

# **Arizona Department of Transportation 2018 Work Zone Safety and Mobility Process Review Report**

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Prepared by  
Arizona Department of Transportation  
206 S. 17th Ave  
Phoenix, AZ 85007

## Work Zone Safety and Mobility Process Review Report

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This Work Zone Safety and Mobility Process Review Report was prepared by the Arizona Department of Transportation (ADOT) and is evidence of Arizona's Conformance with 23 CFR 630.1008(e) Subpart J

Arizona Department of Transportation

Approved By: Dallas & Ham Date: 9/23/2019  
Deputy Director for  
Transportation/State Engineer

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## Executive Summary

The purpose of this biennial Process Review is to guide improvements in the agency's work zone policy, processes and procedures, data and information resources, and training programs to determine whether they are adequate, therefore, enhancing safety and mobility on future projects. ADOT is required to conduct a biennial Process Review of work zones per 23 CFR 630.1008 (e). The Rule states that the ultimate objective of a Process Review is to enhance efforts to address safety and mobility on current and future projects.

### 2014 Process Review:

- 1) **Finding (Cannot Duplicate & Closed):** There was no checklist for project managers to identify significant projects and what components of a TMP are required.
- 2) **Finding (Cannot Duplicate & Closed):** ADOT did not have a process and programmatic agreement for maintenance activities eligible for exemption from the significant project requirements for separate Traffic Operations and Public Information components as defined by the Rule.
- 3) **Finding (In Progress & Open):** ADOT's current process already has the four components of a TMP for most projects, however, contains no formal packaging of the TMP.

### 2016 Process Review:

- 1) **Finding: Performance Measurement (On Hold & Open):** Work zone performance measures should be gathered to evaluate the effect of work zone management and be used to improve future designs. The team identified performance measurement as one of the areas that is not done systematically statewide.
- 2) **Finding: Systems and Technology (Closed):** ADOT currently doesn't have a systematic way to identify new technologies for work zones. A document or way of sharing knowledge about the benefits and best practices of newer work zone technologies could improve work zone traffic control designs.
- 3) **Finding: Culture (In Progress & Open):** The team identified that there is not a committee that regularly reviews WZM practices.
- 4) **Finding: Business Processes (In Progress & Open):** The team identified Business Practices, especially the implementation of TMPs as one of the areas that is being done in a systematic

## Background

The purpose of the Process Review is to assess the effectiveness of Work Zone Safety and Mobility (WZSM) procedures and enhance safety and mobility on current and future projects. Process Reviews are State-led and not to be confused with Federal Highway Administration (FHWA) Conformance Reviews, which are performed on the Project-level to determine if all applicable standards (national, state, or local) have been met.

The first ADOT Work Zone Safety and Mobility (WZSM) Process Review was conducted in 2008. The focus of that review consisted of four areas: speed reduction, lane closure procedures, use of positive protection devices, and mitigation of safety and mobility impacts. In performing this first ADOT-led Process Review, the steering committee elected to focus on Transportation Management Plans. A 2010 and 2012 process review reports could not be found.

The sole focus of the 2014 Process Review was process for the Transportation Management Plan (TMP). This report provided nine observations and recommended actions to take to reconcile the observations/findings. Subsequent committee meetings were held in an effort to resolve the nine findings. As a result of the 2016 and 2018 Reviews, the following three items were found to still need action, but could not be finished as actions must come from staff outside the control of the committee.

### 2014 Process Review:

- 1) **Finding:** There was no checklist for project managers to identify significant projects and what components of a TMP are required.  
**Action:** The checklist was to be developed, but was not completed.
- 2) **Finding:** ADOT did not have a process and programmatic agreement for maintenance activities eligible for exemption from the significant project requirements for separate Traffic Operations and Public Information components as defined by the Rule.  
**Action:** A programmatic agreement was drafted for those activities.
- 3) **Finding:** ADOT's current process already has the four components of a TMP for most projects, however, contains no formal packaging of the TMP.  
**Action:** ADOT Contracts and Specifications developed language that was added to the General Requirements Section of the Special Provisions. The implementation of that specification is still inconsistent.

A key focus of the 2014 WZSM Process Review was to verify the inclusion of all components of a TMP on significant projects. For Arizona, significant projects must include the following components;

- Temporary Traffic Control Plan (TTC)
- Transportation Operations (TO)
- Public Information (PI)
- Emergency Vehicle Access Plan (EVAP)

To track if this was implemented; the 2016 Process Review team researched significant projects that had been in development since the 2014 Process Review to determine if they contained all four TMP components.

