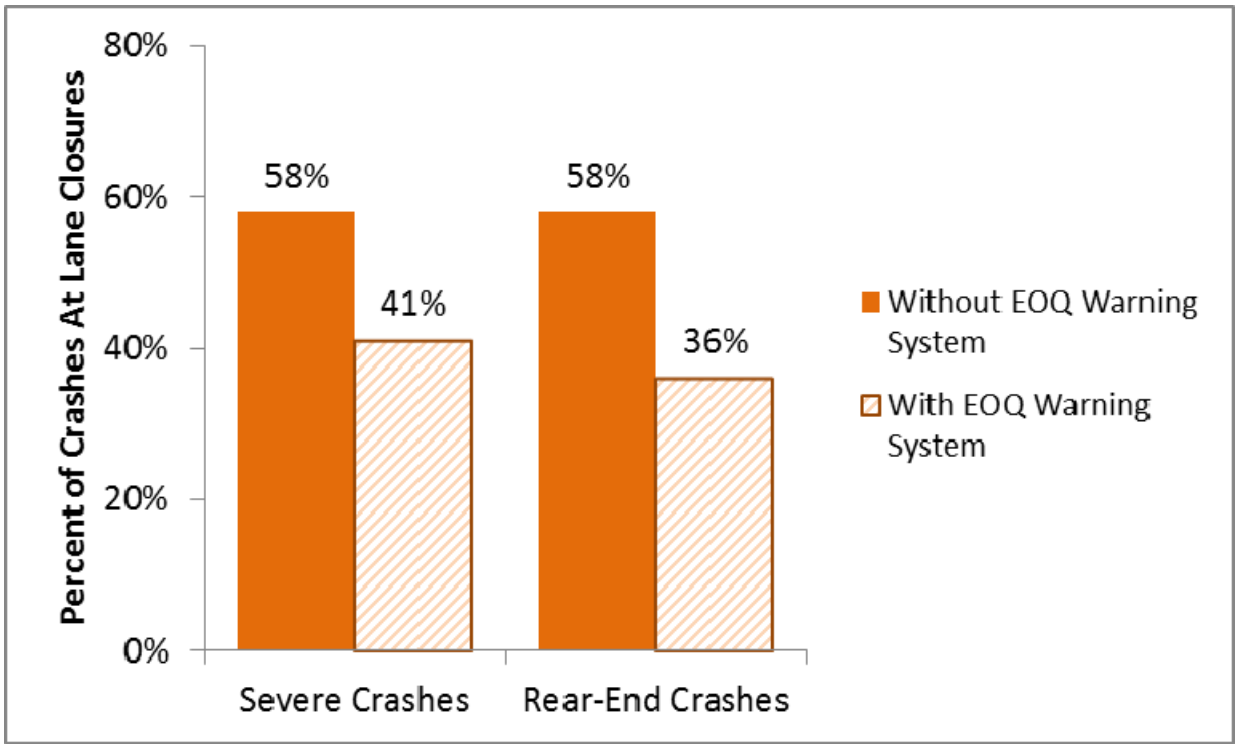
DN.: - LR/MT		SHEET 2 of 2		
CK.: -				
DW.: - DN				
STATE DIST.	FED. REGION	FEDERAL AID PROJECT		SHEET
WAC	6			276B
COUNTY	CONTROL	SEC.	JOB	HIGHWAY
Bell	0015	14	091	IH 35

Benefits

- 44% decrease in crashes
- Avoiding $6,300 in crash costs per night



Procurement: Initial Concept

- Change-ordered into existing contracts
- Include as bid-item in upcoming contracts
- Bid as a per-use cost
  - Estimate remaining EOQ needs
  - Pro-rate equipment and labor accordingly
  - TxDOT to authorize when EOQ system was needed
- Created uncertainty and bid variation amongst contractors

Procurement: Final Approach

- Bid one-time mobilization costs for equipment
- Also bid per-night deployment for labor, maintenance, replacement, etc.
- Reduction of uncertainty yielded 28% lower total bid estimates
- “Sharing” of systems by contractors as needed

WZ ITS Usage Statistics (2013-2015)

