IOWA DOT
SMARTER | SIMPLER | CUSTOMER DRIVEN

ARTBA National Work Zone Management Conference

Iowa Work Zone Management – Traffic Critical Projects

September 12, 2018

Dan Sprengeler, PE
Work Zone Traffic Control Engineer, Office of Traffic and Safety
Iowa Department of Transportation
(515) 239-1823 Dan.Sprengeler@iowadot.us

Presentation Outline

- Traffic Critical Project Program
- Planning for Traffic Critical Projects (aka TCP Checklist)
- Mitigation Strategies
- Intelligent Work Zones
- Work Zone Performance Monitoring
- New Initiatives and Next Steps

Traffic Critical Projects Program

In the beginning…….

Traffic Critical Projects Program

In the beginning…….

Traffic Critical Projects Program

In the beginning……

Not all back-ups are created equal……..

It all depends on who is stuck in traffic.

Traffic Critical Projects Program

Iowa DOT Director, Paul Trombino challenged the Highway Division to improve mobility.

Traffic Critical Projects Program

Iowa DOT Director, Paul Trombino challenged the Highway Division to improve mobility.

Traffic Critical Projects Program

- **Primary Causes of Delay**
  - Weather
  - Crashes
  - **Construction**

Traffic Critical Projects Program

- Initially an Intelligent Work Zone pilot project
- Monitor and improve traffic flow on high-traffic freeways.
- Used money designated for ITS systems .
- Evolved into comprehensive TTC strategy program.

Traffic Critical Projects Program

- Office of Traffic Operations, lead
- Office of Design
- Office of Traffic & Safety
- Office of Construction & Materials
- Office of Bridges & Structures

Traffic Critical Projects Program

- The TCP Program identifies projects that may cause significant safety and mobility issues. Using various mitigation methods, the TCP program works to reduce or eliminate any potential safety or mobility concerns.

- **Vision:** Provide safe, reliable, and efficient travel through construction and maintenance work zones throughout Iowa's highway system.

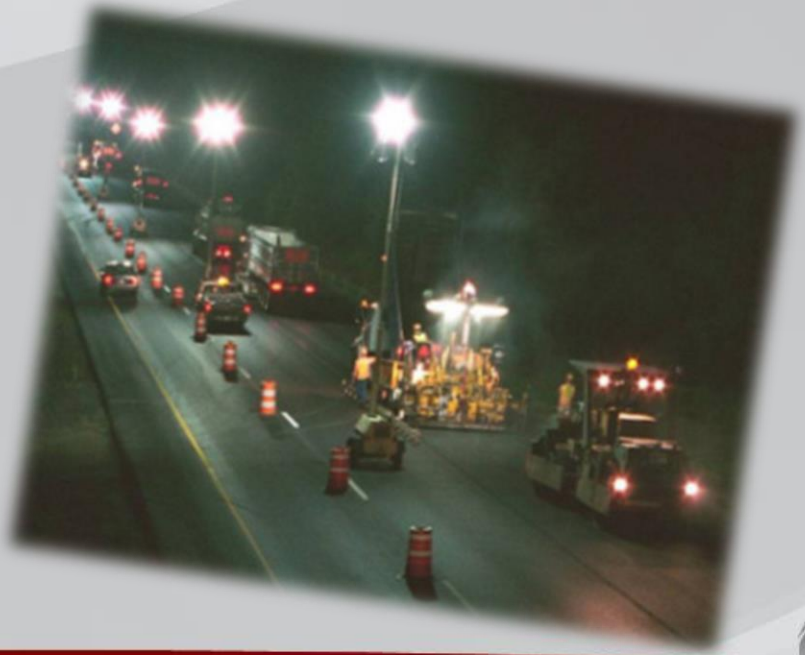
- **Mission:** To identify and implement traffic management strategies that address safety and mobility challenges encountered in construction and maintenance work zones.

Traffic Critical Projects Program

- **Identify projects** during early development that have potential mobility/safety impacts.
- **Apply mitigation strategies** to reduce impacts.
- **Evaluate** mitigation strategies to determine effectiveness.
- Develop **performance measures** to quantify effectiveness of TCP program.
- Develop **organization support** for TCP by developing easily understood procedures.

