

# REVISION HISTORY

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The Iowa Department of Transportation (DOT) will periodically update this document. The following table provides the date and a brief description of each revision to track revision history.

| REVISION NUMBER | DATE OF REVISION | DESCRIPTION OF REVISION        |
|-----------------|------------------|--------------------------------|
| 1.0             | June 2018        | Initial Version                |
| 2.0             | September 2020   | Updated Action Recommendations |
| 3.0             | July 2022        | Updated Action Recommendations |
| 4.0             | December 2024    | Updated Action Recommendations |

## ACTION RECOMMENDATIONS

Many of the Action Recommendations from the original Work Zone Management Service Layer Plan have been completed or revised as progress has been made. This update incorporates revisions to ongoing actions and adds new actions resulting from work zone mobility and safety efforts.

The following action recommendations are proposed to achieve the Work Zone Management Service Layer’s (WZMSL) objectives outlined in the 2018 report. The action recommendations are presented in order of category and not priority.

### 1. Systems and Technology

The systems and technology dimension includes the use of systems engineering, systems architecture standards, interoperability, and standardization. It is the DOT’s approach to building systems (FHWA).

#### ST-01. Work Zone Safety Performance Analysis Tools \*Ongoing/Updated

Iowa has incredible amounts of data used for work zone applications and has been an active participant in the FHWA Work Zone Data Initiative (WZDI).

Iowa’s Data Hub aggregates and summarizes this information to create datasets used by Department staff and others for meaningful, and useful applications such as future project planning. The data includes, but is not limited to work zone data, crash data, Lane Closure Planning Tool (LCPT), hourly volumes, AADT, annual cultural events, weather history, etc. Beyond linking data, Iowa DOT wants to turn data into useful actionable information.

**Action:** Work Zone Safety Performance Analysis Tools

**Lead:** Traffic Operations Bureau, CTRE

**Support:** Traffic and Safety Bureau, IT, TMC, GIS

**Accomplishments:** Establish analytical methods for assessing expected effectiveness of existing & new technology for WZM efforts.

Establish a mechanism to periodically review and update procedures for incorporating new WZM technology and processes in TMP/TCP development process.

Develop a process to systematically collect and aggregate data on the effect of new/existing WZM technologies and procedures.

Perform outreach and updates to districts for use and improvement.

**Duration:** 5 years– Initial development focused creating actionable tools for DOT use, promotion of the tools, and update of current resources.

**ST-02 Connected Devices for the DOT Fleet \*New**

Continue to work to develop and deploy devices such as connected temporary traffic signals and other devices. This includes collaborating with the development of the Work Zone Data Hub, WZDx efforts, and the purchase and deployment of smart work zone devices for maintenance operations. Informing both DOT agencies and private companies that deploy devices on the Iowa highway system is important to the full deployment of these devices.

**Action:** Incorporating maintenance into the innovation – establish the funding sources and get funds allocated for connected arrow boards and connected temporary traffic signals. Develop business cases for maintenance to get funding.

Review maintenance needs for all new connected devices or innovation roll outs; Internal DOT fleet operations should reflect similar deployments to contract operations by contractors.

**Lead:** Bureaus of Traffic Operations, Maintenance

**Support:** Design Bureau. Construction and Materials Bureau, TMC

**Maintenance:** Annual touchpoint

Business case for connected devices on maintenance fleet.

**Accomplishments:** Review maintenance needs for all new connected devices or innovation roll outs.

**Duration:** 5 years

## 2. Performance Measures

The performance measures dimension includes the measures definition, data acquisition, and data use. It is the DOT's approach for establishing and using performance measures (FHWA).

### **PM-01 Investigate Relationship Between Work Zone Speed Density and Work Zone Crashes**

#### **\*Ongoing/Updated**

Use of machine learning to identify slow and stopped conditions has resulted in establishing speed density curves that provide four clusters of information, normal, minor delay/recovery, slow traffic and stopped traffic. This system is currently used to provide real-time alerts to TMC and project managers while reducing the number of false alerts experienced with the previous system that relied on a fixed 45 mph threshold. While critical to assessing mobility in a work zone, no quantifiable linkage to traffic safety has been established. This action item is to determine if there is a statistically valid linkage between these speed density curves and number, type, and severity of traffic crashes. If a relationship can be established, this real time and historic data could be used to determine safety risk based on observed speed in work zones.

