COLORADO
Department of Transportation

April 2026

Local Agency Traffic Control

Best Practices

Table of Contents

List of Figures

List of Tables

Acronyms

ATTSA	American Traffic Safety Services Association
APWA	American Public Works Association
CARSE	Colorado Association of Road Supervisors and Engineers
CCA	Colorado Contractors Association
CDOT	Colorado Department of Transportation
CWZ	Connected Work Zones
FHWA	Federal Highway Administration
HCM	Highway Capacity Manual
IDAS	ITS Deployment Analysis System
ITS	Intelligent Transportation System
LTAP	Local Technical Assistance Program
MHT	Methods of Handling Traffic
MUTCD	Manual on Uniform Traffic Control Devices
NETSIM	Network Simulation
NSC	National Safety Council
OSHA	Occupational Safety and Health Administration
PARAMICS	Parallel Microscopic Simulation
PI	Public Information
PIP	Public Information Plan
PROWAG	Public Right-of-Way Accessibility Guidelines
PS&E	Plans, Specifications and Estimates
QUEWZ	Queue and User Cost Evaluation of Work Zones
RSCP	Road Safety Champion
TCM	Traffic Control Management
TCP	Traffic Control Plan
TCS	Traffic Control Supervisor
TCT	Traffic Control Technician
TMP	Transportation Management Plans
TOP	Traffic Operations Plan
TTC	Temporary Traffic Control
VISSIM	Visual Simulation
WCCA	Western Colorado Contractors Association

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Executive Summary

Local agencies across Colorado play a critical role in ensuring the safety and efficiency of public roadways during new construction and maintenance activities. This document is designed as a user-friendly, comprehensive guide to help local agencies navigate the complexities and define responsibilities for Temporary Traffic Control (TTC) and Transportation Management Plans (TMPs).

The goal of this guide is not to create new mandates, but to summarize the current best practices, training expectations, and regulatory requirements from federal, state, and local sources into one accessible resource.

Aligning the existing materials and resources into one Best Practice guide allows the Department to draw from real-world examples across Colorado municipalities and identify areas for empowerment of local agencies to confidently scale TTC efforts according to the size and risk level of their projects.

The guide includes:

- Definitions and distinctions among certification, endorsement, and education pathways to clarify expectations for who should be planning and implementing TTC.
- A breakdown of federal, state, and local requirements, including the Manual on Uniform Traffic Control (MUTCD) and Federal Highway Administration (FHWA) TMP standards, with guidance on when those rules apply and needs of localities.
- A practical Traffic Control Management (TCM) framework that distinguishes between Traffic Control Plans (TCPs), Methods of Handling Traffic (MHTs), and Public Information Plans (PIPs), with examples of how to apply them to different types of projects—from shoulder closures to major corridor work.
- Guidance on reasonable scaling and flexibility so that agencies can balance safety and operations without being overly burdened. For example, low-volume roads may only require simple devices like cones and signage, whereas larger projects may require modeling tools, crash attenuators, or Connected Work Zone systems.

For those agencies or contractors looking to receive additional guidance on federal rules and resources, please review Section 4 of this document. For those looking for best practices for implementation or scaling of work zone TTCs, please review Section 5.

Ultimately, this guide serves as a living reference that localities can adapt to their unique resources, capacities, and project needs—while still aligning with broader standards and enabling localities to appropriately scale their work zone TTCs and operations while maintaining safety and communication.


STOP
HERE
ON
RED

1

Definitions & Understanding of Terms

To effectively manage the impacts of construction on traffic, agencies and contractors rely on a coordinated set of plans that fall under the umbrella of Traffic Control Management (TCM). TCM outlines the overall approach and is typically broken down into three essential components:

1. Traffic Control Plan (TCP);
2. Traffic Operations Plan (TOP); and
3. Public Information Plan (PIP).

Each of these three elements plays a distinct role in planning, maintaining, and communicating traffic changes. Additionally, Methods of Handling Traffic (MHTs) are developed in support of the TCP to provide detailed, phase-specific strategies for managing traffic during construction. The following definitions are listed for clarity, purpose, and scope of each component throughout the rest of the document:

- **Traffic Control Plan (TCP):** The parts of the contract document for each project that contains the requirements for the maintenance of traffic during the project's construction. This includes all MHTs, the TCP Project Special provision, required certifications for traffic control supervisors, flaggers, all devices, the access maintenance plan, and the emergency vehicle access plan.
- **Traffic Operations Plan (TOP):** The Traffic Operations plan consists of any lane closure policies (CDOT or local agency) and project-specific transportation operations strategies. Requirements necessary to implement the selected strategies are incorporated into the project plans, specifications, general notes, or other contract documents.
- **Method of Handling Traffic (MHT):** Each MHT is the contractor's proposed construction phasing and the proposed traffic control devices consistent with the TCP and consists of a detailed diagram showing traffic control devices, a tabulation of the devices, how other non-vehicular traffic is maintained, and an emergency access plan. MHTs should also include detour plans. MHTs should be produced for each phase.
- **Public Information Plan (PIP):** The public information plan includes communications strategies, including motorist information strategies, which inform stakeholders about:
  - Project characteristics;
  - Expected work zone impacts;
  - Closure details;
  - Changing conditions on the project;
  - Commuter alternatives and detours; and
  - Pedestrian, bicycle, and ADA outreach.

This page provides a breakdown of the Construction Traffic Control Documentation process and the individual's responsibility for TMP approval. This is provided as an example referencing the CDOT process and procedures.

Figure 1. Construction Traffic Control Documentation Pre-Con Meeting Process

Construction Traffic Control Documentation Pre-Con Meeting

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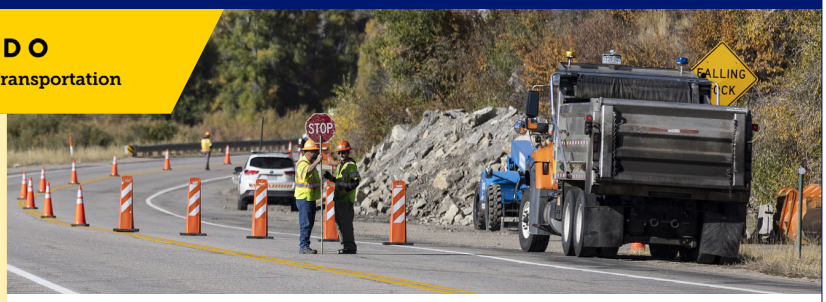


TMP Approval Legend

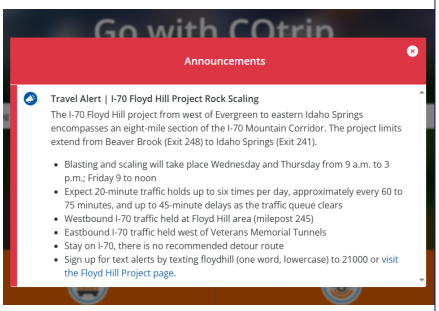
- Must be signed by Contractor, Traffic Control Supervisor, and the CDOT or Local Agency Project Engineer.
- Specific to CDOT projects only, must be approved by the CDOT Project Engineer in writing by Form 105 Speed Memo as part of the TMP.
- Specific to CDOT projects only, must be approved by the CDOT Project Engineer in writing in a 105 Speed Memo as part of the TMP.

