

IOWA DOT WORKSHOP SUMMARY

Improving Business Processes for More Effective Transportation Systems Management and Operations (TSMO): Work Zone Management

Prepared by: Athey Creek Consultants

Overview of Document

This document provides a summary of the workshop on “Improving Business Processes for More Effective Transportation Systems Management and Operations (TSMO): Work Zone Management” conducted with the Iowa Department of Transportation (DOT) on May 8, 2018 in Ankeny, Iowa. The workshop educated participants about the importance of TSMO business processes and featured several tools and resources from the second Strategic Highway Research Program’s (SHRP2) Reliability¹ focus area.

The workshop focused on business processes for work zone management. Attendees worked together to develop a business process for transferring observations, lessons learned, and best practices from field operations to Central Design when changes to the work zone design need to be made in the field due to field conditions. The intent is that by better communicating these changes back to designers it will enhance work zone designs and improve work zone management. The workshop was sponsored by the USDOT Federal Highway Administration (FHWA) and delivered by an American Association of State Highway and Transportation Officials (AASHTO) team which included Athey Creek Consultants.

This Workshop Summary includes the following sections:

- [Business Processes and Application to TSMO](#) – Definitions of key terms and a brief summary of background information presented during the workshop.
- [Resources and Tools to Improve TSMO Business Processes](#) – Overview of a seven-step approach and available tools and resources to support business process improvement.
- [Iowa DOT Business Process Improvement for Work Zone Management](#) – Summary of participant discussion during the workshop and the [Business Process Diagram for Iowa DOT to Communicate Work Zone Field Changes to Central Design](#) developed during the workshop.
- [Action Items for Iowa DOT](#) – Potential actions that Iowa DOT identified during the workshop and may consider pursuing to enhance existing practices and refine the business process developed during the workshop.
- Appendices of Supporting Materials:
 - [A: Workshop Participant List](#) – Name, role, and contact information of workshop participants.
 - [B: Workshop Agenda](#) – Order and structure of activities conducted at the workshop.
 - [C: Raw E-tool Output from the Workshop](#) – Log of inputs to the *E-tool for Business Processes to Improve Travel Time Reliability*², as provided by participants during the workshop, to step through their specific business process improvement.

¹ For more information on SHRP2 Solutions for Reliability, see: <https://www.fhwa.dot.gov/goshrp2/Solutions/Reliability/List>.

² *E-Tool for Business Processes to Improve Travel Time Reliability* (FHWA).
www.ops.fhwa.dot.gov/plan4ops/focus_areas/organizing_for_op/shrp2_le34_etool.htm

Business Processes and Application to TSMO

The term **Business Process** is defined in several SHRP2 Reliability products as “a series of actions or activities that result in a specific or desired outcome to accomplish a specific organizational goal.”

Attributes of Business Processes include:

- A set of structured actions that, once completed, result in a desired outcome to accomplish a specific goal
- Activities performed in a specific sequence, with defined inputs and output(s) and a structured workflow
- A process that adds value for the performing entity
- Ongoing focus on re-engineering processes to improve efficiency

In the context of TSMO, business processes refer to activities such as planning, programming, project development, standard operating procedures, training, human resource management, and agreements. Figure 1 shows examples of management, operational, and supporting processes to enable effective TSMO.

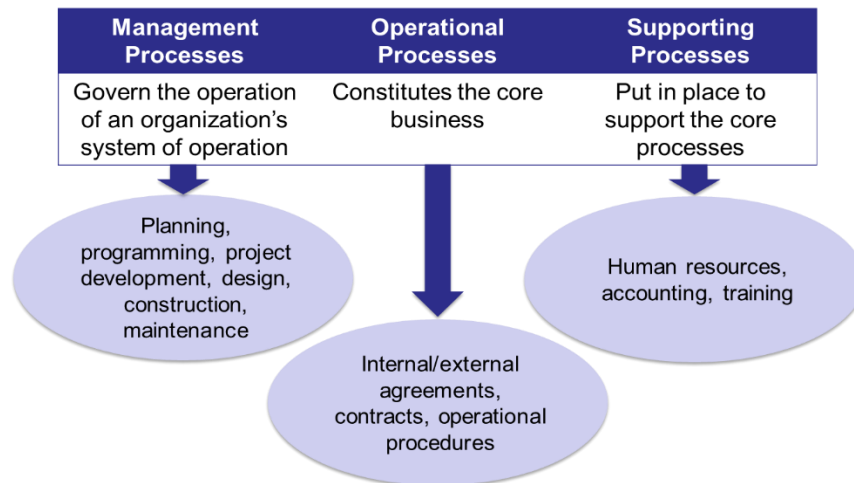


Figure 1. TSMO Business Processes

The SHRP2 “Businesses Processes for Reliability” research and products focused on how business processes can improve TSMO, where TSMO is defined as “integrated strategies to optimize the performance of existing infrastructure through the implementation of multimodal and intermodal, cross-jurisdictional systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of the transportation system management.”³ Examples of these TSMO strategies include incident management, road weather management, planned special event management, work zone management, and traffic management.