CTRE/InTrans developed a model which shows the risk factor for slow and stopped conditions-based speed density data on the duration of the impact (slowdown). The analysis and results were presented, and discussions are ongoing about how the model can be implemented.

#### **Action:**

Develop processes and procedures to report this information to inform management of risks, project managers of issues on specific projects, and provide data driven identification of projects that indicate a need for further review by the process review team.

#### **Lead:**

Traffic Operations Bureau & CTRE/InTrans

#### **Support:**

Bureaus of Traffic and Safety, Construction and Materials, Design

#### **Maintenance:**

Review every three years

#### **Duration:**

12 months

### **PM -02 FHWA Performance Measures \*New**

FHWA released a new Performance Measures Rule 23 CFR 630 document 89 FR 87282 effective December 2, 2024, that listed "Incorporation of a requirement in a State's Work Zone Safety and Mobility Policy to define the safety and mobility performance measures that the State will monitor and report."

The proposed rule suggested the following project-level and programmatic-level performance measure examples: number of fatal and injury crashes occurring in a work zone (project-level measure); percent of projects that exceed a preestablished crash rate in the work zone (programmatic-level measure); number of highway worker fatalities and injuries experienced or highway worker fatality and injury rate per hours worked (project- or programmatic-level measure); percent of projects that experience queues above a predefined threshold (programmatic-level measure); and percent of time when speeds in a work zone drop below a predefined threshold (project-level measure).

The final rule states that the safety and mobility performance measures included in the NPRM are examples and are not mandatory, however the final rule does require States to identify at least one performance measure in their work zone policies. “States may choose performance measures that are best suited to their work zone conditions and impacts, but they must have a documented work zone performance management approach for selecting projects identifying performance measures and collecting performance data.”

**Action:** Adopt the FHWA Proposed Rule 88 FR 64836 Performance Measures as a baseline measure of performance for Iowa work zones. Once implemented DOT will review for refinement and goal setting.

**Lead:** Work Zone Mitigation Team & CTRE

**Support:** Bureaus of Design, Traffic Operations. Traffic and Safety

**Maintenance:** Revised every year

**Duration:** 12 months

### 3. Culture

The culture dimension includes technical understanding, leadership, outreach, and program legal authority. It is the DOT's approach for changing culture and building champions. (FHWA).

Members of the Work Zone Council organization support innovations to improve work zone safety and mobility for both construction and maintenance operations. A key element of this effort is to ensure statewide implementation of successful innovations by promoting them department wide.

#### **CL-01 Promote Work Zone Innovation- Process Reviews WZM Performance Reports**

**\*Ongoing/Updated**

|                     |                                                                                                                                                                                                                            |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Action:</b>      | As part of the annual process reviews collect WZM performance measurement reports. Solicit feedback from key staff and external partners regarding WZM performance measurement reports and revise based on input received. |
| <b>Lead:</b>        | Design Bureau                                                                                                                                                                                                              |
| <b>Support:</b>     | Bureaus of Traffic Operations, Construction and Materials, Maintenance, Traffic and Safety, and Strategic Communications.                                                                                                  |
| <b>Maintenance:</b> | Promote at all quarterly Work Zone Council Meetings                                                                                                                                                                        |
| <b>Duration:</b>    | 5 Years                                                                                                                                                                                                                    |

#### **CL-02 Promote Work Zone Innovation – Temporary Rumble Strips \*Ongoing/Updated**

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|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Action:</b>      | Temporary Rumble Strips - Demonstrate and evaluate long term temporary rumble strips in advance of anticipated queue on freeway projects. |
| <b>Lead:</b>        | Construction and Materials Bureau                                                                                                         |
| <b>Support:</b>     | Bureaus of Design, Traffic Operations, and Maintenance, Traffic and Safety.                                                               |
| <b>Maintenance:</b> | Promote at all quarterly Work Zone Council Meetings                                                                                       |
| <b>Duration:</b>    | 5 Years                                                                                                                                   |

**CL-03 Promote Work Zone Innovation- Worker Safety Initiatives \*New**

Provide regular updates to the districts/maintenance on worker safety device testing & availability. Example Systems: Pi-Lit, Guardian Clips

**Action:** Provide Business case and formal recommendations for distribution after testing.

**Lead:** Traffic Operations Bureau

**Support:** Bureaus of Design, Construction and Materials, Maintenance, Traffic and Safety

**Maintenance:** Annual Touchpoint & Update at quarterly Work Zone Council Meetings

**Duration:** 5 Years

**CL-04 Promote Work Zone Innovation- Worker Mental Health Resource Visibility \*New**

Update work zone reference library (WRL) to include mental health resources.