Colorado Department of Transportation Region 1
Lane Closure Strategy
Sixth Edition
Lane Closure Schedules and Technical Report

1. Transportation Management Plan (TMP)

The TMP as defined in CDOT's Work Zone Safety and Mobility Procedures consists of the strategies to manage the work zone impacts of a project. The requirements for significant projects include:

- Traffic Control Plan (TCP)
- Transportation Operations (TO)
- Public Information Plan (PIP)



2. Traffic Control Plan (TCP)

The parts of the contract documents for each project that contain the requirements for the maintenance of traffic during construction of the project and the measures that guide road users safety through (or around) a work zone. Every **Method of Handling Traffic** documents and the TCP Project Special provision are part of the TCP.

3. Public Information Plan (PIP)

The PIP component includes communications strategies, including motorist information strategies, that inform stakeholders about:

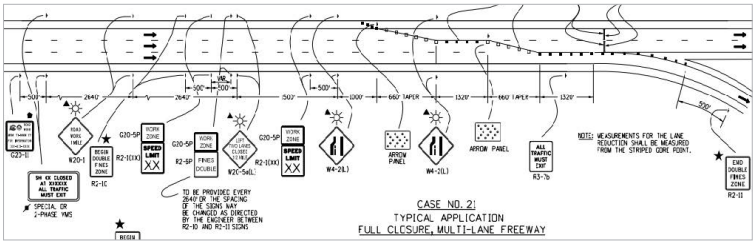
- Project Characteristics
- Expected Work Zone Impacts
- Closure Details
- Changing Project Conditions
- Commuter Alternatives

4. Transportation Operations (TO)

The TO component of the TMP consists of compliance with the appropriate Region Lane Closure policy, Operations Evaluation work zone recommendations, TO strategies, and other strategies used to mitigate impacts of the work zone on the operation and management of the transportation system within the work zone impact area.

5. Method of Handling Traffic (MHT)

The MHT shows the Contractors proposed traffic control devices for each proposed construction phase consistent with the TCP and consists of a detailed diagram showing traffic control devices, a tabulations of the devices, how other non-vehicular traffic is maintained, and an emergency access plan.



2

Certification, Endorsements, and Education

The Manual on Uniform Traffic Control Devices Section 6A.02 Fundamental Principles of Temporary Traffic Control states, as part of the seven fundamental principles of temporary traffic control:

1. General plans or guidelines should be developed to provide safety for motorists, bicyclists, pedestrians, workers, enforcement/emergency officials, and equipment, with the following factors being considered:
    - The basic safety principles governing the design of permanent roadways and roadsides should also govern the design of TTC zones. The goal should be to route road users through such zones using roadway geometrics, roadside features, and TTC devices as nearly as possible, comparable to those for normal highway situations.
    - A TTC plan, in detail appropriate to the complexity of the work project or incident, should be prepared and understood by all responsible parties before the site is occupied. Any changes in the TTC plan should be approved by an official who is knowledgeable (for example, trained and/or certified) in proper TTC practices.

There is no universal definition of "an official who is knowledgeable in proper TTC practices". CDOT, some Colorado local agencies, and other state departments of transportation utilize the "Traffic Control Supervisor" certification offered by the American Traffic Safety Services Association (ATSSA) or Colorado-based contractor associations. However, the liability for turning over a public roadway to a private entity can be risky to both the contractor and the public agency. It is highly recommended that government entities and local agencies develop a process or standard for who can create and execute TTC plans on public roadways. CDOT has a procedural directive for all internal employees, consultants, and contractors who work on CDOT projects. The following is a summary of education, responsibilities, and how CDOT defines who can perform TTC on state and federal highways.

2.1. Types of Traffic Control Education

CDOT has defined two types of traffic control education to cover government employees (and those representing governments) and private companies providing traffic control on public roadways. Public entities in Colorado have limited immunity and partial waiver as defined in Section 24-10-106 of state law. State statute does not make government entities immune to all acts on the public right of way, and the definitions of when sovereign immunity is waived, per 24-10-106, by a public entity. However, if the public entity is acting in good faith and doing all it is required to do for public safety, employees of a public entity do not have to meet the exact requirement of certification as required by private companies.

2.2. Responsibility During Construction

During construction, CDOT partially hands the liability of the traveling public's safety to the contractor and subcontractors contracted to deliver the required construction contract services. For CDOT and larger public agencies, a certified and experienced traffic control supervisor (TCS) is required to maintain traffic control devices defined in the construction plans or specifications. To understand and inspect the decisions and plans of a certified TCS, public agencies should have the same training as a TCS to ensure compliance with the traffic management requirements in the contract.

2.3. CDOT Staff Requirements

CDOT and other public agencies have extensive maintenance teams of maintainers who do everything including snow removal, sign and striping maintenance, hauling, mowing, signal and Intelligent Transportation Systems (ITS) maintenance, guardrail maintenance, and building maintenance. Some of this work requires temporary traffic control on state and federal highways. CDOT requires maintainers to get their Flagger Certification and work their way to obtaining Traffic Control Technician and their Traffic Control Supervisor endorsements. The Flagger Certification and traffic control endorsements provide the same training as a certified traffic control technician or supervisor, but without the required hours of experience. Hours of experience can be challenging to attain when maintenance duties are changing.

2.4. Types of Certifications

2.4.1. Flagger Certification

The Flagger Certification is defined as a certification issued by Government entities to Government entity employees or issued by approved flagger training entities (see the CDOT Flagger Program and CDOT Specification 630.11 for non-government entity employees working on government entity projects and state roadways). It is achieved upon completing a Flagger Certification training class and passing a final exam. Their flagger card must be on their person anytime a flagger actively performs flagging duties. A Flagger Certification is required for Government entities to obtain the Traffic Control Technician (TCT) and TCS endorsements. A Flagger Certification and a TCT or TCS endorsement must be maintained concurrently.

