

Arizona Department of Transportation
2020 Work Zone Safety and Mobility
Process Review Report Appendices

Appendix A: Transportation Management Plan Template

Arizona Department of Transportation

Transportation Management Plan

[Project Name]

[Project TRACS #]

ADOT

Month/Year [contract
award]

Transportation Management Plan - [Project Name]

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ADOT

Month/Year [date of award]

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List of Abbreviations

ACT	ADOT Communications Team
ADE	ADOT Assistant District Engineer
ADOT	Arizona Department of Transportation
AFAD	Automated Flagger Assistance Device
BLM	Bureau of Land Management
CAT	Construction Advisory Team
CMB	Changeable Message Boards
CTCPOC	Contractor's Traffic Control Point of Contact
DE	ADOT District Engineer
DLMS	Dynamic Lane Merge Subsystem
DMS	Dynamic Message Sign
DPS	Department of Public Safety (Uniformed Officers)
ECD	ADOT Enforcement and Compliance Division
ERT	Emergency Response Team
EVAP	Emergency Vehicle Access Plan
FHWA	Federal Highway Administration
GPSLS	Global Positioning System Location Sensor
IDO	ADOT Infrastructure Delivery & Operations Division
MDA	Mobile Device Application
PIP	Public Involvement Plan
PIO	Public Information Officer
PM	ADOT Project Manager
PS&E	Plans, Specifications and Estimate
RACI	Responsibility, Accountability, Consultation, and Informed
RE	ADOT Resident Engineer
RTE	ADOT TSMO Regional Traffic Engineer
SAB	Smart Arrow Board
SEQ	Sequential Flashing Lights
SFS	Speed Feedback Sign
SWZ	Smart Work Zone



Transportation Management Plan - [Project Name]

TCP	Traffic Control Plan
TDCS	Traffic Data Collection Subsystem
TEES	Truck Exit / Entry Subsystem
TIM	Traffic Incident Management
TIS	Traveler Information System (AZ511)
TMP	Transportation Management Plan
TMCS	Traffic Monitoring Camera Subsystem
TOC	ADOT TSMO Traffic Operations Center
TPTS	Temporary and Portable Traffic Signal
TSMO	ADOT Transportation Systems Management and Operations Division
TTS	Travel Time Subsystem
VSL	Variable Speed Limit Subsystem
WZDx	Work Zone Data Exchange
QWS	Queue Warning Subsystem

Transportation Management Plan - [Project Name]

Chapter 1

Transportation Management Plan

1.1 Purpose

This Transportation Management Plan (TMP) outlines the strategies that will be implemented to minimize impacts to the traveling public during construction of this project. This TMP also outlines the roles and responsibilities of the project stakeholders prior to and during construction.

This TMP was prepared to comply with the Arizona Department of Transportation's (ADOT) Policy – *ENG 07-3 WORK ZONE SAFETY AND MOBILITY POLICY*. The policy was implemented in order to comply with the Federal Highway Administration (FHWA) *WORK ZONE SAFETY AND MOBILITY RULE*. All State and Local governments that receive federal funding are required to comply with the provisions of said document. This policy is periodically updated, and the policy that was applicable at time of bid submission shall be the policy enforced for compliance within the plan.

The purpose of a TMP is to minimize motorist delays associated with project construction without compromising public or worker safety, or the quality of the work performed. In order to do so, this document details the application of traffic control and construction sequencing strategies including public and motorist notification, corridor and network management, incident and emergency management, alternate route strategies, and public outreach opportunities.

1.2 Transportation Management Plan Summary

The following strategies and elements will comprise the TMP for this project.

- Project Location
- Project Description
- Roles and Responsibilities
- Motorists Information Strategies
- Incident Management
- Construction TMP Strategies
- Stakeholder Coordination
- Corridor/Network Management Strategies
- Alternate Route Strategies
- Public Information/Public Awareness Campaign
- Contractor and ADOT Emergency Contingency Plan

Transportation Management Plan - [Project Name]

These strategies may be modified, changed, or eliminated as necessary, with consultation from the appropriate Infrastructure Delivery and Operations (IDO) District, Transportation Systems Management and Operations (TSMO) Region, and ADOT Communications, to maximize safety and to minimize traffic congestion throughout the corridor. The Divisions shall appoint the appropriate point of contact for each project. This shall be done during project development by the Traffic Designer to allow enough time to come to a consensus without impacting the contractor's schedule. The ADOT Project Manager (PM), or their designated consultant PM, will be responsible for this to be completed.

Items may also be added back in or further items removed or changed with additional consultation with the project contractor after contract award.

Transportation Management Plan - [Project Name]

Chapter 2 [To be completed by Traffic Designer]

Project Location

2.1 Location

The [Project Name] Project is located within [county], in (or near) [municipality]. The project begins X miles [north/south/east/west] of the [Name] Interchange at (Milepost X.X), and terminates X.X miles down the road at Milepost X.X, X miles [north/south/east/west] of the [Name] Interchange (or major feature).

Figure 2.1a [Title]

[Figure-Map][Large Area]

The figure below shows the project roadway and general limits.

Figure 2.1b [Title]

[Figure-Map2][Project Area]

Transportation Management Plan - [Project Name]

Chapter 3 *[To be completed by Traffic Designer]*

Project Description

3.1 Description

The time allowed for completion of the work included in the construction phase of the contract is _____ calendar/working days. Construction will begin in _____ and is expected to conclude in _____.

The construction improvements will be phased such.....

In general, the project will be constructed as follows:

Phase 1: Construction begins with
Figure 3.1a [Title]

[Cross section]

Phase 2:
Figure 3.1b [Title]

[Cross section]

Chapter 4

Roles and Responsibilities

4.1 Resident Engineer (RE)

The ADOT RE will be the main point of contact during construction for all project related items including this TMP. The RE will ensure full implementation of the TMP in close coordination with the District Engineer or Assistant District Engineer, herein referred to as DE, so that disruption to the traveling public is minimized. The RE will work with the DE and the contractor to ensure that project activities conform to the TMP and that contingency plans are implemented if necessary. The RE facilitates review, approval, modification, or disapproval of planned lane closure requests for this project. The RE directs termination or modification of active planned lane closure operations for this project without compromising the safety of the public or workers, when traffic impact becomes significant. The RE will coordinate with the Traffic Operations Center (TOC) staff to respond with appropriate measures when significant travel delays occur on the highway system as a result of this project. The RE will coordinate work activities with the Department of Public Safety (DPS) and other local and regional transportation stakeholders as appropriate. This includes issue resolution escalation as per the partnering program, countermeasures implementation with DE concurrence.

4.2 District Engineer (DE)

The DE is responsible, along with the RE, and the ADOT Communications Team (ACT) to ensure implementation of the TMP during the project. The DE is to support the RE when not available.

4.3 Project Manager (PM)

The PM assists and supports the RE and DE in assuring the TMP is implemented.

4.4 ADOT Communications Team (ACT)

The ACT is responsible for engaging with the public to provide up-to-date information and address concerns to minimize the disruption to residents, businesses, and the community while work is underway. Individuals with limited English proficiency or disability considerations will be included in outreach efforts and documented. The ACT will be the lead on public outreach including the following activities:

- Media Relations
- Responding to constituents, stakeholders, and government officials and coordinating meetings with these individuals or groups as needed
- Business outreach with assistance from the Local Agencies and MPO's.
- Traffic alert or news release development and distribution. Distribution includes impacted stakeholders, government officials, and constituents who have indicated a desire to receive traffic alerts and releases.
- Communication materials and distribution
- Website development and updates

Transportation Management Plan - [Project Name]

- Hotline maintenance

Typically ADOT assigns a Public Information Officer (PIO) to each project, who will act as a point of contact for ACT.

4.5 Construction Advisory Team (CAT)

Also known in other plans as a transportation systems management team, a CAT meeting is formed to facilitate the coordination and communication among stakeholders during construction. This team is typically assembled after the first partnering workshop to address how ADOT and the contractor work with local emergency service providers to maintain access during construction, and plan for what the team does in various emergency scenarios, such as vehicles or large trucks breaking down within the one-lane constrained traffic control limits. Catastrophic events should also be addressed, like a civil unrest, 100-year flood or an open-range fire approaching the job site. CAT assists the RE in making decisions during construction when applicable and appropriate, and assembles prior to each major stage change or in the event there is an emergency or conflict during construction in which the RE needs input. Participants in the CAT are shown on the Responsible, Accountable, Consulted, and Informed (RACI) Table 5.1a .

4.6 Contractor's Traffic Control Point of Contact (CTCPOC)

The CTCPOC shall be responsible for coordinating efforts involving traffic control for the duration of the project. The CTCPOC shall attend weekly meetings and coordinate the contractor's activities to ensure that traffic alerts are provided to ACT in a timely manner. The traffic alerts shall serve to notify the public of future lane closures and impacts to the public access and affected businesses. The CTCPOC shall work closely with the RE and TOC to coordinate emergency access during all phases of construction. The CTCPOC shall coordinate with traffic control/barricade companies regarding the proper placement and maintenance of traffic control devices. They must be available (24 hours/day) during active Traffic Control.

4.7 Regional Traffic Engineer (RTE)

The RTE can function as a point of contact for the Transportation Systems Management and Operations (TSMO) Division within ADOT. This responsibility should not supersede the roles as defined in the RACI Table 5.1a, and direct communication with other TSMO Groups including the TOC, will be needed at times during the project. The RTE shall be consulted on all Traffic Control Plan (TCP) approvals.

Chapter 5

Motorist Information Strategies

Critical to the success of this TMP is the Motorist Information System that will be implemented during construction. The main components of this system are the CMBs that alert drivers of upcoming traffic conditions, access to corridor and project specific road conditions via a cell phone application, and other dynamic support systems (SEQs on tapers and DMS on the corridor). These tools and information will guide and assist the motorists in making alternate route selections to avoid the impacted area in advance of the project, and alert them to changes through the project. The various motorist information system elements are discussed below:

5.1 Smart Work Zone (SWZ) The SWZ system is a broad range of portable communications-based information and electronic technologies placed in and around work zones to enhance transportation and improve safety and mobility. The real-time information and automation provided by the SWZ system is used by contractors and transportation agencies to alter traffic control strategies and provide traveler information to better inform motorists of upcoming traffic conditions, allow motorists the opportunity to alter their travel routes, and/or modify the travel behavior within work zones. The SWZ system consists of one or multiple SWZ subsystems that operate together. These subsystems include TDCS, QWS, DLMS, TTS, TMCS, VSL, SAB, SFS, GPSLS, and TEES. Data from these subsystems shall conform to the WZDx specification. TPTS, and AFAD are also considered smart device, but not included in the SWZ section of the project contract.

5.2 Portable, Changeable Message Boards (CMB)s

In addition to the CMBs associated with the SWZ, CMBs are truck or trailer mounted message boards that provide advance schedule messages alerting drivers of future traffic changes. These signs are utilized to provide motorists information about expected closures and shifts in traffic, especially prior to alternate work zone movements. In general, CMBs are implemented for inbound traffic as they approach the work zone. Additional CMBs may be placed and operated as deemed necessary by the RE.

5.3 Dynamic Message Signs (DMS)

The DMS shall be utilized when they are available and in a location that is appropriate to the work zone. The primary use of these signs is to advise motorists in advance of upcoming work zones, anticipated delays, and possible detours in advance of the impacted area. Also displayed on the DMS shall be estimated travel time to reach a certain destination, or anticipated delay. With such information accessible to them far in advance, long distance travelers are able to make informed decisions. There are two DMS located within this portion of the [route] corridor. These two DMS are listed below by their location:

- On NB [Route Name] [cardinal direction] of the [NAME] Interchange (MP XX.X)
- On SB [Route Name] [cardinal direction] of the [NAME]k Interchange (MP XX.X)
-



Transportation Management Plan - [Project Name]

Optional: As a result of the stakeholder meeting between FHWA, ADOT, and [municipality], the [municipality] will assist ADOT by modifying their messages on their DMS system. The contact information for [municipality] is provided in Appendix A.

5.4 Ground Mounted Signs

Warning signs shall augment the maintenance of traffic plans by guiding motorists through various traffic control layouts through the active project limits. An adequate signing scheme has been developed within the construction documents to guide motorists through the various stages of construction. There are also a series of signs established to warn motorists that cannot fit through the construction project, to use an alternative route. The contractor and the RE are responsible to make sure that adequate signage is installed and maintained to guide motorists safely through the project.

5.5 AZ511 Traveler Information System

Real-time highway conditions are available to motorists by calling the 511 TIS. By dialing 511, the caller has the option to obtain information on any particular route by selecting the route number. This should be utilized for any traffic impact to the roadway facility, including Freeway Closures, Lane Closures, Shoulder Closures, etc.

5.6 Sequential Flashing Lights

Sequential Flashing lights (SEQ) is an award-winning system of sequential lighting that improves safety by alerting drivers to a work zone ahead and helping guide them through one of the least safe transition points: the merge taper. Particularly useful in nighttime work zones, it is a low-cost, high-benefit solution that is easy to understand and deploy.

By flashing a sequential series of lights mounted on work zone channelizers, the system helps direct a driver's attention to the path that is designated through the work zone while producing a demonstrated reduction in vehicle speed. It also promotes a smooth lane merge, where necessary, to enhance safety and traffic flow.

With a low unit cost and simple installation, SEQ is an alternative to Type C lighting that is rapidly gaining popularity among agency users. The system also demonstrates innovation at work on a project—it is a tangible safety improvement that roadway customers can readily appreciate.

5.7 Website

ADOT's website (www.AZ511.gov) provides travelers and truckers the latest information on the [route] construction projects. The website features links to traffic cameras available at az511.gov, traffic alerts, potential detour routes, informative videos and the latest project news. Additionally this project has a dedicated web page available to notify the public of upcoming delays and detours:

[http://www...\[complete with project web address\]](http://www...[complete with project web address])



Transportation Management Plan - [Project Name]

5.8 Freight Transportation Information

The work zone information may include, but is not limited to, truck restrictions, traffic impacts, detours, occurrence of incidents, planned closures, etc. Such information is disseminated to central locations via fax, or email distribution to trucking companies. Further elements of the Motorist Information System are referenced in the Communications Plan, as described in Chapter 11. ADOT Enforcement and Compliance Division (ECD) is a good resource

5.9 Mobile Device Application

The mobile device, such as a smartphone or tablet, application (app) is a downloadable, free application to the public to download and for use on Apple and Android mobile devices. The purpose of the app is to convey corridor information (delays, restrictions, and closures) to motorists prior to reaching the corridor. ADOT will provide personnel to set up and maintain the app and to keep the information provided on the application up-to-date with the construction activities. The contractor shall coordinate the information provided to ACT to insure there is consistent information and no conflicts in the information provided. The proposed information provided shall be approved by the RE prior to providing it to the ACT. The frequency of updates to be provided shall be as directed by the Engineer. Updates occur prior to construction activities that cause delays or impact the flow of traffic through the construction zone. The information provided by the application should be included in the contract documents. This information could include, but is not limited to travel time, detour routes, lane closures, etc. The contractor shall ensure that the application is active and broadcasting the appropriate information by checking at least once a week.

5.10 Public Involvement Plan

Implement the components of the project Public Involvement Plan (PIP) in accordance with ADOT best practices for communication and community relations prior to and during construction. The project hotline number should be included in all public notifications. Outreach to public transportation is an important aspect to the traveling public, as significant or unforeseen closures could greatly impact travel times and delays affecting connections and scheduling. ACT will initiate a reassessment of stakeholders and community makeup prior to finalization of the PIP. The PIP also includes the Public Information Campaign, see Chapter 11 for more information.

Chapter 6

Traffic Incident Management and Enforcement Strategies

Traffic Incident Management is a planned and coordinated program process to detect, respond to, and remove traffic incidents and restore traffic capacity as safely and quickly as possible. TIM consists of a planned and coordinated multi-disciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. Effective TIM reduces the duration and impacts of traffic incidents and improves the safety of motorists, crash victims and emergency responders. This coordinated process involves a number of public and private sector partners, including:

- Law Enforcement
- Fire and Rescue
- Emergency Medical Services
- Transportation
- Public Safety Communications
- Emergency Management
- Towing and Recovery
- Hazardous Materials Contractors
- Traffic Information Media

On highways under construction, incidents and vehicular breakdowns can compound an already congested highway. In order to minimize the impacts of these events, this TMP incorporates a TIM element. This element aims to reduce the effects of incidents or vehicular breakdowns on the flow of traffic. The following incident management elements will be utilized:

6.1 Access of Emergency Services

In the event that an emergency vehicle must access a particular segment of the construction zone, every effort must be made by the contractor and RE to facilitate the safe access of such vehicles. The current Emergency Vehicle Access Plan (EVAP) in accordance with ARS 28-652 has been prepared for the anticipated construction phasing, and is shown as Appendix E. The EVAP shall be developed separately from the Safety Plan as specified in Section 107.08 of the Standard Specifications. Once the RE approves the EVAP it should then be incorporated into Appendix E. The EVAP should be developed in consultation with project area law enforcement and emergency responders.

The EVAP is intended to pre-plan actions prior to an emergency event and how the contractor and project staff coordinate with emergency response units. The EVAP shall evaluate typical conditions at various locations throughout the project during each construction phase and be implemented throughout construction. The EVAP shall include the following, but not limited to, an emergency contact list, emergency vehicles access to and from all areas of work, and traffic control coordination during an emergency event. An emergency event is defined as an incident that requires an emergency vehicle to respond. If the contractor identifies a condition within the project limits during construction that emergency access cannot be provided from the mainline, an alternative access route shall be identified.

Transportation Management Plan - [Project Name]

The contractor shall submit the EVAP at the preconstruction conference to the RE for approval. The RE will review the EVAP within 15 working days and identify any additional items to be included. The contractor shall then modify the EVAP, if necessary, for re-submittal to the RE within five working days. The contractor shall review the approved EVAP with all staff and subcontractors designated as Project Manager, Superintendent, Foreman, and any other staff that may be in a responsible charge on the project. Each person shall be familiar with the approved EVAP and their responsibilities during an emergency event. The contractor shall not commence work until the EVAP has been approved, unless authorized by the RE.

The approved EVAP shall be communicated to project area law enforcement and emergency responders by electronic mail, fax or other effective means 14 calendar days prior to implementation by the contractor. The contractor and RE should also facilitate a meeting with emergency responders to review every new EVAP that is implemented. See section 8.1 for additional guidance on conducting these meetings.

6.2 Traffic Operations Center (TOC)

The ADOT TOC will coordinate and manage road-user information. Proper messaging shall be displayed on the DMS to inform motorists of incidents and to provide useful information on alternate routes. Close coordination between ADOT TOC, the contractor, and RE is critical to allow quick response to incidents and disseminate information when needed to key operational stakeholders. The TOC Manager will also coordinate with adjoining municipalities for the use of their respective fixed DMS.

6.3 Emergency Response Team (ERT)

The ERT is composed of members from ADOT and the contractor that deal with emergency vehicle access or broken-down vehicles within the project limits. If shoulders are narrowed or closed within the work zone, a broken-down vehicle has the potential to completely block a lane(s) of traffic and completely shut down the roadway. In the event that emergency vehicles need through access to the site, the ERT implements the EVAP.

6.4 Enhanced Enforcement

DPS officers or local enforcement officers are utilized during construction to improve the safety of construction work crews and the motoring public. The types of enhanced enforcement that DPS provides include roving or stationary patrol vehicles for speed enforcement, queue control, and monitoring of traffic control devices. DPS officers may also be utilized for traffic control assignments and provide any needed emergency response support services. Due to the high traffic volumes on [route], enhanced enforcement is needed.

Chapter 7

Construction TMP Strategies

Construction TMP strategies are measures that are included in the plans and specifications and performed by the contractor during construction. The objectives of construction TMP strategies are to reduce construction time, minimize traffic disruptions, and avoid potential safety issues during construction. The construction sequencing and traffic control plans, commonly referred to as the Maintenance of Traffic (MOT), that were developed for the project shall be used as the anticipated construction strategy for the project. The contractor may develop their own strategy that differs from the plans with the approval of the RE. The construction sequencing plans and traffic control plans are shown in Exhibits [X] and [Y] respectively.

The following construction TMP strategies apply:

7.1 Lane Restrictions

The existing [route] facility is a #-lane facility, with # lanes in each direction. Allowable lane restrictions are identified in Section 104.04 Maintenance and Protection of Traffic. Lane restrictions are used to minimize traffic impacts and the contractor is discouraged from closing all of the lanes of this facility.

7.2 Project Coordination

Coordination with other highway projects, specifically improvements or inspections to other bridges in the corridor, as well as non-highway related projects, is critical in minimizing traffic disruptions. Coordination involves scheduling projects within a corridor to ensure that adequate capacity remains available to accommodate the anticipated travel demand within the corridor by not implementing work zones on parallel roadways, or on detours concurrently. At a minimum, care should be taken in the timing of lane closures to ensure that all projects are coordinated during construction to minimize any interference among the various projects and compounding the effects on the motoring public. Prominent projects with known significant impacts have been cited in the Special Provisions.

Chapter 8

Stakeholder Coordination

Further transportation management measures may be implemented, should unusual and unplanned circumstances warrant. These will be determined on an individual, day-to-day basis. The CAT will continuously monitor the project to ensure the safe and efficient movement of traffic.

8.1 Team Meeting

One of the primary roles of the CAT is to facilitate the coordination and communication among stakeholders during construction. The CAT is comprised of members from both ADOT and organizations outside of ADOT. The primary focus of the team is to develop a communication plan that identifies all the possible risks that may arise during construction. With each risk identified, the team identifies an action plan to inform the impacted stakeholders and develop a Communication Plan to resolve the issue. The Communication Plan includes a decision tree with clearly defined lines of communication and responsibilities. The CAT continuously monitors the project to ensure the safe and efficient movement of traffic throughout the execution of the project. At a minimum, 14 calendar days prior to any major stage change, a meeting should be called to discuss issues pertaining to the stage. Issues on hand may be, but not limited to the following:

- Messages to be displayed
- Police or DPS deployment
- Flagger deployment
- Signs to be used
- Identifying closures of lanes, ramps, or connectors
- Review of the Traffic Control Plans
- Modifications to the Detour Plans
- Development of an Emergency Vehicle Access Plan
- Roles and interaction between:
 - ACT
 - CTCPOC
 - TOC
 - ERT

See Exhibit [Z] for the list of CAT members and the respective unit and organization that they represent.

Transportation Management Plan - [Project Name]

Chapter 9

Corridor/Network Management Strategies

These strategies intend to optimize traffic flow through the work zone corridor and adjacent roadways using various traffic operations techniques and technologies.

9.1 TMP Effectiveness Monitoring

If directed by the DE or RTE, the TOC will collect and analyze non-recurring congestion data, using either tachometer runs, or using third party data in combination with the SWZ data.

To gather data using a tachometer, collect the following data during the morning and evening peak periods on a Tuesday, Wednesday, or Thursday on the highway corridors approaching the project area during construction. Each “tach-run” involves a two-car team, using the “floating car” method. The cars are separated by 15 minutes as they follow one another along the corridor. The process is repeated several times during the course of the peak period. Non-recurring congestion determined from the “tach-run” data will be analyzed according to its magnitude, time, and space distribution.

The total vehicle-hours of congestion are converted into congestion measuring parameters of congested lane-miles, congestion duration, average speeds, user delay, and user delay cost. These congestion characteristics can then be compared with the pre-construction condition.

Chapter 10

Alternate Route Strategies

10.1 Detours

There are no full closures planned at this time. For partial lane closures, the contractor shall abide by the specifications established in the project Special Provisions.

There is an alternative route available to smaller vehicles to use (there are weight restrictions on some of the structures on this route). For sensitivity reasons, that route is not formally published on the corridor, but is well known by locals. Transportation officials that work and permit oversized and restricted loads know what cannot be used. It may be used by emergency services.

In the event of an unforeseen closure, the alternative route is as shown in Exhibit [W]. The detour signs necessary to use this alternative route shall be maintained by the Contractor through the duration of this project. At the end of work, the signs shall be removed.