Although each project's Special Provisions contained the TMP components, they did not follow any standard or specific order. It was recommended this item be further explored with additional review, further refinement, and standardized formatting, possibly as a combined stored specification. Also, the Traffic Database is not always being used to track significant projects that require TMPs. It is recommended to educate users of the ADOT Traffic Database about the importance and use of the database for tracking significant projects with TMPs.

The 2016 report used the Work Zone Capability Maturity Framework (CMF), which is a set of questions designed to assist the Department to simply evaluate their work zone policies and practices as a whole. The CMF is based on the Information Technology-developed Capability Maturity Matrix concept. The six Dimensions or Process Areas that are to be addressed within the CMF, which include the Business Process, Systems and Technology, Performance Measurements, Workforce, Culture, and Collaboration shown below in Figure 1.



Figure 1 Key Dimensions of Capability

The results of the CMF that could benefit from a more in-depth review through the Process Review were as follows:

**2016 Process Review:**

- 1) **Finding: Performance Measurement:** Work zone performance measures should be gathered to evaluate the effect of work zone management and be used to improve future designs. The team identified performance measurement as one of the areas that is not done systematically statewide.  
**Recommended Action:**
  - a) Determine how to effectively use the performance measures in ADOT’s Work Zone Mobility Policy which include travel delay, queue lengths, and crash occurrences.
  - b) Determine how to incorporate WZ performance measurement into Arizona Management System: set goals and objectives, measure how we are doing, determine where ADOT will go in next cycle.
- 2) **Finding: Systems and Technology:** ADOT currently doesn’t have a systematic way to identify new technologies for work zones. A document or way of sharing knowledge about the benefits and best practices of newer work zone technologies could improve work zone traffic control designs.  
**Recommended Action:**
  - a) Research and gather information/resources and sharing/educating staff on existing technologies.
  - b) Provide links or training recommendations for staff.

**3) Finding: Culture:** The team identified that there is not a committee that regularly reviews WZM practices.

**Recommended Action:**

a) Create a steering committee with regularly scheduled meetings. Requires support from State Engineers Office and a champion.

**4) Finding: Business Processes:** The team identified Business Practices, especially the implementation of TMPs as one of the areas that is being done in a systematic way, but the team found that there could be improvements. Some team members noted that there is often excess information in TMPs.

**Recommended Action:**

- a) Reduce the length of TMPs by removing extraneous information.
- b) Identify a new example as a best management practice for TMPs.



## **Purpose and Objectives**

The purpose of this biennial Process Review is to guide improvements in the agency's work zone policy, processes, guidelines, procedures, data and information resources, and training programs to determine whether they are adequate, therefore, enhancing safety and mobility on current and future projects. 23 CFR 630.1008 (e) requires ADOT to conduct a biennial Process Review of work zones. The Rule states that the ultimate objective of a Process Review is to enhance efforts to address safety and mobility on current and future projects.

Managing traffic in work zones is necessary to minimize traffic delays, maintain motorist and worker safety, complete roadwork in a timely manner, and maintain access for businesses, institutions, and residents. Process Reviews help assess the effectiveness of the work zone program policies, guidelines, and procedures. The review is to enable ADOT and the FHWA to confirm where a problem does not exist, or to identify systemic problems, and make recommendations to improve situations where shortcomings do exist. It is also to identify Best Practices.

### **Work Zone Committee Framework**

The 2016 WZSM Process Review laid the ground work on how a Work Zone Committee should be structured and conducts itself as it pertains to improving Safety and Mobility in and around work zones. The 2018 Committee acknowledged the framework as a good conceptual idea; but that it would not provide the flexibility the Department was seeking in conducting these reviews in the future. The Department will use this section of the 2016 Report as a guide if further refinement is needed.

The current framework for the 2018 committee will be:

The Deputy Director for Transportation/State Engineer (State Engineer) will be the sponsor. A group manager or district engineer will be the committee chair. The committee will have other various voting members from within ADOT to provide multiple view points and areas of expertise. The members will also solicit input from other ADOT subject matter experts (SME) outside of the committee as needed to maximize the efficiency and reduce waste of the SME while maintaining the high level of precision needed for the report.