Business Process Mapping is a visual representation of the steps, connections, information flows, and responsibilities involved in a business process from start to finish. Business process mapping provides a concise picture of the sequence and relationship of tasks needed to bring a service or activity from genesis to completion, including decision points in the process, when the process takes place, why it takes place, and who is involved in the process and responsible for decisions. A good business process map can be validated (that is, represents reality) and can help stakeholders identify where delays exist, where smooth handoffs are not taking place, and what steps may be eliminated so as to improve processes.

Resources and Tools to Improve TSMO Business Processes

The seven-step approach described in this section and shown in Figure 2 was used during the workshop to help practitioners define, evaluate, and improve a specific business process, and to capture key action items. The seven-step approach is summarized as follows:

- **Step 1: Influences.** At some point, it becomes apparent that a business process needs to be improved. The catalyst for action can be top down, event driven, or needs based. Examples of such influences for action are directives from senior management or elected officials (top down), a significant natural disaster that exposes gaps in current agency processes or response plans (event driven), or a recognized need for the improvement from a grass-roots level by those involved in the process (needs based).
- **Step 2: Define the Specific Goal(s).** The second step is to identify, define, and input the reliability and other operations-oriented goal or goals that the agency can use to measure the effect of the business process implemented. Such goals help focus agency efforts and assist in the development of benchmarks that an agency can use to determine how well the processes are addressing the identified need.
- **Step 3: Identify and Document Current Business Processes.** This step is important to understand an agency’s current business processes, identify any missing stakeholders, identify gaps in communications or data flows, and formalize roles and responsibilities to ensure common understanding of the process, continuity, and retention of institutional knowledge. A key element of this step is to develop a visual representation of the operations process – business process mapping – that represents the agency’s process.
- **Step 4: Develop/Change and Implement Process.** This step involves identifying areas of improvement and identifying changes to be made to the business process or developing a new process. It likely

³ As defined in *Moving Ahead for Progress in the 21st Century* [MAP-21] (Federal Highway Administration [FHWA], 2012)

involves several iterations. The implementation can be formal or informal, depending on the complexity of the process and the agencies involved.

- **Step 5: Assess Process.** Once the new process has been implemented, it is assessed or evaluated against the identified goals. This includes identifying appropriate performance measures (based on the goals developed in Step 2), collecting the necessary data, and comparing the results against pre-implementation conditions as part of a continuous improvement process.
- **Step 6: Document Process.** Once the new business process has been implemented and proven effective, it is important to document the details of the new business process, the details of the assessment process, benefits, and the roles and responsibilities of the stakeholders. Documentation can be as simple as an interagency agreement or as complex as a multi-volume operations manual.
- **Step 7: Institutionalize Process.** The seventh step of business process integration may consist of adopting operational activities and processes, implementing formal policies, establishing training, or other actions. Institutionalization requires the buy-in and support of upper management, as well as additional stakeholders who have a vested interest in the outcomes of the business process. This step will have a direct impact on the long-term survival of a process within an organization.