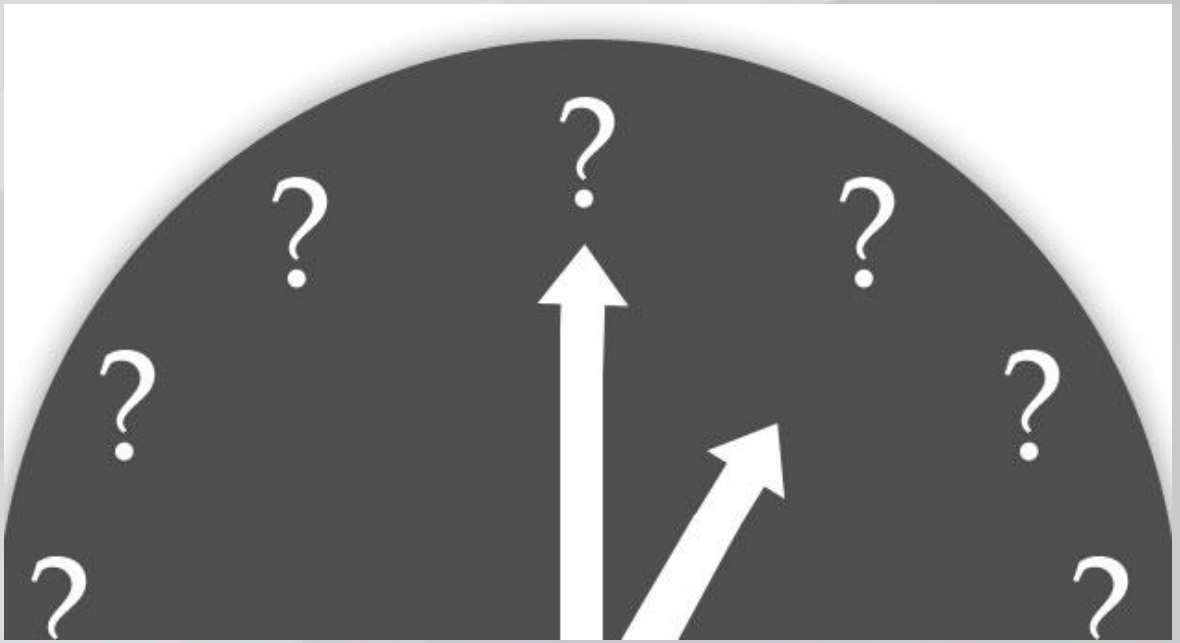
Benefits of the Program

- Provides safe, reliable, and efficient travel through work zones on Iowa's highway system.
- Provides traveling public with meaningful, accurate, and time-appropriate work zone information.
- Provides a variety of strategies to maintain reliable travel during a project.



Planning for Traffic Critical Projects

- Project Concept
- Design Stages
- Maintenance – District Input
- Emergency Projects



Traffic Critical Project Checklist

- The purpose and outcome of the TCP Checklist.
  - Identify Traffic Critical Projects Early in Development
  - Document TMP (if significant)
  - Identify Solutions to Incorporate in Project Concept Documents
  - Document Mitigation Selection

Traffic Critical Project Checklist

- Identify Candidate TCP's
  - Freeways/Expressways
  - 55 mph or greater posted speed limit
  - AADT over 15,000 vpd; or AADT over 11,000 vpd; 20% trucks

Traffic Critical Project Checklist

- Currently screening projects is a “Willy, Mark, and Dan” effort as we try to catch up to the current 5 year program.

- Eventually the TCP Checklist will be used by everyone writing a project concept.

Iowa DOT TCP Checklist

Notice: This checklist is used to identify key construction projects across the state of Iowa that may cause significant safety or mobility issues to the traveling public. This form and any required attachments constitute the TCP checklist.

Instructions: Complete all sections of this checklist. All Iowa DOT projects, regardless of funding, shall have this completed checklist in the project concept file. Submit completed checklist to the Office of Traffic & Safety for final approval.

Candidate Traffic Critical Project (TCP)

Any project on interstates, freeways, or expressways where the speed limit is 55 mph or greater or border bridge where any work, including parking for equipment or material delivery, loading or unloading, is within 15 feet of the normal traveled lane. The attached map shows this TCP network.
If your project is highlighted it is considered a candidate TCP. Otherwise your project is not a TCP and you are finished. Ensure project has appropriate TTC plan.

Click here to view the Transportation Systems Management and Operations speed limit map

Section I: Project Information

County:

Project Number:

Project PIN:

Letting Date:

Construction Year:

Construction Year AADT:

Percent Trucks:

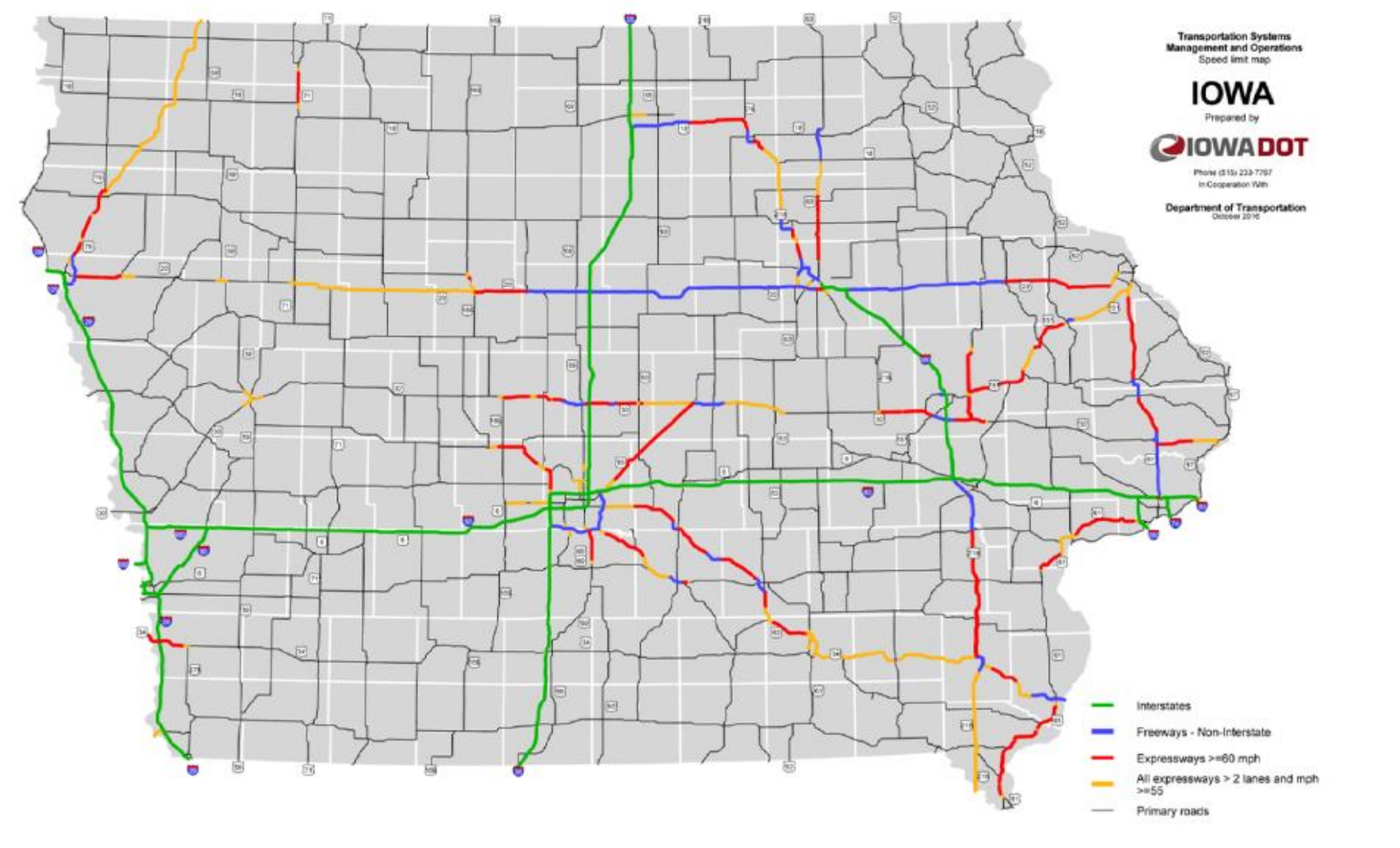
If you have:

- > 15,000 AADT – more data is required.
- > 11,000 & 20% Trucks (or more) seek assistance from DOT-TCP@iowadot.us

Is work, materials, or equipment within 15 feet of the edge of travel lane?

- Yes
- No - Project is non-TCP, ensure project has appropriate TTC Plan

Next


Transportation Systems
Management and Operations
Speed limit map
IOWA
Prepared by
IOWA DOT
Department of Transportation
Interstates
Freeways - Non-Interstate
Expressways >=60 mph
All expressways > 2 lanes and mph >=55
Primary roads

Iowa DOT TCP Checklist

Notice: This checklist is used to identify key construction projects across the state of Iowa that may cause significant safety or mobility issues to the traveling public. This form and any required attachments constitute the TCP checklist.

Instructions: Complete all sections of this checklist. All Iowa DOT projects, regardless of funding, shall have this completed checklist in the project concept file. Submit completed checklist to the Office of Traffic & Safety for final approval.

Traffic Critical Project (TCP)

If a candidate TCP requires any mobility or safety mitigation it shall be classified as a TCP Click here to view a table of Mitigation methods . A candidate TCP that does not require any mobility or safety mitigation shall not be classified as a TCP.

Section III: Candidate Determination

Does analysis identify any mobility and safety concerns?

- Yes
- No - Project is non-TCP, ensure project has appropriate TTC Plan

Can the project be designed or scheduled to address safety and mobility concerns?