### **Committee Procedures**

The Work Zone Committee's role will be to complete the Work Zone Safety and Mobility Process Reviews on a biennial basis. Within the completed Process Review the committee will propose updates to ADOT's Work Zone Safety and Mobility Policies, Processes, Procedures, and Guidelines to the appropriate ADOT group to complete and/or implement the findings/tasks of the report. The Committee will also establish timeframes for the completion of tasks.

### Committee Members

The new committee that conducted the 2018 Process Review included ADOT representatives from Development, Districts, Traffic Standards, Regional Traffic, Traffic Safety, and Communications as follows:

#### Voting Members

<b>Randy Everett (2018 Chair)</b>	<a href="mailto:REverett@azdot.gov">REverett@azdot.gov</a>	ADOT IDO Central District
<b>James Gomes</b>	<a href="mailto:JGomes@azdot.gov">JGomes@azdot.gov</a>	ADOT TSMO Regional
<b>Douglas Pacey</b>	<a href="mailto:DPacey@azdot.gov">DPacey@azdot.gov</a>	ADOT IDO Communications
<b>Tafwachi Katapa</b>	<a href="mailto:TKatapa@azdot.gov">TKatapa@azdot.gov</a>	ADOT IDO Development (Project Management Group)
<b>Hasina Luna</b>	<a href="mailto:WFaber@azdot.gov">WFaber@azdot.gov</a>	ADOT IDO Traffic Standards
<b>Adam Carreon</b>	<a href="mailto:ACarreon@azdot.gov">ACarreon@azdot.gov</a>	ADOT TSMO Traffic Safety

#### Non-Voting Members

<b>Toni Whitfield</b>	<a href="mailto:Toni.Whitfield@dot.gov">Toni.Whitfield@dot.gov</a>	FHWA Arizona Division
<b>Ammon Heier</b>	<a href="mailto:Ammon.Heier@dot.gov">Ammon.Heier@dot.gov</a>	FHWA Arizona Division

## Observations and Recommendations

For 2018 WZSM Process Review, the committee chose to review the findings from previous reports and assess the level of completeness of those findings. The committee wanted a solid foundation on which they could move forward. Findings that are not complete will not only leave the Department with a level liability, but more importantly does not provide for policies and procedures on which to build going forward.

This assessment of previous reviews can also help turn a previous idea into an interesting question for the current review, it can tell if a question has already been answered, it can help evaluate the importance to the Department of a topic, it can give ideas for how to conduct future reviews, and it can tell if your current findings fit into the direction the Department is choosing to take with the reviews.

The committee found several findings that did not have a thorough enough explanation on which future findings could be built. Each of the findings will be listed with a status of the issue. The findings are broken down into two categories, Open and Closed. Open items will be carried into the next Process Review. Closed item status is used when work on an issue is complete and will not be carried into the next review. On Hold is used to indicate that there has been a delay in completing the issue. On Hold items most likely will not be address in the next review, but should be considered or reopened for future Process Reviews. On Hold is a sub status to open. In Progress is used to indicate that work on the issue had started in a previous review. In Progress is a sub status of Open. Cannot Duplicate is used to indicate that we are closing the issue, and we do not see the problem that triggered opening the issue. This status is important in reporting, to differentiate between findings that are completed and whose problem has been addressed and issues whose problem is not visible at a given time. Cannot Duplicate is a sub status of closed

**2014 Process Review:**

- 1) Finding (Cannot Duplicate & Closed):** There was no checklist for project managers to identify significant projects and what components of a TMP are required.  
**Action:** The checklist was to be developed but was not completed.

The committee found that although a checklist was not completed, ADOT significant projects had all four required pieces required for a TMP. Therefore, the process that is in-place is delivering the required, desired results.

- 2) Finding (Cannot Duplicate & Closed):** ADOT did not have a process and programmatic agreement for maintenance activities eligible for exemption from the significant project requirements for separate Traffic Operations and Public Information components as defined by the Rule.  
**Action:** A programmatic agreement was drafted for those activities.

The committee found that a programmatic agreement was not needed. There are no maintenance activities that meet the definition of a significant project that do not contain the four required components for a TMP.

- 3) Finding (In Progress & Open):** ADOT's current process already has the four components of a TMP for most projects, however, contains no formal packaging of the TMP.  
**Action:** ADOT Contracts and Specifications developed language that was added to the General Requirements Section of the Special Provisions. The implementation of that specification is still inconsistent.