Number of Plan 1 Deployments	237
Number of Plan 2 Deployments	82
Nights with:	
1 Deployment	178 (74%)
2 Deployments	50 (21%)
3 Deployments	11 (5%)
4 Deployments	1 (0%)

WZ ITS Cost Summary

Average Mobilization Cost per Plan 2 System (8 systems procured for corridor)	$203,000
Per Deployment Cost (Plan 1)	$900
Per Deployment Cost (Plan 2)	$1,500
Total WZ ITS Deployment Costs to Date	$1.96 million

For More Information:

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Smarter Work Zones

Iowa DOT's Procurement Approach

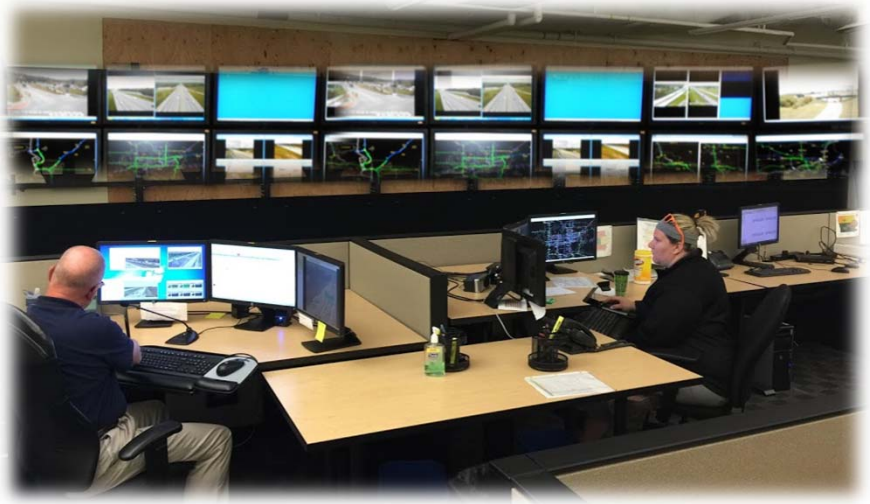
Intelligent Work Zone (IWZ) Goals

- Expanded Monitoring
  - Traffic Sensors, Portable Cameras
- Warn Drivers
  - Portable DMS, 511ia.org
- Automation
  - Queue Detection, Trucks Entering, Speed Warning

Statewide Integration

IWZ Resources

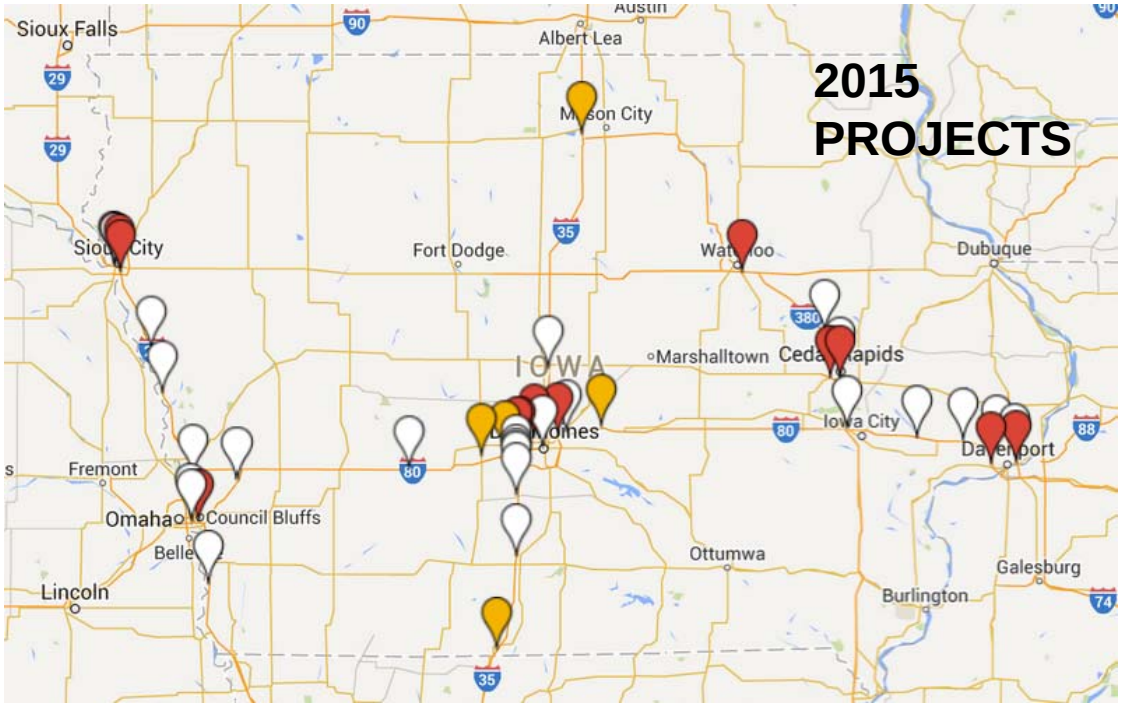
- Statewide Traffic Management Center (TMC)
- Existing ITS Devices:
  - Cameras, Sensors, DMS
- TransSuite Software
  - "Queue Detection"
- ITS Communication Network
- Integration of Rental Devices