- Yes - implement a design or schedule change, and repeat Mobility and Safety Analysis, Phase 1 with these changes
- No - prepare justification summary for inclusion in project concept statement

Are recurring delay or additional mobility and safety concerns still anticipated?

- Yes
- No - Project has been mitigated

Previous Next

Iowa DOT TCP Checklist

Notice: This checklist is used to identify key construction projects across the state of Iowa that may cause significant safety or mobility issues to the traveling public. This form and any required attachments constitute the TCP checklist.

Instructions: Complete all sections of this checklist. All Iowa DOT projects, regardless of funding, shall have this completed checklist in the project concept file. Submit completed checklist to the Office of Traffic & Safety for final approval.

Transportation Management Plan Template

Temporary Traffic Control Plan (TTC)

This section identifies the issues and conditions considered in ultimately developing the project traffic control "J" sheets.

The TTC determines where traffic is located and how traffic is impacted by construction for the duration of the project. Traffic interaction should be considered throughout the development of the project and is an integral part of the staging plan. All types of traffic should be addressed in the TTC, this includes pedestrians, bicyclists, and oversize loads. The TTC should be developed with consensus from the entire project team. Guidance on developing a TTC Plan is included within Chapter 9 of the Iowa DOT Design Manual (Traffic Control) 9A-5. Some questions to be considered include:

Do the standard TTC Plans cover all work on this project?

- Yes
- No

If no please explain what special strategies and plans were considered.

Does the project include long-term closures and/or extended weekend closures?

- Yes
- No

If yes what are the major times and issues that impact traffic?

Can traffic be detoured?

- Yes
- No

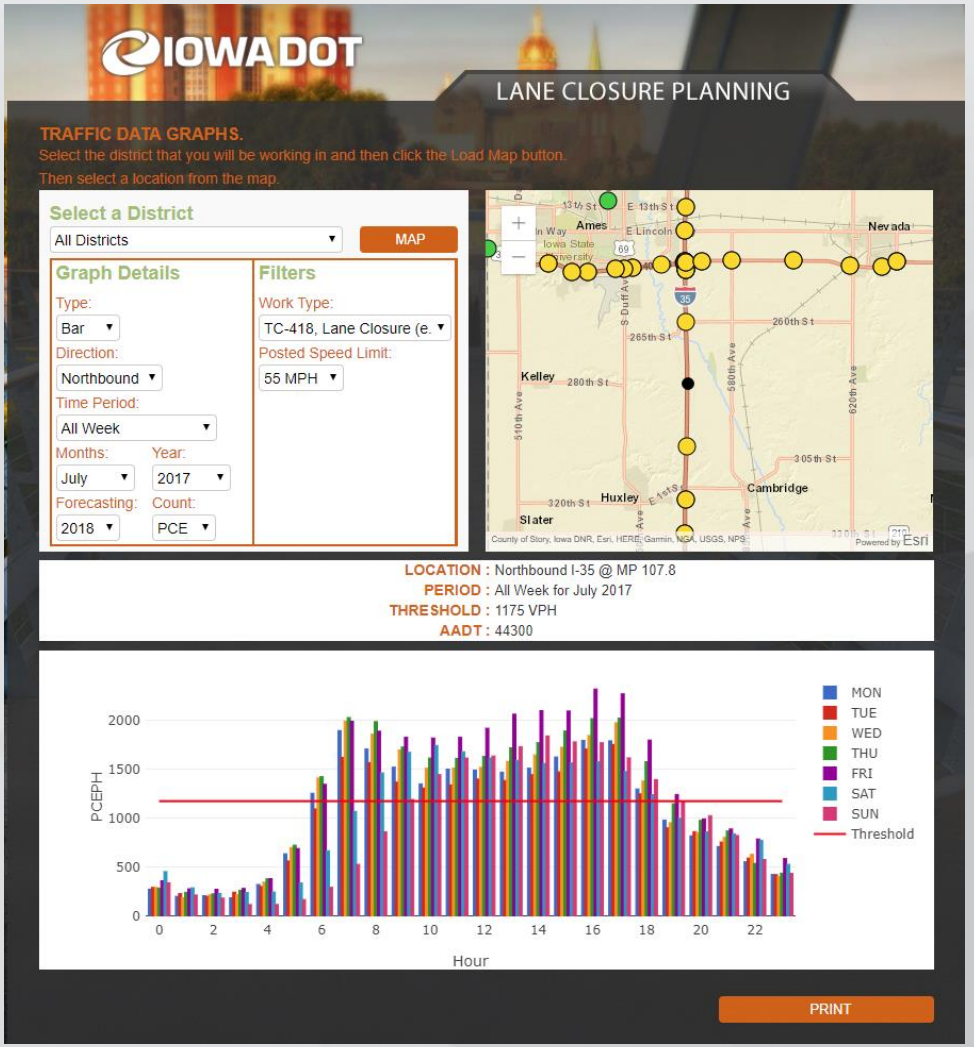
Will the project timing or contractor operations be restricted by rush hours, local celebrations, holidays, weekends, or during major events?