2.4.2. Traffic Control Technician Certification

The Traffic Control Technician is defined as a certification issued by approved vendors, including the National Safety Council (NSC), ATSSA, and typically provided to non-government entity employees working on Government entities projects. This one-day course serves as an entry-level certification for any technician-level employees responsible for traffic control and is required to begin working towards obtaining TCS certification. After obtaining a TCS certification, a TCT certification does not need to be maintained. To complete the course, students must pass a final exam.

To renew a TCT certification, a TCT Refresher class must be completed, and a final exam passed. The TCT certification and course are not required for any contractor or non-government entities personnel at this time.

2.4.3. Traffic Control Supervisor Certification

The Traffic Control Supervisor is defined as a certification issued by approved vendors, including the NSC, ATSSA, Colorado Contractors Association (CCA), and the Western Colorado Contractors Association (WCCA) and provided to non-Government entity employees working on Government entity projects. A TCS certification is achieved upon completing the two-day Traffic Control Supervisor training, passing the final exam, and obtaining the required number of in-field hours set forth by the specific training vendor. To renew a TCS certification, a TCS Refresher class must be completed, and a final exam passed.

2.4.4. OSHA Work Zone Safety Certification

OSHA Work Zone Safety Certification is a course offered by the Occupational Safety and Health Administration (OSHA) and was developed to combat the increasing number of traffic fatalities in highway work zones. This interactive course explores the hazards in work zones, the protective equipment, and safety procedures that road workers can use to avoid. The training course is intended for any worker who operates in highway or road construction zones and is available 24/7 online.

2.5. Endorsements (Consultant or Local Agency Engineers/Inspectors/PMs/Superintendents)

2.5.1. Traffic Control Technician Endorsement

The Traffic Control Technician is defined as an endorsement issued by Government entities and provided to Government entity employees working on Government entity projects or state roadways. This one-day course serves as an entry-level endorsement for any employees responsible for traffic control and is required to begin working towards obtaining a TCS endorsement. After obtaining a TCS endorsement, a TCT endorsement does not need to be maintained. To complete the course, students must pass a final exam. To renew a TCT endorsement, a TCT Refresher class must be completed, and a final exam passed.

2.5.2. Traffic Control Supervisor Endorsement

The Traffic Control Supervisor (TCS) endorsement is defined as an endorsement issued by Government entities or other approved vendors, including the NSC, ATSSA, CCA, and the WCCA. A TCS endorsement requires completing a two-day TCS training and passing the final exam. The TCS Endorsement is written proof that a passing score was achieved on the Traffic Control Supervisor Exam. Each approved training vendor has its testing process. The individual with the TCS Endorsement must abide by the specific training vendor's requirements for testing. An individual with a TCS Endorsement is not a TCS; a TCS Refresher class must be completed to renew a TCS endorsement, and a final exam must be passed.

2.6. Education

Colorado offers a variety of educational programs for engineers, including training modules and certifications to help engineers/designers, and technicians stay up to date on the latest standards and practices and improve the quality of the state's transportation infrastructure.

2.6.1. Work Zone Management & Design

The Work Zone Management & Design (National Highway Institute Course #3800072) training is a required consultant designer education course for those who design traffic control plans for federally aided projects.

2.6.2. Advance Work Zone Management and Design Training

Advance Work Zone Management and Design Training (National Highway Institute Course #133115) is a three-day training course that provides participants with advanced levels of knowledge and competencies with technical and non-technical aspects of work zone traffic control, including “best practices” in work zone planning, design, project management, and contract issues. The course is designed to provide maximum flexibility by including core, recommended, and optional lessons. The course targets state, local, and consultant design engineers, traffic and safety engineers, senior work zone traffic engineers, transportation planners, construction engineers, and senior technicians.

2.6.3. Safe and Effective Use of Law Enforcement Personnel in Work Zones

The Safe and Effective Use of Law Enforcement Personnel in Work Zones (National Highway Institute Course #133119) is a hybrid class that provides law enforcement agencies with the practices and procedures to improve traffic safety in work zones. The initial training for each participant must be taken in a classroom setting, and web-based training may be used to complete ongoing training requirements. The course provides basic knowledge to help save lives, avoid work zone crashes, and improve safety when working in a work zone. This course will provide tips for safe practices for law enforcement officers in work zones as well as providing for a safer work zone environment and the standards and guidelines related to temporary traffic control in work zones.

2.6.4. Roadway Safety & Work Zone Traffic Control Program

The Roadway Safety & Work Zone Traffic Control program is a Colorado Local Technical Assistance Program (LTAP) part of the four required core classes to become a Road Scholar I. This class provides an understanding of key elements used to control the traveling public and their role in developing safe and effective work zones.

In addition to the four core curriculum, five additional electives of their choice will need to be completed to become a Road Scholar I. There is no time limit to completing coursework, and each participant receives a certification of attendance upon completion of each course. Each course is 7 hours long and does not need to be taken in any order. Additionally, many Road Scholar I offerings include the Road Safety Champion (RSCP) Modules. The RSCP certification can be earned in tandem with the Road Scholar I Program through the National Center for Rural Road Safety. The American Public Works Association (APWA) and Colorado Association of Road Supervisors and Engineers (CARSE) have provided money for scholarships and interested individuals in transportation topics, and courses are open to all state, county, and city municipal employees.

2.6.5. Which is appropriate for staff?

Colorado's Work Zone Best Practices Safety Guide was developed in 2007 by a working task force and outlines suggested training based on different groups, job titles and training topics. These range from practical on-the-job experience to formal education. Specific roles, such as flaggers and Traffic Control Supervisors, require certification through standardized testing. Figure 2 illustrates the distribution of required training types across various construction-related tasks, emphasizing the scope and structure of workforce preparedness.

Figure 2. Suggested Training Matrix

	Hazards	Established Program	Accountability	Personal Protective Equipment	MUTCD Knowledge	MUTCD Skills	Field Corrective Actions	Laws & Regulations	
City/County/CDOT								●	Policy Makers
		●	●				●	●	Managers
	●	●		●	●		●	●	Engineers/Designers
	●	●	●	●	●	●	●	●	Field Oversight
	●	●	●	●	●	●	●	●	Safety
	●	●	●	●	●	●	●	●	Maintenance
Contractors/Subcontractors		●						●	Managers
					●			●	Estimators
				●	●			●	Engineers/Designers
	●	●	●	●	●	●	●	●	Safety
	●	●	●	●	●	●	●	●	Field Supervisors
	●	●	●	●	●	●	●	●	Workers/Operators
	●	●	●	●	●	●	●	●	Flaggers
	●	●	●	●	●	●	●	●	Stripers
	●	●	●	●	●	●	●	●	Traffic Control
	●	●	●	●	●	●	●	●	Maintenance
Law Enforcement	●			●	●	●		●	Local Police
	●			●	●	●		●	Local Sheriff
	●			●	●	●		●	State Patrol
	●	●		●	●			●	OSHA
	●	●		●					Work Zone Visitors

3

Federal vs. Colorado Traffic Control Requirement

This section provides an overview of traffic control requirements across federal, state, and local jurisdictions, with a focus on ensuring consistent, safe, and effective implementation of TTC measures. Based on review of the established federal and state standards, specifications, and regulations. Local agencies can further tailor these standards based on roadway classification, project complexity, and available resources. These layered requirements create a flexible framework for maintaining safety and mobility in work zones across varying project scopes and jurisdictions.