Chapter 11

Public Information Campaign

Public information is a vital component of this TMP. The objective of the public information campaign is to create awareness of the project and disseminate timely information related to construction activities and traffic impacts to the public and local business communities. The campaign includes targeted messages and customized information for the following key target audiences:

- General Public
- Businesses
- Local Government Officials and Staff
- Community Organizations and Stakeholders
- Emergency Service Providers
- Trucking/freight/shuttle service companies
- Media
- Internal ADOT employees and divisions

The information campaign for this project consists of various strategic tactics over the construction period. Additional details about the campaign and the strategies for each of the market segments that were previously identified are available in the Communications Plan, which can be found in Exhibit B of this TMP. Some of the elements of the campaign include, but are not limited to:

11.1 Printed Communications Materials

Printed information about the project will be distributed to the public and stakeholders. General information about the project, traffic alerts, fact sheets, project maps, lane closure announcements, and other information will be distributed to each of the target audiences listed above through mailings, media outlets, public meetings, special events, and other available distribution channels.

11.2 Press Releases

Information about upcoming traffic impacts, detours and construction milestones will be regularly issued to the local media so that they can publicize the information to the public. The recipients of the press releases include local radio, TV, newspapers, publications and websites. A complete list of the media that will be receiving regular press releases about this project can be found in the Communications Plan.

Transportation Management Plan - [Project Name]

11.3 Project Hotline and Public Feedback

Although not initially envisioned as necessary, ADOT could quickly implement a project hotline during the project to allow the public to contact ADOT for inquiries, questions, concerns, and comments. This has been done successfully on other projects. A toll-free hotline could be staffed during regular business hours (8 a.m. – 4 p.m., Monday – Friday). Callers could leave voice messages 24 hours a day, 7 days a week, which is checked at least twice a day and responses are provided as soon as possible depending on the research time needed.

With no hotline in place, ACT receives public questions and comments related to the construction project and address them in any of the following ways:

- By email: Subscribe(link is external) to receive project updates and traffic alerts.
- By phone: Call the ADOT Bilingual Project Information Line at 855.712.8530.
- Online: Submit a question or comment through the ADOT website. Visit azdot.gov/Contact and then select Projects from the dropdown menu.
- By mail: Write to ADOT Community Relations, 1655 W. Jackson St., MD 126F, Phoenix, AZ 85007

11.4 Electronic Media

Traffic alerts and project updates will also be distributed to the public and stakeholders through electronic media, including email blasts, web updates, electronic newsletters, and Facebook.

ACT works in collaboration with the RE, TOC, and other key members of the [NAME] District to provide the public with timely information about the project. The RE will keep ACT, TOC, and the DE informed and up to date on the construction progress, delays, closures and other information which may assist them in the performance of their duties.

Chapter 12

Contractor & ADOT Traffic Emergency Contingency Plan

12.1 Contractor's Responsibility

The contractor shall be required to submit a traffic control plan for approval by the RE prior to any lane or ramp closures or the use of any detour plans. The traffic control plan shall contain a detailed contingency plan to ensure opening of the route by the designated time. During construction activities requiring lane or ramp closures, or the use of any detour plans, the contractor shall provide appropriate personnel to monitor activities and make decisions regarding activation of contingency plans.

12.2 Contingency Plans

The contractor shall provide contingency plans that are approved by the RE and CAT. These plans identify key operational decision points with a timeline listing the expected completion time of each critical path activity. Clearly defined trigger points shall be identified with each critical path activity to establish when the contingency plan is activated.

12.3 Emergency Communication Plan

A Communication Plan will include a decision tree with clearly defined lines of communication (provided in the section below). The information includes names, telephone numbers and mobile numbers of the contractor's Project Manager, ADOT TOC, RE, ADOT Permit and/or Construction Inspector, DPS Area Commander, and other applicable personnel (local law enforcement or emergency responders (fire/medical)).

12.4 TOC Response Protocol

The ADOT traffic contingency plan basically follows the TOC major incident response protocol. When a major lane-blocking incident occurs, TOC should receive a report from DPS, ADOT, or the Contractor field personnel.

Transportation Management Plan - [Project Name]

Chapter 13

Responsibility, Accountability, Consultation, and Informed (RACI)

13.1 TMP RACI Table:

TMP Responsibility, Accountability, Consultation, and Informed (RACI) Table

Project Description (or Activity) - as applicable to project	Project Development Team							
	Law Enforcement**	Project Management Group	Contracts & Specifications	Districts	Traffic Operations Center	Regional Traffic Engineer	ADOT Communications Team	Traffic Designer
* R = Responsible (does the work); A = Accountable (to review/ensure the work is getting done); C = Consulted (for input as needed); I = Informed (as needed, is kept in the loop on progress)								
** Law Enforcement could be DPS, ECD, or local (City or County) uniformed law enforcement officers								
Task								
Define as "Significant" for WZSM		A	I	R*	C	R*	I	C
Traffic Control Plans	C	A	I	C	C	C	I	R
Emergency Vehicle Access Plan	C	A	I	C	C	C	I	R
TMP Template	I	A	I	C	C	C	I	R
TMP Specification	I	A	R	C	C	C	I	C

** Projects should be defined as Significant for Work Zone Safety & Mobility by ADOT Multimodal Planning Division during project scoping, however the District will be responsible at the start of design.*

Table 13.1a TMP RACI Table (Development)

Transportation Management Plan - [Project Name]

TMP Responsibility, Accountability, Consultation, and Informed (RACI) Table

Project Description (or Activity) - as applicable to project	Construction Advisory Team Roles*					
	Law Enforcement**	Contractor	RE	TOC	RTE	ACT
* R = Responsible (does the work); A = Accountable (to review/ensure the work is getting done); C = Consulted (for input as needed); I = Informed (as needed, is kept in the loop on progress) ** Law Enforcement could be DPS, ECD, or local (City or County) uniformed law enforcement officers						
Motorist Information Strategies	Chapter 5					
Smart Work Zone		R	A	I	C	I
Changeable Message Board		R	A	I	C	
existing fixed overhead digital Dynamic Message Sign		C	A	R	C	I
Ground Mounted Signs	I	R	A		C	
A2511 Traveler Information System	C	C	A	R	C	I
Sequential Flashing Lights		R	A	I	C	
Website	I	C	C	I	C	R
Freight Transportation Information	C	C	C	C	C	R
Mobile Device Application	C	C	C	I	C	R
Public Involvement Plan	C	C	C	I	C	R
Traffic Incident Management & Enforcement Strategies	Chapter 6					
Access of Emergency Services	C	R	A	I	C	
Traffic Incident Management	R	C	C	A	C	I
Law Enforcement	R	C	C	A	C	I
Emergency vehicle access management and planning	C	R	A	C	C	
Construction TMP Strategies	Chapter 7					
Lane Restrictions	I	R	A	I	C	C
Project Coordination		R	A	I	C	C
Stakeholder Coordination	Chapter 8					
Team Meeting	I	A	R	I	C	A
Corridor/Network Management Strategies	Chapter 9					
TMP Effectiveness Monitoring	I	A	R	I	C	C
Alternate Route Strategies	Chapter 10					
Detours	C	R	A	C	C	C
Public Information Campaign	Chapter 11					
Printed Communications Materials		A	C	I	I	R
Press Releases		A	C	I	I	R
Project Hotline and Public Feedback		A	C	I	I	R
Electronic Media		A	C	I	I	R
Emergency Contingency Plan	Chapter 12					
Contingency Plans	I	R	A	A	C	C
Emergency Communication Plan	I	C	C	A	C	R
TDC Response Protocol	I	A	A	R	C	I

Table 13.1a TMP RACI Table (Construction)

Transportation Management Plan - [Project Name]

Appendix A: Emergency Contact List



Transportation Management Plan - [Project Name]

Appendix B: Response Protocol

ADOT inspector or contractor responsibility:

- Call 911 and report incident
- Notify TOC.
- Notify the RE.
- Not leave post until released.
- Update any events to TOC and RE.
- Document the accident and accident report number.

TOC responsibilities:

- Notify DPS, EMS, and Fire Department if applicable, ADOT Maintenance (first response team) if needed.
- Verify details with DPS unit and ADOT inspector on duty.
- Release a 511 alert and will keep updates.
- Activate the DMS for accident, closure and detour route. (DMS will be deactivated once the roadway re-opens)
- Collaborate with [municipality] counterparts to activate DMS within [municipality], respectively.
- Update any events to RE.
- Document the accident and accident report number.

RE responsibilities:

- Notify the DE if the emergency detour plan would need to be implemented.
- Notify and coordinate with [municipalities] to implement the emergency detour route.
- Notify the ADOT media.
- Notify the DE, Community(s) of [municipalities] when the roadway is reopened.

DE responsibilities:

- Notify ADOT Senior Management (if applicable).
- Notify FHWA (if applicable).
- Notify the adjacent District (if applicable).
- Notify ADOT Senior Management, FHWA, and adjacent District when the roadway is re-opened (if applicable).

Uniformed officers (including DPS) responsibilities:

- Coordinate with RE, and ADOT and contractor project staff throughout incident
- Monitor local streets and roadway closure.
- Notify and update TOC of any changes to the closure.
- Coordinate with ADOT and contractor for clean-up, if HAZMAT is needed.

Contractor responsibilities:

- Set-up and take down traffic control to divert traffic to alternative route (if applicable).
- Update TOC of any changes to the closure.
- Coordinate with DPS for clean-up, if HAZMAT is needed.



B-1

Transportation Management Plan - [Project Name]

Appendix C: Traffic Control Plans

Transportation Management Plan - [Project Name]

Appendix D: Emergency Vehicle Access Plans



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Transportation Management Plan - [Project Name]

Appendix E: Meeting Agendas & Minutes

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Formatting Guide:

The following information is to be deleted

This shall not be used in the TMP once approved. It is used to aid in proper formatting of additional information added to this document.

(This TMP Template is version 1.0 - October 2020)

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Chapter 1

[Chapter Title]

1.1 [Section Title]

[Content] Block, Justified, Calibri 12 Body

1. Numbers should be used for a series of steps or lists that are written in complete sentences with punctuation.
2.
 - a.

1.1.1 [Subsection Title]

[Content]

1.2 [Section Title]

[Content]

Format Guide - to be deleted/removed

Format Guide - to be deleted/removed

Chapter 2

[Chapter Title]

2.1 [Section Title]

[Content] Block, Justified, Calibri 12 Body

Table 2.1 [Title]

[Table]

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[Figure]


Figure 2.1b [Title]

[Figure]

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Appendix B: 2020 Work Zone Safety and Mobility Policy ENG 07-3

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ARIZONA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION POLICIES AND PROCEDURES

ENG 07-3 Work Zone Safety and Mobility Policy

Effective: September 16, 2020
Supersedes: ENG 07-3 (March 10, 2017)

Review: September 16, 2025
Page 1 of 5

PURPOSE

The purpose of this document is to define the policy requirements and expand on existing guidance and requirements for systematically considering and managing work zone safety and mobility impacts on Arizona Department of Transportation (ADOT) administered projects.

SCOPE

This policy applies to all construction, maintenance, and procurement projects determined by ADOT to be a *significant project* as defined in this policy.

AUTHORITY

Current Federal Highway Administration (FHWA) regulations in this area are provided through 23 CFR 630 Subpart J *Work Zone Safety and Mobility Rule* (§630.1002 through §630.1016) and 23 CFR 630 Subpart K *Temporary Traffic Control Devices Rule* (§630.1102 through §630.1110). Arizona Revised Statutes (ARS) §28-332 *Department of Transportation, Jurisdiction, Duties, Divisions* gives ADOT exclusive control and jurisdiction over state highways and routes. ARS §28-652 *State Highway Work Zones; Definition* sets ADOT's authority to adopt standards and specifications for traffic control and mobility in state highway work zones. ARS §28-710 *State Highway Work Zone Safety; Civil Penalty; Fund* allows a civil penalty for exceeding speed limits in work zones when workers are present.

DEFINITIONS

Incident	An Incident is any non-recurring event that causes a reduction of roadway capacity or an abnormal increase in demand. Such events include traffic crashes, disabled vehicles, spilled loads, highway construction and maintenance activities, and special events (e.g., sporting events, concerts, parades).
Mobility	As specifically related to work zones, mobility refers to moving road users efficiently through or around a work zone area with minimal delay when compared to travel when no work zone is present, while not compromising the safety of highway workers or road users. The commonly used performance measures for the assessment of mobility include delay, speed, travel time and queue lengths.

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ENG 07-3 Work Zone Safety and Mobility Policy

Significant Project A Significant project is one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered tolerable based on engineering judgment and cooperation with the FHWA. This judgment is based on existing traffic volumes, duration of construction and anticipated impacts to travel time and the surrounding transportation network; these issues are discussed further in the *ADOT Guidelines for Work Zone Safety and Mobility*. In addition, all interstate system projects within the boundaries of a Transportation Management Area that occupy a location for more than three days with either intermittent or continuous lane closures are considered significant.

Transportation Management Area (TMA) Per the Federal Transit Administration (FTA) and FHWA, all urbanized areas with populations greater than 200,000 as determined by the 2010 Census (see <http://www.census.gov/> for more information) are designated as Transportation Management Areas.

Transportation Management Plan (TMP) The Transportation Management Plan outlines the strategies that will be implemented to minimize impacts to the traveling public during construction of a project. The TMP may consist only of a Temporary Traffic Control Plan and Emergency Vehicle Access Plan, and may add a Transportation Operational and Public information components/documents dependent upon if the project is Significant. On Significant projects, the TMP will define the roles and responsibilities of the project stakeholders prior to and during construction.

All projects will include:

1. Temporary Traffic Control Plan (TTC)
2. Emergency Vehicle Access Plan (EVAP)

Significant Projects will also include:

3. Transportation Operational (TO) component
4. Public Information (PI) component

Work Zone Safety Minimizing potential hazards to road users and highway workers in the vicinity of a work zone, defines Work Zone Safety. Measures for highway safety are the number of crashes or the consequences of crashes (fatalities and injuries) at a given location or along a section of highway during a period of time.

POLICY

ADOT will :

- A. Assess work zone impacts during project development and manage safety and mobility during project implementation as outlined in these procedures.
- B. Use field observations, work zone crash data, public feedback and operational information to manage work zone impacts for specific projects during implementation to continually pursue

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ENG 07-3 Work Zone Safety and Mobility Policy

improvement of work zone safety and mobility by analyzing work zone crash and operational data from multiple projects to improve State processes and procedures.

- C. Require competent personnel for the development, design, implementation, operation, inspection, and management of work zones and traffic control appropriate to their job decision-making authority. Competency may include professional registration and experience in accordance with ARS and the Arizona Board of Technical Registration (BTR) Rules or a combination of education, experience and specialized training, such as courses taken through the National Highway Institute or the American Traffic Safety Services Association. Enforcement duties shall be restricted to sworn officers in accordance with ARS §38-1101.
- D. Perform a process review every two years to evaluate and improve work zone processes and procedures with the intent to increase safety and mobility. Process reviews may include, at a minimum, evaluation of work zone crash data, review of public feedback and a review of randomly selected Significant projects and that may involve project personnel from different project development stages, FHWA representatives and outside stakeholders.
- E. Identify a project as a Significant project before scoping is complete. This determination is based on a project's characteristics and the magnitude and extent of the anticipated work zone impacts.
- F. Develop TMPs in consultation with stakeholders as determined by the project characteristics and the traffic control requirements identified for the project.
 - 1. For **significant projects**, the TMP should include:
 - a. A TTC describing measures designed to facilitate road users' travel through the work zone. The plan must be consistent with Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD), the Arizona Supplement to the MUTCD, ADOT Traffic Guidelines and Processes, and the ADOT Traffic Control Design Guidelines.
 - b. A TO component that identifies strategies for mitigating the impacts of the work zone on the operation and management of the transportation system. This component may include demand management, corridor/network management, safety management, enforcement and work zone traffic management. Incorporate TTC using Integrated Traffic Systems (ITS).
 - c. A PI component that includes outreach and communication strategies designed to inform the traveling public, area residences and businesses, appropriate public entities and other stakeholders about the project and the expected work zone impacts. The selected communication method(s) should convey information including project characteristics, expected impacts and duration, closure details and commuter alternatives. Information should be updated as needed to reflect changing conditions.

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ENG 07-3 Work Zone Safety and Mobility Policy

- d. An EVAP, which must be included in the TMP in accordance with ARS §28-332 *Department of Transportation Jurisdiction; Duties; Divisions* and §28-652 *State Highway Work Zones; Definition*. The EVAP will be established in consultation with, and will be communicated to, area law enforcement agencies and emergency responders
2. For projects that are not designated as significant, the TMP may consist of a TTC and EVAP only. However, addressing traffic operations and public information in the plan should also be considered.
- G. Develop Plans, Specifications and Estimates (PS&E) that include a TMP or provisions for contractors to develop a TMP. The PS&E should include appropriate pay item provisions for implementing the TMP through either method-based or performance-based specifications.
- H. Designate a competent person, in conjunction with the competent person designated by the contractor, who has authority and responsibility for implementing the TMP and other safety and mobility aspects of the project. The competent person selected must be approved by the ADOT Engineer.
- I. Monitor work zone impacts during construction and take corrective action to manage mobility and safety based on criteria such as travel delay, queue lengths and crash occurrences.
- J. Initiate appropriate incident management procedures to restore the roadway to full capacity after becoming aware of an incident. The ADOT Traffic Operations Center is to respond to incidents and dispatch appropriate teams to manage and clear the incidents in a work zone.

RESOURCES

ADOT Implementation Guidelines for Work Zone Safety & Mobility

<https://azdot.gov/sites/default/files/2019/04/work-zone-safety-and-mobility-implementation.pdf>

ADOT Work Zone Safety and Mobility Process Review

<https://azdot.gov/business/engineering-and-construction/construction-and-materials/work-zone-safety-and-mobility>

ADOT Work-Zone Safety Tips

<https://azdot.gov/about/transportation-safety/work-zone-safety>

Guidance for Conducting Effective Work Zone Process Reviews

<http://www.ops.fhwa.dot.gov/publications/fhwahop15013/index.htm>

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ENG 07-3 Work Zone Safety and Mobility Policy

National Work Zone Safety Information Clearinghouse

<https://www.workzonesafety.org/>

Performance Measurement Development (guidance, training and other tools)

http://www.ops.fhwa.dot.gov/wz/decision_support/performance-development.htm

Transportation Management Plan (TMP) Examples

http://ops.fhwa.dot.gov/wz/resources/final_rule/tmp_examples.htm

Work Zone Best Practices Guidebook (3rd Edition)

<http://www.ops.fhwa.dot.gov/wz/practices/best/bestpractices.htm>

Work Zone Management Capability Maturity Framework

http://www.ops.fhwa.dot.gov/tsmoframeworktool/available_frameworks/work_zone.htm

DocuSigned by:

Dallas Hammit

9/24/2020

Dallas Hammit

Date

Deputy Director for Transportation

Appendix C: Implementation Guidelines for Work Zone Safety and Mobility

Arizona Department of Transportation

Implementation Guidelines for
Work Zone Safety & Mobility

ADOT

September/2020

Implementation Guidelines for Work Zone Safety & Mobility

PREFACE

Effective: 2020

Review: 2025

Supersedes: May 27, 2009

Page 2 of 40

Pursuant to 23 CFR 630 Subpart J & K
Arizona Department of Transportation
Work Zone Safety & Mobility
Policy, Processes, Guidelines, and Procedures

ADOT practices achieve the intent of this Rule through our policy, processes, guidelines, and procedures. These guidelines will expand/enhance existing practices currently in place.

Primary responsibility for responding to Questions and Revisions of this document is the
Arizona Department of Transportation (ADOT),
Transportation Systems Management & Operations Division (TSMO),
Operational Traffic and Safety Group (OTAS)
(602) 712-2212

ADOT

September/2020

Implementation Guidelines for Work Zone Safety & Mobility

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Implementation Guidelines for Work Zone Safety & Mobility

Introduction to Users

In September 2004, the Federal Highway Administration (FHWA) published updates to the work zone regulations at 23 CFR 630 Subpart J referred to as *Work Zone Safety & Mobility Rule* (herein referred to as the Rule). In December 2007, FHWA added new regulations at 23 CFR 630 Subpart K referred to as *Temporary Traffic Control Devices Rule*. Both are applicable to all Federal-Aid Highway Projects with the intent to improve road user and workers exposed to motorized traffic. The Rule was effective October 12, 2007, and Subpart K was effective on December 4, 2008.

These guidelines describe how ADOT has and will continue to improve Work Zone Safety & Mobility (WZSM); by identifying if projects are “significant” for all projects added to ADOT’s Five-Year Transportation Facilities Construction Program, herein referred to as the “Five-Year Program,” cycle based on the criteria defined in ADOT’s WZSM Policy and these guidelines. The use of the term “Significant” within this document is always in reference to WZSM and as defined in our Policy ENG 07-3. All projects will be continually re-evaluated and assessed for Work Zone impacts from Pre-Design through Design, Construction and Maintenance phases.

The Rule broadens some aspects of work zones in the CFR and identifies key areas where States have an opportunity to develop and strengthen their current methods for providing mobility through work zones while maintaining a safe and efficient work environment for highway workers. In response to the requirements of the Rule, ADOT WZSM Policy ENG 07-3 was developed. The policy describes the importance of the Rule and ADOT’s commitment to comply with the Rule. The policy also explains that ADOT will develop guidelines for implementation of the Rule on all ADOT projects, which is the purpose of this document.

ADOT’s Mission:

Connecting Arizona. Everyone. Everywhere. Everyday.

True North

Safely Home

Our Values

- Accountability: We take responsibility for our actions.
- Integrity: We hold ourselves to the highest ethical and professional standards.
- Respect: We treat everyone with respect and dignity.



Implementation Guidelines for Work Zone Safety & Mobility

Chapter 1

Work Zone Safety & Mobility Committee

1.1 Work Zone Safety & Mobility Committee

A team was established in 2007 to define, document and implement the Rule (23 CFR, Part 60, Subpart J & K). After the creation of the TSMO Division in 2015, the WZSM Process Review Team recognized the need to reestablish the team as a standing committee. The committee has cross-functional membership throughout ADOT.

1.2 Work Zone Safety & Mobility Committee Framework

Starting in calendar year 2018, ADOT established a standing Work Zone Safety & Mobility Committee (WZSMC) with the Deputy Director for Transportation/State Engineer as the sponsor. The Committee has ten voting members, including a Committee Chair, four representatives from the ADOT Infrastructure Delivery and Operations Division (IDO), three representatives from Transportation Systems Management and Operations (TSMO), one representative from ADOT Communications, and one representative from the ADOT Multimodal Planning Division (MPD).

1.3 WZSMC Members

The discipline areas that have voting members on the committee are:

1. Committee Chair
2. Construction (IDO)
3. Development (IDO)
4. Districts (IDO)
5. Traffic Standards (IDO)
6. Operational Traffic (TSMO)
7. Traffic Operations Center (TOC) (TSMO)
8. Traffic Safety (TSMO)
9. Communications
10. MPD

All of these representatives are selected by the division/district/group manager responsible for those areas except for the Traffic Standards representative, which is the ADOT Traffic Standards Engineer from IDO Traffic Group. The State Engineer may add or remove voting representatives at any time. The Committee Chair may add or remove voting members, but must initiate a vote and receive a majority of voting members present in favor of that action. If a voting member is unable to attend a committee meeting, they may appoint someone to represent them at the meeting. The Committee may appoint non-voting representatives to serve as advisors.

1.4 Committee Chair

The Committee Chair is one of the District Engineers or Development Group Managers and is selected by the State Engineer. The Committee Chair is selected for a two year term as a member of the committee with no limits on the number of consecutive terms.



Implementation Guidelines for Work Zone Safety & Mobility

1.5 Purpose of Committee

The Committee is responsible for the continuous improvement of work zone safety and mobility, primary responsibilities include:

1. Conducting and delivering the biennial Work Zone Safety and Mobility Process review and implementing recommendations.
2. Updating the Work Zone Safety and Mobility.
3. Implementing continuous improvements.

These responsibilities are accomplished by:

- Reviewing recent work zone data.
- Identifying and discussing work zone safety and mobility-related issues at a program level.
- Identifying potential improvements.
- Establishing action plans to implement those improvements.
- Empowering Committee members to propose changes to processes, standards, and/or guidelines within their areas through the ADOT Standards Committee process.
- Reviewing work zone practices to evaluate implementation.