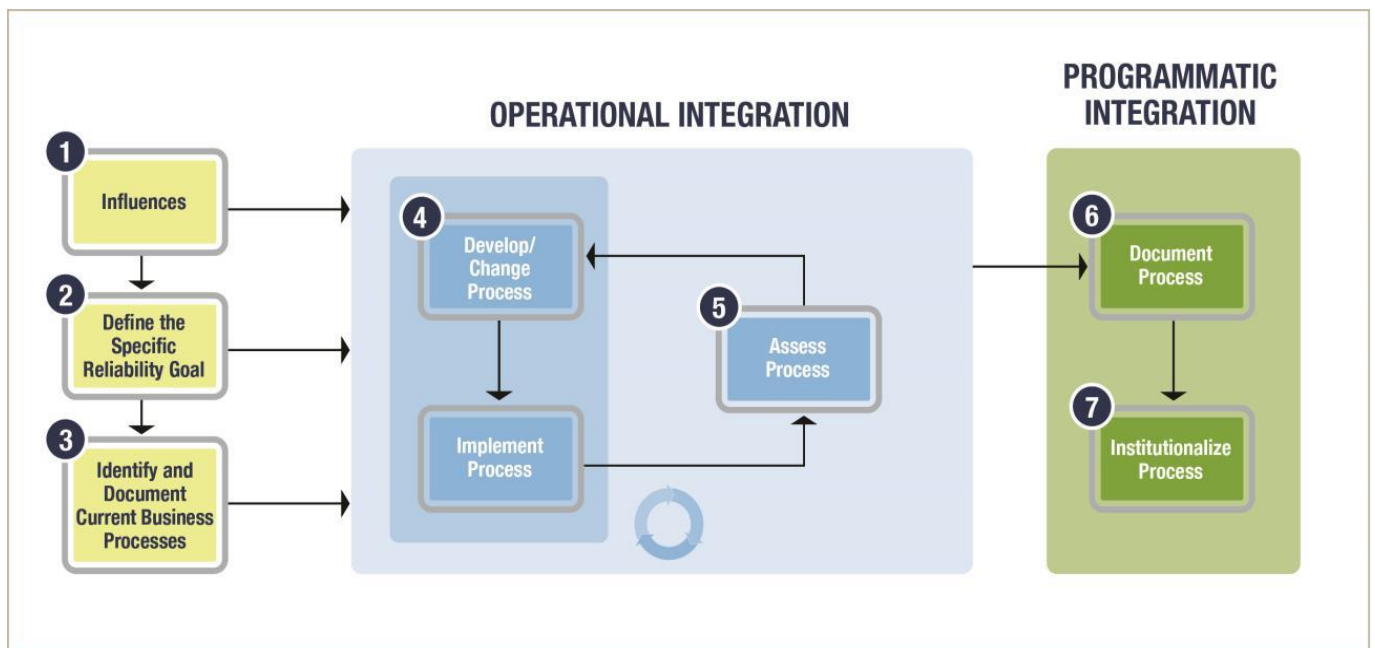


Figure 2. Seven-step approach for business process improvements

Available resources for assisting agencies with improving TSMO business processes include:

- *Primer on Improving Business Processes for More Effective Transportation Systems Management and Operations*, a guidance resource for using the a seven-step approach to improve business processes with examples from traffic incident management, work zone management, planned special events, road weather management, and traffic management. Content includes business process issues, case studies, questions to consider when identifying business process issues, business process challenges, and potential stakeholders.

<https://ops.fhwa.dot.gov/publications/fhwahop16018/fhwahop16018.pdf>.

- *E-tool for Business Processes to Improve Travel Time Reliability*, a downloadable tool for applying the seven-step approach to improve a TSMO business process in a group setting.
www.fhwa.dot.gov/goshp2/Solutions/Available/L06_L01_L31_L34/Organizing_for_Reliability_Tools
- *FHWA Business Process Frameworks to support TSMO*, featuring Capability Maturity Frameworks (CMFs) and supporting documentation for Road Weather Management, Planned Special Events, Traffic Incident Management, Traffic Management, Traffic Signal Management, and Work Zone Management. <https://ops.fhwa.dot.gov/tsmoframeworktool/index.htm>.

Iowa DOT Business Process Improvement for Work Zone Management

Prior to the workshop, Iowa DOT contacts had identified the following three ideas for potential topics for business process development included:

- 1) Coordinating adjacent work zones;
- 2) Considering maintenance work zone needs during the design phase; and
- 3) Communication of field operations work zone layout/traffic control/other changes to Central Design.

Ultimately, the third idea was selected for the focused business process improvement to be the topic of this workshop. It had been noted that in the past, there was a process for field staff to document changes and to share the changes with other offices. The agency transitioned to an electronic documentation system but the process of how information was shared was not revised/updated to identify how staff not in the field would access or utilize the electronic system. In the instances where the field had to make adjustments to the traffic control or work zone layout, the changes are not always being communicated back to the designers or tracked. Communicating field changes to Central Design can help to determine if there are common field changes that can be incorporated into the initial design and warrant updates to standards, and thus minimize changes that must be made in the field.

This section presents a summary of the discussion during the workshop regarding current business processes at Iowa DOT and ways to enhance them.

Current business processes at Iowa DOT. An informal poll at beginning of the workshop showed that participants recognize that business processes are used daily at Iowa DOT and most participants believe that business processes are very important to Iowa DOT's transportation operations. One participant noted that business processes are essential, indicating that it is critical to document what you are doing and tweak it to make improvements as best practices are identified so that they become every day practices.

Participants identified the following examples of business processes that are currently used or needed:

- Design Manuals (documented process);
- Pavement thickness determination (documented process);
- Policy and Procedure Manual (documented process);
- "DOTU" training program for on-boarding new employees (documented process);
- Electronic Reference Library (reference to documented processes);
- Transportation Management Plans (formal policy in place, less defined roles and responsibilities when transitioning from policy to practice);
- Adjacent construction projects with two different traffic control plans and consistent use of data

to evaluate lane closures (process needed).