3.1. Federal Requirements

3.1.1. Manual on Uniform Traffic Control Devices (MUTCD) Requirements

The Manual on Uniform Traffic Control Devices (MUTCD) is the national standard published by the Federal Highway Administration (FHWA) which establishes uniform standards for the design, installation, and maintenance of traffic control devices (signs, signals, and pavement markings). The MUTCD focuses on ensuring road user safety, consistency, and predictability.

1. Primary Function of TTC (Paragraphs 02-04)
    - » Facilitate the movement of motorists, bicyclists, and pedestrians (including persons with disabilities) through or around TTC zones.
    - » Protect workers, responders, road users, and equipment while ensuring continuity of traffic flow and accessibility.
2. Safety and Accessibility (Paragraph 06)
    - » Ensure road user safety, worker safety, and traffic flow efficiency during all phases of planning and execution.
    - » Minimize disruption and vulnerability for all parties.

3. Suitability to Conditions (Paragraph 07)
    - Traffic control devices must be adapted to the specific roadway type, user conditions, activity duration, and work area proximity.
    - Example: Low-volume or low-speed roads may require minimal TTC, such as warning flashers or a single flagger.
4. Clear and Positive Guidance (Paragraph 10)
    - Traffic control devices must clearly guide all road users, including those with vision or mobility impairments, through the TTC zone using proper markings, signage, and channelization.
5. Removal of Devices (Standard, Section 6A.03, Paragraph 04)
    - All traffic control devices must be removed promptly when they are no longer needed. Devices not applicable to the current conditions (e.g., during work suspension) must be removed or covered.
6. TTC Plan Responsibility (Paragraph 11)
    - The public body, official, or private owners of roadways open to public travel are responsible for TTC plans and device implementation.
    - TTC plans must be detailed and adjusted as needed based on project complexity
7. Inspection and Monitoring (Section 6A.02, Paragraph D)
    - Trained personnel must routinely inspect Traffic control devices to ensure visibility, effectiveness, and compliance with TTC plans.
    - Traffic control devices should be adapted to changing conditions like traffic volumes, light, and weather.
8. Specialized Use of ITS (Paragraph 10)
    - ITS technologies such as variable speed limits, camera systems, and queue detection may enhance traffic monitoring, worker safety, and traffic flow in TTC zones.
9. Statutory and Enforcement Authority (Paragraph 12)
    - Jurisdictions must have sufficient statutory authority to enforce TTC plans, manage incidents, and regulate road user behavior.
10. General Principles for Traffic Control Devices (Section 6A.02)
    - Ensure minimal disruption to road users while prioritizing safety.
    - Provide adequate warning and delineation for TTC zones.
    - Flagging procedures and signage must offer clear guidance to users.
    - Provide safe and accessible routes for all users, including bicyclists, pedestrians, and persons with disabilities.

3.1.2. FHWA Requirements

FHWA requires adherence to MUTCD and Public Right-of-Way Accessibility Guidelines (PROWAG) unless a state adopts stricter guidelines and must meet additional federal regulations if federal funds are involved, such as environmental or accessibility standards.

1. **TMP Development, Implementation, and Assessment**: TMP is required for all Federal-aid highway projects. A full TMP document is not developed until design; however, conducting analyses during planning and preliminary engineering stages can help ensure that the TMP development and implementation costs are accounted for in project budgets. Federal guidelines provide a general TMP assessment process to classify the level of effort:
    - **Basic:** For minimal disruptions, only includes a TTC plan
    - **Intermediate:** Adding optional Transportation Operations (TO) and Public Information (PI) components for moderate impacts.
    - **Major:** For significant projects, includes TTC, TO, and PI components to address mobility, safety, and public communication

3.1.3. FHWA Work Zone Safety and Mobility Rule

The Work Zone Safety and Mobility Rule went into effect October 12, 2007. All state and local governments that receive federal-aid highway funding are required to comply with the provisions of this rule. Focus is placed on a state-level work zone policy approach that addresses increasing traffic and work zones while facilitating roadway user focused project development. The rule has three primary components, policy-level provisions, state-level processes and procedures, and project-level provisions.

Policy-Level Provisions: Partner with FHWA to develop and implement a policy for systemic consideration and management of work zone impacts. The policy should be structured as processes, procedures, or guidance, and tailored to each state's unique context while remaining responsive to specific project characteristics and anticipated work zone impacts.

State-Level Processes and Procedures: Establish consistent procedures for assessing and managing work zone impacts, utilizing safety and mobility data to monitor ongoing projects and evaluate performance across programs. Require personnel training and routine process reviews to enhance statewide work zone practices and operational outcomes.

Project-Level Provisions: Identify projects anticipated to cause sustained work zone impacts early in the development phase. Develop Transportation Management Plans (TMPs) including a TTC plan and where applicable, Transportation Operations (TO) and Public Information (PI) strategies. Appropriate TMP provisions must be reflected in the Plans, Specifications, and Estimates (PS&Es), with designated personnel assigned to oversee implementation and monitor safety and mobility.