Source: Iowa DOT

Iowa DOT Statewide IWZ Project

- Procurement by leasing equipment and services
- Used pay for performance contract
- Selected based on previous contractor experience



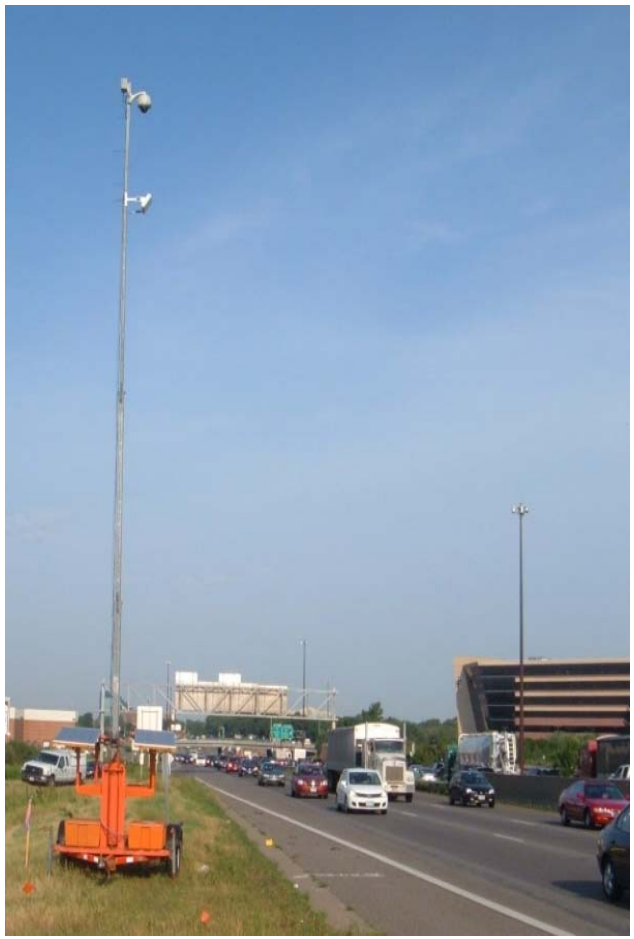
Source: Google

IOWA DOT
SMARTER | SIMPLER | CUSTOMER DRIVEN

White = Monitor-Only
Red/Orange = IWZ

Procurement Example

- Iowa Statewide IWZ Deployment
- Standalone Procurement
  - Assistance from SRF Consulting in writing contract and managing projects
  - Qualifications and Cost-based selection of Street Smart Rentals – Minnesota
  - Integration Support from TransCore
  - Operations by Schneider/Telvent



Source: Iowa DOT

IWZ Successes

- TMC Monitoring
- Flexible Statewide IWZ Contract
  - Very easily added or removed deployments
- Integration
  - Permanent vs. Portable; Owned vs. Rental
  - Cameras & DMS on 51ia.org
- Extensive Coordination
- Performance and Data Tracking Tools

