

AGENCY IMPROVEMENT: IOWA'S COMPREHENSIVE WORK ZONE MANAGEMENT PROGRAM

By: Iowa Department of Transportation

IN THIS CASE STUDY YOU WILL LEARN:

1. Development strategies using Iowa's Traffic Critical Projects (TCP) checklist leading to a Detailed Work Zone Management Plan.
2. Innovative methods of sharing and disseminating work zone information.
3. Ways safe truck parking leads to more efficient and safe movement of goods across the country.

BACKGROUND



Iowa is the crossroads of America's Heartland with Interstates 35 and 80 crisscrossing the state. A recent report by TRIP, a national transportation research nonprofit, indicates freight moved by trucks in Iowa will increase 53 percent (by value) from 2016 to 2045. Managing interstate and other critical

regional connections to meet the needs of existing and projected freight growth has challenged the Iowa Department of Transportation (Iowa DOT) to focus on minimizing delays and improving safety, especially when highway construction creates these issues. Iowa DOT's 2016 TSMO Strategic and Program Plans reinforced the Department's continued need to focus on proactive work zone management as one of eight critical areas.

A detailed five-year Work Zone Management Service Layer Plan was developed to clarify the tactical areas to which the department

should apply time and resources. The plan development has elevated the importance of work zone management throughout Iowa DOT, resulting in many activities, all of which contribute to improving delay, safety, and the department's TSMO maturity.

TSMO PLANNING, STRATEGY, AND DEPLOYMENT

To determine which types of highway projects require additional work zone management attention, the Traffic Critical Projects (TCP) process was developed and integrated into the department's Design Manual in March 2019.

THE TWO-STEP PROCESS DETERMINES:

- 1) Does the proposed work qualify as a TCP
- 2) Is the project designated as Significant, which requires an added level of planning.

TCP – Yes or No?	Significant – Yes or No?
<ul style="list-style-type: none"> • Primary Highway System • High Speed Multi-Lane Highway • Work within 15' of Edge of Slab • AADT over 15,000 or 11,000 w/ 20% trucks • Lane Closure Planning Tool (Figure 1) shows proposed work exceeds capacity 	<ul style="list-style-type: none"> • Located within a Metropolitan Planning Organization (MPO) or Transportation Management Areas (TMA) <ul style="list-style-type: none"> ◦ Des Moines, Quad Cities or Council Bluffs • On an Interstate • Lane closure lasting more than three days

An online checklist has been developed to verify the mitigation measures that will be integrated into the TCP. A newly developed Work Zone Reference Library also houses a consolidated collection of practitioner resources that include:

- **Lane Closure Planning Tool:**
<https://secure.iowadot.gov/lcptool/Index.aspx>
- **Online TCP Checklist:**
<https://webapps.srfconsulting.com/idottcp/>
- **TCP Section of Design Manual:**
<https://iowadot.gov/design/dmanual/09e-01.pdf>
- **Work Zone Reference Library:**
<https://iowadot.gov/workzonereferencelibrary>

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Based on outcomes of the TCP process checklist, several mitigation countermeasures are integrated into the project Design Manual including:

TRAFFIC OPERATIONS TREATMENTS

(<https://iowadot.gov/design/dmanual/09f-06.pdf>)

Options include extra enforcement, contractor ingress/egress requirements, maximum allowable delay specifications to minimize backups, detours during full closure, and contraflow operations to manage peak traffic volumes.

INTELLIGENT WORK ZONE (IWZ) EQUIPMENT

(<https://iowadot.gov/design/dmanual/09f-07.pdf>)

Iowa DOT is an early adopter in requiring all IWZ equipment to seamlessly integrate with the statewide TMC's advanced traffic management system (ATMS). TMC operators can visually monitor permanent field equipment and temporary IWZ equipment simultaneously. A variety of IWZ solutions are employed, depending on specific needs:

- End-of-Queue Warning
- Monitoring Sensors
- Speed Feedback Signs
- Dynamic Truck Entering Traffic Warning System
- Portable DMS with Radar Warnings
- Travel Time Systems (including alternate routes)