Work zone technologies used by Iowa DOT. Participants provided a number of comments when asked about examples of work zone technologies that Iowa DOT uses as a part of their current IWZ business process. These technologies include:

- Queue warning systems;
- Traveler information;
- Speed detection and feedback displays;
- Truck enter/exit system;
- New flashing/audible warning system for mobile paint operations;
- Portable rumble strips;
- Portable dynamic message signs (PDMS) for incident management alternate routing; and
- Use of an aware system is being considered, to alert workers of intrusion into the work zone.

Business process improvement background for Iowa DOT. Following the presentation of background information regarding business processes and the tools available to assist agencies, the workshop shifted to interactive sessions focused on improving an Iowa DOT work zone business process. Work Zones are a focus area for the agency and the development of the Work Zone Service Layer Plan, which is part of the TSMO Program Plan is currently underway.

E-tool exercise. Workshop participants walked through the 7-step process in the E-tool as a group to begin thinking about the development, implementation, and institutionalization of the work zone business process. This section summarizes the inputs provided by the group. The full [E-tool PDF output](#) from this exercise is included as an attachment to this report.

Step 1 – Identify Influences. The group identified the impetus for developing this work zone management business process as “Needs Based” (bottom-up), as there was strong consensus among participants that there is need to improve communication of work zone changes made in the field to Central Design to improve future work zone designs and traffic management plans and reduce the need for changes in the field.

Step 2 – Define the Specific Goal(s). Participants defined the following as possible goals for this process improvement:

- Capturing institutional knowledge (successes, challenges/issues)
- Refining the design process for future projects.
- Not repeating mistakes; documenting lessons learned.
- Documenting traffic control changes that are common and recurring.
- Documenting a consistent, statewide process for all designers, both internal and external/consultants, to increase uniformity.
- Encouraging and support everyone involved in the process to be open minded, acknowledge different perspectives, and work together to consider and implement changes for future projects.
- Recognizing the relevance and importance of having this business process (documenting the why and educating about this process).
- Recognizing the importance of two-way feedback (field staff to design and vice versa) both to communicate successes (what works well) as well as issues and changes.

Step 3 – Identify and Document the Business Process. Participants brainstormed situations that have occurred in the past where there may be opportunities and benefits to communicating work zone changes to Central Design. Seven scenarios were identified that would require a work zone change and could provide an opportunity for feedback to designers. The three scenarios in *italics* were selected and assigned to the three small breakout groups to consider as a specific example when developing a business process during the afternoon session.

1. *Limited sight distance approaching a static lane closure due to a vertical curve in a long-term work zone.*
2. *Enforcement operations observations (e.g. law enforcement observe limited signage within a work zone to communicate a reduced speed limit which presents enforcement challenges),*
3. *Narrow lane widths on bridges present challenges for trucks navigating through the work zone.*
4. Work zone traffic control placement for short-term lane closures
5. Type or condition of signs, paint, and other traffic control being used in a work zone.
6. Understanding access control for cross streets, medians, or left turns and when these access points can be closed.
7. Challenges associated with urban construction work zones.

To document/develop the process, a mapping exercise was done. Participants broke into three groups to develop a business process map for communicating a work zone change to Central Design with additional actions to improve future contract documents. Specifically, participants were asked to consider the following during process mapping:

- How will the work zone field change be documented? By whom? In what way?
- How will the work zone field change be communicated to Central Design?
- How will Central Design evaluate the change and consider future design modifications?
- What actions will Central Design or other entities take to modify future designs?
- How will the resulting action or inaction be communicated back to work zone field staff?
- Are regular interactions needed to share issues, best practices, and typical field changes?

The three groups reconvened to present a summary of their individual discussions and business process maps. The three business processes developed had several similarities that the full group agreed could be merged into a single business process map as a part of Step 3 of the seven-step approach. The [Business Process Diagram for Iowa DOT to Communicate Work Zone Field Changes to Central Design](#) in Figure 3 reflects the business process suggested by workshop participants.