1.6 Committee Procedures

The WZSMC's role is to create/update procedures to complete the Work Zone Safety and Mobility Process reviews, update Work Zone Safety and Mobility Policies, Processes, and Procedures and Implementation Guidelines and implement improvements/recommendations. The Committee has also established timeframes for the completion of tasks, including organizing the timing and frequency of committee meetings. The Committee makes decisions based on majority votes. The State Engineer may veto any decisions.

Implementation Guidelines for Work Zone Safety & Mobility

Chapter 2

Work Zone Safety & Mobility Policy

ARIZONA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION POLICIES AND PROCEDURES

ENG 07-3 Work Zone Safety and Mobility Policy

Effective: July 1, 2020

Review: March 10, 2022

Supersedes: ENG 07-3 (March 10,-2017)

Page 1 of 4

2.1 PURPOSE

The purpose of this document is to define the policy requirements and expand on existing guidance and requirements for systematically considering and managing work zone safety and mobility impacts on Arizona Department of Transportation (ADOT) administered projects.

2.2 SCOPE

This policy applies to all construction, maintenance, and procurement projects determined by ADOT to be a *significant project* as defined in this policy.

2.3 AUTHORITY

Current Federal Highway Administration (FHWA) regulations in this area are provided through 23 CFR 630 Subpart J *Work Zone Safety and Mobility Rule* (§630.1002 through §630.1016) and 23 CFR 630 Subpart K *Temporary Traffic Control Devices Rule* (§630.1102 through §630.1110). Arizona Revised Statutes (ARS) §28-332 *Department of Transportation, Jurisdiction, Duties, Divisions* gives ADOT exclusive control and jurisdiction over state highways and routes. ARS §28-652 *State Highway Work Zones; Definition* sets ADOT's authority to adopt standards and specifications for traffic control and mobility in state highway work zones. ARS §28-710 *State Highway Work Zone Safety; Civil Penalty; Fund* allows a civil penalty for exceeding speed limits in work zones when workers are present.

2.4 DEFINITIONS

- 2.4.1 Incident** An incident is any non-recurring event that causes a reduction of roadway capacity or an abnormal increase in demand. Such events include traffic crashes, disabled vehicles, spilled loads, highway construction and maintenance activities, and special events (e.g., sporting events, concerts, parades).
- 2.4.2 Mobility** As specifically related to work zones, mobility refers to moving road users efficiently through or around a work zone area with minimal delay when compared to travel when no work zone is present, while not compromising the safety of

Implementation Guidelines for Work Zone Safety & Mobility

highway workers or road users. The commonly used performance measures for the assessment of mobility include delay, speed, travel time and queue lengths.

2.4.3 Significant Project A Significant project is one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered tolerable based on engineering judgment cooperation with the FHWA. This judgment is based on existing traffic volumes, duration of construction and anticipated impacts to travel time and the surrounding transportation network; these issues are discussed further in the *ADOT Guidelines for Work Zone Safety and Mobility*. In addition, all interstate system projects within the boundaries of a Transportation Management Area that occupy a location for more than three days with either intermittent or continuous lane closures are considered significant.

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2.4.5 Transportation Management Plan (TMP) The Transportation Management Plan outlines the strategies that will be implemented to minimize impacts to the traveling public during construction of a project. The TMP may consist only of a Temporary Traffic Control Plan and Emergency Vehicle Access Plan, and may add a Transportation Operational and Public information components/documents dependent upon if the project is Significant. On Significant projects, the TMP will define the roles and responsibilities of the project stakeholders prior to and during construction.

All projects will include:

1. Temporary Traffic Control Plan (TTC)
2. Emergency Vehicle Access Plan (EVAP)

Significant Projects will also include:

3. Transportation Operational (TO) component
4. Public Information (PI) component

2.4.6 Work Zone Safety Minimizing potential hazards to road users and highway workers in the vicinity of a work zone, defines Work Zone Safety. Measures for highway safety are the number of crashes or the consequences of crashes (fatalities and injuries) at a given location or along a section of highway during a period of time.

2.5 POLICY

ADOT will :

- A. Assess work zone impacts during project development and manage safety and mobility during project implementation as outlined in these procedures.
- B. Use field observations, work zone crash data, public feedback and operational information to manage work zone impacts for specific projects during implementation to continually pursue improvement of

Implementation Guidelines for Work Zone Safety & Mobility

work zone safety and mobility by analyzing work zone crash and operational data from multiple projects to improve State processes and procedures.

- C. Require competent personnel for the development, design, implementation, operation, inspection, and management of work zones and traffic control appropriate to their job decision-making authority. Competency may include professional registration and experience in accordance with ARS and the Arizona Board of Technical Registration (BTR) Rules or a combination of education, experience and specialized training, such as courses taken through the National Highway Institute or the American Traffic Safety Services Association. Enforcement duties shall be restricted to sworn officers in accordance with ARS §38-1101.
- D. Perform a process review every two years to evaluate and improve work zone processes and procedures with the intent to increase safety and mobility. Process reviews may include, at a minimum, evaluation of work zone crash data, review of public feedback, and a review of randomly selected Significant projects and that may involve project personnel from different project development stages, FHWA representatives and outside stakeholders.
- E. Identify a project as a Significant project before scoping is complete. This determination is based on a project's characteristics and the magnitude and extent of the anticipated work zone impacts
- F. Develop TMPs in consultation with stakeholders as determined by the project characteristics and the traffic control requirements identified for the project.
 - 1. For **significant projects**, the TMP should include:
 - a. A TTC describing measures designed to facilitate road users' travel through the work zone. The plan must be consistent with Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD), the Arizona Supplement to the MUTCD, ADOT Traffic Guidelines and Processes, and the ADOT Traffic Control Design Guidelines.
 - b. A TO component that identifies strategies for mitigating the impacts of the work zone on the operation and management of the transportation system. This component may include demand management, corridor/network management, safety management, enforcement and work zone traffic management. Incorporate TTC using Integrated Traffic Systems (ITS).
 - c. A PI component that includes outreach and communication strategies designed to inform the traveling public, area residences and businesses, appropriate public entities and other stakeholders about the project and the expected work zone impacts. The selected communication method(s) should convey information including project characteristics, expected impacts and duration, closure details and commuter alternatives. Information should be updated as needed to reflect changing conditions.
 - d. An EVAP, which must be included in the TMP in accordance with ARS §28-332 *Department of Transportation Jurisdiction; Duties; Divisions* and §28-652 *State Highway Work Zones*;

Implementation Guidelines for Work Zone Safety & Mobility

Definition. The EVAP will be established in consultation with, and will be communicated to, area law enforcement agencies and emergency responders

2. For projects that are not designated as significant, the TMP may consist of a TTC and EVAP only. However, addressing traffic operations and public information in the plan should also be considered.
- G. Develop Plans, Specifications, and Estimates (PS&E) that include a TMP or provisions for contractors to develop a TMP. The PS&E should include appropriate pay item provisions for implementing the TMP through either method-based or performance-based specifications.
- H. Designate a competent person, in conjunction with the competent person designated by the contractor, who has authority and responsibility for implementing the TMP and other safety and mobility aspects of the project. The competent person selected must be approved by the ADOT Engineer.
- I. Monitor work zone impacts during construction and take corrective action to manage mobility and safety based on criteria such as travel delay, queue lengths and crash occurrences.
- J. Initiate appropriate incident management procedures to restore the roadway to full capacity after becoming aware of an incident. The ADOT Traffic Operations Center is to respond to incidents and dispatch appropriate teams to manage and clear the incidents in a work zone.

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Chapter 3

Significant Project

In compliance with 23 CFR 630 Subpart J, all projects in ADOT's Five-Year Program will be identified as "Significant" or not. If a project is Significant, it will be stated in the project description.

3.1 Definition of a Significant Project:

Per ADOT Work Zone Safety and Mobility Policy (ENG-07) and in compliance with 23 CFR 630 Subpart J, a Significant project is

"...one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered tolerable based on engineering judgment and cooperation with the FHWA. This judgment is based on existing traffic volumes, duration of construction and anticipated impacts to travel time and the surrounding transportation network; these issues are discussed further in the ADOT Guidelines for Work Zone Safety and Mobility. In addition, all interstate system projects within the boundaries of a Transportation Management Area that occupy a location for more than three days with either intermittent or continuous lane closures are considered significant."

For an Interstate system project or categories of Interstate system projects that are classified as Significant through the application of this provision, but in the judgment of ADOT they do not cause sustained work zone impacts, ADOT may request from the FHWA, an exception to the requirements triggered by the classification. Exceptions to these provisions may be granted by the FHWA based on ADOT's ability to show that the specific Interstate system project or categories of Interstate system projects do not have sustained work zone impacts.

3.2 ADOT Process for Defining a Significant Project:

The intent of ADOT's Policy is to maintain flexibility in determining if a project is Significant for all projects added to ADOT's Five-Year Program. ADOT identifies upcoming projects that are expected to be Significant as early as possible in the process and in cooperation with FHWA. All projects are continually reevaluated as they move from Pre-Design into the Design, Construction and Maintenance Phases using the Transportation Management Plan Memo.

To better anticipate the impacts associated with individual projects every project will require a Transportation Management Plan (TMP). The Transportation Management Plan outlines the strategies that will be implemented to minimize impacts to the traveling public during construction of a project. The TMP may consist only of a TTC and EVAP, and may add Transportation Operational (TO) and Public Information (PI) components/documents if the project is Significant. On Significant projects, the TMP will define the roles and responsibilities of the project stakeholders prior to and during construction.

Implementation Guidelines for Work Zone Safety & Mobility

Significant Projects will include:

1. TTC
2. EVAP
3. TO component
4. PI component

Significant Projects: Significant projects have a high level of public interest and will likely impact a large number of travelers. This impact must be analyzed individually and also in combination with concurrent active projects. It will have moderate to high user-cost impacts and the duration is usually moderate to long. These characteristics create work zone impacts that fall outside of the typical work zone safety and mobility thresholds. Examples of this work type may include major corridor reconstruction, high impact intersection reconstruction, full closures on high volume facilities, major bridge reconstruction or repair, repaving projects that require long term lane closures, etc. It is important to note that Significant projects are unique in that they have considerable impacts to areas outside of the project area as well as the surrounding community.

A project is always Significant if the following three criteria are met:

1. It is on an Interstate
2. In a Transportation Management Area (TMA)
3. Lane closures for three or more days (can be intermittent)

ADOT or the FHWA can designate a project as Significant based on engineering judgment (e.g. I-15 in the Virgin River Gorge).

Implementation Guidelines for Work Zone Safety & Mobility

Chapter 4

WZSM Process, Guideline and Procedure

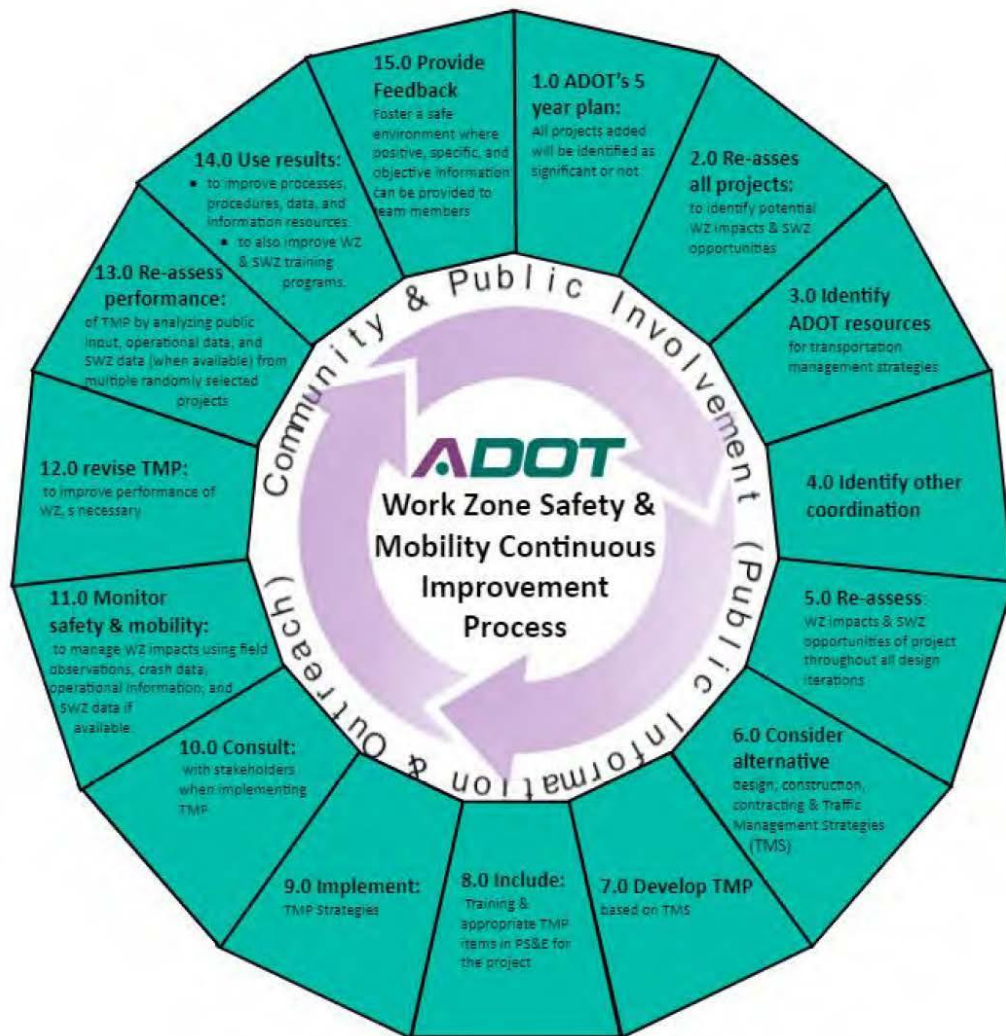


Figure 4a: ADOT's process for the identification, assessment, implementation and re-assessment of WZSM.

Implementation Guidelines for Work Zone Safety & Mobility

Table 4 WZSM Process, Guideline and Procedure	
Process Owner(s): MPD, Communications, IDO, and TSMO	Date and Revision: August 2020 Version 4.0
Activity	Tasks/Key Actions
<p>4.1 All Projects added to ADOT's Five Year Program will be identified as Significant or not.</p> <p><u>Responsible:</u> MPD, Communications, Pre-Design and IDO/TSMO Leadership Team</p>	<p>Projects added to ADOT's Five-Year Program will be identified as Significant or not.</p> <p>Projects within a TMA and an access controlled divided highway will be marked as "Significant for WZSM" and will include the conception of a four part TMP during the scope of the project. Additionally all Projects:</p> <ul style="list-style-type: none"> • within the Central District • on US60 from Superior to Miami (MP 227 to 242) • on US60 from Chrysotile Road to Gila County/Navajo County line (MP 283 to 317) • on US70 from Peridot to Gila River (MP 273 to 292) • anywhere on I-10, I-17, I-19 and I-15 • on I-40 in Flagstaff <p>The two additional parts of the TMP can be removed at a later stage if the project team deems that the project is not a Significant project.</p> <p>This will be designated in the Pre-Design Scoping document in Activity 2.0. Projects will be continually re-assessed throughout Pre-Design, Design, Construction and Maintenance for Work Zone Safety & Mobility issues.</p> <p>Review of Work Zone Impact will be included in the Stages Checklist; including a Traffic Management Plan Memo.</p>
<p>4.2 Re-Assess all Significant Projects to identify potential work zone impacts and Smart Work Zone opportunities</p> <p><u>Responsible:</u> Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic and Communications</p>	<p>The Project Manager needs to coordinate with Contracts and Specifications, Traffic Engineering, TSMO Operational Traffic and Communications Office at each phase of the project.</p>



Implementation Guidelines for Work Zone Safety & Mobility

Table 4 WZSM Process, Guideline and Procedure (continued...)	
Process Owner(s): MPD, Communications, IDO, and TSMO	
Date and Revision: June 2020 Version 4.0	
Activity	Tasks/Key Actions
<p>4.3 Identify ADOT resources for Transportation Management Strategies (TMS)</p> <p>Responsible: Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic, Communications, Environmental, Local Governments, IPA and IGA</p>	<p>Starting from typical ADOT strategies in limiting traffic restrictions, closures and closure times, examine contract acceleration and construction phasing. Communication is at the same time identifying Public Notice and feedback strategies.</p> <p>Environmental strategies (Hazard Identification and Reduction plans) are developed to eliminate hazards such as; vehicle collisions with wildlife, tree removal, etc.</p>
<p>4.4 Identify other coordination needs</p> <p>Responsible: Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic, Communications, Environmental, Local Governments, U&RR, IPA and IGA</p>	<ul style="list-style-type: none"> ● Utility and Railroads (U&RR) ● Enforcement (Uniformed Law Enforcement/DPS) ● Local Government coordination ● Environmental strategies ● Contact all affected first responders including Fire and Ambulance services and potentially towing services ● Develop EVAP concepts
<p>4.5 Re-Assess WZ impacts and SWZ opportunities of the project throughout all design iterations</p> <p>Responsible: Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic and Communications</p>	<p>This re-assessment should be completed at all phases of the project starting with Pre-Design, Traffic Engineering, Construction and Maintenance (Districts), and Operational Traffic. Review of Work Zone Impact, SWZ opportunities, and EVAP concepts will be included in the Stages Checklist; including a Traffic Management Plan Memo identified at Stage 1 and updated as necessary during each successive design phase.</p>
<p>4.6 Consider alternative design, construction, contracting and TMS</p> <p>Responsible: PMG, Traffic Engineering, Districts and Operational Traffic</p>	<ul style="list-style-type: none"> ● Design continues coordination as in Pre-Design ● Update TMP Memo to reflect any changes



Implementation Guidelines for Work Zone Safety & Mobility

Table 4 WZSM Process, Guideline and Procedure (continued...)	
Process Owner(s): MPD, Communications, IDO and TSMO	Date and Revision: September 2020 Version 4.0
Activity	Tasks/Key Actions
<p>4.7 Develop TMP based on TMS</p> <p><u>Responsible:</u> PMG, Traffic Engineering, Districts, Operational Traffic, Communications and Traffic Operations Center</p>	<ul style="list-style-type: none"> Develop TMP for contract documents from TMP Memo. <p>All projects will include:</p> <ol style="list-style-type: none"> TTC EVAP <p>Significant Projects will also include:</p> <ol style="list-style-type: none"> TO component PI component
<p>4.8 Include Training and appropriate TMP items in PS&E for the project</p> <p><u>Responsible:</u> PMG, C&S, LTAP, Traffic Engineering, Districts, Operational Traffic, Communications and Traffic Operations Center</p>	<ul style="list-style-type: none"> Training on new technologies should be a continued practice that is renewed as technology changes. PMG should plan for enough budget in CE costs for the Districts and Operational Traffic to effectively review and participate with the operational component aspect of the project. Likewise, PMG should include enough budget for Communications to perform their required tasks. Smart Work Zone items and specifications should always be included on Significant projects.
<p>4.9 Implement TMP strategies</p> <p><u>Responsible:</u> Districts and Communications</p>	<ul style="list-style-type: none"> Reference TMP Project Specifications in the Contract and the Project Plans. Hold periodic meetings with Stakeholders as specified.
<p>4.10 Consult with stakeholders when implementing TMP</p> <p><u>Responsible:</u> Districts and Communications</p>	<p>ADOT hosts TSM and ESM meetings with Contractors, TOC , Operational Traffic and Safety, ADOT Technical staff, PM’s, Traffic Engineering, Local Government, Schools, Hospitals, Uniformed Law Enforcement/DPS, Fire, Ambulance services and any other previously identified stakeholders.</p>
<p>4.11 Monitor safety and mobility to manage WZ impact</p> <p><u>Responsible:</u> Districts, Communications and Traffic Safety</p>	<ul style="list-style-type: none"> Monitor safety and mobility to manage WZ impacts using field observations, crash data, operational information and SWZ data, if available. Solicit community feedback.



Implementation Guidelines for Work Zone Safety & Mobility

Table 4 WZSM Process, Guideline and Procedure (continued...)	
Process Owner(s): MPD, Communications, IDO and TSMO	Date and Revision: September 2020 Version 4.0
Activity	Tasks/Key Actions
<p>4.12 As necessary, revise TMP to improve performance of WZ, as necessary</p> <p><u>Responsible:</u> Traffic Engineering, Districts, Operational Traffic and Communications</p>	<p>ADOT uses community input, operational data and crash reports (done by RE's) to determine if any changes are necessary.</p>
<p>4.13 Monitor safety and mobility to manage WZ impacts using field observations, crash data, operational information and SWZ data if available.</p> <p><u>Responsible:</u> MPD, Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic and Communications</p>	<p>Use Community feedback and Operational data from multiple randomly selected projects.</p> <p>Conduct Process Reviews as required.</p>
<p>4.14 Use results to improve Work Zone Safety & Mobility</p> <p>MPD, Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic and Communications</p>	<ul style="list-style-type: none"> ● Eng 07-3 Work Zone Safety & Mobility Policy ● Processes ● Procedures ● SWZ Data and Information resources ● WZ Training programs
<p>4.15 Provide Feedback</p> <p>MPD, Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic, and Communications, Partnering Office.</p>	<p>Foster a safe environment where positive, specific and objective information can be provided to team members in an effort to continually improve our process.</p> <ul style="list-style-type: none"> ● Hold facilitated lessons learned workshops on all Significant Projects upon project completion.



Implementation Guidelines for Work Zone Safety & Mobility

Chapter 5

Transportation Management Plans (TMP)

TMP's are strategies/methodologies that will be implemented to manage mobility and ensure a safe work zone in and around transportation projects. The project's classification as Significant or not will determine what is required for the TMP.

To better anticipate the impacts associated with individual projects every project will require a TMP. A TMP memo will be initially submitted for all projects at Stage 1 in the development process and then updated as needed at each successive submittal to re-assess work zone impacts. The TMP memo will guide the project team on what should be included in the contract documents for the contractor and what is expected from ADOT during the project's construction. The TMP memo is a "dynamic document" that will be maintained and revised by the project team as project development progresses. As the TMP evolves, it is important to reassess the management strategies to confirm that the work zone impacts are addressed and the necessary funding is available.

5.1 All projects will include a TMP that consist of at least:

1. TTC: A TTC plan describes temporary traffic control measures to be used for facilitating road users through a work zone or an incident area. The TTC plan plays a vital role in providing continuity of reasonably safe and efficient road user flow and highway worker safety when a work zone, incident or other event temporarily disrupts normal road user flow. The TTC plan shall be consistent with the provisions of the ADOT State Supplement of the MUTCD and AASHTO Roadside Design Guide. The Traffic Control Design Guide is intended to provide design guidelines for the State of Arizona Highway System and should be used in addition to the ADOT State Supplement of the MUTCD. IDO Traffic Engineering Group is ultimately responsible for developing the temporary traffic control plans for inclusion within the TMP.
2. EVAP: Pursuant to ARS 28-652 Part C: For projects requiring a traffic management plan (all projects) the standards and specifications for work zone safety and mobility adopted will provide for consultation with stakeholders, including area law enforcement and emergency responders. ADOT will establish an EVAP emergency vehicle access plan as part of the TMP in consultation with area law enforcement and emergency responders and communicate the EVAP to area law enforcement and emergency responders by electronic mail, fax or other effective means. IDO Traffic Engineering Group is ultimately responsible for developing the TTC temporary traffic control plans for inclusion within the TMP, but will consult with the Traffic Operations Center.

Implementation Guidelines for Work Zone Safety & Mobility

5.2 For Significant projects the TMP will also include:

3. TO component: The TO component shall include the identification of strategies to mitigate impacts of the work zone on the operation of the transportation system within the work zone impact area. The work zone impact area consists of the immediate work zone as well as affects to the surrounding roadways and communities. TSMO OTAS is ultimately responsible for developing transportation operations plans for inclusion within the TMP.

4. PI component: The PI component shall include communication strategies that seek to inform the general public of work zone impacts and the changing condition of the project. The general public may include road users, area residences and businesses, and other public entities. Communications is ultimately responsible for developing public information and outreach plans for inclusion within the TMP.