3.1.4. FHWA Intelligent Transportation Systems Consideration

To address mobility needs on higher-volume corridors or significant projects, agencies may also consider integrating Connected Work Zone (CWZ) or ITS technologies as a complement to conventional TTC. The FHWA Work Zone Intelligent Transportation Systems Implementation Guide introduces several Connected Work Zone technology options and highlights the benefits of ITS in enhancing traffic safety, mobility, work zone efficiency, and public communication:

1. **Safety:** ITS enhances safety for travelers and workers by delivering real-time warnings about traffic queues, travel times, and construction vehicle activity. Automated systems like variable speed limits, incident management tools, and traffic law enforcement reduce crashes and improve incident response. For instance, a New Mexico work zone saw a 20-minute reduction in average incident clearance time, decreasing secondary crashes.
2. **Mobility:** ITS reduces travel delays by enabling dynamic route adjustments, departure timing, and lane management. Real-time traveler information in California prompted 19% of drivers to choose alternate routes, easing congestion. Facilities with significant commercial vehicle traffic particularly benefit from improved mobility.
3. **Work Productivity and Durability:** By streamlining operations, ITS minimizes the time and cost of work zone activities. Real-time traffic monitoring allows prompt lane closures, enhances material delivery efficiency, and supports higher-quality construction. Automated systems reduce manual interventions and provide data for performance evaluation, aiding traffic control planning and contractor accountability.
4. **Customer Satisfaction:** ITS fosters trust and satisfaction by delivering timely updates through various platforms, such as social media and websites. Improved communication helps drivers adjust to changing traffic conditions, as demonstrated by a Utah project that displayed comparative travel times to optimize route selection.

3.2. Colorado Requirements

Colorado requirements build on federal guidelines. Projects under government entity jurisdiction must comply with the M&S Standards, the Work Zone Safety and Mobility Procedure Document, and Colorado supplement of the MUTCD. All MHTs shall follow current government entity standards and specifications, MUTCD, and the Colorado Supplement to the MUTCD, and any other government entity ordinances. MHTs adhere to the appropriate CDOT Region Lane Closure Strategy unless a variance is granted through the Lane Closure Strategy process.

3.2.1. CDOT Work Zone Safety Guidelines Chief Engineer Memo

1. Originally issued in July 2012, this memo serves as a living document of work zone safety guidelines for maintenance staff and engineers.
2. It is regularly reviewed and updated to reflect new technologies, practices, and devices.
3. The goal is to continually improve the quality of work zone safety practices across the state.

3.2.2. CDOT Standard Specifications for Road and Bridge Construction

1. Section 630 defines the description, materials, construction requirements, method of measurement, and basis of payment for Construction Zone Traffic Control when furnishing, installation, moving, maintaining, and removing temporary traffic devices as required by the MUTCD.
2. All devices must comply with performance criteria from:
    - National Cooperative Highway Research Program (NCHRP) Report 350 (for devices developed before 2011); or
    - Manual for Assessing Safety Hardware (MASH) Implementation (acceptable for all devices, including newer designs).

3.2.3. CDOT's Connected Work Zone (CWZ) Considerations

On construction projects, CDOT may encourage using Connected Work Zones (CWZ) and SWZ devices to improve safety and mobility. Based on the project's scope and budget, CDOT has identified nine subsystems that can be applied to address specific traffic challenges within project limits.

CDOT has developed Connected Work Zone Pilot Project Special Provisions outline requirements for implementing Connected Work Zone technologies. These include standalone or connected devices to monitor traffic in real-time, enhancing safety and mobility.

Users must first utilize the SWZ Decision Tool to select appropriate systems and specifications, such as revised Section 630 device/system specifications. SWZ plans are discussed at preconstruction meetings, with weekly reporting requirements.

3.2.4. Colorado's Work Zone Best Practices Safety Guide

The state provides best practices based on the MUTCD and key considerations for hazard analysis, pre-job planning, and worker and traffic protection.

Within each of these sections reasonableness, scale, and tiered expectations are explored for various hazards, such as:

- Pedestrian access;
- Limited sight distance;
- Utilities;
- Law enforcement for both planning and security needs;

» Traffic control equipment and devices; and
» External and internal TCP.

3.2.5. CDOT Work Zone Safety and Mobility Rule Procedures Document

During project development (i.e., preliminary engineering), a project's potential work zone impacts should be assessed, and work zone transportation management strategies and associated costs should be identified.

The level of detail of this assessment may increase as more project-specific information becomes available. The TMP development process is intended to work in an iterative manner that helps identify the work zone impacts of a project, given a certain combination of construction phasing and impact management strategies. A significant project should be determined as government entities may define this as one project that, alone in or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts at a location for three or more consecutive days with intermittent or continuous lane closures.

TMP consists of three components for Significant Projects: TCP, TO, and PIP.

3.2.6. Expectations and Rule of Law for Colorado

Confusion can arise among local agencies and their staff regarding legal authority and liability related to work zone setup and traffic control.

The Colorado Revised Statue §42-4-614 defines the designation of highway maintenance, repair, or construction zones. Through this statute, (2) the Colorado Department of Transportation or other public entity shall designate a maintenance, repair, or construction zone by erecting or placing an appropriate sign in a conspicuous place before the area where the maintenance, repair, or construction activity is taking place or will be taking place within four hours.

§42-4-106 (6)(a) allows the department and local authorities within their respective jurisdictions to close through traffic temporarily, establish appropriate detours, or provide alternative routing as necessary for traffic safety and protection of work crews and road equipment. (c) allows entities to enter into agreements between the Department, local municipal authorities, and local county authorities for the establishment of signing and marking of appropriate detours and alternative routes.

This statutory framework reinforces that local agencies have both the authority and responsibility to manage traffic control in work zones and should ensure staff are trained and clear on the legal requirements when designating closures or detours.

4

Work Zone Safety and Mobility Rule

4.1. Overview of the Rule

The primary goal of the Work Zone Safety and Mobility Rule is to reduce crashes and congestion due to work zones. Implementing the Rule promotes consistency in road project planning and execution, leading to safer and more efficient work zone management. It fosters integrated transportation strategies, strengthens stakeholder coordination, and enhances performance monitoring. These improvements are expected to reduce work zone-related congestion and crashes, while increasing public satisfaction.