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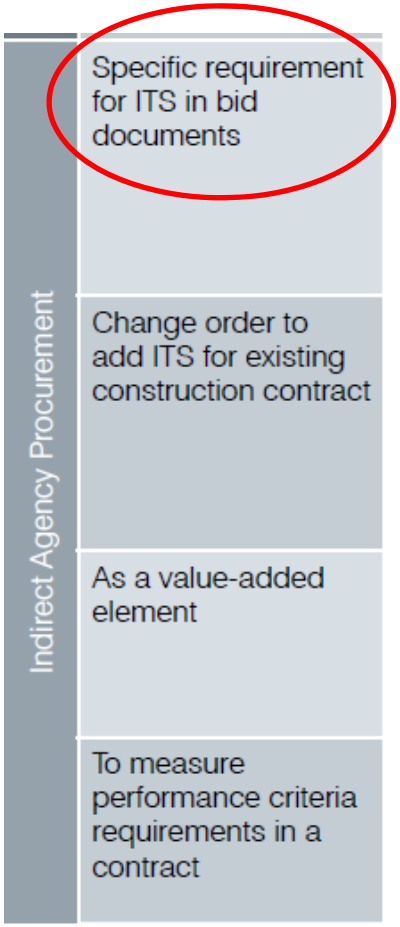
Smarter Work Zones

Procurement of Work Zone ITS Systems and On-Call Smart Work Zone Systems in Illinois

Procurement

- IDOT follows the ITS Implementation Guide Process when procuring Work Zone ITS
- IDOT has used the direct method in deploying ITS devices to supplement existing surveillance systems or monitor work zone conditions
- More typically, IDOT utilizes the indirect method when a Work Zone ITS is needed.

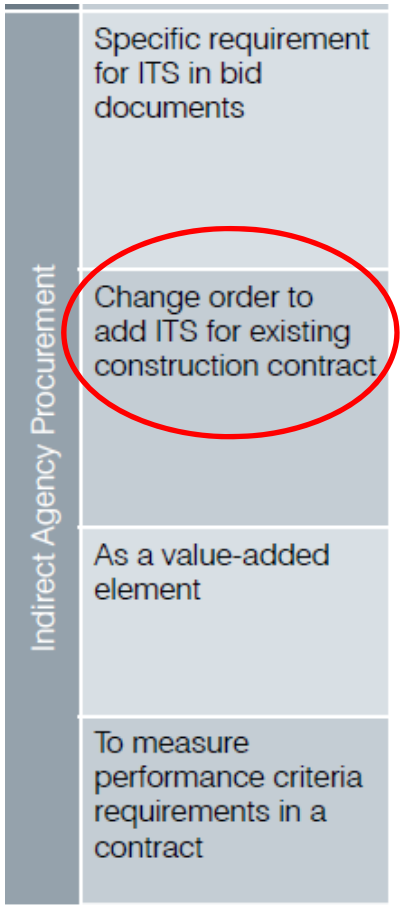
As Part of a General Construction Contract



Source: Battelle

- IDOT generally uses the indirect procurement method when utilizing work zone ITS.
  - Provisions for Work Zone ITS are included in an overall construction contract.

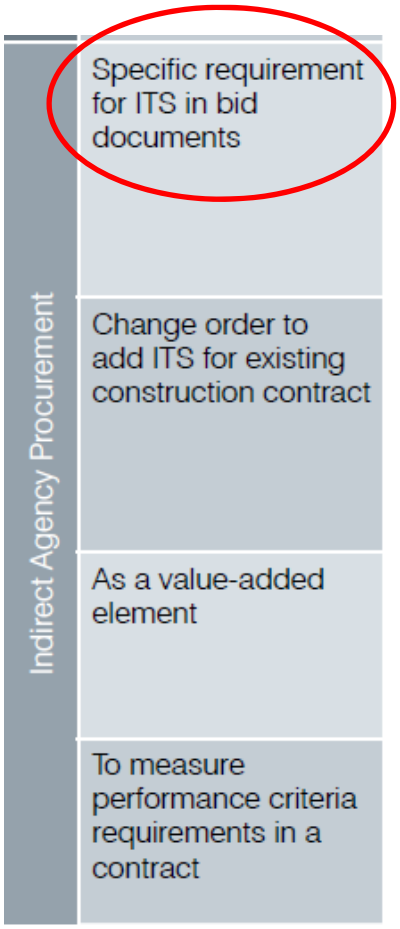
As a Change Order to an Existing Contract



Source: Battelle

- IDOT also has added ITS work zone systems as a change order to existing contracts.
  - General guidance on the number of devices, expected performance, and methods of measurement and payment in a special provision.
  - In such cases, the district would have required the prime contractor to seek bides from 2 or 3 smart work zone system providers, and likely would have accepted the low “bidder”.