Even though a group within ADOT is listed as "ultimately responsible" for different parts of the TMP, the appropriate counterpart on a consultant designed project will develop these plans and only consult with the ADOT Group as needed.

Implementation Guidelines for Work Zone Safety & Mobility

Chapter 6

Work Zone Impact Assessment

6.1 Work Zone Impact Assessment Tools

The work zone impact assessment is a process for understanding the safety and mobility impacts of road construction/maintenance/rehabilitation projects. For all projects, work zone impacts are continually re-assessed at all stages of the project; including Systems Planning (MPD), Pre-design, Design, Construction and Maintenance.

These stages can be summarized into three types:

1. During project development, the likely work zone impacts are estimated and, where possible, mitigated.
2. During construction, the TMP is implemented and the actual impacts are gauged against what was expected. If actual impacts are greater than allowable, alternative work zone strategies may be implemented.
3. Following project completion an assessment is helpful to determine what worked and what did not. The results of the assessment should be used to improve future TMPs.

Factors that will influence the level of impact in a work zone include traffic conditions and characteristics, project characteristics, geographic/physical features and aspects of the surrounding area (e.g., alternate routes, nearby businesses).

Work zones can cause a variety of impacts that affect different stakeholders.

Worker safety is critical since workers are subject to the direct dangers of moving traffic. Motorist safety is critical as drivers are subjected to unfamiliar driving conditions in work zones. Work zone capacity reductions impact the mobility of traffic, including freight, leading to queues and delays that can reduce mobility.

The transportation network is impacted when a work zone can't serve all the demand, or detours traffic to surrounding roads. Depending on the location, size and complexity of a project, a work zone can also impact the access, mobility and safety of pedestrians, bicyclists, transit users, and business and property owners, as well as emergency services.

Environmental impacts like noise and dust can be a primary concern as they tend to generate complaints from the public.

A work zone impacts assessment should consider all the potential impacts.

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Figure 6.1a: Types of Work Zone Impacts

Beginning work zone impacts assessment early in the life of a project can significantly increase the chances of successful traffic management for the project.

An assessment of work zone impacts during the early planning stages of the project will help identify issues or uncover problem areas that should be considered during project development. This provides ADOT with an opportunity to evaluate the work zone impacts along with the design alternatives analysis,

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which can lead to the selection of a design alternative that alleviates many of the work zone impacts. This also helps to allocate adequate funding in the project budget for TMP implementation.

Start impacts assessment early in project development to:

- Identify issues/problem areas
- Consider WZ impacts in design alternative analysis
- Ensure MOT alternatives analysis is done along design alternatives analysis
- Choose a design alternative that alleviates many WZ impacts
- Ensure TMP development and implementation costs are included in the project budget

It is difficult to change options at a later stage due to issues such as:

- Affecting the chosen preferred alternative
- Environmental impact study already done
- Need for additional analysis
- May incur additional costs

There are four general steps in assessing the impacts of work zones during the project development stages. These steps lead to identifying strategies for the TMP:

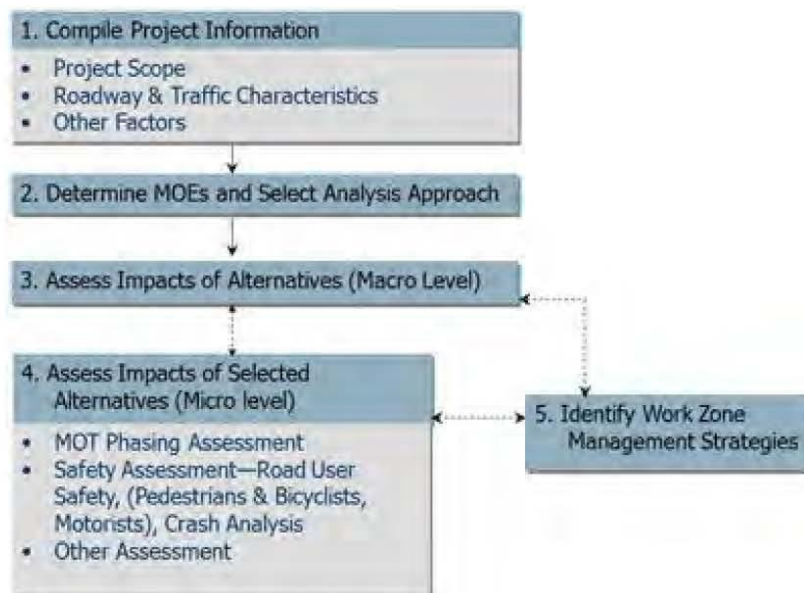


Figure 6.1b: Work Zone Impact Assessment Process

Work zone impacts assessment leads to identification and understanding of potential impacts, brings work zone considerations into project alternatives analysis, enables more effective selection of TMP

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strategies to manage impacts, provides information for a more accurate cost estimate, and targets resources to projects with the greatest need.

6.2 INCIDENT MANAGEMENT

A highway incident is any non-recurring event (such as a vehicle crash, a vehicle breakdown, or a special event) that causes a reduction in roadway capacity or an abnormal increase in traffic demand that disrupts the normal operation of the transportation system. Most highway incidents are random events that occur with little or no advance warning. They can vary widely in terms of severity, ranging from a minor crash involving a single response agency (such as law enforcement) to a natural disaster or other catastrophe requiring a multi-agency response from multiple jurisdictions and disciplines. Incidents are a major source of congestion on the roadway system and can contribute to problems away from the actual incident scene (for example, secondary crashes caused due to unexpected congestion).

Traffic Incident Management (TIM) is defined as the coordinated, preplanned use of technology, processes, and procedures to reduce the duration and impact of incidents, and to improve the safety of motorists, crash victims, and incident responders. Specifically, TIM involves the use of technology, procedures, and processes to accomplish the following:

- Reduce the amount of time to detect and verify that an incident has occurred,
- Shorten the time required for appropriate response personnel and equipment to respond to the scene,
- Facilitate the management of response apparatus and personnel on site so as to minimize the amount of capacity lost due to the incident and the response equipment,
- Reduce the amount of time required to clear the incident from the travel lanes,
- Provide for the rapid notification of travelers upstream of the incident so as to encourage a reduction in traffic demand entering the incident area and to reduce driver frustration.

TIMs are successful when they are built on a foundation of cooperation and collaboration. When planning or organizing a construction project, it is essential that work zone planners and construction personnel coordinate with the incident responders in the area. This includes identifying and meeting with agencies to discuss current response policies, procedures and practices.

To improve the nation's preparedness to respond to incidents of all magnitudes, the Department of Homeland Security has developed the National Incident Management System (NIMS). NIMS was developed so responders from different jurisdictions and disciplines can work together better to respond to natural disasters and emergencies. Part of the NIMS structure involves the use of the Incident Command System (ICS). ICS is a systematic tool used for the command, control and coordination of an emergency response. It is designed to facilitate agencies working closely together through the use of common terminology and operating procedures to control personnel, facilities, equipment and communications at a single incident scene. The guiding concepts and principles of ICS are as follows:

Implementation Guidelines for Work Zone Safety & Mobility

- Most incidents are managed locally by local agencies to provide a coordinated, cooperative response.
- The field command and management functions should be performed in accordance with a standard set of ICS organizations, doctrine and procedures.
- ICS is modular and scalable so that responses can be adapted as situation, technology, size and complexity of the incident changes.
- All components of the response are managed interactively in a coordinated manner.
- ICS establishes common terminology, standard, and procedures that enable diverse organizations to work together effectively.
- Incidents are managed by objectives, which are measurable and begin at the top and are communicated throughout the entire response.
- Implementation of ICS should have the least amount of disruption of existing systems and processes as possible.
- ICS should be user friendly and be applicable across a wide spectrum of emergency response and incident management disciplines.

The overwhelming majority of highway incidents do not require the formal implementation of the ICS. Instead, most highway incidents involve just law enforcement or highway personnel and a tow truck. In these situations, there is usually no need for the organization and command structure of the ICS. Only when traffic incidents are large and more complex does the ICS become necessary because of the need for multiple responders from multiple agencies. In these situations, it is critical for work zone planners and construction personnel to understand what the ICS is and how emergency responders use the ICS to manage all types of incidents, not just highway traffic incidents.

The term Unified Command (UC) is used to define the application of ICS when there is more than one agency with incident jurisdiction or when an incident crosses political jurisdictions. In situations where an incident crosses multiple jurisdictions or in the case where multiple agencies have jurisdiction over the same incident (for example, a wreck with injuries or fatalities), unified command allows all agencies that have statutory authority for an incident to jointly participate in the development of the overall response strategy.

More information on the ICS and its application to highway incidents, can be found in *Simplified Guide to the Incident Command System for Transportation Professionals*.

The process to be used to develop a TIM program for a particular construction or maintenance project is not unlike the process used to develop a traditional incident management program. What is different about the TIM program for a construction or maintenance program is who commonly initiates the development process – the construction project manager or the contractor. This process needs to begin at the very early planning stages of the project, predominantly well before traditional incident responders are aware that the project is going to be let. Work zone and construction planners need to first assess if there is a need to implement special incident management procedures with a particular work zone.

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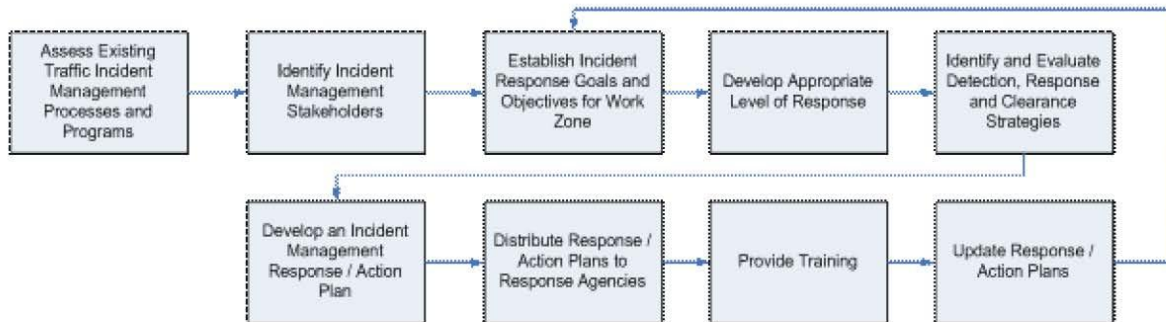


Figure 6.2a: Process for Planning Traffic Incident Management for Highway Work Zones

In many locations throughout the United States, comprehensive incident management programs and processes already exist; therefore, the first step in developing a TIM program for a specific construction or maintenance project is to determine and assess what incident management processes and procedures already exist in the area where the work zone will be in effect. In many cases, it may be wasteful and counterproductive to develop new and different response procedures. Work zone planners need to first check to see if the project lies within the boundaries and jurisdiction of any existing incident management program. If it does, work zone planners and contractors need to coordinate with appropriate response and traffic operations personnel to determine if the existing processes and procedures are adequate for the project. Together, these agencies can identify those changes, additions and modifications to the existing procedures and responses that may be needed to accommodate the project. In the situation where existing TIM practices and procedures are already in place, at a minimum, work zone planners should contact appropriate response agencies in the corridor to discuss issues and concerns about managing incidents in the proposed work zone and agree upon the procedures and strategies that will be implemented to support TIM in the work zone. On more complex projects, it is necessary for the work zone planner, project administrators and construction personnel to become active partners in the existing incident management program for the duration of the project. On projects with multiple phases, it may be necessary to develop a plan for each phase of the project.

If the proposed project lies outside the jurisdiction of any existing TIM program, it may be necessary for work zone planners and contractors to identify, develop, and deploy TIM strategies that are appropriate for the type and level of work zone. In most regions, multiple agencies are involved in the TIM process. At a minimum, work zone planners and contractors should meet with key incident response agencies to discuss how the project will impact TIM responses. The following is a list of potential agencies and organizations that are traditionally involved in the development of TIM programs in a region:

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- Federal, state and local transportation agencies
- State and local law enforcement personnel
- Public and volunteer fire and rescue agencies
- Regional, county or local 911 dispatch
- Towing and recovery providers
- Emergency medical service providers
- State and local hazardous material recovery personnel
- Media
- Other response personnel (as defined by the project area), including state and local offices of emergency management, coroner's office, etc.

Work zone planners and contractors must be aware that multiple agencies may have jurisdiction over incident responses within the limit of a construction project. It is not uncommon for multiple police, fire and rescue and emergency service providers to have incident management responsibilities on a given highway. Work zone planners need to make sure that all appropriate incident responders are identified for any given project.

Agencies have at their disposal a large number of strategies, technologies, techniques and procedures for providing incident management in work zones; however, not all are appropriate for every work zone situation or incident scenario. Each strategy, technology and procedure needs to be evaluated within the context of project needs and duration, the infrastructure requirements, the level of cooperation and coordination between incident responders, and the costs and perceived effectiveness of the strategy. Some strategies are needed to provide a solid foundation for other strategies, while other strategies are more appropriate when the work zone project is expected to impact traffic operation for extended periods (years, for example). Agencies need to carefully evaluate each strategy and incident scenario and determine the appropriate level of response for each type of incident. Agencies also need a realistic assessment of the likelihood that an incident of major severity may occur when the work zone is in effect.

Agencies need to keep in mind that all incident situations are not the same and that not all incidents require or mandate the same level of response. Recognizing this fact, the *Manual on Uniform Traffic Control Devices 11* divides incidents into three general classes based on duration, each of which has unique traffic control characteristics and needs. These classes are as follows:

- Major – typically traffic incidents involving hazardous materials, fatal traffic crashes involving numerous vehicles and other natural or man-made disasters. These traffic incidents typically involve closing all or part of a roadway facility for a period exceeding 2 hours.
- Intermediate – typically affect travel lanes for a time period of 30 minutes to 2 hours, and usually require traffic control on the scene to divert road users past the blockage. Full roadway closures might be needed for short periods during traffic incident clearance to allow traffic incident responders to accomplish their tasks.
- Minor – typically disabled vehicles and minor crashes that result in lane closures of less than 30 minutes. On-scene responders are typically law enforcement and towing companies and occasionally highway agency service patrol vehicles. Diversion of traffic into other lanes is often not needed or is needed only briefly. It is not generally possible or practical to set up a lane closure with traffic control devices for a minor traffic incident. Traffic control is the responsibility of on-scene responders.

Implementation Guidelines for Work Zone Safety & Mobility

Agencies can use these general criteria for classifying incident levels as a beginning point for determining appropriate levels of responses. However, these criteria should be refined to be consistent with agency goals and objectives.

One underlying principle of the ICS is that it allows responses to be scaled to the level that is appropriate for the situation and existing conditions. An initial small response can be transitioned to a large, multi-agency operation with only minimal adjustment for the agencies involved.

Once the appropriate level of response has been determined for the work zone, the next step in the process is to identify and evaluate candidate strategies for detecting, responding to, and clearing incidents from the roadway.

After determining which strategies are appropriate for a particular work zone, agencies then need to develop criteria and conditions for when and how these responses should be executed. This is typically called a response or action plan. The response or action plan lays out the conditions and criteria for what types of responses are needed for different levels of incidents that might occur in the work zone.

Once the response plans have been developed, the next step in the process is to distribute the response plans to the appropriate response agencies. Because the response plans are usually developed in cooperation and collaboration with emergency responders, dissemination of the plan to the incident responders often occurs naturally, but it is important for traffic operators to ensure that the response/action plan is disseminated to the appropriate response and field personnel. As part of the plan development process, stakeholders should also discuss methods and procedures for distributing and disseminating the response plan to appropriate personnel within their organization—both at the administrative and field personnel levels.

A critical aspect of planning for TIM in work zones is ensuring that emergency response procedures and practices remain valid through all phases of construction. Agencies should also plan to meet routinely to ensure that the important elements of the plan remain valid and up-to-date. On large construction projects, incident responders, transportation agencies and construction personnel should meet routinely throughout the project to review actual responses to incidents that have occurred during the project and update response and communication plans as needed. Response plans often need to be updated and/or revised as conditions, lane closures, and access to the work zone changes. It is essential that incident responders be notified when new conditions might impact response times or access to the site.

Furthermore, response plans may need to be revised based on feedback from the public, agency decision-makers and field personnel. If any part of the response plan or program is revised, it is critical that all responding agencies receive notification of how the established response procedure or access needs have changed. Likewise, incidents that damage the pavement or other infrastructure within the work zone need to be communicated to work zone traffic planners as these may impact or change the construction sequences in the work zone. Good two-way communication between incident responders and construction personnel is critical.

Implementation Guidelines for Work Zone Safety & Mobility

Chapter 7

Work Zone Training

7.1 Work Zone Training

The provision that pertains to training is provided in Section 630.1008(d) of the Rule. This provision:

1. Specifies that agencies require appropriate training for personnel involved in the development, design, implementation, operation, inspection and enforcement of work zone related transportation management and traffic control. Further, the Rule also states that agencies require periodic training updates for these personnel. These periodic training updates are to reflect changing industry practices and agency processes and procedures.
2. Clarifies appropriate training as training that is relevant to the job decisions that each individual is required to make.

ADOT in partnership with the Arizona Chapter of the American Traffic Safety Services Association (ATSSA) developed a two tiered training program for workers, and supervisors and managers:

- TCH1168 ATSSA Workzone Traffic Control Technician
- TCH1167 ATSSA Workzone Traffic Control Supervisor

The partnership also developed a third course for flagging:

- TCH1114 ATSSA Flagger Certified Training.

International Municipal Signal Association (IMSA) work zone safety specialist is equivalent to the ATSSA Traffic Control Technician or Traffic Control Supervisor. ADOT Signals, Lighting and Technical Electrical (SLATE) employees take the IMSA classes, and therefore do not need to take the equivalent ATSSA classes.

Designer Training will be required for those with responsibility or authority to decide on specific maintenance of traffic requirements including the Engineer responsible for work zone traffic control phasing and plans; and Technicians drafting or electronically generating work zone traffic control plans.

ADOT Point of Contact (POC) is:
AZ LTAP Program Manager
602-712-4252

As training courses become available, notice of the new training for Work Zone Safety and Mobility will be distributed to those affected.



Implementation Guidelines for Work Zone Safety & Mobility

ADOT has also partnered with other groups to provide Traffic Incident Management (TIM) training. The Arizona TIM program is made up of a consortium of Federal, State, County, Local Government agencies as well as private industry partners such as tow and utility companies. Although TIM is not focused solely on work zones, when incidents are within a work zone, the trained staff will increase safety and efficiency of those responding

For questions about TIM training, please visit their website @ tim.az.gov

Implementation Guidelines for Work Zone Safety & Mobility

Chapter 8

Process Reviews

8.1 Process Review Stages

The provision that pertains to process reviews is provided in Section 630.1008(e) of the Rule. This provision:

- Requires agencies to perform a process review at least every two years to assess the effectiveness of their work zone safety and mobility procedures.
- Provides two options for ADOT to conduct the process review. The first option is to evaluate work zone data at the ADOT level and the second option is to review randomly selected projects across their jurisdictions. A combination of these approaches can also be used.
- Recommends that appropriate personnel, representing the project development stages and various divisions within ADOT, as well as the FHWA, participate in the process reviews.
- Allows the participation of other non-ADOT stakeholders in the reviews as appropriate.
- Explains that the process review results are intended to lead to improvements in ADOT work zone processes and procedures, data and information resources and training programs that ultimately enhance efforts to address safety and mobility on current and future projects.

Periodic evaluation of work zone policies, processes, procedures and work zone impacts aid in addressing and managing the safety and mobility impacts of work zones. Reviews help assess the effectiveness of a program and its processes and procedures, enabling ADOT and respective FHWA Division Office to confirm that an issue does not exist and to make recommendations to improve situations where shortcomings might exist.

Implementation Guidelines for Work Zone Safety & Mobility



Figure 8.1a: Process review stages

Implementation Guidelines for Work Zone Safety & Mobility

8.2 ADOT's approach for FHWA Work Zone Self Assessment

To help evaluate work zone practices, ADOT uses the Work Zone Safety & Mobility Self Assessment Tool (WZSM-SAT). The WZSM-SAT consists of 46 questions designed to assist with work zone management responsibilities, assessing our programs, policies and procedures against other work zone practices used.

Modeled after the AASHTO Systems Operations and Maintenance guidance, this tool assesses work zone management capability in the same six dimensions — Business Processes, Systems and Technology, Culture, Organization and Workforce, Performance Measurement and Collaboration. However, in this tool, work zone management is viewed as a subset of the larger TSMO program. The capability levels and the actions are more focused and defined from a traffic manager's perspective. The actions may require other agencies to be the responsible party, which is intended to foster multi-agency collaboration and dialogue about work zone management at the regional level. Users that take this assessment are encouraged to share this tool with agencies that they collaborate and work with on work zone management of their respective agency's transportation systems.

A. 8.2.1 Assemble a multi-disciplinary team.

There are several groups, teams, or divisions responsible for carrying out a program or operation. It is important that these different perspectives are represented in a process review team. A practice that works well for one unit may cause difficulties for the other units (e.g., decisions made independently by the design unit could make development of effective TMP's or traffic control plans problematic for the traffic engineers). Or a step taken by one unit might be more effective if taken earlier in the process by another unit (e.g., identifying significant projects). The appropriate personnel, who represent the various project development stages and the different offices within ADOT, as well as the FHWA, should participate in the process reviews. Non-ADOT stakeholders should be invited to participate in the reviews, as appropriate. They can provide a useful perspective and may have insights that ADOT personnel are not in a position to see.

The maximum effective team size is generally around eight people. If the team is too large, the participation of some members will likely be limited. Other people can support the review but not be a member of the core review team. For example, the review team may interview other stakeholders on specific topics of interest or make use of data collected by others.

B. 8.2.2 Develop a review plan

Preparing a review plan can be helpful to ensure that all team members have a common understanding and remain focused on the scope of the review. What needs to be considered to plan for a review?

- a. Purpose
- b. Function/processes reviewed
- c. Expected results
- d. Information needed
 - i. What do we know now?



Implementation Guidelines for Work Zone Safety & Mobility

- ii. Gaps in information and possible sources
 - e. Team members and roles
 - f. Schedule and resources

 - a. **8.2.2.1 Purpose:** Having a clear purpose and scope for the review and an agreed upon set of objectives is vital to the success of a review.

 - b. **8.2.2.2 Function/processes reviewed:** The review should identify the limits to ensure it remains focused on the key processes and should specify the timeframe to be covered by the review (e.g., the most recent two years). ADOT and the FHWA Division Office generally work together to identify the review, based on the Stewardship Agreement and a risk assessment.

 - c. **8.2.2.3 Expected results:** The process review should have clear and concise goals that define what the review is trying to accomplish and identify the expected results and performance metrics. The review team should base the selection of topics on opportunities for improvement and consider a fairly uniform distribution of review topics among the various program areas to serve the desired purpose.

 - d. **8.2.2.4 Data needed:** Data for review should come from a variety of sources. After determining the type of data the review team needs, it should next assess what information is already available and identify what needs to be generated. Data sources may include field data collection, data records (e.g., crash reports), project logs, and interviews with key stakeholders, post-construction reports and other sources. This may include:
 - Collection of data including project related information as well as public and stakeholder perception.
 - Synthesis and analysis of data at multiple levels (project, local, regional, State and national) and comparison of findings to performance metrics.
 - Application of the analysis results toward continually improving work zone practices, policies, processes and procedures.

 - e. **8.2.2.5 Team members and roles:** The team members should know their roles, limitations and authority.

 - f. **8.2.2.6 Schedule and resources:** The review team should identify target dates for conducting the review and presenting the results, as well as the resources available for the review. Resources should include staff time and expertise, data availability and budget.
- C. **8.2.3 Conduct review**
- This step involves carrying out the review plan developed by the team. The review team leader should designate appropriate assignments to the team members to promote active participation

Implementation Guidelines for Work Zone Safety & Mobility

by everyone. It is valuable to document the steps taken and data collected during the planning phase to have a good basis for any conclusions reached and recommendations made.

D. **8.2.4 Analyze and Interpret results**

In this step, the team should compile and analyze the collected data and compare the results with the stated goals of the processes and functions being reviewed to identify the gaps and problem areas. If the goals are not being met in certain areas, then the analysis should attempt to identify the “root cause.” It is valuable to identify the “root cause(s)” as much as possible, rather than focusing on the symptoms and how to treat them.