The committee found this still to be true. This will be the focus of this committee going forward to the next review and its first action item. The subject of a standard stored specification for TMPs was brought before the ADOT Standards Committee where a consensus could not be reached on whether or not this was the ultimate responsibility of the designer or contractor. The Standards Committee asked that this be brought before the Sub-program Project Initiation Review Board (SuPIRB) for further discussion. The committee is currently waiting to schedule a time to coordinate this effort with SuPIRB.

**2016 Process Review:**

**1) Finding: Performance Measurement (On Hold & Open):** Work zone performance measures should be gathered to evaluate the effect of work zone management and be used to improve future designs. The team identified performance measurement as one of the areas that is not done systematically statewide.

**Recommended Action:**

- a) Determine how to effectively use the performance measures in ADOT's Work Zone Mobility Policy which include travel delay, queue lengths, and crash occurrences.
- b) Determine how to incorporate WZ performance measurement into Arizona Management System: set goals and objectives, measure how we are doing, determine where ADOT will go in next cycle.

The committee has found this recommended action to be a very ambitious goal. Before performance measure can be used effectively or incorporated into anything, data must be collected first. In hindsight, the action should have been to start collecting work zone data. Data collection is the most basic component of a Smart Work Zone (SWZ). The Department is currently administering its first Smart Work Zone and has developed a standard specification for SWZs. These efforts will be very valuable for the next process review to begin to collect the data and make further recommendations, with the end goal to create performance measures.

**2) Finding: Systems and Technology (Closed):** ADOT currently doesn't have a systematic way to identify new technologies for work zones. A document or way of sharing knowledge about the benefits and best practices of newer work zone technologies could improve work zone traffic control designs.

**Recommended Action:**

- a) Research and gather information/resources and sharing/educating staff on existing and developing technologies.
- b) Provide links or training recommendations for staff.

These recommended actions have been addressed and are continuing with further refinement. The Operational Traffic and Safety Group (OTAS) of ADOT's TSMO Division was able to coordinate resources and funding to hire a consulting firm to develop policies, guidelines, and processes for SWZs. As a part of this development, two working papers have been generated thus far. The first working paper was a nationwide review of SWZ technologies and the second was focused on challenges to implementation.

Training on Smart Work Zones concepts and the content behind working papers one and two have been shared with several ADOT groups by OTAS staff. The OTAS staff has presented to the Traffic Standards Subcommittee, the Arizona ATSSA branch, the Arizona AGC's Young Members Forum, and ADOT Project Management Group. OTAS staff also currently has additional training scheduled for ADOT Statewide Resident Engineers and the District Engineers.

The OTAS Staff also brought in FHWA representatives to host two-one day training sessions on the Work Zone ITS Implementation Tool V1.0, which is based on the Work Zone ITS Manual. The participants of these sessions touched on every group with ADOT and also included other municipalities and private industry.

**3) Finding: Culture (In Progress & Open):** The team identified that there is not a committee that regularly reviews WZM practices.

**Recommended Action:**

- a) Create a steering committee with regularly scheduled meetings. Requires support from State Engineers Office and a champion to lead the effort.

This committee felt this item should be explored in greater detail for the 2020 report. What role this committee takes with Work Zones needs more input and discussion.

**4) Finding: Business Processes (In Progress & Open):** The team identified Business Practices, especially the implementation of TMPs, as one of the areas that is being done in a systematic way, but the team found that there could be improvements. Some team members noted that there is often excess information in TMPs that could be organized and utilized more effectively.

**Recommended Action:**

- a) Reduce the length of TMPs by removing extraneous information.
- b) Identify a new example as a best management practice for TMPs.
- c) Determine exact point in the project development process in which all project team members will know how to carry out a significant project.

The resolution to these findings ties into the resolution of finding number 3 from 2014. How to address TMPs going forward has been recommended to be taken to SuPIRB. We hope to add more content for the 2020 report.

A summary of these findings is as follows:

Open	Closed	Year	Finding
	X	2014	Project Manager checklist for Significant projects
	X	2014	Programmatic agreement for maintenance activities
X		2014	Formal packaging of the TMP in project specifications
X		2018	Work Zone Performance Measures
	X	2018	Identify new technologies
X		2018	Need for WZSM Committee
X		2018	BMPs for TMPs