**Action:** Add links for Shawn Havick training and all additional DOT approved mental health resources available, will be an internal DOT link to the Safety and Wellness site for now, work with HR to determine if additional visibility is appropriate.

**Lead:** Traffic Operations Bureau

**Support:** Bureaus of Design, Construction and Materials, and Maintenance, Traffic and Safety, Strategic Communication, and HR.

**Maintenance:** Annual Touchpoint

**Duration:** 5 Years

#### 4. Collaboration

The collaboration dimension includes relationships with public safety agencies, local governments, metropolitan planning organizations, and the private sector. It is the DOT's approach for improving working relationships. (FHWA).

##### **CO-01 Work Zone Design Stakeholders - Lane Closure Maps \*Ongoing/Updated**

**Action:** District allowable lane closure maps have been created for maintenance and construction closures. A review schedule must be defined and set to maintain the integrity of the map information. As the Lane Closure System progresses, an annual review of the system overrides may assist in this review.

**Lead:** TSMO Engineers

**Support:** Bureaus of Construction and Materials, Traffic and Safety, and Design

**Maintenance:** Annual Review

**Duration:** 5 Years

##### **CO-02 Design/Field Support – Mitigation Team Support \*New**

**Action:** Add information to the WRL & Design Manual about how to contact the mitigation committee and what their role is. Add a date in Masterworks for the new checklist/flowchart.

**Lead:** Mitigation Team

**Support:** Bureaus of Design, Construction and Materials, Traffic and Safety, Traffic Operations

**Maintenance:** Mitigation Team report at WZMTO Committee meetings.

**Duration:** One year

##### **CO-03 External Partner Co-Lab: Trucking - Special Situations - Commercial Vehicles \*New**

**Action:** Investigate/Evaluate Concerns from Trucking Industry.  
Meet once or twice a year for an external stakeholder meeting.

**Lead:** Construction and Materials Bureau

**Support:** Bureaus of Design, Traffic and Safety, and Traffic Operations

**Maintenance:** Annual/Bi-Annual Touchpoint

**Duration:** 5 years

**CO-04 Maintenance Collaboration \*New**

**Action:** Collaboration with Maintenance Task Force to accommodate concerns/provide updates/etc. Meet quarterly or twice a year.

**Lead:** Work Zone Safety Committee and Maintenance Work Zone Safety Subcommittee

**Support:** Bureaus of Design, Traffic and Safety, Construction and Materials, Traffic Operations

**Maintenance:** Quarterly/Bi-Annual Touchpoint

**Duration:** 5 years



## 5. Business Process

The business process dimension includes formal scoping, planning, programming, and budgeting. It is the DOT's approach for plans, programs, and budgets. (FHWA).

### **BP-01 Improve Plan Development Process and Collaboration Tools - End of Season Workshops \*New**

|                     |                                                                                                  |
|---------------------|--------------------------------------------------------------------------------------------------|
| <b>Action:</b>      | Hold end of season after action workshops in each District for construction and maintenance.     |
| <b>Lead:</b>        | TSMO Engineers                                                                                   |
| <b>Support:</b>     | Bureaus of Design, Bridges and Structures, Traffic and Safety, Construction and Materials Bureau |
| <b>Maintenance:</b> | Annual                                                                                           |
| <b>Duration:</b>    | 5 years                                                                                          |

### **BP-02 Improve Processes to Implement Data Driven Decisions- Work Zone Speed Limits \*Updated/Ongoing**

Develop or improve policies, standards, specifications, guidelines, and standard operating procedures that will facilitate implementing mitigations and improvements based on data collected and used for work zone management.