A Work Zone ITS Specific Contract

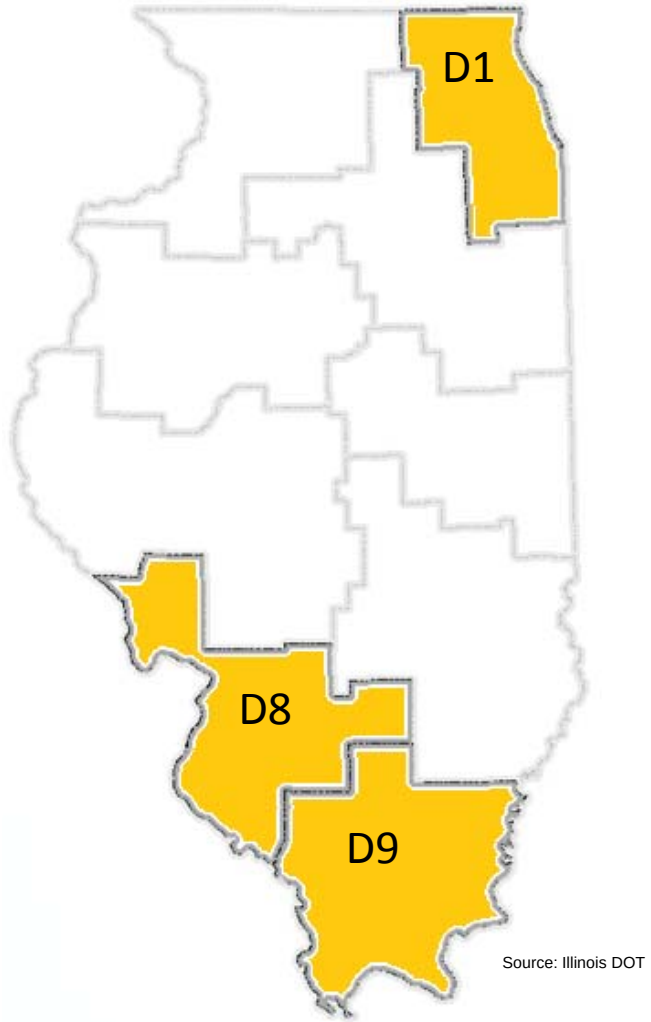


Source: Battelle

- In 2015 IDOT let on-call smart work zone contracts were developed.
  - Standalone Work Zone ITS Contract
  - General guidance on the number of devices, expected performance, and methods of measurement and payment in a special provision.

On-Call Smart Work Zone Systems in Illinois (1 of 2)

- IDOT awarded three on-call contracts in 2015.
- These are three year contracts.
- These contracts are targeted for use with short duration operations/activities.
- The systems provide queue detection and warning.



Source: Illinois DOT

On-Call Smart Work Zone Systems in Illinois (2 of 2)

- Generally, operation/activity durations of no longer than approximately 2 weeks or less.
- Operations/activities involving lane closures on freeways/expressways where significant traffic impacts are anticipated.
- Most often their use has been on IDOT internal operations/maintenance projects, although some have been deployed on contractor-performed projects.

Current On-Call Contracts in Illinois (1 of 2)

- Pay Items:
  - Districts 1 and 8: consisting of four (4) portable changeable messages signs, smart traffic monitoring system which includes four (4) devices, and call-out per typical deployment
  - District 9: consisting of one (1) portable changeable message sign, smart traffic monitoring system, and four (4) smart traffic monitoring devices per typical deployment

Current On-Call Contracts in Illinois (2 of 2)

- Method of Measurement and Basis of Payment:
  - District 1 and District 8
    - Call outs are set on an each basis
    - Smart Traffic Monitoring System and Changeable Message Signs are per calendar day.
  - District 9 allows for the Smart Traffic Monitoring System and Changeable Message Signs per the calendar day, week, and monthly.

On-Call Contract Advantages

- Only pay for the system when needed to address queueing conditions.
- Work directly with the Vendors
- Staff has access to the system, direct monitoring
- Very valuable tool to use with other mitigation strategies.