E. **8.2.5 Develop inferences, recommendations**

Once the root causes of problem areas or gaps are identified, the team needs to develop recommended improvements targeting these areas. The team may find it helpful to brainstorm solutions or conduct follow-up interviews to identify or assess alternatives for improvements.

During the review, the team may also identify weaknesses, as well as best practices that should be documented in the findings. Documenting best practices is an opportunity to give credit for good things that are discovered, can help build rapport with partners and may lead to solutions that can be shared.

Recommendations/solutions should be:

- Conceivable
- Achievable
- Valuable
- Manageable
- Constructive

F. **8.2.6 Prioritize recommendations**

The team should suggest a prioritization to the recommendations based on several considerations, including the amount of influence the recommendation will have on the desired outcomes and ability to implement it.

G. **8.2.7 Present the findings from the review**

A close-out meeting should be held with the non-ADOT stakeholders to present the findings and receive feedback. The review team should provide a brief overview of the process followed; the information considered and the basis for each recommendation. The review team should be prepared to support its findings and may encounter the need to defend the recommendations.

H. **8.2.8 Apply recommendations and lessons learned**

Based on the team’s findings, proposed recommendations and the feedback during the closeout meeting, the team should develop an action plan that identifies the actions, responsible parties, timeframe for implementation and expected outcomes. The results of the review and carrying out the action plan should lead to improvements in ADOT policies, processes and procedures.

Implementation Guidelines for Work Zone Safety & Mobility

8.3 Work Zone Crash Review

When a work zone experiences a significant crash or a pattern of vehicular crashes, a Work Zone review is performed by the RE and the Regional Traffic Engineer. It shall review the adequacy of the existing Traffic Control Plan (TCP) and consider refinements and / or alternative traffic control. At a minimum it shall include:

- 1) A site visit
- 2) A review of police crash reports (if available)
- 3) Interviews with the construction staff and contractor
- 4) Collaboration with the Roadway & Traffic Design Engineers/ District staff / Traffic Safety / Regional Traffic Operations.

When the review is complete, a report containing recommended changes (if any) is sent to the Regional Traffic Engineer (RTE) and District Engineer (DE) for review. The intent is a timely review to implement changes as necessary, not the creation of a lengthy or formal report – the use of email is encouraged.

If change(s) are implemented, changes to contract documents shall be made in accordance with the Standard Specifications. A paper copy of the report / email shall be filed with project records.

- Each project will conduct process reviews, similar to the crash review, to examine adjustments to traffic management strategies when the TCP is not meeting desired outcomes.
- Mitigation / changes to the TCP are then agreed to and implemented, by the appropriate RTE and DE.

Implementation Guidelines for Work Zone Safety & Mobility

Chapter 9

Compliance with 23 CFR630 Subpart K

9.1 ADOT Compliance with Subpart K (Traffic Control Devices)			
Category	Use	Status & Location	Responsible
Positive Protection Devices	Based on an Engineering Study (ADOT-wide or to determine measures to be applied on an individual project)	Addressed in Traffic Control Design Guidelines and Standard drawings	Traffic Engineering Group & OTAS
Exposure Control Measures	Considered to avoid or minimize exposure for workers & road users (Full road closures, ramp closures, median crossovers & night work)	Addressed in Traffic Control Design Guidelines and Standard drawings Valley Transportation White Paper on lane closure	Traffic Engineering Group & OTAS
Other Traffic Control Measures	Considered to reduce work zone crashes, risks & consequences of intrusions into the work space	Addressed in Traffic Control Design Guidelines	Traffic Engineering Group & OTAS
Uniformed Law Enforcement/DPS	Develop Guidelines and Procedures	See: Construction Bulletins	Construction Group
Safe Entry/Exit for Work Vehicles	Develop Guidelines and Procedures	Being Developed Traffic Control Design Guidelines	Traffic Engineering Group & OTAS



Implementation Guidelines for Work Zone Safety & Mobility

9.1 ADOT Compliance with Subpart K (Traffic Control Devices)(continued...)			
Category	Use	Status & Location	Responsible
Payment for Traffic Control Features & Operations	Incidental to the contract or included in payment of work unrelated to traffic control and safety	Standard Specifications/Special Provisions Bid Tabs	Contract & Specifications (C&S)
Quality Guidelines	Maintain quality & adequacy of TCC devices during project	Quantlists See: Construction Bulletins	Construction Operations

Appendix D: 2014 Process Review

Work Zone Safety and Mobility Process Review Report

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

September 2014

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

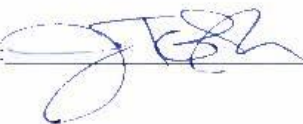
ADOT

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Work Zone Safety and Mobility Process Review Report

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

Arizona Department of Transportation

By:  Date: 09/30/2014



Work Zone Safety and Mobility Process Review Report

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Work Zone Safety and Mobility Process Review Report

Executive Summary

The focus of the required bi-annual Process Review conducted by the Arizona Department of Transportation (ADOT) is the Traffic Management Plan (TMP). The purpose of this review was to determine Arizona's compliance with 23 CFR Part 630 requiring a TMP for all projects and to identify best practices and opportunities for improvement.

The process and criteria utilized for conducting this review consisted of:

Phase 1

1. Run a report of active construction projects for January 1, 2012 to December 31, 2012 reviewing all projects for significance using the following criteria as outlined in 23 CFR 630.1010:
 - ✓ Interstate Projects that occupy a location for more than three days
 - ✓ Projects within Transportation Management Areas (TMA)
 - ✓ Projects with continuous or intermittent lane closures
2. Review each significant project for the components of a full TMP:
 - ✓ Traffic Control Plan (TCP)
 - ✓ Emergency Vehicle Access Plan (EVAP)
 - ✓ Public Information - ADOT Communications (PI)
 - ✓ Traffic Operations (TO)

Phase 2

Identify and review projects for compliance, best practices, and areas needing improvement.

Observations and Recommendations

The following observations and recommendations were identified.

1. **Finding:** There is no formal tracking device in place showing which projects have a full TMP and those that have a partial TMP.
Recommendation: The Process Review Team recommended that a field be added to the Traffic Database for tracking projects with a full TMP.
Action: This recommendation was implemented by the ADOT Traffic Group.



Work Zone Safety and Mobility Process Review Report

2. **Finding:** The committee noted that there were many questions from staff regarding significant projects, impact, and the need for all four components of a TMP.

Recommendation: The Work Zone Safety and Mobility Steering Committee should develop training for ADOT staff on the Rule, Significant Projects, TMP components and other items as required by the **Rule**.

Action: A member of the Steering Committee has developed a Power Point presentation (Appendix L) for training on 23 CFR 630, subparts J & K as part of the Resident Engineers' Academy presented May 28, 2014. A similar presentation will be part of ADOT's Project Managers' Academy.
3. **Finding:** There is no checklist for project managers to use to identify significant projects and what components of a TMP are required.

Recommendation: Develop a checklist.

Action: The development of a checklist has been assigned to the Work Zone Safety and Mobility Steering Committee.
4. **Finding:** ADOT does not have a process to identify maintenance activities eligible for exemption from the significant project requirements for separate TO and PI components as defined by the **Rule**.

Recommendation: Identify those maintenance activities eligible for an exemption; identify existing ADOT processes which include the TO and PI components and request the exemption from the **Rule** from the Federal Highway Administration (FHWA).

Action: Members of the committee have worked with the Maintenance Group to identify those activities. A letter requesting an exemption for those activities has been drafted.
5. **Finding:** ADOT's "Implementation Guidelines for Work Zone Safety and Mobility pursuant to 23 CFR 630, Subparts J & K" requires revision to include more details and a template for exemptions.

Recommendation: Develop a template that will be included in the Implementation Guidelines.

Action: The Implementation Guidelines are being revised and a template has been developed for requesting exemptions and is currently being reviewed by FHWA.

Work Zone Safety and Mobility Process Review Report

6. **Finding:** The I-10 Reconstruction project, TRACS # H624101C/010-D(013)N, Ruthrauff Road to Prince Road, has been identified as a **Best Management Practice** in the packaging of the TMP components.

Recommendation: Use this project as an example in the development of a template for TMPs for significant projects.

Action: The first draft of a template has been presented at a Steering Committee Meeting and is currently being revised.

7. **Finding:** ADOT's current process already has the four components of a TMP for most projects, but is experimenting with developing a single, stand-alone TMP.

Recommendation: Insertion of a section within the special provisions of the contract documents stating, "This is a Significant Project requiring a full TMP. The four components are found..." This would become a contract provision binding on the contractor and reduce the cost of preparing a standalone TMP.

Action: This recommendation will be discussed and considered by the Steering Committee.

8. **Finding:** The Emergency Vehicle Access Plan (EVAP) component required by Arizona Statute was not clearly identified as EVAP in specifications. For instance, it was found in some Special Provisions as "Emergency Action Plan" which contained all of the provisions required by A.R.S. §28-652.

Recommendation: The Emergency Action Plan Special Provision should reference compliance with the Emergency Vehicle Access Plan (EVAP) required by Arizona Statute A.R.S. §28-652.

Action: A proposed (draft) Special Provision has been sent to the ADOT Contracts and Specifications Group for development and use in all projects.

9. **Finding:** The public information function does not compete for funding with construction in individual projects. It is focused on the entire construction and maintenance program impact rather than individual projects. As such it best fulfills the mobility requirements of the Rule and is a **Best Management Practice**.

Action: The review team commends ADOT's Public Information practice for work zones and we have identified them as a Best Practice, which is described in further detail later in this report.

Work Zone Safety and Mobility Process Review Report

Background

Process Reviews are state led and not to be confused with FHWA Conformance Reviews, which are to determine if all applicable standards (national, state, or local) have been met. They should also not be confused with the annual Work Zone Self-Assessment, which is a set of questions designed to assist the Department to simply evaluate their work zone policies as a whole. The results of the Self-Assessment often identify areas that may benefit from a more in-depth review such as a Process Review.

The purpose of the Process Review is to determine agency compliance with 23 CFR Part 630 and to identify best practices and opportunities for improvement.

The last work zone safety and mobility process review was conducted by FHWA with ADOT's participation 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.

It is worth noting that ADOT and FHWA have also recently completed a formal conformance review of the Department's compliance with 23 CFR 630, Subpart J (The Rule). This conformance review resulted in four primary observations from FHWA, each with several associated recommendations. To date, ADOT has completed or adopted most of the recommendations.

Work Zone Safety and Mobility Process Review Report

Purpose and Objectives

The purpose of this biannual Process Review led by ADOT 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.

23 CFR 630, Subpart J (The Rule) requires ADOT to conduct a bi-annual Process Review. 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.

Process reviews help assess the effectiveness of the work zone program and policies and procedures. The review is to enable ADOT and the FHWA Division Office to confirm that 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.

The focus of the required bi-annual Process Review conducted by ADOT is the TMP. The purpose of this review was to determine Arizona's compliance with 23 CFR Part 630 requiring a TMP for all projects and to identify best practices and opportunities for improvement.

The objectives of this process review in relation to the TMP are:

- Education and Training
- Data Collection and Tracking
- Presentation and Formal Packaging

Work Zone Safety and Mobility Process Review Report

Team Members

The Process Review Team, part of the Work Zone Safety and Mobility Steering Committee, with team members from the State Engineer's Office, Communications, Project Management, Traffic Engineering and Construction conducted the process review and FHWA provided technical guidance.

The Process Review Team includes the following ADOT staff members:

Lisa Sinclair	LSinclair@azdot.gov	State Engineer's Office (Chair)
Scott Orrahood	SOrrahood@azdot.gov	Traffic Group
Robert Wade	RWade@azdot.gov	Construction Group
Paki Rico	PRico@azdot.gov	Communications
Mohammad A. Zaid	MZaid@azdot.gov	Urban Project Management
Giuly Caceres	GCaceres@azdot.gov	Statewide Project Management

Process

An initial training was provided by FHWA on what should be included when conducting a process review. The Process Review Team then chose an area of concentration and the methodology that was utilized in conducting this process review. The Process Review Team elected to review ADOT Traffic Management Plans (TMP) on Interstate Highways. Although, all the required components of a TMP are developed and implemented throughout projects of significance, as noted in the 2013 Conformance Review (Appendix G), there is no mechanism in place or designated section responsible for determining the significance of a project and formally compiling and submitting the TMP as part of the Plans, Specifications and Estimate (PS&E). Additionally, there were considerable variations among the few projects with a separately packaged full TMP.

Work Zone Safety and Mobility Process Review Report

The process review was conducted in accordance with the flow diagram shown below.

Work Zone Safety & Mobility Biannual Process Review

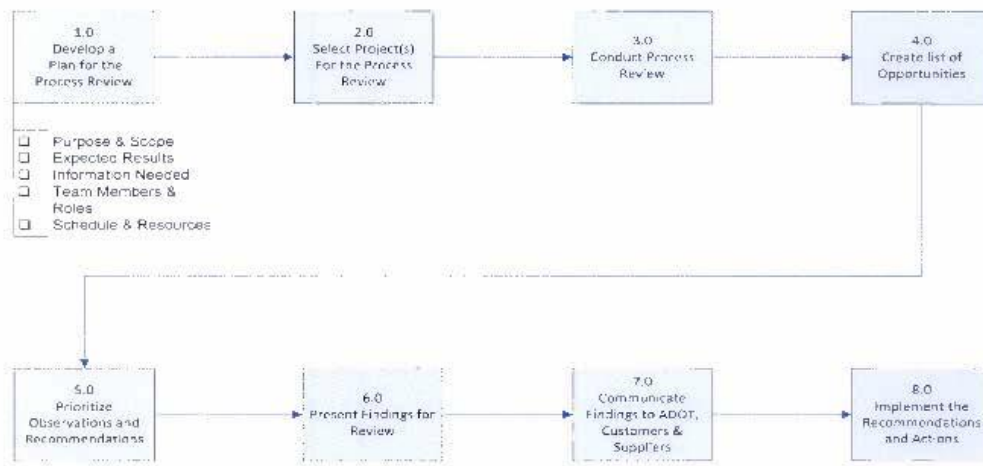


Figure 1 Biannual Process Review Flow Diagram

Initially, over eighty active projects under construction on Interstate Highways between January 1, 2012 and December 31, 2012, were identified using ADOT’s Field Office Automation System (FAST). The list was too large a sample for anything other than cursory examination and after further discussion among the Process Review Team, additional parameters were applied to identify projects for review. This was an iterative process to identify significant projects:

- ✓ Eliminated projects which did not have full or partial closures (Continuous or Intermittent) while in location for more than three days.
- ✓ Eliminated Rehabilitation and Pavement Preservation projects that were lacking complexity.
- ✓ Eliminated projects with start dates earlier than October 1, 2011.

2020 Work Zone Safety and Mobility Process Review Report

Work Zone Safety and Mobility Process Review Report

This produced a short list of ten significant projects, all of which were document reviewed for the four components of a TMP:

- Temporary Traffic Control Plan (TTC)
- Emergency Vehicle Access Plan (EVAP) required by Arizona Statute A.R.S. §28-652
- Public Information component (PI) - ADOT Communications
- Traffic Operations Plan (TO)

Short List of Projects

District	Org	TRACS / Project #	Begin milepost	End milepost	Start Date	Completion
Yuma	8230	H800101C/010-A-(215)T	98	98.3	10/09/2012	05/21/2013
Ehrenberg-Phoenix Hwy I-10 Sun Valley Pkwy to Winters TIs						
Tucson	8133	H816801C/010-D-(210)A	199	0	09/18/2012	05/20/2013
Casa Grande-Tucson Hwy I-10 I-8 to SR-87						
Tucson	8131	H806501C/010-E-(209)T	267	271.99	08/13/2012	12/28/2012
Tucson-Benson Hwy I-10 Valencia to Rita TIs						
Safford	8430	H779501C/010-F (205)T	384	391.23	12/19/2012	06/10/2013
Benson-Steins Pass Hwy I-10 San Simon to State Line						
Prescott	8832	H799101C/017-A-(225)T	243	244	10/24/2012	03/07/2013
Cordes Junction-Flagstaff Hwy I-17 N&SB Bridges						
Prescott	8831	H766401C/017-B-(212)A	289	299.15	05/23/2012	11/28/2012
Cordes Junction-Flagstaff Hwy I-17 Middle Verde to Sedona TIs						
Tucson	8131	H774101C/019-A-(203)A		63.3	04/18/2012	03/15/2013



Work Zone Safety and Mobility Process Review Report

Nogales-Tucson Hwy I-19 Mexico to I-10						
Holbrook	8730	H831101C/040-E-(210)A	323	323.08	06/25/2012	10/30/2012
Holbrook Lupton Hwy I-40 Crazy Creek Bridge EB						
Tucson	8132	H624101C/010-D(013)N	252	0	09/16/2011	10/30/2013
Casa Grande-Tucson Hwy I-10 Ruthrauff to Prince						
Phoenix	4050	H686601C/ARRA-060B(201)A	138	148.5	01/07/2010	11/23/2011
Wickenburg Phoenix Hwy US60 Loop 303 to 99th Ave						

Figure 2 Short List of Projects

All of the projects on the short list were found to contain the required TMP components. However, they varied in organization and some had the TO and PI components as a separate Communications Plan. ADOT had also requested a waiver of one project which was not approved by FHWA because that project already had all four TMP components (Appendix J).

From this analysis, the review team elected one project, nominated by ADOT Communications as best meeting all TMP criteria in a single document, for the purpose of developing a standard template for packaging a TMP. The project selected, Interstate 10: Ruthrauff Road to Prince Road, contained a full TMP packaged in a single document (Appendix E) and met all criteria established by ADOT and FHWA. The work area is located in Pima County, within the City of Tucson. The purpose of the reconstruction project was to increase capacity on I-10 and improve the operational characteristics of the Prince Road interchange by widening to four lanes each direction.

Work Zone Safety and Mobility Process Review Report

Observations and Recommendations

Based upon the teams' Process Review, the following findings and recommendations were identified:

- Finding:** There is no formal tracking device in place showing which projects have and require a full TMP and those requiring a partial TMP.

Recommendation: The Process Review Team recommended that a field be added to the Traffic Database for tracking projects with a full TMP.

Action: This recommendation was implemented by the ADOT Traffic Group.
- Finding:** The committee noted that there were many questions from staff regarding significant projects, impact, and the need for all four 4 components of a TMP.

Recommendation: The Work Zone Safety and Mobility Steering Committee should develop training for ADOT staff on the Rule, Significant Projects, TMP components and other items as required by the Rule.

Action: A member of the Steering Committee has developed a Power Point presentation for training on 23 CFR 630, subparts J & K as part of the Resident Engineers' Academy presented May 28, 2014. A similar presentation will be part of ADOT's Project Managers' Academy.
- Finding:** There is no checklist for project managers to use to identify significant projects and what components of a TMP are required.

Recommendation: Develop a checklist.

Action: The development of a checklist has been assigned to the Work Zone Safety and Mobility Steering Committee.
- Finding:** ADOT does not have a process to identify maintenance activities eligible for exemption from the significant project requirements for separate TO and PI components as defined by the Rule.

Recommendation: Identify those maintenance activities eligible for an exemption; identify existing ADOT processes which include the TO and PI components and request the exemption from the Rule from FHWA.

Action: Members of the committee have worked with the Maintenance Group to identify those activities. A letter requesting an exemption for those activities has been drafted.

Work Zone Safety and Mobility Process Review Report

5. **Finding:** ADOT's "Implementation Guidelines for Work Zone Safety and Mobility pursuant to 23 CFR 630, Subparts J & K" requires revision to include more details and a template for exemptions.

Recommendation: Develop a template that will be included in the Implementation Guidelines.

Action: The Implementation Guidelines are being revised and a template has been developed for requesting exemptions and is currently being reviewed by FHWA.

6. **Finding:** The I-10 Reconstruction project, TRACS # H624101C/010-D(013)N, Ruthrauff Road to Prince Road, has been identified as a **Best Management Practice** in the packaging of the TMP components.

Recommendation: Use this project as an example in the development of a template for TMPs for significant projects.

Action: The first draft of a template has been presented at a Steering Committee Meeting and is currently being revised.

7. **Finding:** ADOT's current process already has the four components of a TMP for most projects, but is experimenting with developing a single, stand-alone TMP.

Recommendation: Insertion of a section within the special provisions of the contract documents stating, "This is a Significant Project requiring a full TMP. The four components are found...." This would become a contract provision binding on the contractor and reduce the cost of preparing a standalone TMP.

Action: This recommendation will be discussed and considered by the Steering Committee.

8. **Finding:** The Emergency Vehicle Access Plan (EVAP) component required by Arizona Statute was not clearly identified as EVAP in specifications. For instance, it was found in some Special Provisions as "Emergency Action Plan" which contained all of the provisions required by A.R.S. §28-652.

Recommendation: The Emergency Action Plan Special Provision should reference compliance with the Emergency Vehicle Access Plan (EVAP) required by Arizona Statute A.R.S. §28-652.

Action: A proposed (draft) Special Provision has been sent to the ADOT Contracts and Specifications Group for development and use in all projects.

Work Zone Safety and Mobility Process Review Report

9. **Finding:** The public information function does not compete for funding with construction in individual projects. It is focused on the entire construction and maintenance program impact rather than individual projects. As such it best fulfills the mobility requirements of the Rule and is a **Best Management Practice**.

Action: The review team commends ADOT's Public Information practice for work zones and we have identified them as a Best Practice, which is described in further detail in the next section of this report.

Work Zone Safety and Mobility Process Review Report

Best Practices

Public Information

ADOT has a proactive and involved public information process on all construction projects. One example of such proactivity is the practices of requiring Transportation System Management (TSM) meetings that project supervisors or resident engineers hold with applicable stakeholders to coordinate major changes in traffic control, such as lane closures and lane shifts. TSM meetings have been found to be especially beneficial for coordinating lane closures between adjacent or nearby construction projects, such as in the metropolitan areas where there can be many active construction projects in multiple jurisdictions within the same corridor or area. In both rural and metro areas, TSM meetings have proven beneficial in minimizing impacts to the public and ensuring continuity of essentials services (emergency medical services, schools, mail services and others).

ADOT Communications tracks public input through a computer database called ENVOY. This enables them to ensure follow-up issues are completed and to track trends in work zone issues across projects. The ENVOY system could also be used to address program-level issues.

ADOT has a detailed software program called the Highway Condition Reporting System (HCRS) that enables tracking of work zone impact such as lane closures, full road closures and incidents. This information is provided in a standardized format to law enforcement, media, and the general public through ADOT's 511 driver information system. The ADOT Traffic Operations Center (TOC) updates the system in real time to include weather conditions, incidents, and congestion levels in order to warn traffic, suggest alternative routes when applicable and provide travel time estimates. This information is widely available to the public through social media (Facebook, Twitter and Az511) radio, TV and digital message boards.

It is also the Agency's position to measure and react in a timely manner to public perceptions; a function at which ADOT Communications excels. Because of this organization, two components of the Traffic Management Plan (TMP), the Transportation Operations (TO) component and the Public Information (PI) component are frequently contained in a single document. Please note that ADOT does not limit these two TMP components to significant projects. They may be developed for projects such as sidewalk rehabilitation during a school year.

Work Zone Safety and Mobility Process Review Report

In light of the importance of ADOT Communication's contribution to the elements of a TMP, an explanation of ADOT's organization is helpful for an understanding of how ADOT fully meets the intent and purpose of 23 CFR 630, subpart J (the Rule).

ADOT has an independent communications division, ADOT Communications, which reports directly to the Director of the Agency. Its budget is independent of specific projects and it is tasked to think across boundaries in communicating with Arizona residents and our visitors. By organization and action, they have expanded the Rule's concept of work zone transportation management, considering work zone issues and solutions beyond the immediate work zone itself to include corridor, network, and regional considerations (e.g., special events, other nearby work zones, use of alternate routes). ADOT Communications is involved in all aspects of project development, construction, maintenance and operation of Arizona's highway system. ADOT is a leader in innovative thinking for work zone planning, design, and management through their visionary use and formation of ADOT Communications.