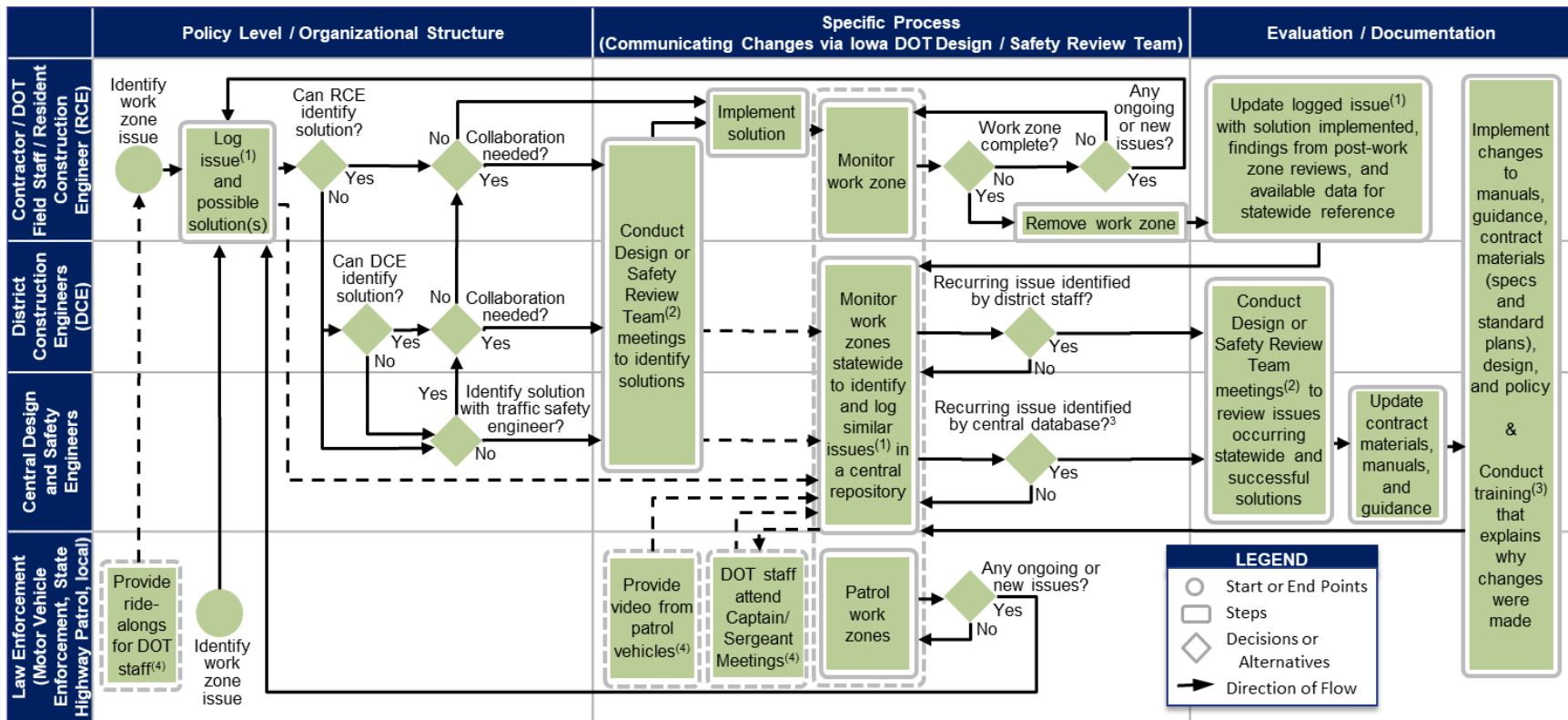
Specific ideas related to documenting and communicating work zone changes included:

- Iowa DOT is using an ESRI app called Collector that is a repository for geolocated photos via the cloud, which could potentially be used as a central repository to log and store work zone issues and changes, and to identify chronic issues.
- Change orders document only a small portion of issues that need to be considered for communicating changes to Central Design. Further, the lack of change orders does not reflect lack of issues in the field; often, changes are made without completing change orders.
- Consider the exchange of information and problem-solving that often occurs at the district level with the design and construction engineers before the issue is raised to the Central Office.
- A statewide database may be helpful such that if a trend was identified for similar issues across

various work zones, this may trigger a need for improvement to standard practices or further action.

- A statewide Design or Safety Review Team may be helpful as a smaller group of 6-8 people that could include staff from several districts and help to identify solutions for recurring issues and communicate them back to designers.
- Post-work zone meetings were conducted in the past with contractors and DOT staff to document lessons learned and changes, but these typically no longer occur.

The business process diagram in Figure 3 shows the interactions of two related business processes for communicating work zone changes and solutions. The top row focuses primarily on a process for a single work zone: identifying an issue and potential solution, implementing the solution, monitoring, and associated documentation in a central repository. The middle two rows focus on a statewide process for identifying recurring issues, conducting meetings with proposed Design or Safety Review Teams to identify solutions, making guidance and policy changes, and conducting training. Law enforcement also plays a role in helping to identify work zone issues directly or by providing data and support, which is shown in the bottom row.



- (1) Work zone issues and solutions are logged and stored in a central repository (e.g., Central Statewide Database), and may be done using the ESRI app.
 - (2) A new Design Review Team and/or Safety Review Team may be established to check the design intent, coordinate potential solutions, and review recurring issues.
 - (3) Training and information exchange may be conducted via an annual statewide Work Zone Review, annual Resident Construction Engineer (RCE) Conferences (if re-instated), the Multidisciplinary Safety Team (MDST), annual District Training that is conducted every winter, winter work zone training classes, and other venues.
- Note: Arrows with dashed lines indicate a secondary contribution or flow to the business process.