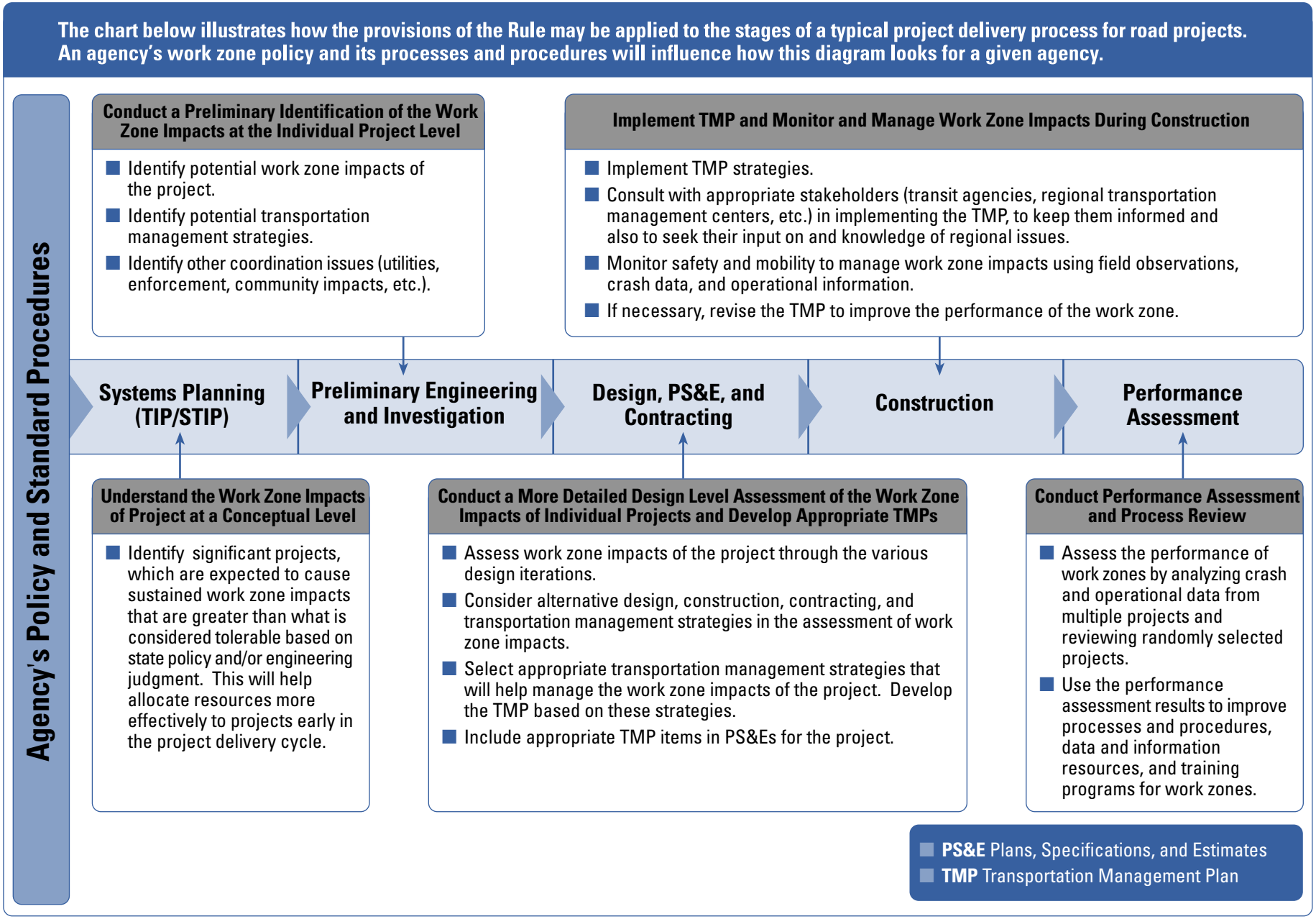
The rule takes a systematic approach to managing safety and mobility within work zones. Provides a flexible framework that accommodates varying project types and regional DOT priorities, it is organized into three main components: policy provisions, agency-level procedures, and project-level processes. The rule promotes continuous feedback among these levels to improve work zone practices, with policy guiding implementation and field performance informing ongoing refinement.

Figure 3 outlines a framework for applying the provisions of the rule to the project delivery process.

4.2. FHWA's Role in Implementation

- **Policy-Level:** Coordinate on implementing an overall work zone policy that best suits the needs of the agency.
- **Process-Level:** Coordinate with the agency in developing work zone processes and procedures, implementing them, and in conducting process reviews.
- **Project-Level:** Collaborate with the agency to identify significant projects, review Interstate System exception requests, and upon request assist in assessing work zone impacts and developing and implementing suitable TMPs.
- **Rule Implementation and Compliance:** Partner with the agency to implement, review, and periodically reassess its work zone policies and procedures for compliance with, and to integrate, the rule into stewardship agreements.

Figure 3. Applying the Rule to the Project Delivery Process



4.3. Work Zone Policy

Key components for agencies to consider when developing or revising a work zone safety and mobility policy include a clear vision, defined goals and objectives, and specific provisions for application during project delivery.

Vision: An overall policy statement articulates the agency's vision and commitment to systematically manage work zone safety and mobility, ensuring safe and efficient travel, worker protection, and construction quality.

Goals and Objectives: Strategic goals set the agency's work zone safety and mobility vision, and performance objectives guide actions to achieve those goals within defined time frames.

Specific Policy Provisions: Specific policy provisions, including processes, procedures, criteria or guidance, support and sustain the overall work zone policy. Agencies may adopt them as mandatory requirements or advisory guidance, tailored to their operating environments. Classification of projects based on expected work zone impacts enables agencies to apply policies and practices that are best suited to each type of project. Work zone performance standards/requirement set measurable safety and mobility targets that guide planning, design, and management to maintain consistency and minimize construction revisions. Policy guidance and agency processes and procedures institutionalize, streamline, and standardize work zone safety and mobility practices.

A work zone policy should also define key terms, identify stakeholders and team contacts, assign clear roles and responsibilities, designate primary contact persons, and establish exemption criteria and procedures. Work zone policy development and implementation typically falls to internal agency management, though agencies may collaborate when needed. Management level staff lead work zone policy development and implementation with technical and field support, guided by a multidisciplinary team of internal and external stakeholders, and informed by continuous feedback to keep the policy current.

The Work Zone Policy Process

Step 1: Develop the Policy

Agencies convene a multidisciplinary team—drawing from executive and technical management, planning, design, construction, maintenance, operations, and public information—to draft or update their work zone policy.

- Review any existing vision, goals, objectives, and policy provisions.
- Incorporate new Rule requirements (e.g., criteria for significant projects, TMP development).
- Identify emerging safety and mobility issues, technological advances, and agency priorities.

Step 2: Apply the Policy to Program Delivery

Roll out the policy across systems planning, project development, construction, operations, and maintenance by assigning clear roles, educating stakeholders, and embedding provisions into everyday tools.

- Assign policy implementation responsibilities to divisions and key positions.
- Train agency staff, contractors, consultants, and regional stakeholders on the policy and its provisions.
- Integrate policy language into manuals, standard procedures, drawings, and specifications.
- Foster coordination with external partners: FHWA, law enforcement, transit providers, local jurisdictions, and industry groups.

Step 3: Refine and Update the Policy

Use ongoing feedback and performance data to keep the policy effective, practical, and aligned with changing conditions.

- Collect input from internal teams (planners, designers, field staff) and external stakeholders (contractors, public, trade associations).
- Evaluate whether safety and mobility objectives are being met and if policy provisions are user-friendly in real projects.
- Identify gaps or outdated elements—such as emerging incident management strategies—and draft revisions.
- Establish a clear update process and designate the office or individual responsible for policy maintenance.