It is also the Agency's intent to measure and react in a timely manner to public perceptions, a function at which ADOT Communications excels. Because of this organization, two components of the TMP, the Transportation Operations (TO) component and the Public Information (PI) component are frequently contained in a single document. Please note that ADOT does not limit these two TMP components to significant projects. They may be developed for projects regardless of size, location or duration.

ADOT's approach incorporates multiple considerations such as anticipated queue lengths and travel delays of alternatives. ADOT also relies on the Resident Engineer's responsibility for the day-to-day management of a project and expands that management into regional/corridor thinking with coordination by ADOT Communications. The two urban area districts within Arizona, Phoenix and Tucson, each provide guidelines on when lane closures or restrictions are permitted (Appendix H and Appendix I).

ADOT construction plans typically detail concepts and phasing to integrate a single project into the broader corridor issues. Detailed temporary traffic control plans, which include the types and spacing of individual devices are usually developed and approved at project level.

ADOT Communications is represented at the district level, where scheduling and chairing monthly Transportation System Management (TSM) meetings occurs for all stakeholders within a corridor, including contractors, law enforcement and fire, local governments, as well as interested parties such as those organizing special events and the managing Resident Engineers.

Work Zone Safety and Mobility Process Review Report

Appendix

- A. [ADOT Communications – Public Information & Outreach Strategies](#)
- B. [Final Rule Language 23 CFR Part 630 Subpart J](#)
- C. [Literature Review Documents for Conformance Review 2012](#)
- D. [Implementation and Resolution Plan for Conformance Review 2012](#)
- E. [Transportation Management Plan – Interstate 10 Reconstruction: Ruthrauff Road to Prince Road July 15, 2011 - TRACS/Project # H624101C/010-D\(013\)N](#)
- F. [ADOT WZSM Implementation Guidelines](#)
- G. [ADOT Conformance Review Final Report](#)
- H. [Valley Transportation Group Freeway Closures](#)
- I. [Tucson District Freeway Closures](#)
- J. [Response to Waiver Request](#)
- K. [Proposed Specification for Emergency Vehicle Action Plan](#)
- L. Work Zone Safety and Mobility Presentation at:
<http://www.azdot.gov/docs/default-source/construction-group/wzsm-presentation-6-10-14-for-web.pdf?sfvrsn=2>

Appendix E: 2016 Process Review

Work Zone Safety and Mobility Process Review Report

Arizona Department of Transportation 2016 Work Zone Safety and Mobility Process Review Report

December 2017

Prepared by
Arizona Department of Transportation
206 S. 17th Ave
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ADOT

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2020 Work Zone Safety and Mobility Process Review Report

Work Zone Safety and Mobility Process Review Report

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: *Della Z. H...* Date: *Jan 31, 2018*
Deputy Director for
Transportation/State Engineer

ADOT

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Appendix 20

Work Zone Safety and Mobility Process Review Report

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. 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.

Arizona Department of Transportation (ADOT) process reviews are due at the end of every even calendar year. The previous process review was completed in 2014. This process review has been conducted for 2016, and the next process review will be completed by the end of 2018.

ADOT conducted the 2016 Process Review with the focus of identifying best practices and opportunities for improvement. Since this was conducted in a short timeframe, the intent was to utilize the review as a follow-up from 2014 and a catalyst for 2018. The 2016 Process Review included:

- Evaluation of four projects to determine effectiveness of the 2014 Process Review actions.
- Assessment of the November 1 and 2, 2017 ADOT Work Zone Capability Maturity Framework (CMF) Workshop Results to identify actions for program improvement.

The 2016 Process Review findings and recommendations included the following:

- The assessment of four projects concluded that the 2014 Process Review recommendations were implemented with some opportunities for further improvement. Recommendations included:
 - Establishing consistent TMP development and implementation practices across Districts.
 - Improving written TMP documentation by removing extraneous information.
 - Improving education about tracking TMPs.
- The ADOT WZ CMF Workshop identified performance measurement, systems and technology, and culture as dimensions with lowest capability. Recommendations included:
 - Identify of WZ PMs to incorporate into AMS

Work Zone Safety and Mobility Process Review Report

- Develop informational resources for staff regarding WZ management technologies and innovations with mechanisms to periodically update.
- Establish a steering committee of key agency champions and WZ management core staff.

Work Zone Safety and Mobility Process Review Report

Background

Process Reviews are State-led and not to be confused with Federal Highway Administration (FHWA) Conformance Reviews, which are to determine if all applicable standards (national, state, or local) have been met. They should also not be confused with 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 as a whole. The results of the CMF often identify areas that may benefit from a more in-depth review through the Process Review.

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.

The first ADOT work zone safety and mobility 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.

Then for the 2014 Process Review conducted by ADOT with FHWA, the sole focus was the Transportation Management Plan (TMP). The purpose of this review was to determine Arizona's compliance with 23 CFR Part 630 requiring a TMP for all projects. The 2014 Process Review made nine observations and recommendations. Subsequent committee meetings resolved the nine findings:

- Finding:** There was no formal tracking device in place showing which projects have a full TMP and those that have a partial TMP.
Action: The Traffic Group added a TMP tracking field to the Traffic DataBase.
- Finding:** There were many questions from staff regarding significant projects, impact, and the need for all four components of a TMP.
Action: A Power Point presentation was developed and was presented at the ADOT Resident Engineers' Academy and the ADOT Project Managers' Academy.
- 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.

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4. **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.
5. **Finding:** ADOT's Guidelines for Work Zone Safety and Mobility pursuant to 23 CFR 630, Subparts J & K required revision to include more details and a template for exemptions.
Action: Developed a template for exemptions and added it to the guidelines.
6. **Finding:** I-10 Reconstruction project, TRACS H624101C, Ruthrauff Road to Prince Road was identified as a best management practice for packaging TMP components.
Action: The Ruthrauff Road to Prince Road project TMP was used as a template.
7. **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.
8. **Finding:** The Emergency Vehicle Access Plan (EVAP) component required by Arizona Statute (A.R.S. §28-652) was not clearly identified as EVAP in specifications.
Action: ADOT Stored Specification 701PDMPT was published defining EVAP.
9. **Finding:** The public information function does not compete for funding with construction in individual projects. It is focused on the entire construction and maintenance program impact rather than individual projects. It was identified as a best management practice.
Action: No action was required.

A key focus of the 2014 Work Zone Safety and Mobility Process Review was ensuring the inclusion of all components of a TMP on significant projects. To track if this was implemented; the team researched recent significant projects that had been in development since the 2014 Process Review to determine if they contained all four TMP components. This research produced a short list of three projects shown in Table 1.

Work Zone Safety and Mobility Process Review Report

Table 1 Research Results - TMP Components in Projects

Project Name		Contract Award Date	TMP Components				TMP Requirement listed in Traffic Database
TRACS #	Project #		Temp. Traffic Control	Public Involvement	EVAP	Traffic Ops.	
I-19 Ajo Way TI (Jct SR 86) Capacity Additions		10/16/2015	Yes	Yes	Yes	Yes	No
H846701C	NH-019-A-(220)S						
I-10 SR 303L System T.I. (Phase II)		12/18/2015	Yes	Yes	Yes	Yes	No
H857701C	IM-303-A(216)S						
South Mountain Freeway		2/26/2016	Yes	Yes	Yes	Yes	No
H882701C	202-D-(200)S						
I-10 Ina Road Traffic Interchange Reconstruction		12/16/2016	Yes	Yes	Yes	Yes	Yes
H847901C	NH-STP-010-D(216)S						

In review of the projects in Table 1, it was found that all of the projects contained the requirements of the TMP as outlined in the Implementation Guidelines for Work Zone Safety & Mobility pursuant to 23 CFR 630 Subpart J & K, and were provided in the Special Provisions of the project's Contract Documents. Based on the recommendations from the 2014 Process Review, the Traffic Database has a field showing whether each of the projects required a TMP, but the field was not correctly filled in for three of the projects that were sampled.

For TMPs, there are several items worth noting during this review. As can be inferred from Table 1, the projects selected were awarded during the time period between the 2014 and 2016 process reviews, as such the language contained within the Special Provisions in each project for the TMP varied slightly. There is standard language used in the Special Provision regarding the TMP, the EVAP, and Public Involvement. The Traffic Operations component of the TMP is described in the Transportation System Management Program section of the General Requirements. Although each project's Special Provisions contained the TMP components, they did not follow any specific order. It is recommended this item be further explored with additional review, further refinement, and standardized formatting, possibly as a combined stored specification.

The Traffic Database is not always being used to track 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 projects with TMPs.

Work Zone Safety and Mobility Process Review Report

Purpose and Objectives

A two-day guided Process Review workshop was held where instructors that presented on behalf of the FHWA stressed the capability for effective work zone traffic management.

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. 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.

ADOT conducted the 2016 Process Review with the focus of identifying best practices and opportunities for improvement. Since this was conducted in a short timeframe, the intent was to utilize the review as a follow-up from 2014 and a catalyst for 2018. The 2016 Process Review created a list of recommendations that the agency wants to prioritize and work on for the next year. Use the 2016 Process Review to look at recommendations from the previous Process Review and determine if its recommendations were addressed.

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 and policies and procedures. The review is to enable ADOT and the FHWA to confirm that 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.

The objectives of this Process Review was to assess ADOT's current work zone management capabilities, determine actions needed to improve ADOT's work zone management capabilities, and determine how to incorporate action items into ADOT's next Process Review through the use of a Capability Maturity Framework (CMF).

Work Zone Safety and Mobility Process Review Report

Team Members

The team that conducted the Process Review included ADOT representatives from the Southcentral District, Central District, Transportation Systems Management and Operations (TSMO) – Southern Region, Construction Group, Communications, Project Management, and Traffic Design. Representatives from the FHWA Arizona Division Office provided technical guidance.

The Process Review Team includes the following:

Roderick F. Lane (Chair)	RLane@azdot.gov	ADOT Southcentral District
Daniel Casmer	DCasmer@azdot.gov	ADOT Southcentral District
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Julie Kliewer	JKliewer@azdot.gov	ADOT Construction and Materials
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Pedram Shafieian	PShafieian@azdot.gov	ADOT Construction and Materials
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Tom Herrmann	THerrmann@azdot.gov	ADOT Communications
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William Faber	WFaber@azdot.gov	ADOT Traffic
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Process

This Process Review was intended to develop a continuous improvement culture towards work zone safety and mobility management. This concept, illustrated graphically in Figure 1, is a major reason why Process Reviews are required every two years. The two-year cycle encourages ADOT to take an incremental, systematic approach towards improvement. Each Process Review should build upon the knowledge gained, lessons learned, and improvement successes achieved with previous reviews.

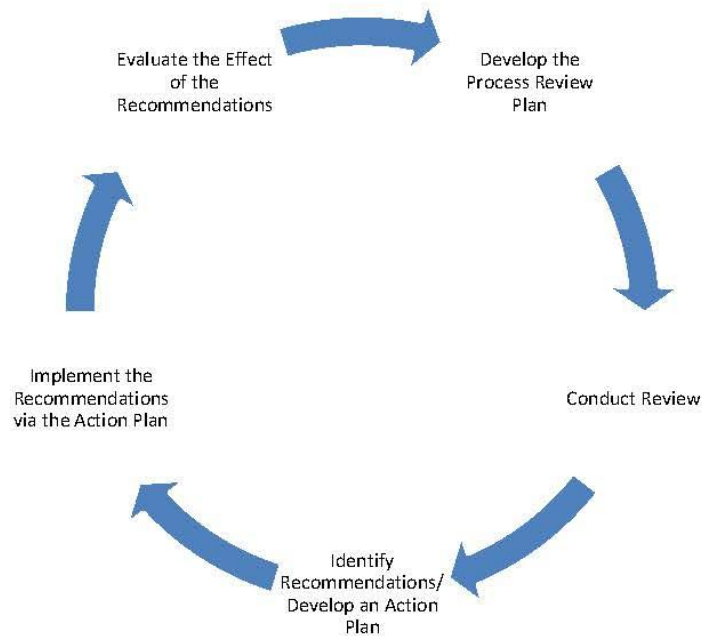


Figure 1 Guidance for conducting effective work zone Process Reviews (Adapted from FHWA-HOP-15-013)

Adopting a continuous improvement perspective towards Process Reviews also has practical value. Given current work demands on ADOT staff, it is often not feasible to spend large amounts of time during each Process Review examining in detail all aspects of agency operations that could relate to improved work zone safety and mobility. ADOT's focus on the Lean Process for continuous improvement will allow a high-level look at the current effectiveness of the

Work Zone Safety and Mobility Process Review Report

overall work zone safety and mobility policies and procedures during each review, and then focus in greater detail on one or two topic areas. These areas of special emphasis then rotate for each Process Review. For example, we may choose to focus on how to significantly improve work zone mobility and safety data collection and analysis procedures to achieve useful performance measures in one Process Review. In the next Process Review, we might then work on determining how to best utilize those performance measures in project planning and development tasks.

The team immediately identified a need to establish a standing work zone management “team,” or part of the “Steering Committee,” to meet regularly to review recent data, identify and discuss work zone safety and mobility-related issues at a program level, identify potential improvements, and establish action plans to implement those improvements. The Committee will also complete the required biennial Work Zone Safety and Mobility Process Reviews.

By establishing a continuing improvement perspective regarding Process Reviews, ADOT can further investigate specific aspects of its work zone safety and mobility procedures and better understand what is working and what needs to be changed. Determining what to target within a given Process Review is a key activity that influences the effectiveness of each review. Three key questions (with follow-up questions about how to answer those main questions) can assist the agency to maintain a continuing improvement perspective, as depicted in Figure 2.

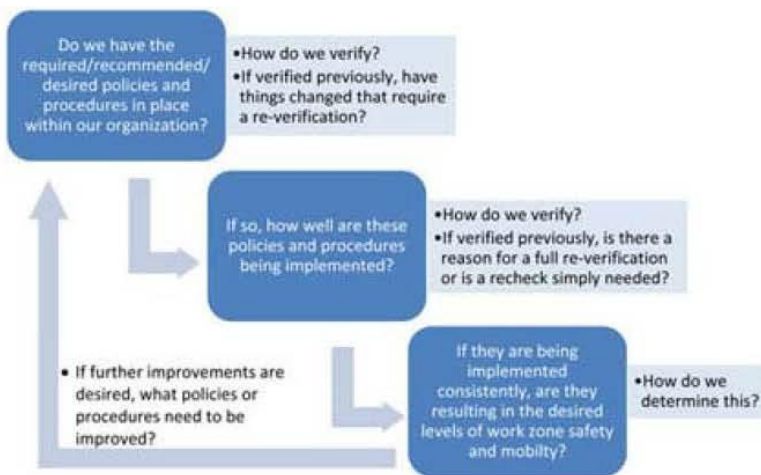


Figure 2 Questions to Help Guide Process Review Planning

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In developing a plan for conducting Process Reviews, ADOT should consider where it stands in this sequence, and base its plans for upcoming and subsequent reviews accordingly. Early Process Review efforts have focused on verifying that all of the federal requirements regarding work zone safety and mobility policies and procedures are in place, and on assessing how well the policies and procedures have been implemented. Eventually, it is desirable for ADOT to be able to assess whether the required policies and procedures are having the desired effect on safety and mobility, and determining how best to obtain data to assess the policies and procedures. If ADOT determines that a policy or procedure is not providing an adequate level of work zone safety and mobility performance, decisions may be made to establish new policies and procedures above the current requirements as part of the Process Review. This feedback would take the agency back to the first set of questions in Figure 2, with the emphasis focused on those new policies and procedures.

To implement a continuing improvement perspective, ADOT decided to use the Work Zone Management (WZM) Capability Maturity Framework (CMF) in conjunction with the current Process Review. The concept of the CMF emerged from the Strategic Highway Research Program 2 (SHRP2) L01 and L06 projects that promoted a process-driven approach to improve Transportation Systems Management and Operations (TSM&O). Building on SHRP2 results, the American Association of State Highway and Transportation Officials (AASHTO) has continued development of this concept and a capability maturity concept was published as part of the TSM&O guidance. To continue the emphasis on capability maturity and to provide program-level guidance, FHWA developed additional frameworks that focus on improvement actions for specific TSM&O program areas including Traffic Management, Traffic Incident Management, Road Weather Management, Planned Special Events, Work Zone Management, and Traffic Signal Management. This framework is designed to assess the current strengths and weaknesses and develop a targeted action plan for the program area.

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 3.



Figure 3 Key Dimensions of Capability

The matrix then provides explanations for each of these Dimensions/Process Areas. It also contains four different levels at which each process area might be evaluated by the government agency performing the self-evaluation. Level 1 is ad-hoc or low level of capacity, Level 2 is managed or a medium level of capacity, Level 3 is integrated or high level of capacity, and Level 4 is optimized or highest level of capability. The four levels are shown below in Table 2. The framework is available at <https://ops.fhwa.dot.gov/tsmoframeworktool/tool/wzm/index.htm>.

Table 2 Levels and Key Characteristics of Capability

LEVEL	KEY DESCRIPTOR	KEY CHARACTERISTICS
1	Performed	<ul style="list-style-type: none"> · Activities and relationships ad-hoc · Champion driven
2	Managed	<ul style="list-style-type: none"> · Processes developing · Staff training · Limited accountability
3	Integrated	<ul style="list-style-type: none"> · Process documented · Performance measured · Organization / partners aligned · Program budgeted
4	Optimized	<ul style="list-style-type: none"> · Performance based improvement · Formal program · Formal partnerships

Three steps were performed during the evaluation:

Work Zone Safety and Mobility Process Review Report

1. Self-Assessment to assess where ADOT is in terms of the capabilities in each process area (or dimension).
2. Identifies areas of improvement and the desired levels of capability to improve program effectiveness.
3. Identifies actions that ADOT needs to take to move to the desired levels of capability.

Observations and Recommendations

On November 1 and November 2, 2017, the team completed the FHWA WZM CMF Tool to identify areas where ADOT was successful and where improvement was needed. Table 3 shows the results. Figure 4 shows a visual representation of the scores.

Table 3 - Results from WZ CMF and Process Review Workshops

DIMENSION OF CAPABILITY	LEVEL	SCORE
Business Processes	3	12/20
Systems and Technology	2	4/8
Performance Measurement	1	2/8
Organization and Workforce	2	6/12
Culture	2	6/12
Collaboration	3	9/12

See Work Zone Capability Maturity Framework and Process Review Workshops for notes and scores.

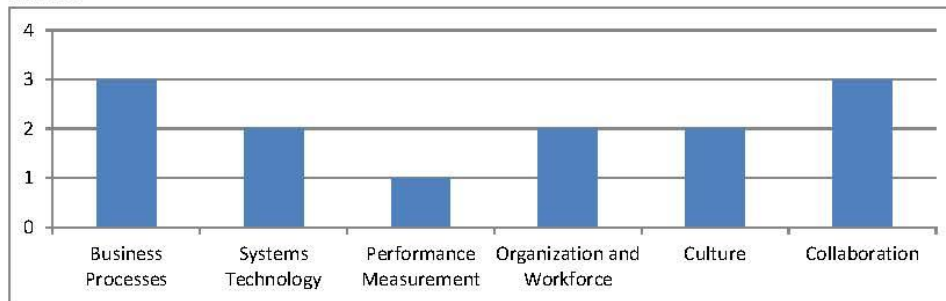


Figure 4 Levels of Capability

The workshop should show WZM process areas where ADOT could make the most improvement. Based on these results, the team chose to take action on Performance

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Measurement, Systems and Technology, and Culture. The team also chose to take action on Business Processes to improve TMPs.

Action Items

Performance Measurement (L1)

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. To improve in this area ADOT should:

- Determine how to effectively use the performance measures in ADOT's Work Zone Mobility Policy which include travel delay, queue lengths, and crash occurrences.
- 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.

Systems and Technology (L2)

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. To improve ADOT's capability in this area, ADOT should:

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

Culture (L2)

The team identified that there is not a committee that regularly reviews WZM practices. To improve, ADOT should:

- Create a steering committee with regularly scheduled meetings. Requires support from State Engineers Office and a champion. For more information see the Work Zone Committee Framework section.

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Business Processes (L3)

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, so ADOT should:

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

Work Zone Committee Framework

ADOT will reestablish a standing Work Zone Committee with the Deputy Director for Transportation/State Engineer (State Engineer) as the sponsor. The Work Zone Committee will be reestablished starting calendar year 2018. The Committee will have ten voting members, including four representatives from the ADOT Infrastructure Delivery and Operations Division (IDO), three representatives from Transportation Systems Management and Operations (TSMO), one representative from ADOT Communications, and one representative from the ADOT Multimodal Planning Division (MPD).

Committee Members

The discipline areas that will have voting members on the committee will be:

1. Committee Chair
2. Construction and Materials
3. Development
4. Districts
5. Traffic Standards
6. TSMO Regional
7. Traffic Operations Center (TOC)
8. Traffic Safety
9. Communications
10. MPD

All of these representatives shall be selected by the division/district/group manager responsible for those areas except for the Traffic Standards representative, which shall be the ADOT Traffic Standards Engineer from IDO Traffic Group. Each representative will be selected for a two year term as a member of the committee with no limits on the number of consecutive terms. The

Work Zone Safety and Mobility Process Review Report

terms for serving on the committee will start on January 1 and expire on December 31 the next year (Example: January 1, 2018-December 31, 2020).

The terms for the voting members will be staggered by one year, so that each time new members are selected, there will be continuity. Initially, four of the voting members will serve three year terms to establish the staggered rotation.

The State Engineer may add or remove voting representatives at any time. The Committee Chair may add or remove voting members, but must initiate a vote and receive a majority of voting members present in favor of that action.

If a voting member is unable to attend a Committee meeting, they may appoint someone to represent them at the meeting.

The committee may appoint non-voting representatives to serve as advisors.

Committee Chair

The Committee Chair will be one of the District Engineers or Development Group Managers and will be selected by the State Engineer. The Committee Chair will be selected for a two year term as a member of the committee with no limits on the number of consecutive terms. The terms for serving as the Committee Chair will start on January 1 and expire on December 31 the next year (Example: January 1, 2018-December 31, 2020).

The Committee Chair is also a voting member of the Committee.

Purpose of Committee

The Committee shall be responsible for the continuous improvement of work zone safety and mobility. This will include:

1. Conducting and delivering the biennial Work Zone Safety and Mobility Process review and implementing recommendations.
2. Updating the Work Zone Safety and Mobility Policies, Processes, and Procedures and Implementation Guidelines.
3. Implementing continuous improvements.

These purposes can be accomplished by:

- Reviewing recent work zone data.
- Identifying and discussing work zone safety and mobility-related issues at a program level.

Work Zone Safety and Mobility Process Review Report

- Identifying potential improvements.
- Establishing action plans to implement those improvements.
- Empowering Committee members to propose changes to processes, standards, and/or guidelines within their areas through the ADOT Standards Committee process.
- Reviewing work zone practices to evaluate implementation.

Committee Procedures

The Work Zone Committee's initial role will be to create procedures to complete the Work Zone Safety and Mobility Process reviews, update Work Zone Safety and Mobility Policies, Processes, and Procedures and Implementation Guidelines, and implement improvements. The Committee will also establish timeframes for the completion of tasks. This will include organizing the timing and frequency of committee meetings.

The Committee will make decisions based on majority votes. The State Engineer may veto any decisions.

Work Zone Safety and Mobility Process Review Report

Appendix

- A. November 1, 2017 ADOT WZ CMF and PR Workshop Summary Report
- B. ADOT WZ CMF Self-Assessment Worksheet
- C. Executive Summary February 2, 2015 WZSM Quarterly Report
- D. September 2014 Process Review Report Final
- E. Work-Zone-Safety-and-Mobility-Implementation
- F. Images of Traffic Database with TMP Tracking Field
- G. Work Zone Safety and Mobility PowerPoint for Resident Engineers' and Project Managers' Academy – May 28, 2014
- H. Programmatic Agreement for Maintenance Exemptions for Significant Projects
- I. Transportation Management Plan: Interstate 10 Reconstruction: Ruthrauff Road to Prince Road
- J. TMP and EVAP Specification

Appendix F: 2018 Process Review

Work Zone Safety and Mobility Process Review Report

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

June 2019

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

ADOT

Work Zone Safety and Mobility Process Review Report

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 L. Ham Date: 9/23/2019
Deputy Director for
Transportation/State Engineer

ADOT

Work Zone Safety and Mobility Process Review Report

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Work Zone Safety and Mobility Process Review Report

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



Work Zone Safety and Mobility Process Review Report

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.