Figure 3. Business Process Diagram for Iowa DOT to Communicate Work Zone Field Changes to Central Design

Step 4 - Develop and Implement the Process. In order to implement a new work zone management business process, the group felt the following were important considerations:

- Include additional stakeholders to review and contribute to the newly developed process before implementation: law enforcement, TIM groups, and the MDST groups.
- Identify a champion to continue the dialogue with stakeholders and lead implementation of the new process.
- Potential avenues for implementation include the Statewide TIM Committee and/or the Work Zone Service Layer. This new business process fits within both groups and they could potentially provide resources for implementation via a prioritized action item that could go to management for approval and resource allocation.

Specific ideas for increasing collaboration with law enforcement and other stakeholders to increase awareness and further enhance this business process included:

- Leverage periodic MVE Captains/Sergeants Meetings to gain time on the agenda to discuss work zone management topics.
- Encourage design/safety/field staff to participate in MVE ride-alongs to help understand field conditions from a law enforcement perspective.
- Obtain video captured by MVE when operating in work zones, for use by design/safety/field staff, to see how drivers experience various work zones.
- Increase awareness about work zone issues and changes by leveraging MDST meetings which include state and local law enforcement and transportation agencies.

Step 5 – Assess the Process. Participants identified the following as data and measures for assessing the newly developed business process:

- Number of crashes or incidents – fewer crashes and incidents would indicate success. Making crash report diagrams and narratives more accessible to staff would help to identify causes and log issues for more effective implementation of the process.
- Number of work zone changes logged in a new statewide database that is created as a repository to identify recurring issues – more issues/changes logged initially would indicate success in the short term as it would show the new process is being used. In the longer term an indicator of success would be when the number of issues/changes decreases over time as staff are no longer seeing recurrence of the same issues.
- Number of times staff identify and log a work zone issue in the central repository.
- Number of connected and automated vehicle (CAV) reports of identified issues in work zones, as available at some future date.
- Number of public complaints harvested from social media - fewer complaints would indicate success.
- Anecdotal stories of success from Iowa DOT staff, contractors, or others.

Step 6 - Document the Process. Several places to document the new business process were identified:

- Work Zone Service Layer Plan.
- Construction Manual.
- Design Manual.
- Maintenance Standards and Instructional Memorandums.

Step 7 – Institutionalize the Process. The group identified the following as potential ways to institutionalize the new business process:

- Link back to agency goals. The Iowa DOT TSMO Strategic Goals and Objectives are shown in Figure 4. This new process supports several goals and objectives, including Reliability, Safety, and Coordination.
- Communicate this new process to staff and managers to assist with buy-in, define benefits to staff, and convey to managers the resources needed to implement and sustain the process. When the process results in changes to Traffic Control standards for work zones, it would be helpful to explain to field staff why an update to a standard has been made. In the past when standards have been updated, the reasoning/need behind these updates has not always been communicated.
- Implement this new business process as part of the TSMO Work Zone Service Layer.
- Conduct training and outreach: The Work Zone Service Layer plan has proposed to re-initiate the RCE conference which could be a venue for communicating the new process, and for sharing work zone issues, changes, and lessons learned. Other venues could include the annual District Training conducted each winter, winter work zone training classes, or an annual statewide Work Zone Review meeting.
- Document the value for Iowa DOT’s partners and customers, to highlight the importance of this new process and to increase communication and collaboration.
- Incorporate this new process into overall efforts for Traffic Critical Projects / IWZ projects and planning, as a similar process is needed to capture feedback from staff at the conclusion of a project about the special countermeasures implemented in these critical work zones.

The TSMO Strategic Goals and Objectives shown in Table 1 provide direction for the structure, strategies, actions and management of the TSMO Program. They reflect the Iowa DOT Core Values and are consistent with the MAP-21 National Goals for Performance. Also, these goals were developed based on both internal agency and external partner input. The goals are key to achieving Iowa DOT’s vision of a transportation system that is safer, more efficient, and more reliable as a result of strategic TSMO investments and actions.







TABLE 1. STRATEGIC GOALS AND OBJECTIVES		
Strategic Goal	Strategic Objective	
 1. <i>Safety</i>	Reduce crash frequency and severity	
 2. <i>Reliability</i>	Improve transportation system reliability, increase system resiliency, and add highway capacity in critical corridors	
 3. <i>Efficiency</i>	Minimize traffic delay and maximize transportation system efficiency to keep traffic moving	
 4. <i>Convenience</i>	Provide ease of access and mobility choices to customers	
 5. <i>Coordination</i>	Engage all DOT disciplines, and external agencies and jurisdictions to proactively manage and operate the transportation system	
 6. <i>Integration</i>	Incorporate TSMO strategies throughout DOT’s transportation planning, design, construction, maintenance, and operations activities	

Figure 4. Excerpt of Iowa DOT TSMO Program Strategic Goals and Objectives⁴

⁴From the Iowa DOT Transportation Systems Management and Operations (TSMO) Program Plan (February 2016), which can be accessed at: <https://www.iowadot.gov/TSMO/TSMO-Program-Plan.pdf>.