- Yes
- No

If yes please explain why.

Previous Next

Lane Closure Planning Tool

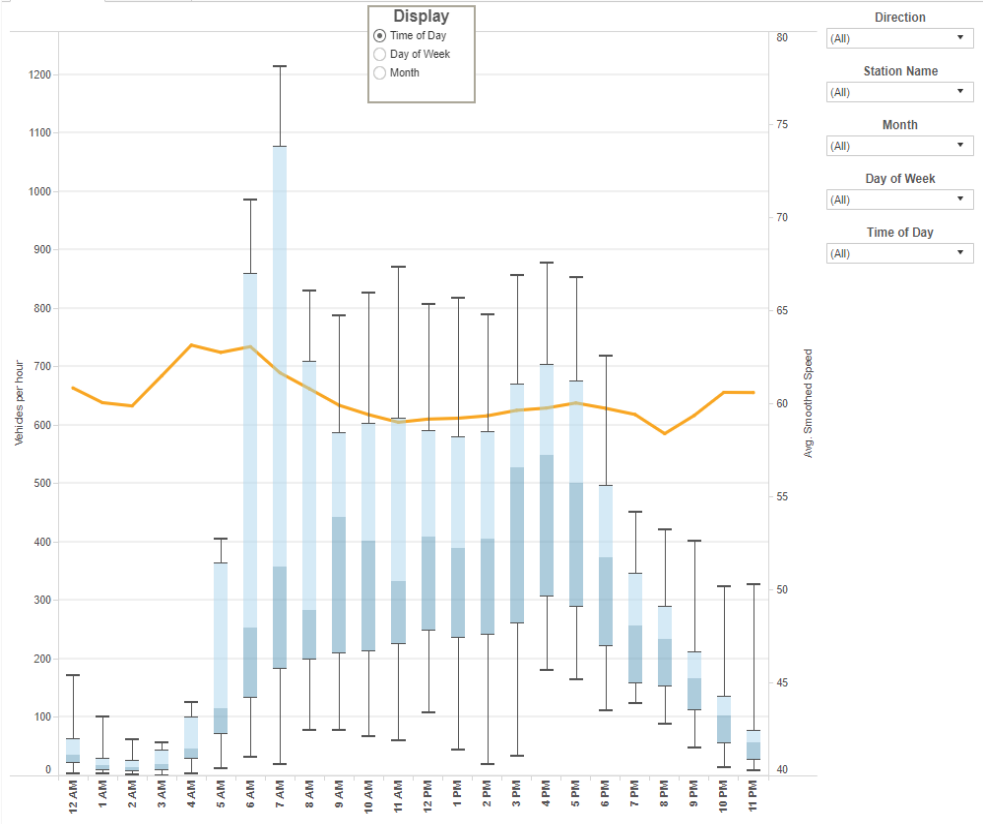


- Provides traffic volumes for sensors across the state (ATR and ITS)
- Users define time (month/year) and work type
- Chart updates with hourly volumes and threshold

https://secure.iowadot.gov/lcptool/Index.aspx

Lane Closure Planning Tool

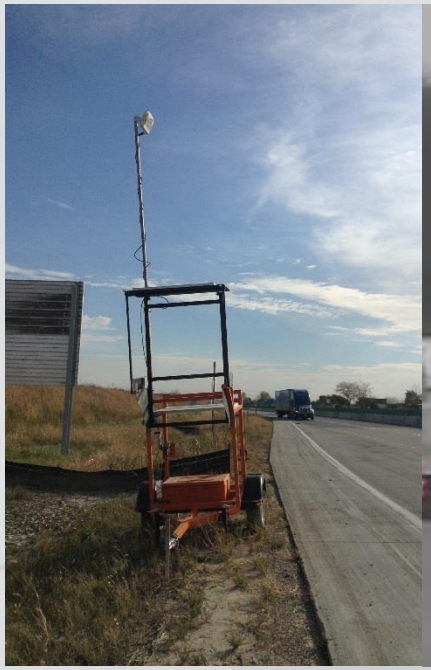
- Expand sensor coverage with additional ITS sensors
- Incorporating RWIS sensors
- Update graphics to box and whisker
- Continue incorporation of LCPT into TCP program



Mitigation Strategies

- Traffic Incident Management Planning
- Work Day Restrictions (Day of Week / Seasonal)
- Limited Working Hours / Night Work
- Public Information (PI) Plan
- Innovative Contract Provisions (Lane Rental)
- Accelerated Scheduling
- Work Zone Length/Area Restrictions
- Intelligent Work Zones