Work Zone Safety and Mobility Process Review Report

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.



Work Zone Safety and Mobility Process Review Report



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.

Work Zone Safety and Mobility Process Review Report

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.



Work Zone Safety and Mobility Process Review Report

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 Safety and Mobility Process Review Report

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.



Work Zone Safety and Mobility Process Review Report

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

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

Non-Voting Members

Toni Whitfield	Toni.Whitfield@dot.gov	FHWA Arizona Division
Ammon Heier	Ammon.Heier@dot.gov	FHWA Arizona Division

Work Zone Safety and Mobility Process Review Report

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



Work Zone Safety and Mobility Process Review Report

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:



Work Zone Safety and Mobility Process Review Report

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.



Work Zone Safety and Mobility Process Review Report

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



Appendix G: ADOT 2020 Update to the Implementation Guidelines for Work Zone Safety and Mobility

Arizona Department of Transportation
2020 Update to the
Implementation Guidelines
for Work Zone Safety and Mobility

ADOT

2020

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Primary responsibility for inquiries regarding this document is the
Arizona Department of Transportation (ADOT),
Transportation Systems Management & Operations Division (TSMO),
Operational Traffic and Safety Group (OTAS)
(602) 712-2212

Items in the following sections are color coded as follows. Blue is used for existing language. Blue with a strikethrough is the existing language that was removed; ~~example~~. Items in red are new language.

Chapter 1

1.1 Background

The following is a summary of the changes to the Implementation Guidelines for Work Zone Safety and Mobility (IGWZSM). This effort was initiated by the State Engineer. The guidelines were started in 2007 and published in 2009 and have not been updated. Therefore, the Work Zone Safety and Mobility Committee (WZSMC) thought it best to completely rewrite the document.

Chapter 2

1.2 Format Changes

The first, and most obvious, change was to format the document in accordance with ADOT's "Transportation Guidance Document Template Long Version" (TGDTLV). This document was originally designed in 2014 for the purpose of standardizing guidance documents posted on group webpages for anyone in IDO, TSMO or MPD. This changed mainly how the document appears by dictating things like what font type and size to use, what should be in the header and footer, and how to number the pages. This is reflected in Figure 5.3a below. Although the document received a complete rewrite, the WZSMC tried to follow the same order of content as the previous version.



Figure 1.1a Updated Cover for ADOT Implementation Guidelines for WZSM

Another major format change was to remove the signatory section of the IGWZSM. The original IGWZSM was signed by the ADOT Director, State Engineer, Multimodal Planning Division Director, and Director of Communication and Community Partnerships (Figure 5.3b). The need or requirement of the signatures was brought up within the revision process of the IGWZSM. The WZSMC researched practices of other Department of Transportations (DOTs) and did not find a single signature of approval on any other states implementation guidelines. By removing the signatures, it would allow for the flexibility to change specific elements in a more efficient manner and eliminate any "muda" waste associated with collecting signatures of unaffected

parties. This will allow the WZSMC to make changes and updates to the IGWZSM in the most efficient manner possible.



Figure 5.3b Removal of signatures

It is important to note that ADOT has adopted a Lean Business Model that is reflected in many of the changes to the IGWZSM. "Lean" is considered a philosophy of continuous improvement. A lean organization focuses on increasing customer value, the elimination of waste and optimizing operations.

Items in the following sections are color coded as follows. Blue is used for previous/existing language. Blue with a strikethrough is the existing language that was removed; ~~example~~. Items in red are new language. All of the changes to IGWZSM could not be described within this document as this not the appropriate vehicle to do so. Only items critical to improving the agency's work zone policy, processes and procedures, data and information resources, and training programs to assess the effectiveness of a work zone program are noted in the following sections.

Chapter 3

3.1 IGWZSM Introduction, Chapters 1 & 2

The introduction was removed as section one, and was listed as more of an informal greeting to the reader. This also follows the format of the ADOT TGDTLV. This section also clarifies the new definition of significance for projects, eliminating the old “Major and Minor” levels and replacing them with significant or not.

These guidelines describes how ADOT has and will continue to improve Work Zone Safety & Mobility; by identifying the “Level of Significance” (Major or Minor) for all projects added to ADOT’s 5 year Construction Plan beginning with the FY09-FY10 cycle based on the criteria defined in ADOT’s Work Zone Safety & Mobility Policy and these guidelines.

These guidelines describe how ADOT has and will continue to improve Work Zone Safety & Mobility (WZSM); by identifying if projects are “significant” for all projects added to ADOT’s Five-Year Transportation Facilities Construction Program, herein referred to as the “Five-Year Program,” cycle based on the criteria defined in ADOT’s WZSM Policy and these guidelines.

The new Chapter 1 outlines the WZSMC as it was defined in the 2016 WZSM PR. This also replaces the Team Members/Contacts list, which was too specific listing members by name, instead of by position or group (Figure 5.3.1a). Section two remains the WZSM Policy, with the recently updated 2020 version. This policy was included as text, instead of as a picture as it was previously added, which allows it to be a searchable part of the overall document. The biggest advantage of being searchable is it can save time. You can use a few tools like windows file search or command line to search for desired information. This will also allow colleagues to open and copy data from this file just like a from a word or excel file, which enhances the overall value of IGWZSM. This also allows the IGWZSM to be easier to find online and in search results. This can help enhance the customer experience with increased accessibility. A scanned document is just an image of a text document and is therefore inaccessible for a disabled person, so you can not extract the words or read the document using an assistive technology software. By adding the policy as searchable text it will save time, increase productivity, and improve the end-user experience.

A team was established to define, document and implement the Work Zone Safety & Mobility Rule (23 CFR, Part 65, Subpart J & K). The team has cross-functional membership throughout ADOT and work zone safety stakeholders.

Organization Function	Team Members/Contacts
Multimodal Planning Division (MPD)	Raksh Tripathi Don J. Fisher Arnold Burbanck
Communications & Community Partnerships	Matt Burdick Timothy Tait
Intrastate Transportation Division (ITD)	
Construction Group	Robert Wade*
Construction District Representatives	Paul Patino (DE Yuma) Maddie Keady (Senior IEE Phoenix District)
Engineering Technical Group	Joe Roman
Office of Environmental Services	Jodi Williams Staff Asst
Roadway	
Safety	Socra Herrera
State Construction	Julio Al-wade - Sponsor
State Engineer's Office	Lisa Sinclair*
State Maintenance	Loren Hendrix
Statewide Project Management	Geoff Casera Steve Hays
Traffic Engineering Group	Mike Minkley Scott Overhood*
Transportation Technology Group	Scott Nolas
Valley Project Management	Larry Langer
Trade Association & Consultants	
American Council of Engineering Companies of Arizona (ACEC)	Janice L. Barnett (Executive Director)
Arizona General Contractors (AGC)	David Martin (President) Ron Jones (AZ ATSSA Barricade Contractors)
Arizona Chapter, ATSSA	Ron Jones (AZ ATSSA Chapter President) Dan O'Connor (TC training)
American Traffic Safety Services Association (ATSSA)	Donna Clark (Int.) Director of Training & Products
American Traffic Safety Services Association (ATSSA)	Donna Clark (Int.) Director of Training & Products Juan M. Morales (ATSSA Trainer Instruction (Consultant))
Carter & Associates	Larry Lambert (Team Facilitator)*
Training Development	
ADOT	Enita Blindenship, LTAF and ITD Tech Director
FHWA (Arizona Safety Representative)	Karen King

5/27/2009 6

- 3.3 WZSMC Members**
The discipline areas that have voting members on the committee are:
1. Committee Chair
 2. Construction (DO)
 3. Development (DO)
 4. Districts (DO)
 5. Traffic Standards (DO)
 6. Operational Traffic (TSMO)
 7. Traffic Operations Center (TOC) (TSMO)
 8. Traffic Safety (TSMO)
 9. Communications
 10. MPD

Figure 3.1a Revised list of WZSMC

Chapter 4

4.0 IGWZSM Chapters 3 & 4

The title of Chapter 3 was changed from "Work Zone Safety & Mobility Process & Procedure" to "Significant Project."

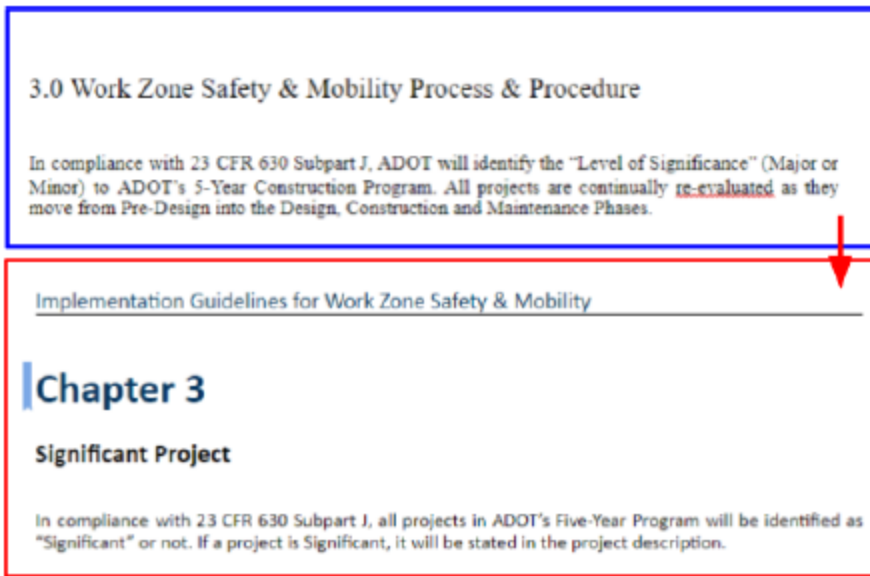


Figure 4.1a Chapter 3 title change

This chapter also reflects the updated definition of a significant project.

Per ADOT Work Zone Safety and Mobility Policy (ENG-07) and in compliance with 23 CFR 630 Subpart J, a significant project is

"...one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are considered greater than what's tolerable based on engineering judgment and cooperation with the FHWA. The judgment is based on existing traffic volumes, duration of construction, anticipated impacts to travel time and surrounding transportation network and is further defined in ~~these implementation guidelines~~ the ADOT Guidelines for Work Zone Safety and Mobility. In addition, all Interstate system projects within the boundaries of a Transportation Management Area that occupy a location for more than three days with either intermittent or continuous lane closures are ~~also~~ considered significant.

This chapter again adds clarity to the subject on the newer definition of a Significant Project versus the old definition of Major Significance and Minor Significance.

~~Projects of Major Significance~~ → Significant Projects

~~Projects of Minor Significance~~ → [all other] "Projects"

Figure 4.1b Change in definition of significance

The intent previously in the other part of the old section three was moved to the new Chapter 4, "WZSM Process, Guideline and Procedure." Also in the new Chapter 4 is "ADOT's process for the identification, assessment, implementation and re-assessment of WZSM", which was changed from a linear flow chart to a circular model to mimic our continuous improvement strategy, or the Lean Business Model [See Figure 5.3.2c Updated WZSM Process].

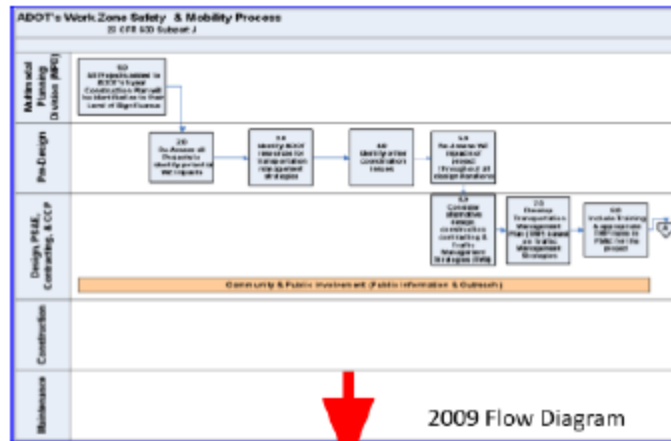


Figure 4.1c Updated ADOT Process for the identification, assessment, implementation and re-assessment of WZSM

There were a number of updates to the Tasks/Key Actions section of Table 4. For Activity 4.1, the tasks were almost completely revised. Most important to note is that projects are no longer designated as minor or major. Being that the designation as Significant relative to

WZSM (and not environmentally) is critical to do as early as possible. The WZSMC met with ADOT MPD to discuss how to do this accurately. The team members agreed to the following revised task, *"Projects within a TMA and an access controlled divided highway will be marked as "Significant for WZSM" and will include the conception of a four part TMP during the scope of the project...The two additional parts of the TMP can be removed at a later stage if the project team deems that the project is not a Significant project."* The District Engineers were also solicited for input and further defined this task with, *"Additionally all Projects:*

- *within the Central District*
- *US60 from Superior to Miami (MP 227 to 242)*
- *on US60 from Chrysotile Road to Gila County/Navajo County line (MP 283 to 317)*
- *US70 from Peridot to Gila River (MP 273 to 292)*
- *anywhere on I-10, I-17, I-19 and I-15*
- *I-40 in Flagstaff"*

Title: Work Zone Safety & Mobility Procedure	
Process Owner(s): MPD, CCP, PreDesign, Design, Districts' & Maintenance	Date & Revision: 02/26/09 Version 3.0
Activity	Tasks/Key Actions
1.0 All Projects added to ADOT's 5 year Construction Plan will be identified as to their Level of Significance Responsible: MPD, CCP, Pre-Design, and IID Leadership Team	Starting FY09-FY10 cycle projects added to ADOT's 5 year Construction Plan will be identified, as to their level of significance (Major or Minor). The level of significance will be designated in the Pre-Design Scoping Document in Activity 2.0 Projects will be continually re-assessed throughout Pre-Design, Design, Construction & Maintenance for Work Zone Safety & Mobility issues. Review of Work Zone Impact will be included in the Stages Checklist, including a Traffic Management Plan Memo.



Table 4 WZSM Process, Guideline and Procedure	
Process Owner(s): MPD, Communications, IDO, and TSMO	Date and Revision: August 2020 Version 4.0
Activity	Tasks/Key Actions
4.1 All Projects added to ADOT's Five Year Program will be identified as Significant or not. Responsible: MPD, Communications, Pre-Design and IDO/TSMO Leadership Team	Projects added to ADOT's Five-Year Program will be identified as Significant or not. Projects within a TMA and an access controlled divided highway will be marked as "Significant for WZSM" and will include the conception of a four part TMP during the scope of the project. Additionally all Projects: <ul style="list-style-type: none"> • within the Central District • on US60 from Superior to Miami (MP 227 to 242) • on US60 from Chrysotile Road to Gila County/Navajo County line (MP 283 to 317) • on US70 from Peridot to Gila River (MP 273 to 292) • anywhere on I-10, I-17, I-19 and I-15 • on I-40 in Flagstaff The two additional parts of the TMP can be removed at a later stage if the project team deems that the project is not a Significant project. This will be designated in the Pre-Design Scoping document in Activity 2.0. Projects will be continually re-assessed throughout Pre-Design, Design, Construction and Maintenance for Work Zone Safety & Mobility issues. Review of Work Zone Impact will be included in the Stages Checklist, including a Traffic Management Plan Memo.

Figure 4.1d Updated Activity 1.0 to Activity 4.1

Tasks in Activity 4.2 were changed from, "The Project Manager needs to coordinate with Contract Phasing, Traffic Control, and Communications & Community Partnerships (CCP) at each phase of [the] project. Reference - Arizona Supplement to MUTCD can be found in Appendix G" to "The Project Manager needs to coordinate with Contracts and Specifications, Traffic Engineering, TSMO Operational Traffic and Communications Office at each phase of the project."

<p>2.0 Re-Assess all Significant Projects to identify potential work zone impacts <u>Responsible: Pre-Design, Traffic Engineering, Districts & CCP</u></p>	<p>The Project Manager needs to coordinate with Contract Phasing, Traffic Control, and Communications & Community Partnerships (CCP) at each phase of project.</p> <p>Reference - Arizona Supplement to MUTCD can be found in Appendix G</p>
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<p>4.2 Re-Assess all Significant Projects to identify potential work zone impacts and Smart Work Zone opportunities <u>Responsible: Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic and Communications</u></p>	<p>The Project Manager needs to coordinate with Contracts and Specifications, Traffic Engineering, TSMO Operational Traffic and Communications Office at each phase of the project.</p>
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Figure 4.1e Updated Activity 2.0 to Activity 4.2

No changes were made in the update from Activity 3.0 to Activity 4.3.

Tasks in Activity 4.4 added the following two bullets:

- Contact all affected first responders including Fire and Ambulance services and potentially towing services
- Develop EVAP concepts

<p>4.0 Identify other coordination issues</p> <p><u>Responsible:</u> Pre-Design, Traffic Engineering, Districts, CCP, Environmental, U&RR, Local Governments, Uniformed Officers, IPA & IGA</p>	<ul style="list-style-type: none"> • Utility & Railroads (U&RR) • Enforcement (Uniformed Law Enforcement/DPS) • Local Government • Environmental strategies
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<p>4.4 Identify other coordination needs</p> <p><u>Responsible:</u> Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic, Communications, Environmental, Local Governments, U&RR, IPA and IGA</p>	<ul style="list-style-type: none"> • Utility and Railroads (U&RR) • Enforcement (Uniformed Law Enforcement/DPS) • Local Government coordination • Environmental strategies • Contact all affected first responders including Fire and Ambulance services and potentially towing services • Develop EVAP concepts
--	--

Figure 4.1f Updated Activity 4.0 to Activity 4.4

No changes were made in the update from Activity 5.0 to Activity 4.5.

No changes were made in the update from Activity 6.0 to Activity 4.6.

Tasks in Activity 4.7 were updated from:

- Update TMP Memo to reflect any changes
Reference – CCP- Communications & Public Involvement See Appendix A
Reference – ADOT Traffic Control Design Guidelines
See Appendix F
Reference – Arizona Supplement to MUTCD
See Appendix G

to:

- Develop TMP for contract documents from TMP Memo.
All projects will include:
 1. TTC
 2. EVAP
 Significant Projects will also include:
 3. TO component
 4. PI component

7.0 Develop TMP based on Traffic Management strategies <i>Responsible: Design, Traffic Engineering & CCP</i>	<ul style="list-style-type: none"> ● Update TMP Memo to reflect any changes Reference – CCP- Communications & Public Involvement See Appendix A Reference – ADOT Traffic Control Design Guidelines See Appendix F Reference – Arizona Supplement to MUTCD See Appendix G
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4.7 Develop TMP based on TMS <i>Responsible: PMG, Traffic Engineering, Districts, Operational Traffic, Communications and Traffic Operations Center</i>	<ul style="list-style-type: none"> ● Develop TMP for contract documents from TMP Memo. All projects will include: <ol style="list-style-type: none"> 1. TTC 2. EVAP Significant Projects will also include: <ol style="list-style-type: none"> 3. TO component 4. PI component
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Figure 4.1g Updated Activity 7.0 to Activity 4.7

Tasks in Activity 4.8 were completely rewritten from, "ADOT is developing a two tiered training program for workers, supervisors and managers. It also differentiates between operations (field) and design (office) personnel with a third course. These courses will ensure targeted training for the Project Team, including (but not limited to) Pre-Designers, Designers, Construction Workers, Construction and Permit Inspectors, and Maintenance Workers. Training shall be required for personnel involved in the supervision and / or oversight of Design, Implementation (set up & maintenance of TC devices), Operation & Enforcement of the Work Zone. See Section 6.0 for more details." to:

- Training on new technologies should be a continued practice that is renewed as technology changes.
- PMG should plan for enough budget in CE costs for the Districts and Operational Traffic to effectively review and participate with the operational component aspect of the project.
- Likewise, PMG should include enough budget for
- Communications to perform their required tasks.
- SWZ items and specifications should always be included on Significant projects.

<p>8.0 Include Training & appropriate TMP items in PS&E for the project</p> <p><i>Responsible:</i> C&S, LTAP / ITD Tech Training, Approved Providers, CCP & Consultant Construction Administration (CCA), Districts</p>	<p>ADOT is developing a two tiered training program for workers, and supervisors and managers. It also differentiates between operations (field) and design (office) personnel with a third course. These courses will ensure targeted training for the Project Team, including (but not limited to) Pre-Designers, Designers, Construction Workers, Construction and Permit Inspectors, and Maintenance Workers. Training shall be required for personnel involved in the supervision and / or oversight of Design, Implementation (set up & maintenance of TC devices), Operation & Enforcement of the Work Zone. See Section 6.0 for more details.</p>
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<p>4.8 Include Training and appropriate TMP items in PS&E for the project</p> <p><i>Responsible:</i> PMG, C&S, LTAP, Traffic Engineering, Districts, Operational Traffic, Communications and Traffic Operations Center</p>	<ul style="list-style-type: none"> • Training on new technologies should be a continued practice that is renewed as technology changes. • PMG should plan for enough budget in CE costs for the Districts and Operational Traffic to effectively review and participate with the operational component aspect of the project. • Likewise, PMG should include enough budget for Communications to perform their required tasks. • Smart Work Zone Items and specifications should always be included on Significant projects.
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Figure 4.1h Updated Activity 8.0 to Activity 4.8

Tasks in Activity 4.9 were updated to add *“Hold periodic meetings with Stakeholders as specified.”*

9.0 Implement TMP strategies Responsible: Districts & CCP	Reference – Contract & Project Specifications
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4.9 Implement TMP strategies Responsible: Districts and Communications	<ul style="list-style-type: none"> • Reference TMP Project Specifications in the Contract and the Project Plans. • Hold periodic meetings with Stakeholders as specified.
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Figure 4.1i Updated Activity 9.0 to Activity 4.9

Tasks in Activity 4.10 were changed as shown:

10.0 Consult with stakeholders when implementing TMP Responsible: Districts & CCP	CCP hosts meetings with Contractors, Local Government, ADOT Technical staff, PM's, Local Government, Traffic Engineering and Uniformed Law Enforcement/DPS
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4.10 Consult with stakeholders when implementing TMP Responsible: Districts and Communications	ADOT hosts TSM and ESIM meetings with Contractors, TOC , Operational Traffic and Safety, ADOT Technical staff, PM's, Traffic Engineering, Local Government, Schools, Hospitals, Uniformed Law Enforcement/DPS, Fire, Ambulance services and any other previously identified stakeholders.
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Figure 4.1j Updated Activity 10.0 to Activity 4.10

Tasks in Activity 4.11 was changed from:

- Community Feedback available through CCP
- Operational data – Scope, Schedule, Budget & Quality

NOTE: Crash data – available at project level through RE/Inspectors or at statewide level through ALISS database

to:

- *Monitor safety and mobility to manage WZ impacts using field observations, crash data, operational information and SWZ data, if available.*
- *Solicit community feedback.*

<p>11.0 Monitor safety & mobility to manage WZ impact Responsible: Districts, CCP, MPD (Mr. Talley) & GTSAC</p>	<ul style="list-style-type: none"> • Community Feedback available through CCP • Operational data – Scope, Schedule, Budget & Quality <p>NOTE: Crash data – available at project level through RE/Inspectors or at statewide level through ALISS database. Contact Larry Talley (MVD), Traffic Records Coordinating Committee (TRCC) Coordinator (602) 712-7029.</p>
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<p>4.11 Monitor safety and mobility to manage WZ impact Responsible: Districts, Communications and Traffic Safety</p>	<ul style="list-style-type: none"> • Monitor safety and mobility to manage WZ impacts using field observations, crash data, operational information and SWZ data, if available. • Solicit community feedback.
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Figure 4.1k Updated Activity 11.0 to Activity 4.11

There was no change to the tasks in the update from Activity 12.0 to Activity 4.12. The only change was in who is designated as “responsible.” The change was from **Responsible: Districts, CCP & Design** to **Responsible: Traffic Engineering, Districts, Operational Traffic and Communications**.