Action Items for Iowa DOT

The following action items are largely derived from the [Business Process Diagram for Iowa DOT to Communicate Work Zone Field Changes to Central Design](#) (See Figure 3) developed during the workshop to support its initiation, implementation, and institutionalization. These action items include a variety of options for implementing (in part or in full) the new process that was developed by workshop participants.

1. **Identify a champion at Iowa DOT** to continue the dialogue with stakeholders and lead the effort to refine the proposed process (Communicating Work Zone Field Changes to Central Design) for implementation.
2. **Increase collaboration with Motor Vehicle Enforcement (MVE):**
 - Establish ride-along opportunities with MVE on a recurring basis to increase understanding and help identify issues in work zones.
 - Establish a means to access video from MVE vehicles to help identify issues in work zones.
 - Periodically attend MVE Captains/Sergeants meetings to discuss work zone issues. Primary participants at this meeting would likely be the Work Zone Traffic Control Engineer (Office of Traffic and Safety), Traffic Safety Engineer (Office of Construction and Materials), or the Traffic and Safety Engineer (Office of Traffic and Safety). Field staff may be occasional participants depending on the topic.
3. **Establish a means to access crash reports including narrative and pictures**, to help identify causal factors that may require changes in work zones. Consider how to further track and communicate crash information that may influence work zone design changes.
4. **Determine a means to systematically collect work zone issues and changes:**
 - Consider whether to resume meetings with contractors and DOT staff after a project is completed to document lessons learned and changes that would be helpful for identifying work zone issues.
 - Consider whether to retain external services (i.e. consultant) to conduct “after-project reviews” to interview field staff to gather details about work zone issues and changes.
5. **Examine alternatives for creating a statewide repository of work zone changes**, to log and store details about the issue, the implemented solution, and supporting data and photos. Identify:
 - The proposed technology. One possibility is an ESRI app called Collector that Iowa DOT uses as a repository for geolocated photos via the cloud.
 - The manager who will oversee and maintain it.
 - The types of issues and level of detail desired in the repository, and how to consistently label inputs in order to identify recurring issues.
 - The communication mechanism for Resident Construction Engineers (RCEs) and others in the field to provide information to the repository and to access the repository to identify similar issues encountered in other districts and the solutions implemented.
 - The thresholds that would flag a “chronic” or recurring issue for Central Design staff to examine in greater detail.
6. **Examine alternatives to establish a statewide Design Review Team and/or Safety Review Team** to collaborate on solutions for recurring issues in work zones. Specifically:
 - Identify the desired size of the group(s) and appropriate representation. For example, a smaller group of 6-8 people could include staff from the central office (Design/Safety/Construction) and several districts, where district members could periodically rotate.

- Identify a meeting frequency for the Design and/or Safety Review Team. For example, regular meetings could be held every spring and fall, and/or be conducted on an as-needed basis, (e.g. as requested by an RCE or as a recurring issue is identified via the statewide repository).
- 7. Develop training sessions or presentations on new or changed standards and processes** to communicate the reasoning and benefits, and to encourage buy-in and sustainability.
- Training and information exchange may be conducted via an annual statewide Work Zone Review, an annual RCE Conference (if re-instated), the Multidisciplinary Safety Team (MDST) meeting, annual District Training conducted each winter, winter work zone training classes, and other venues.
- 8. Select who will lead implementation for this new process.** Implementation could be led by the Work Zone Service Layer or the Statewide Traffic Incident Management (TIM) Committee, which may have resources that could be used to support the effort if this were proposed to management for approval and resource allocation. The new process could be incorporated into the existing Traffic Critical Projects (TCPs)/Intelligent Work Zone (IWZ) planning processes.

Appendix A: Iowa DOT Workshop Participant List

Improving Business Processes for More Effective Transportation Systems Management and Operations (TSMO), May 8, 2018

Name	Iowa DOT Position Title	Organization and Area	Email address
1. Yan Jia	Transportation Eng. Manager	Office of Design – Rural Design Section Leader	yanxico.jia@iowadot.us
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Appendix B: Iowa DOT Workshop Agenda



Agenda

Improving Business Processes for More Effective Transportation Systems Management and Operations (TSMO)

Business Processes for Work Zone Management

Iowa Department of Transportation
 Iowa Motor Vehicle Division Building, 6310 SE Convenience Blvd, Ankeny, IA 50021
 2nd Floor Large Conference Room
May 8, 2018
9:00 AM – 4:30 PM