Intelligent Work Zones



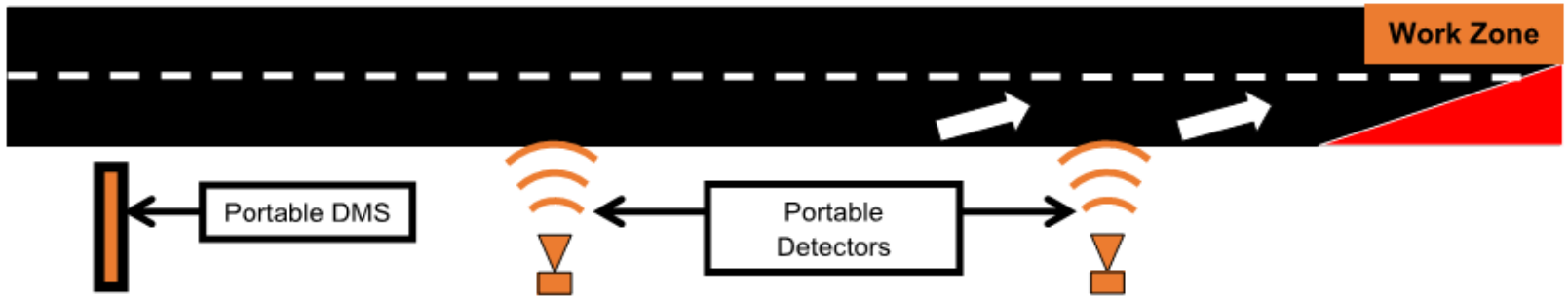
Overview

- Intelligent Work Zones – Using technology to improve safety or traveler awareness within or leading up to a work zone.
- Multiple systems available – different systems for different applications.
- IWZ provides detailed traffic data near, within, and throughout a work zone area.
- Iowa DOT procures IWZ systems through a single vendor to cover projects state-wide.

Intelligent Work Zone Team

- DOT Personnel (Operations, Traffic & Safety, Construction)
- TMC Staff
- Support Consultant Staff
- System Integration Staff
- IWZ Vendor
- Permanent Devices ITS Maintenance Vendor
- University

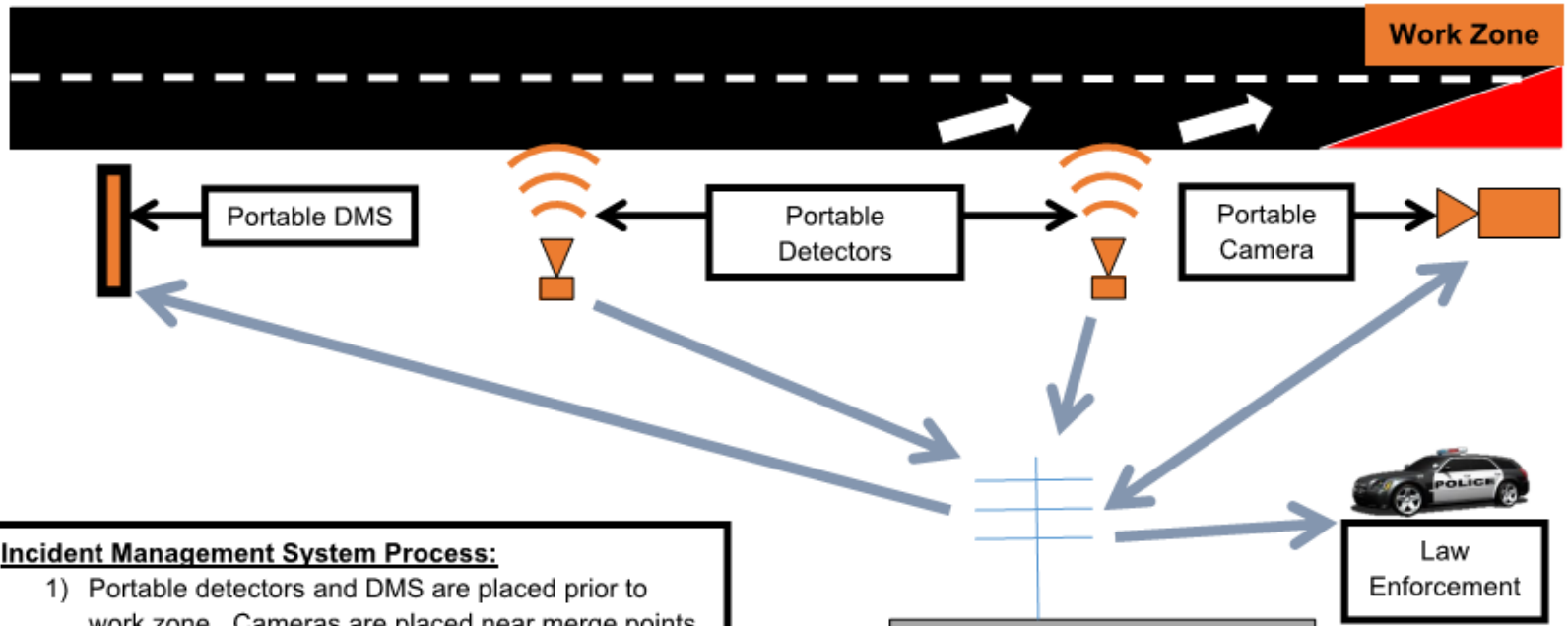
Queue Warning System



Queue Detection System Process:

1) Detectors are placed at consistent intervals leading up to the work zone.
2) Signs are placed prior to points of low visibility (vertical and horizontal curves).
3) Detectors communicate to central or on-site server to look for queuing using programmed logic.
4) When slow speeds are detected, logic posts automated alert messages to portable DMS and sends alert e-mails to project stakeholders.

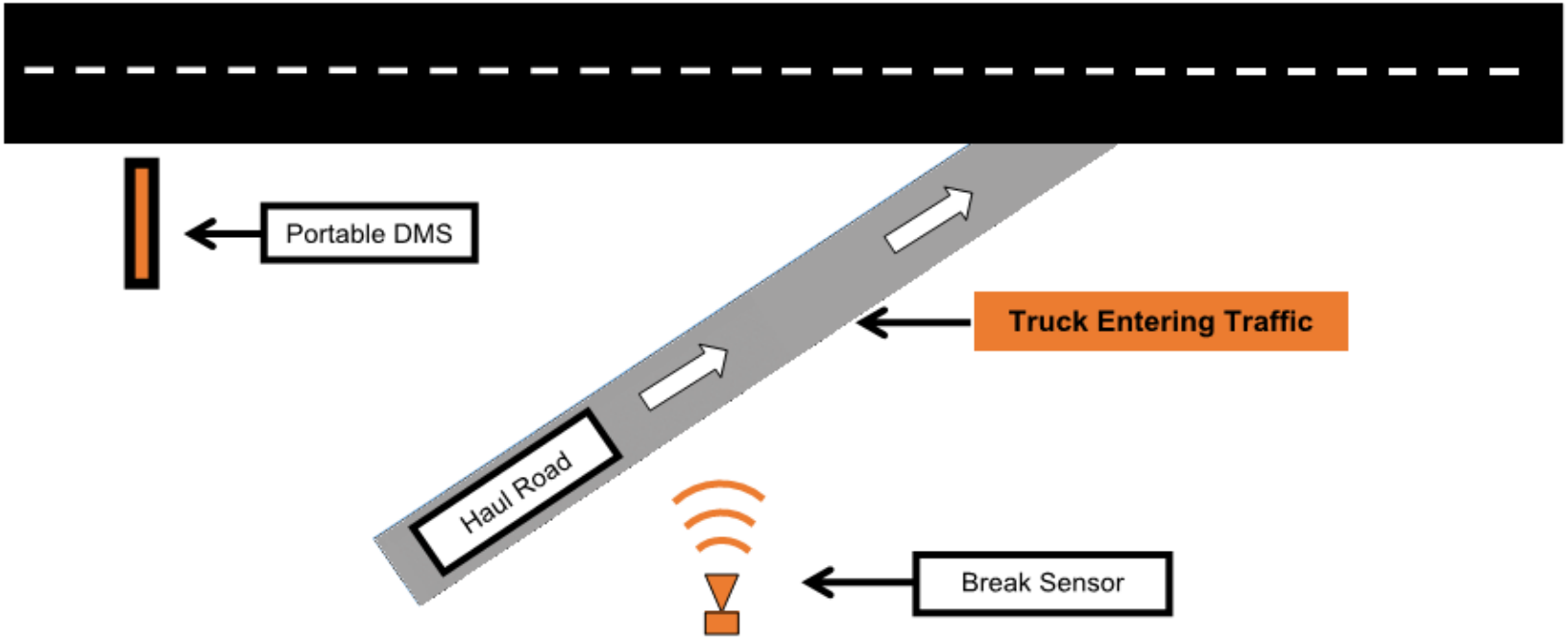
Incident Management System



Incident Management System Process:

1) Portable detectors and DMS are placed prior to work zone. Cameras are placed near merge points or within work zone.
2) Detectors and cameras communicate to Operations Center for traffic monitoring.
3) Logic from central server posts automated alert messages to portable DMS and sends alert e-mails to TOC when slow traffic is detected.
4) TOC verifies slow traffic detections via portable cameras and dispatches appropriate response team, following project's TMP/TIM.