4.4. Agency-Level Processes and Procedures

The process element comprises agency-level procedures that institutionalize, streamline, and standardize work zone safety and mobility practices across program and project delivery, covering work zone assessment and management, data use, training, and process reviews. Work zone assessment and management procedures embed a structured framework into project development to identify and assess safety and mobility impacts, evaluate design alternatives, prioritize significant projects and resource allocation, select and implement management strategies, monitor and adjust during construction, and conduct post-construction performance assessments.

Procedures

Agencies should review and update existing work zone impacts assessment and management procedures to integrate new concepts and ensure effective practices throughout project development and delivery. The following work zone impacts assessment and management procedures illustrate key considerations for effective implementation:

- Tiered assessment procedures that vary in rigor and intensity based on expected project impacts;
- Criteria for identifying and categorizing significant projects;
- Triggers for evaluating specific project options and management strategies;
- Guidelines for developing TMPs according to impact categories or intensity;
- Monitoring protocols for TMP and work zone performance during construction; and
- Post-construction performance assessment procedures for continuous improvement.

Work Zone Data

Comparing predicted impacts with actual outcomes, work zone data enables performance assessments at both project and program levels and drives continuous process improvements. Under the rule, agencies must draw on existing field observations, crash records, and operational metrics to enhance safety and mobility during construction and to refine impact assessment procedures in project development.

Additional insights come from structured work zone reviews conducted in both daytime and nighttime conditions, which reveal specific concerns and evaluate the consistency of traffic control measures and mitigation strategies such as alternate route signing and ITS. Analysis of real-time and archived ITS data uncovers emerging safety and congestion trends, while police crash reports received through law enforcement agreements provide verified incident details and rapid notification. By integrating these data sources, agencies can optimize work zone procedures, improve outcomes, and respond swiftly to evolving challenges.

At the process level, agencies must aggregate work zone crash and operational data across projects to identify trends and systemic issues and drive policy or practice changes. Retaining this data supports post-construction evaluations, process reviews, and lessons learned that refine agency procedures. Work zone data systems should evolve iteratively, enhancing storage, adding elements, and integrating new sources like ITS as needs arise. Though maintenance requires effort, robust data resources are vital for spotting issues, tracking trends, and guiding improvements.

Training

All personnel involved in work zone planning, design, implementation, operation, inspection, and enforcement must receive role-specific training and, where applicable, formal certification (for example, flaggers and traffic control supervisors).

Agencies must ensure both internal staff and external partners (consultants, contractors) complete periodic training updates. Although agencies don't have to develop every course, they must establish and enforce training and certification requirements through contracts, procurement processes, and state engineering registration standards.

An effective work zone training program requires agencies to:

- Define target audiences and their core competencies;
- Inventory existing courses and develop agency-specific or trainer-focused modules to fill gaps;
- Schedule periodic refresher training and embed requirements in work-zone policy;
- Establish record-keeping, funding sources, and rollout timelines; and
- Ensure consultants, contractors, and other external partners meet the same standards.

Process Reviews

Periodic evaluations using agency-level data aggregation and targeted project reviews enable agencies and FHWA Division Offices to validate safety, mobility and overall performance, ensure compliance and address deficiencies. This dual track approach merges quantitative metrics and stakeholder feedback across project, local, regional, state and national scales and benchmarks results against established goals. Agency-level analysis uncovers trends and statistical clusters, while project reviews probe specific conditions, decision processes and traffic control effectiveness under varied scenarios such as day or night operations, different work types and durations, traffic patterns and management strategies. Insights from these assessments drive iterative updates to policies, procedures and practices, enhancing safety, mobility, efficiency and public satisfaction. Conducting process reviews may include the following action items:

- Assemble multidisciplinary team;
- Develop review objectives;
- Determine review methods;
- Conduct review;
- Analyze and interpret results;
- Develop inferences, recommendations, and lessons learned;
- Prioritize recommendations and lessons learned;
- Set performance objectives for next review; and/or
- Apply recommendations and lessons learned.

4.5. Significant Projects

A significant project is a project that a State or local transportation agency expects will cause a relatively high level of disruption.

Early classification of projects expected to produce significant work zone impacts enables agencies to allocate resources efficiently, improve coordination and scheduling, and secure funding for effective transportation management strategies while budget, sequencing and design decisions remain flexible, thereby enhancing outcomes and mitigating impacts. Agencies should flag significant projects during systems planning, when Statewide Transportation Improvement Programs (STIPs) and TIPs are drafted. At this stage, long-term (20–25 years) and short-term (2–6 years) system needs are assessed at statewide, regional, metropolitan and local levels through collaboration with agencies, stakeholders and the public. Because project details and impacts evolve during development, agencies must reconfirm each project's significance in later stages to ensure resources and management strategies remain properly aligned.

Project significance can be assessed using qualitative or quantitative approaches. Qualitative criteria rely on subjective judgment and often are the only option during systems planning when detailed data is lacking. Quantitative methods become practical for major projects or later design stages, using metrics such as expected delay, queue length and user cost. These metrics also let agencies reconfirm or adjust a project's classification as conditions evolve. Assessment of significant work-zone projects should consider three key areas:

1. **Project characteristics:** Type; scale (length, duration, cost, complexity); work scope and traffic control configuration (closures, lane reductions, crossovers, night operations); schedule; roadway classification; and context (urban, suburban, rural).
2. **Travel and traffic characteristics:** Traffic volumes and their hourly, daily and seasonal variations; vehicle mix; corridor function (commuter, tourist, freight or transit); access constraints such as shift change facilities or park and ride; special events; and weather impacts.
3. **Work zone impact characteristics:** Corridor and network effects including parallel routes and concurrent work zones; capacity changes; user cost and safety impacts; delay and travel time thresholds; effects on critical junctions (intersections, interchanges, railroad crossings, transit hubs); evacuation routes; and impacts on adjacent public and private properties (schools, hospitals, businesses, and residences).