The second and third paragraphs in the tasks for Activity 4.13 were changed from; “At a minimum, process reviews to be held every two years commencing FY10. This information will be presented to the ITD Leadership Team meeting at least once every two years. The ITD Leadership team will identify a subgroup to define improvements to WZS&M and CCP will facilitate the bi-annual assessment process.” This was changed to *“Conduct Process Reviews as required.”*

<p>13.0 Assess performance of WZ Safety & Mobility</p>	<p>Use Community feedback & Operational data from multiple randomly selected projects.</p>
<p>Responsible: CCP, Districts, Traffic Engineering, Pre-Design, Design, Valley & SW Project Mgmt & MPD</p>	<p>At a minimum, process reviews to be held every two years commencing FY10.</p> <p>This information will be presented to the ITD Leadership Team meeting at least once every two years. The ITD Leadership team will identify a sub-group to define improvements to WZS&M and CCP will facilitate the bi-annual assessment process.</p>



<p>4.13 Monitor safety and mobility to manage WZ impacts using field observations, crash data, operational information and SWZ data if available.</p>	<p>Use Community feedback and Operational data from multiple randomly selected projects.</p> <p>Conduct Process Reviews as required.</p>
<p>Responsible: MPD, Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic and Communications</p>	

Figure 4.11 Updated Activity 13.0 to Activity 4.13

Only the fourth bullet point for tasks in Activity 4.14 was changed from; “Data & Information resources” to “SWZ Data & Information resources”.

<p>14.0 Use results to improve Work Zone Safety & Mobility</p>	<ul style="list-style-type: none"> ● Eng07-3 Work Zone Safety & Mobility Policy ● Processes ● Procedures ● Data & Information resources ● WZ Training programs
<p>Responsible: CCP, Districts, Traffic Engineering, Pre-Design, Design, Valley & SW Project Mgmt & MPD</p>	



<p>4.14 Use results to improve Work Zone Safety & Mobility</p>	<ul style="list-style-type: none"> ● Eng 07-3 Work Zone Safety & Mobility Policy ● Processes ● Procedures ● SWZ Data and Information resources ● WZ Training programs
<p>MPD, Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic and Communications</p>	

Figure 4.1m Updated Activity 14.0 to Activity 4.14

As previously stated, Activity 4.15 is completely new, and the tasks for this activity are; *“Foster a safe environment where positive, specific and objective information can be provided to team members in an effort to continually improve our process. Hold facilitated lessons learned workshops on all Significant Projects upon project completion.”*

<p>4.15 Provide Feedback</p>	<p>Foster a safe environment where positive, specific and objective information can be provided to team members in an effort to continually improve our process.</p>
<p>MPD, Pre-Design, PMG, Traffic Engineering, Districts, Operational Traffic, and Communications, Partnering Office.</p>	<ul style="list-style-type: none"> ● Hold facilitated lessons learned workshops on all Significant Projects upon project completion.

Figure 4.1n New Activity 4.15

Chapter 5

5.1 IGWZSM Chapters 5 & 6

Much of Chapter 5 (previously section 4.0) was revised, although the title remained the same, "Transportation Management Plans (TMP)." As previously, but briefly mentioned, the classification naming conventions at the Federal level changed from what was originally used. Originally projects were categorized as a Project of Major Significance or a Project of Minor Significance. This was changed to either Significant or not. All projects require a TMP with a TTC and EVAP, but Significant projects add a TO and PI component. As previously outlined in the Policy, this was again outlined in the Implementation Guidelines.

4.0 Transportation Management Plans (TMP)

TMP's are strategies/methodologies that will be implemented to ensure safe and mobile work zones within transportation projects. The project classification will determine the detail level of significance required for the TMP.

Projects of Major Significance: The TMP for high significance projects shall consist of a TTC, a TO, and a PI.

Projects of Minor Significance: The TMP for minor projects shall consist of a TTC. A TO and a PI are not required, but may be applicable to certain projects as determined by the Project Manager.



Chapter 5

Transportation Management Plans (TMP)

TMP's are strategies/methodologies that will be implemented to manage mobility and ensure a safe work zone in and around transportation projects. The project's classification as Significant or not will determine what is required for the TMP.

Figure 5.1a Excerpt from Chapter 5

The title of Chapter 6 (previously section 5.0) was changed from “Work Zone Impact Assessment Tools” to “*Work Zone Impact Assessment*” and the substance of the chapter was completely rewritten. Although the first subsection in Chapter 6 does cover Work Zone Impact Assessment tools, the content was changed from items very specific to ADOT. At the time the document was drafted, it was changed to take a more general viewpoint and mirror what was found in Federal documentation.

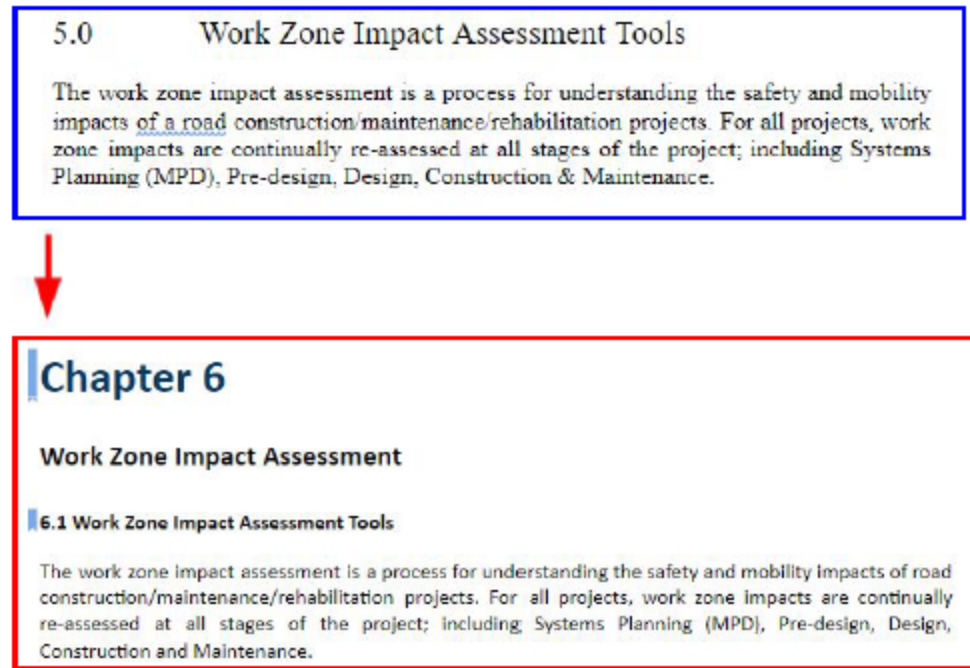


Figure 5.1b Excerpt from Chapter 6

One specific change from the Federal documentation of note was the revision of the figure for Types of Work Zone Impacts. The change was to add “Environmental Impacts (noise, dust, etc.)” as a type of Work Zone Impacts. This is a small but very substantial addition as environmental impacts can be the most significant and impactful to the project and the public.

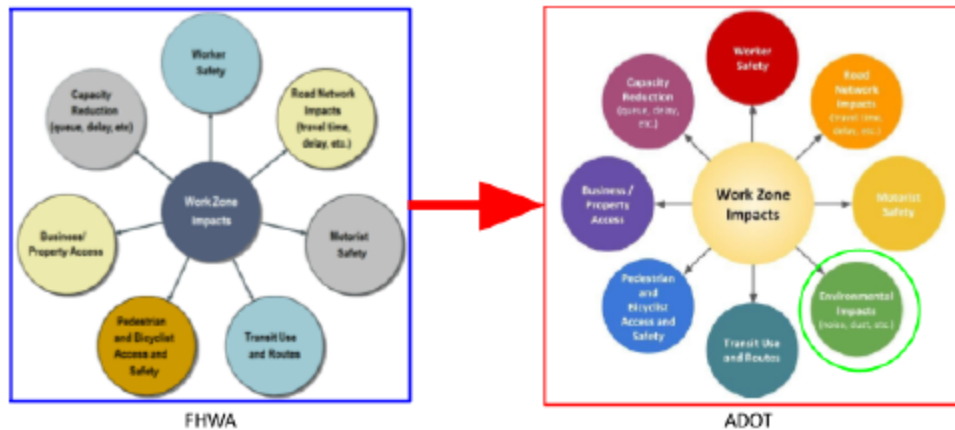


Figure 5.3.3c Revision to FHWA Types of Work Zone Impacts

The Federal figure (Figure 5.3.3d Work Zone Impact Assessment Process) for the Work Zone Impact Assessment Process along with the language almost exactly to the Federal definition was also added.

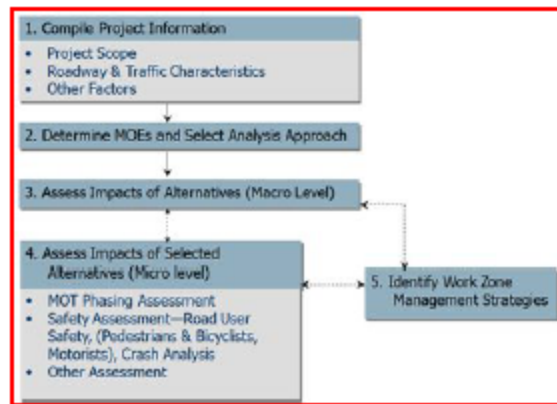


Figure 5.3.3d Work Zone Impact Assessment Process

Sticking with the overall theme of the revision subsection 6.2 covers Incident Management, and was completely rewritten to match the Federal documentation as it relates to work zones. The

Federal figure for the Process for Planning Traffic Incident Management for Highway Work Zones was transferred exactly as is. Although the flow diagram uses boxes and straight lines, it does incorporate a circle back, or element of continuous improvement that allows for application of the Lean Process.

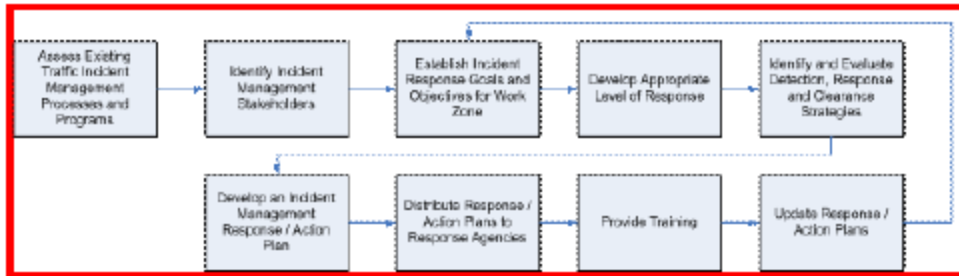


Figure 5.3.3e Process for Planning Traffic Incident Management for Highway Work Zones

Chapter 6

6.0 IGWZSM Chapters 7, 8, & 9

The title of Chapter 7 (previously section 6.0) remains the same, *“Work Zone Training.”* Again, the content was rewritten with up-to-date information. This section was verified by the Arizona Local Technical Assistance Program (AZ LTAP) group and the name-specific contact information was revised to reflect the position.

ADOT currently trains all field workers (Construction, Maintenance & Environmental) in Traffic Safety courses TCH 3004 & TCH 3005. These Matrix courses are not affected by this program.



ADOT in partnership with the Arizona Chapter of the American Traffic Safety Services Association (ATSSA) developed a two tiered training program for workers, and supervisors and managers:

- TCH1168 ATSSA Workzone Traffic Control Technician
- TCH1167 ATSSA Workzone Traffic Control Supervisor

The partnership also developed a third course for flagging:

- TCH1114 ATSSA Flagger Certified Training.

Figure 6.1a Excerpt from Chapter 7

The title of Chapter 8 (previously section 7.0) remains the same, *“Process Reviews.”* Much of the original guidance content from the original document was retained with only expanding minor information and further details. Once again the process flow chart was changed from a linear format to circular to match the Lean Process. One interesting finding was that in the original process the final task was to *“Apply recommendations and lessons learned.”* but this logic was not shown on the flow diagram to complete the loop back as with the revised format. These diagrams are shown in Figure 5.3.4a Change in Process Review Stages Flow Diagram below. The Sample Process Review Questions were deleted from the updated revision as they do not lend the team to conduct the review that is most advantageous to the department. Section 8.3 Work Zone Crash Review remains largely unchanged.

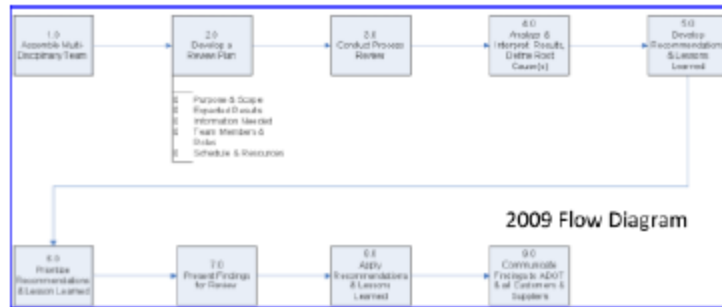


Figure 6.1b Change in Process Review Stages Flow Diagram

The title of Chapter 9 (previously section 8.0) changed from “23 CFR630 Subpart K (Temporary Control Devices)” to “Compliance with 23 CFR630 Subpart K.” Table 9.1 then outlines the category, use, status, location, and responsible party. The categories remained the same. Any references to a specific Construction Bulletin was removed as these do receive updates, and we did not want to reference an outdated bulletin. Under the “Responsible” heading all references to “Traffic Group,” were updated to “Traffic Engineering Group & OTAS.” In the Use column of Positive Protection Devices it was updated from “agency-wide” to “ADOT-wide.” In the Use column for Uniformed Law Enforcement/DPS it was updated from “Develop a policy for use on Federal-aid highway projects” to “Develop Guidelines and Procedures” and the new status removed the reference to a “DRAFT Being Reviewed.” In the Use column for Safe Entry/Exit for Work Vehicles it was changed from “Develop a Policy” to “Develop Guidelines and

8.0 23 CFR630 Subpart K (Temporary Control Devices)			
ADOT Compliance with Subpart K			
Category	Use	Status & Location	Responsible
Positive Protection Devices	Based on an Engineering Study (agency-wide or to determine measures to be applied on an individual project)	Addressed in Traffic Control Design Guidelines and Standard drawings	Traffic Group

↓
Procedures.”

Chapter 9			
Compliance with 23 CFR630 Subpart K			
9.1 ADOT Compliance with Subpart K (Traffic Control Devices)			
Category	Use	Status & Location	Responsible
Positive Protection Devices	Based on an Engineering Study (ADOT-wide or to determine measures to be applied on an individual project)	Addressed in Traffic Control Design Guidelines and Standard drawings	Traffic Engineering Group & OTAS

Figure 5.3.4c Excerpt from Chapter 9

The new implementation guidelines removed the entire appendix.



Appendix H: ADOT 2020 Update to the Work Zone Safety and Mobility Policy ENG 07-3

Arizona Department of Transportation
2020 Update to the
Work Zone Safety and Mobility Policy ENG 07-3

ADOT

2020

Contents

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Primary responsibility for inquiries regarding this document is the
Arizona Department of Transportation (ADOT),
Transportation Systems Management & Operations Division (TSMO),
Operational Traffic and Safety Group (OTAS)
(602) 712-2212

Items in the following sections are color coded as follows. Blue is used for existing language. Blue with a strikethrough is the existing language that was removed; ~~example~~. Items in red are new language.

Chapter 1

1.1 Background

The following is a summary of the updates made to the Work Zone Safety and Mobility (WZSM) Policy, ADOT Policy ENG 07-3. Having a policy is a requirement of The Rule of any Department of Transportation (DOT) that receives Federal funds. The original policy was created in 2007, updated in 2013, and updated again in 2017. This update came into effect on September 16, 2020 and is scheduled for review again on September 16, 2025.

Chapter 2

2.1 WZSM Policy

The WZSMC suggested the following changes that were accepted by the SEO:

1. The purpose of this document is to ~~establish~~ **define the** policy requirements and expand on existing guidance and requirements for systematically considering and managing work zone safety and mobility impacts on ~~highway construction projects~~ **Arizona Department of Transportation (ADOT) administered projects.**
2. This policy applies to all construction, maintenance, and procurement projects determined by ~~Arizona Department of Transportation (ADOT)~~ **ADOT** to be significant projects as defined in this policy.
3. The definitions section included five changes:
 - a. Incident was added to the definitions list. This definition was added in conjunction with the added item, Letter 'J' to address the inclusion of the ADOT Traffic Operations Center (TOC) and Traffic Incident Management (TIM)

Incident Any non-recurring event that causes a reduction of roadway capacity or an abnormal increase in demand. Such events include traffic crashes, disabled vehicles, spilled loads, highway construction and maintenance activities, and special events (e.g., ball games, concerts, parades).

- b. The mobility definition was expanded to include the identification of performance measures. Performance measurement enhances management decision making. It allows control of the inputs, outputs and outcomes of performance. Data generated by performance measurement can be used to determine program efficiency and effectiveness and to make decisions about what services to continue, start and stop

Mobility As specifically related to work zones, mobility refers to moving road users efficiently through or around a work zone area with minimal delay when compared to travel when no work zone is present, while not compromising the safety of highway workers or road users. **The commonly used performance measures for the assessment of mobility include delay, speed, travel time and queue lengths.**

- c. The definition of a Significant Project was changed to include the FHWA:

Significant Project A significant project is one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered tolerable based on engineering judgment **and cooperation with the FHWA.** This judgment is based on existing traffic volumes, duration of construction and anticipated impacts to travel time and the surrounding transportation network; these issues are discussed further in the *ADOT Guidelines for Work Zone Safety and Mobility*. In addition, all Interstate system projects within the boundaries of a Transportation Management Area that occupy a location for



more than three days with either intermittent or continuous lane closures are considered significant.

d. The definition of a TMP was updated for the more recent 2010 census.

Transportation Management Area (TMA) Per the Federal Transit Administration (FTA) and FHWA, all urbanized areas with populations greater than 200,000 as determined by the ~~2000~~2010 Census (see <http://www.census.gov/> for more information) are designated as Transportation Management Areas.

e. The definition of a TMP included several changes. This change is important to match the changed Federal definition on how projects are defined as Significant. It also helps clarify that all projects in Arizona have a TMP, unless exempt, and can consist of simply the Temporary Traffic Control and Emergency Vehicle Access Plans. This clarification is often confused within discussions of a TMP at ADOT.

Transportation Management Plan (TMP) ~~The Transportation Management Plan outlines the strategies that will be implemented to minimize impacts to the traveling public during construction of a project, and the roles and responsibilities of the project stakeholders prior to and during construction. The TMP may consist only of a Temporary Traffic Control Plan and Emergency Vehicle Access Plan—consists of one or more of the following~~, and may add a Transportation Operational and Public Information components/documents dependent upon ~~the significance of a project~~. If the project is Significant. On Significant projects, the TMP will define the roles and responsibilities of the project stakeholders prior to and during construction.

All projects will include:

1. Temporary Traffic Control Plan (TTC)
2. Emergency Vehicle Access Plan (EVAP)

Significant Projects will also include:

3. Transportation Operational (TO) component
4. Public Information (PI) component

- ~~1. Temporary Traffic Control Plan (TTC)~~
- ~~2. Transportation Operational Component~~
- ~~3. Public Information Component~~
- ~~4. Emergency Vehicle Access Plan (EVAP)~~



- f. Finally the definition of Work Zone Safety was expanded. This clarification adds a measurement for safety. Effective safety measurement empowers you with quantifiable evidence of what is or isn't working. Furthermore, if you use effective data and indicators, safety measurement can even enable you to determine why something isn't working:

Work Zone Safety Minimizing potential hazards to road users and highway workers in the vicinity of a work zone, defines Work Zone Safety. Measures for highway safety are the number of crashes or the consequences of crashes (fatalities and injuries) at a given location or along a section of highway during a period of time.

- 4. The Policy then outlines what is required of ADOT in 10 sections:
 - a. Initially the lead statement was changed from shall to will. The common practice at ADOT is "shall" is used for other party obligations and "will" is used for our own obligations.

POLICY

ADOT ~~shall~~ will:

- b. Next, letter B was updated to add language about what to do with the data that is collected. This follows the same logic of previous changes to the policy about the importance of measuring performance.
- B. Use field observations, work zone crash data, public feedback and operational information to manage work zone impacts for specific projects during implementation to continually pursue improvement of work zone safety and mobility by analyzing work zone crash and operational data from multiple projects to improve State processes and procedures.
 - c. Subsection D was changed to allow for flexibility in process review, which also allows for focusing on Significant projects, without excluding projects that are not.
- D. Perform a process review every two years to evaluate and improve work zone processes and procedures with the intent to increase safety and mobility. Process reviews ~~will~~ may include, at a minimum, evaluation of work zone crash data, review of public feedback, and a review of randomly selected Significant projects and ~~will~~ that may involve project personnel from different project development stages, FHWA representatives and outside stakeholders.
 - d. The important change to subsection E was to more clearly define that a project was to be identified as Significant before scoping. This was an important clarification to the WZSM process and the WZSMC. The previous language of "Early in development" could mean a multitude of points within a project life. Adding scope requires additional funds, a contract modification, pricing, and time consuming negotiations. The remainder of the definition was removed, because this is already clarified in the federal requirements, and the WZSMC was not aware of a single project where it has been used.

- E. Identify a project as a ~~“significant”~~ **Significant** Project ~~early in the development process before scoping is complete~~. This determination is based on a project’s characteristics and the magnitude and extent of the anticipated work zone impacts. ~~ADOT will request an exception from FHWA in the event that an interstate system project is classified as significant, but in ADOT’s judgment the project does not cause sustained work zone impacts.~~
- e. Subsection F included only minor edits and one additional reference. Two acronyms that were previously defined were shortened by removing the spelled out words. In subsection ‘a’ reference to the *ADOT Traffic Guidelines and Processes* was added.
- F. Develop TMPs in consultation with stakeholders as determined by the project characteristics and the traffic control requirements identified for the project.
1. For significant projects, the TMP should include:
 - a. A ~~plan for Temporary Traffic Control (TTC)~~ **TTC** ~~that describes~~ **describing** measures designed to facilitate road users’ travel through the work zone. The plan must be consistent with Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD), the Arizona Supplement to the MUTCD, **ADOT Traffic Guidelines and Processes**, and the ADOT Traffic Control Design Guidelines.
 - b. A ~~Transportation Operations~~ **TO** component that identifies strategies for mitigating the impacts of the work zone on the operation and management of the transportation system. This component may include demand management, ~~corridor/network~~ management, safety management, enforcement and work zone traffic management.
 - c. A ~~Public Information~~ **PI** component that includes communication strategies designed to inform affected road users, the general public, area residences and businesses and the appropriate public entities about the project and the expected work zone impacts. The selected communication method(s) should convey information including project characteristics, expected impacts, closure details and commuter alternatives. Information should be updated as needed to reflect changing conditions.
 - d. An ~~plan for Emergency Vehicle Access~~ **EVAP**, which must be included in the TMP in accordance with ARS §28-332 *Department of Transportation Jurisdiction; Duties; Divisions* and §28-652 *State Highway Work Zones; Definition*. The EVAP ~~plan~~ will be established in consultation with, and will be communicated to, area law enforcement agencies and emergency responders.
 2. For projects that are not designated as significant, the TMP may consist of a ~~Temporary Traffic Control~~ **TTC** and EVAP plan only. However, addressing traffic operations and public information in the plan should also be considered.

3. Finally an entirely new section 'J' was added for incident management. Incident management is an important strategy to be considered in the transportation operations component of the TMP. The goals, objectives, and reasons for incident management as well as the issues and concerns that incident responders and TOC employees need to consider are critical to a successful work zone.

J. Initiate appropriate incident management procedures to restore the roadway to full capacity after becoming aware of an incident. The ADOT Traffic Operations Center is to respond to incidents and dispatch appropriate teams to manage and clear the incidents in a work zone.

5. The previous section titled "Roles and Responsibilities" was removed in its entirety.

ROLES AND RESPONSIBILITIES

~~Each Group affected by this policy is required to develop or revise internal processes and procedures for inclusion in the ADOT Guidelines for Work Zone Safety and Mobility.~~

6. The resource section was updated with new web links where applicable.

These changes were accepted by the SEO and was signed via Docusign by Dallas Hammit, State Engineer / Deputy Director of Transportation on September 24, 2020.