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | Work Zone Speed Limit Task Force:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Action:</b>      | <ul style="list-style-type: none"><li>• Include discussion of issues that indicate the need to revise policies, standards, guidelines, and procedures in the Work Zone Council network of committees, teams, and task forces. Focus actions from these meetings toward continued improvement. Review processes and procedures on a periodic basis.</li><li>• Develop recommendations to improve timing of median crossover construction.</li><li>• Investigate incrementally reducing speed limits in work zones rather than a system wide 15mph decrease.</li><li>• Study proper regulatory speed limits in work zones</li></ul> |
| <b>Lead:</b>        | Design Bureau                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Support:</b>     | Bureaus of Traffic and Safety, Construction and Materials Traffic Operations, Maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Maintenance:</b> | Annual report to Work Zone Council                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Duration:</b>    | 5 years                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

**BP-03 Improve Project Coordination/Communication - Design Feedback Loop \*New**

|                     |                                                                                                                                                                                                                                                                                                                                      |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Action:</b>      | Address design comments/feedback from information sharing and CMF workshops with workshop/webinar with Design & send to consultants to clarify the problems and develop solutions. <ul style="list-style-type: none"><li>• Design Feedback Task Force - Meet Quarterly/Monthly</li><li>• Feedback from the Field to Design</li></ul> |
| <b>Lead:</b>        | Design Bureau                                                                                                                                                                                                                                                                                                                        |
| <b>Support:</b>     | Bureaus of Traffic and Safety, Construction and Materials Project Management                                                                                                                                                                                                                                                         |
| <b>Maintenance:</b> | Annual report to Work Zone Council                                                                                                                                                                                                                                                                                                   |
| <b>Duration:</b>    | 5 years                                                                                                                                                                                                                                                                                                                              |

## 6. Organization and Work Force

The organization and work force dimension includes programmatic status, organizational structure, staff development, and recruitment and retention. It is the DOT's approach for improving the capability of their workforce. (FHWA).

### **OW-01 Support Continued Effort to Integrate TCP Efforts – Shoulder Design**

#### **\*Ongoing\Updated**

This action item is currently in progress. The TCP program deals directly with Iowa work zones so having the TCP program housed under the TSMO WMZSL umbrella is appropriate. This action recommendation is a continuation of the TCP program as it updates standards and guidelines for the DOT as 'a way of doing business for Iowa work zones.

|                     |                                                                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Action:</b>      | Investigate revising shoulder design to widen inside shoulders to facilitate MVE and maintenance operations as well as providing additional capacity during work zone operations. |
| <b>Lead:</b>        | Design Bureau                                                                                                                                                                     |
| <b>Support:</b>     | Bureaus of Traffic and Safety, Traffic Operations, Construction and Materials, Bridges and Structures                                                                             |
| <b>Maintenance:</b> | Final Report to Work Zone Council                                                                                                                                                 |
| <b>Duration:</b>    | One Year                                                                                                                                                                          |

**OW-02 Work Zone Management Training Program – Formalize Training \*Ongoing/Updated**

Develop a work zone management training program to provide information and new developments in management of mobility and safety in work zones. This includes both construction and maintenance operations.

Develop formal and ongoing training program on WZM that is offered and supported by the agency.

**Action:**

1. Develop training program on WZM. Identify organizational units within agency where WZM knowledge and skills are required. Distribute list of critical WZM knowledge and skills throughout the agency and encourage or require training and capability – building efforts to develop skills and knowledge. Make training a part of the technical training program for renewal every 2 or 3 years.
2. Identify organizational units within agency where WZM knowledge and skills are required.
3. Distribute list of critical WZM knowledge and skills throughout the agency and encourage or require training and capability – building efforts to develop skills and knowledge.
4. Evaluate online Basics of Work Zone Traffic Control.
5. Formalize employee training program for work zones.

**Lead:**

Work Zone Training Team

**Support:**

Bureaus of Traffic and Safety, Construction and Materials, Bridges and Structures, Maintenance, Design

**Maintenance:**

Monthly Meetings

**Duration:**

On going

**OW-03 Standards Task Force \*Updated**

Standards & Guidelines Task Force - Meet Quarterly.

- Action:**
1. Update Temp Signal Standards
  2. Review Standards with TBR
  3. Review /Add standard specs for 5 lane roadways.
  4. Contract work periods do not match the TSMO Operational Goals
  5. Review of design manual for reconstruction and expansion direction.

**Lead:** Work Zone Safety Committee

**Support:** Bureaus of Traffic and Safety, Construction and Materials, Bridges and Structures, Maintenance, Design

**Maintenance:** Monthly Meetings

**Accomplishments:**

**Duration:** On going