WORK ZONE TRAFFIC INCIDENT MANAGEMENT (TIM) PLANS

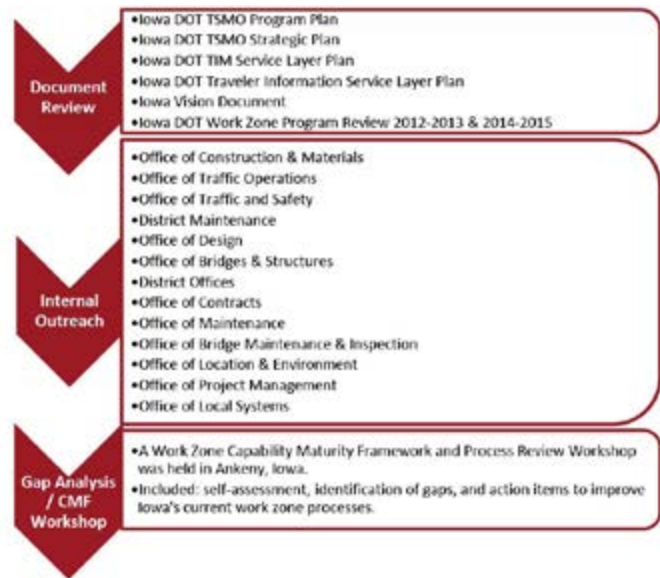
(<https://iowadot.gov/design/dmanual/09f-08.pdf>)

Most TCP locations, including all Interstates, are covered by permanent TIM Plans. The TCP process includes a TIM plan assessment to ensure adequate response throughout the construction project. TIM plans are created by many stakeholders including city/county/state law enforcement, first responders, public works, communication centers, towing and recovery, and Iowa DOT. Beyond the content of the permanent TIM Plans, Work Zone TIM Plans may include:

- Diversion Route Plan Modifications
- Additional Diversion Route Signing
- Temporary Cameras or Sensors
- Portable DMS
- Emergency Traffic Control Procedures
- Emergency Response Routes

COMMUNICATIONS, PLANNING, AND EXECUTION

Iowa DOT has a commitment to proactively monitor and share information on work zone performance to mitigate unforeseen



Work Zone Plan Development Process

issues using several strategies. These include real-time performance monitoring, flex-enforcement, smart arrow boards, a work zone data hub, a work zone council, and annual work zone safety awards.

Iowa institutes real-time performance monitoring in partnership with the Institute of Transportation (InTrans) at Iowa State University. Daily and weekly reports are shared with the statewide TMC, construction engineers, and law enforcement partners. InTrans also used machine learning to develop an application that identifies slow and stopped conditions and sends text alerts with camera images during sustained traffic delays. This allows those responsible for day-to-day operations to have an immediate awareness of traffic delays.

While extra enforcement is considered early in project development, sometimes not enough supplemental enforcement resources are planned. Through Iowa DOT Motor Vehicle Enforcement, a flex-enforcement program has been established where additional officers can be shifted into problematic areas as needed.

The Iowa DOT has also developed a specification to require smart arrow boards by 2021 for Interstate routes and 2022 for all state highway projects. The smart arrow boards include a GPS unit and cellular modem which continuously reports location and status. This generates an accurate record of lane closures and allows the TMC, and others via data feed, to be notified automatically with work zone closure times and locations.

In an additional partnering effort, Iowa DOT is working with InTrans to develop a "research grade" work zone data hub leveraging proposed standards and architecture developed through the Federal Highway Administration (FHWA) National Work Zone Data Initiative.