9:00 – 9:30 AM	<p>Welcome and Introductions</p> <ul style="list-style-type: none"> Welcome (Iowa DOT, FHWA, AASHTO) Purpose of Workshop and Agenda Overview Self-introductions and Interests 	<p>Donna Matulac, Iowa DOT Tracy Scriba, FHWA Pam Hutton, AASHTO Self-introductions by All</p>
9:30 – 10:30 AM	<p>Business Processes and Application to TSMO</p> <ul style="list-style-type: none"> Overview of Business Processes Business Process Mapping Application to TSMO and Work Zone Management <ul style="list-style-type: none"> Discussion: What business processes do you use in your work? Tools for Developing Business Processes: <ul style="list-style-type: none"> Capability Maturity Frameworks, Primer, E-tool 	<p>Linda Preisen, Athey Creek Input and Discussion by All</p>
10:30 – 10:45 AM	Break	
10:45 – 11:15 AM	<p>Improving Business Processes</p> <ul style="list-style-type: none"> Preparing for Business Process Improvement 7-Step Approach and E-tool Case Study Example 	Athey Creek

11:15 – 11:45 AM	Business Process Improvement: Transferring Best Practices from Field Operations to Central Design for Improved Communication of Work Zone Changes <ul style="list-style-type: none"> • Need for this Business Process Improvement • Initial E-tool Input: Influences and Reliability Goals • Typical Work Zone Field Changes <ul style="list-style-type: none"> – Scenario(s) for Business Process Mapping Exercise 	Willy Sorenson Facilitated by Athey Creek Input and Discussion by All
11:45 AM – 12:45 PM	Lunch Break (off-site)	
12:45 – 1:45 PM	Business Process Mapping Exercise <ul style="list-style-type: none"> • Small Group Breakouts 	All
1:45 – 2:30 PM	Review Initial Mapping and Discussion <ul style="list-style-type: none"> • Small Groups Report Out 	All
2:30 – 2:45 PM	Break	
2:45 – 4:00 PM	Continue Process Improvement <ul style="list-style-type: none"> • First Iteration of Process Map • Looking Ahead: Implement, Assess, Document, Institutionalize the Process • Action Planning 	Facilitated by Athey Creek Input and Discussion by All
4:00 – 4:30 PM	Applying What You’ve Learned and Next Steps <ul style="list-style-type: none"> • Opportunities for Additional Process Improvements – Work Zone Management • Workshop Evaluation • Closing Comments 	Facilitated by Athey Creek Input and Discussion by All Donna Matulac and Willy Sorenson

Appendix C: Raw E-tool Output from the Workshop

Report for Project Iowa DOT Work Zone Business Process

Type of process assessed: **Work Zone Management**

Case study best matching process: **Case Study 5: Michigan DOT Work Zone Traffic Control Modeling**

Type of influence identified: **Bottom-up**

Influence description: **Identified as part of the FHWA Work Zone Management CMF workshop.**

Reliability goals: **Capturing institutional knowledge of what works and what does not work. Help to refine the design process in putting plans together for future work Not repeating mistakes; documenting lessons learned Document a process that routinely comes up Document a consistent, statewide process for all designers, both internal and external, to report back and increase uniformity Once the process is established, information will come back to different groups and formalize response issues Encourage and support groups receiving information to be open minded to acknowledge and accept the changes for future projects Recognize the relevance and importance of having this business process (documenting the why and educating about this process) Provision of feedback on what is going right in addition to what is not - broadcast successes Examine whether focus on short-term impacts requires return to issue multiple times in the long-term**

Business process model files associated with the process:

Operational Integration Iteration 1:

- Implementation description: **Include State patrol, law enforcement, TIM groups, MDSTs Identify champion / co-champions to continue discussion and take to the next level Statewide TIM Committee (multi-disciplinary committee) and WZ Service Layer (categorized list of items of interest) - this fits within both groups and can attach resources = prioritized action items that will go to management**
- Process evaluation data description: **Fewer crashes / incidents - incidents can be a lot of different things and are already tracked Number of issues in statewide database (regarding success: more is good in short-term = being**

used; may see number go down over time) - not seeing recurrence of the same issues
Number of interactions between staff to report issues / make changes
CAV / AV reports of corrections / issues within WZ Public complaints -
harvested from social media Anecdotal stories of success Make crash report
diagrams and narratives more accessible to staff

Process documentation description: **Work Zone Service Layer Plan Construction
Manual Design Manual Maintenance Standards and Instructional Memorandums**

Process documentation files:

Process institutionalizing description: **Link back to agency goals Training
Management buy-in Employee buy-in - define benefits for those carrying out the
process Management presentation to see what is needed to get it done, what the
benefits are Work Zone service layer discussed bringing back the RCE
conference (training and outreach), that includes others from the districts:
highway division conference - what went well, what didn't, etc. - help share
information from the database even for those that did not look to share lessons
learned Document value for partners and customers - increase comfort in
communication and collaboration**