WORK ORDER

DISTRICT 1 SMART TRAFFIC MONITORING SYSTEM

Sheet 1 of 2

WORK ORDER NO. 3 Date of Issue 3/7/2016 ROUTE WB I-80

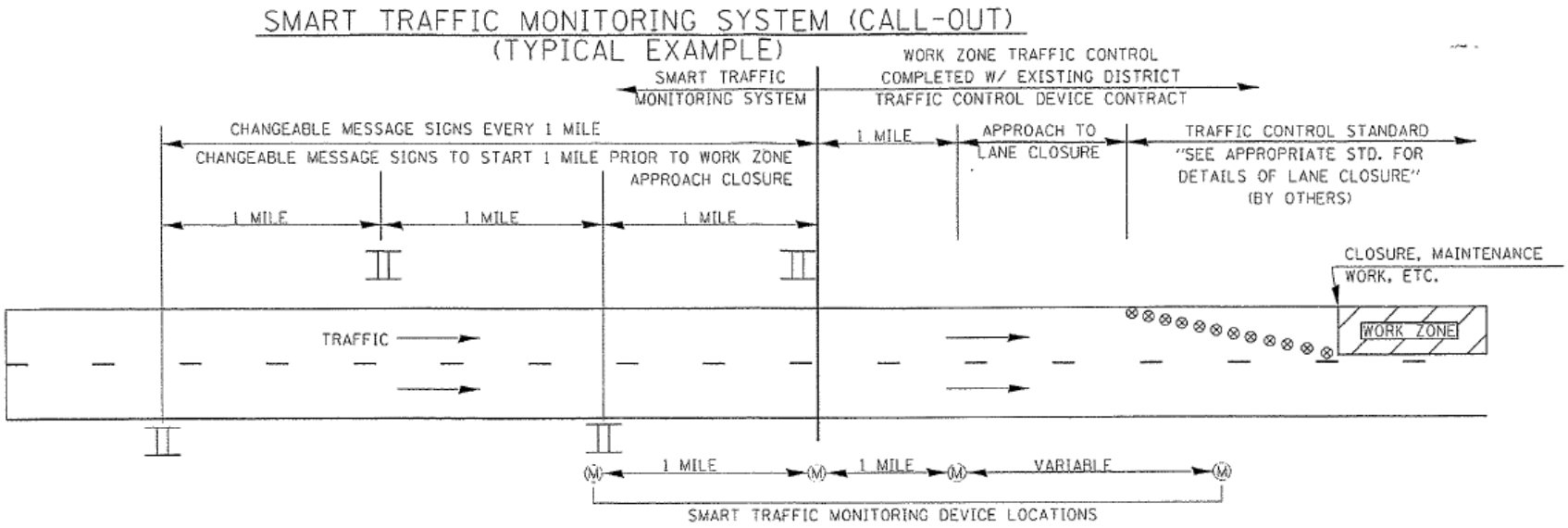
LOCATION DESCRIPTION WB I-80 at Des Plaines River in Will County, IL

CONTRACT NO. 62A35 CLAIM NO.:

HIGHWAY LIGHTING CABLE PRESENT (YES) (NO) (N/A) JOB NO. C-91-150-15

CODE NUMBER		UNIT	QUANTITY	UNIT PRICE	ITEM COST
X7010237	CHANGE MESSAGE SN SPL	CAL DA	16.00	100.00	$1,600.00
X8570001	SMART TRAF MONIT SYS	CAL DA	4.00	500.00	$2,000.00
Z0008759	CALL OUT	EACH	1.00	19,366.66	$19,366.66
				TOTAL COST	$22,966.66

Source: Illinois DOT



*NOTES:

(1) ACTUAL LOCATION OF SMART MONITORING DEVICES SHALL BE BASED ON MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS ALONG WITH THE SPECIAL PROVISIONS AND AS DIRECTED BY THE ENGINEER.

(2) MODIFICATIONS MAY BE NECESSARY TO ACCOMODATE SPECIFIC CLOSURES. ALL CHANGES WILL BE APPROVED BY THE ENGINEER.