Finally, Iowa has created a cross cutting Work Zone Council to rapidly address developing issues and share new initiatives. The

MAASTO REGIONAL TRUCK PARKING INFORMATION SYSTEM

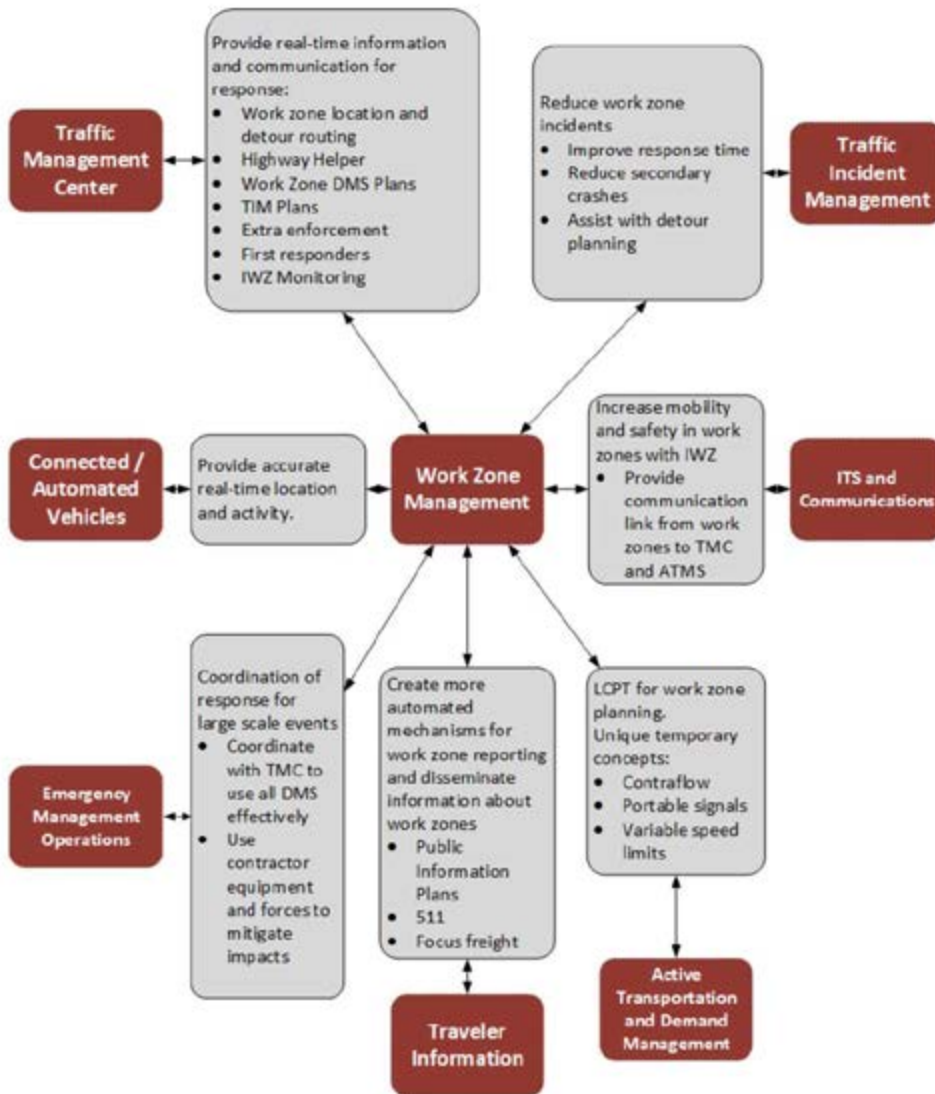
DOT also highlights exemplary work and commitment through annual work zone safety awards. Iowa DOT has established several awards for a range of project types using a variety of selection criteria that demonstrate compliance, innovation, and stakeholder communications.

OUTCOMES, BENEFITS, AND LEARNING

The results of Iowa's comprehensive work zone management program have been tremendous. The program has helped advance Iowa DOT's TSMO capability maturity through the development of policy and procedure as well as good communication channels.

Opportunities Created by a TSMO Based Approach

The core mission of TSMO as defined by the Federal Highway Administration (FHWA) is to facilitate system management and operation by building on existing staff, processes, and systems to fully realize a transportation system's capacity. By identifying the relationships and interconnection of Iowa's TSMO service layers, collaboration, and new opportunities for growth within the DOT can be realized.



FURTHER INFORMATION

Iowa TSMO Management Plan

Iowa TSMO Strategic Plan

Iowa Work Force Service Plan

NOCoE Knowledge Center: <https://transportationops.org/knowledge-center>