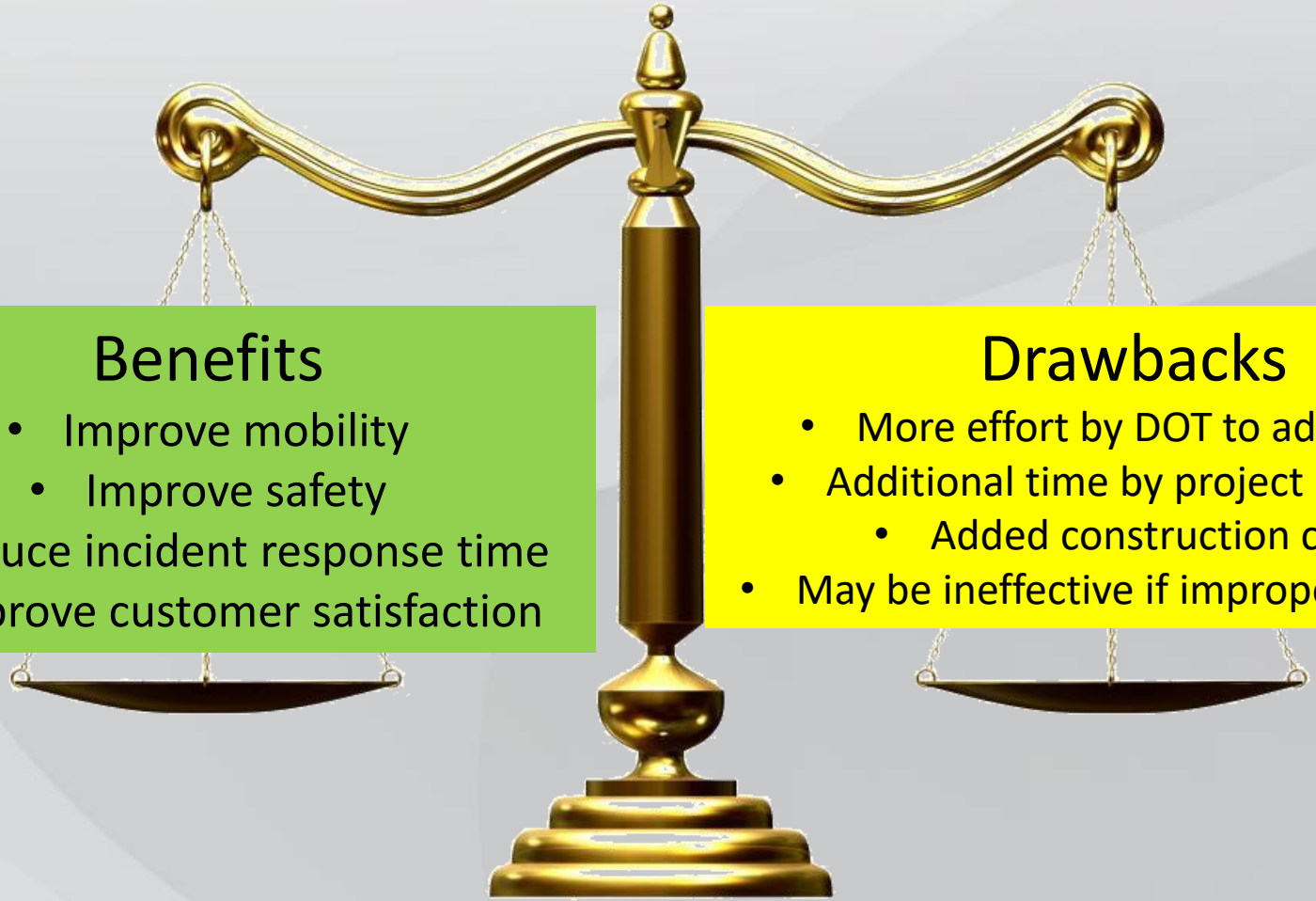
Truck Entering Warning System



Truck Entering Traffic System Process:

1) Break sensor placed on truck hauling route close to the point where the truck is to enter traffic.
2) Sign is placed prior to point of truck entering.
3) If sensor detects a vehicle, a message is displayed on the PDMS warning traffic of slow moving truck entering.

Overview



Benefits

- Improve mobility
- Improve safety
- Reduce incident response time
- Improve customer satisfaction

Drawbacks

- More effort by DOT to administer
- Additional time by project personnel
- Added construction costs
- May be ineffective if improperly applied

New Initiatives Underway

- Real-time Smart Arrow Board
- SWZDI Data Archival
- InTrans “GO Team” Initiative
- Lane Closure Permitting System

Real-time Smart Arrow Boards

- Iowa DOT is ENTERPRISE member and contributed to Model Requirements
- Developing plan to integrate smart arrow boards into construction and maintenance operations