LEGEND

- CHANGEABLE MESSAGE SIGN LOCATIONS
- (M) SMART TRAFFIC MONITORING DEVICE LOCATION
- ⊗ DRUM/BARRICADES PER APP. STANDARD (BY OTHERS)

Source: Illinois DOT

Lessons Learned and Future Considerations (1 of 2)

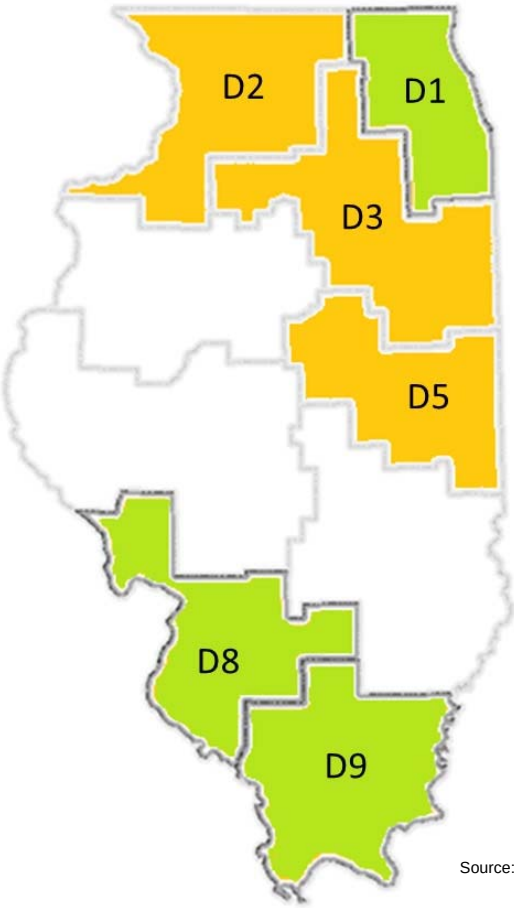
- It is recommended to:
  - Add provisions that require the vendor to install and text any software on IDOT computers within 1 month of contract execution
  - Provide greater flexibility by adding a pay item for individual sensors, if needed (similar to District 9)
  - Specify a required timeline for each of the work orders (issuance, system in place and functional, etc.)

Lessons Learned and Future Considerations (2 of 2)

- Provide clarification on how IDOT would pay for deployments that exceed 1 week, but less than 1 month
- Include an additional statement under “Cooperation Between Contractors” to avoid potential conflicts when deploying on-call systems on other contractor-performed projects
- Provide quantity for CCTV cameras
- Provide clarification on how to handle relocation of systems/devices under a single work order (payment or incidental)

Future of On-Call Smart Work Zone Systems in Illinois

- Success of initial on-call contracts has prompted IDOT to expand statewide.
- District 3 had an on-call contract on the April 22, 2016 letting.
- Districts 2 and 5 will have on-call contracts on the June 2016 letting.



Source: Illinois DOT

For More Information:

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Smarter Work Zones

FHWA Resources

SWZ Interactive Toolkit Available!

https://www.workzonesafety.org/SWZ/

Source: FHWA

Other Resources – Technology Application

FHWA	• FHWA Work Zone Mobility and Safety Program – ITS and Technology http://www.ops.fhwa.dot.gov/wz/its/index.htm • FHWA Work Zone Mobility and Safety Program – Peer-to-Peer Program http://www.ops.fhwa.dot.gov/wz/p2p/index.htm • Work Zone ITS Implementation Guide http://www.ops.fhwa.dot.gov/publications/fhwahop14008/fhwahop14008.pdf • Work Zone ITS Case Studies http://www.ops.fhwa.dot.gov/publications/fhwahop14007/ • Work Zone ITS Overview Webinar http://www.ops.fhwa.dot.gov/wz/webinars/itsoverview013014/ullman/index.htm

Thanks for joining us!

- **Upcoming Events**
  - Webinar #14: *Leveraging TMC Resources for Work Zone Management*
    - Thursday, June 16, 2016, 1:00-2:30pm EST

- Registration: Coming Soon!
  - Check The National Work Zone Safety Information Clearinghouse website for updates https://www.workzonesafety.org/SWZ/

- **Questions or Comments?**
  - Jawad Paracha (FHWA Operations, WZ Team) jawad.paracha@dot.gov