Under the Rule, any Interstate project within a Transportation Management Area that involves continuous, or intermittent lane closures for more than three days is classified as significant. Agencies may request exceptions for projects with limited disruption, such as night or off-peak closures, minor maintenance, or when capacity greatly exceeds traffic volumes. Exception requests, whether on a per project or per category basis, are reviewed by the FHWA Division Office using qualitative or quantitative analyses to confirm the absence of sustained work zone impacts. The process for exception requests may include the following actions:

1. Assess the work zone impacts of the specific Interstate project or categories of projects using appropriate methods (qualitative, quantitative, or combination of both).
2. Compare the expected work zone impacts with the agency's policy provisions and determine whether the project is expected to have sustained work zone impacts.
3. If the project appears to meet the conditions for an exception, prepare an exception request and submit it to the FHWA Division Office. Blanket exceptions for certain categories of projects that meet certain criteria may be requested on an ongoing basis.
4. FHWA reviews the exception request.
5. Take appropriate action based on the results of the review—either reassess the impacts (go back to Step 1) or implement an appropriate TMP based on whether the exception request is approved or not.

4.6. Developing Transportation Management Plans

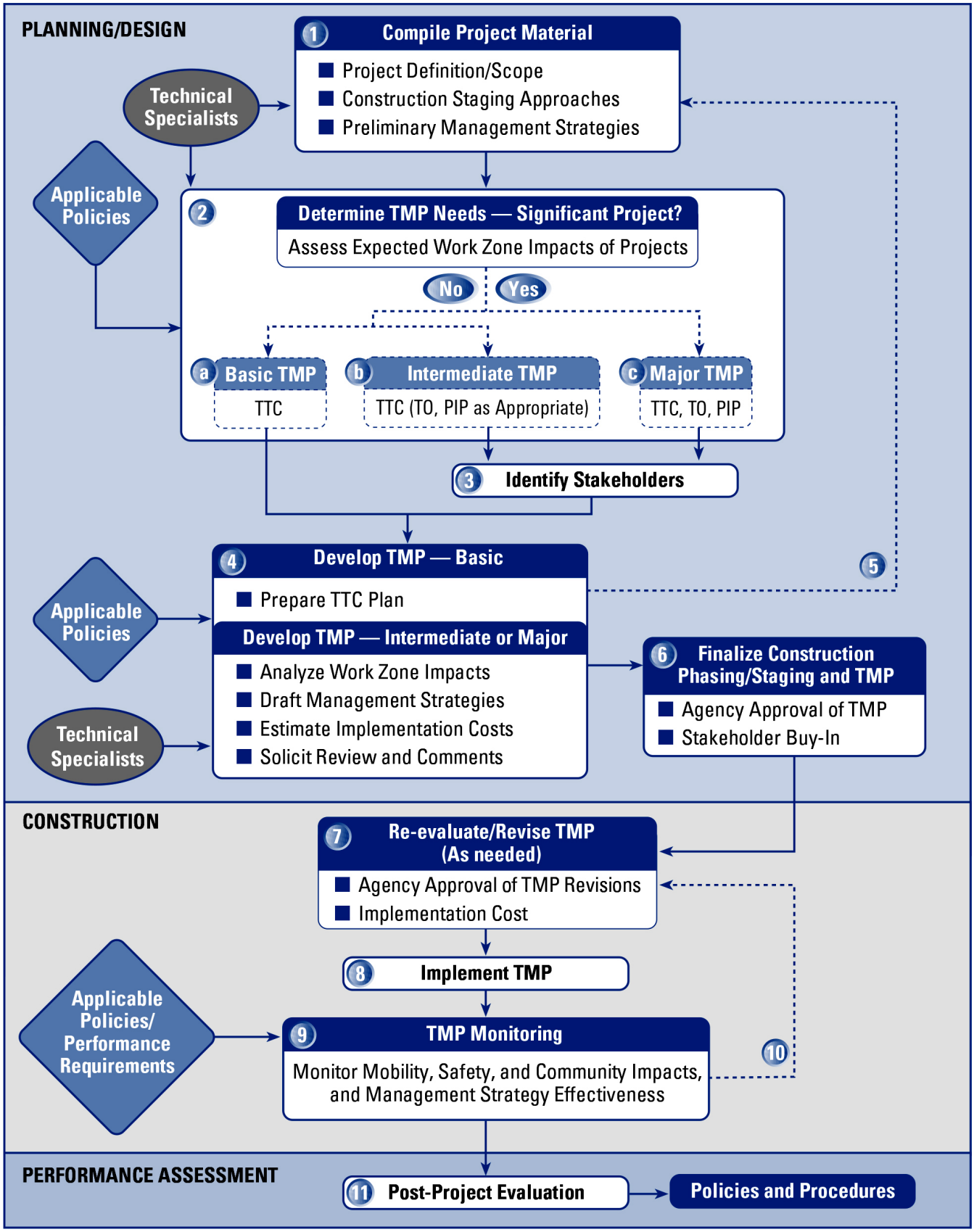
A TMP lays out a set of coordinated strategies and describes how these strategies will be used to manage the work zone impacts of a project. The scope, content, and level of detail may vary based on the agency's work zone policy and the anticipated work zone impacts of the project. The type needed for a project is based on whether the project is determined to be a significant project.

Two keys to a successful TMP:

- **Early planning:** Start TMP analysis in systems planning and preliminary engineering to secure budget, broaden mitigation options and select design alternatives that minimize work zone impacts.
- **Multidisciplinary collaboration:** Engage design, construction, traffic operations and stakeholder-outreach specialists to develop comprehensive, cross-disciplinary strategies.

Figure 4 outlines the steps for developing and implementing the TMP through the stages of the project.

Figure 4. TMP Development



TMP Components

The following guidance outlines potential TMP components. The choice of components, terminology and level of detail should align with project specifics, significance classification, agency policies and anticipated work zone impacts.

- **Introductory Material:** Cover page, Licensed Engineer stamp page (if required by the agency), table of contents, list of figures, list of tables, list of abbreviations and symbols, and terminology.
- **Executive Summary:** Overview of each of the TMP components.
- **TMP Roles and Responsibilities:** TMP manager, stakeholders/review committee, approval contact(s), TMP implementation task leaders (e.g., public information liaison, incident management coordinator, etc.), TMP monitoring, and emergency contacts.
- **Project Description:** Information such as project type, project background, project area/corridor, project goals and constraints, proposed construction staging, general schedule and timeline, and related projects.
- **Existing and Future Conditions:** For the project area, including data collection and modeling approach, existing roadway characteristics (history, roadway classification, number of lanes, geometrics, urban/suburban/rural), existing and historical traffic data (volumes, speed, capacity, volume/capacity, percent trucks, queue length, peak traffic hours), existing traffic operations (signal timing, traffic controls), incident and crash data, local community and business concerns/issues, traffic growth rates (for future construction dates), and traffic predictions during construction (volume, delay, queue).
- **Work Zone Impacts Assessment:** Depending on the type of TMP, could just be a qualitative assessment of the potential work zone impacts and the effect of the chosen management strategies; or a detailed analysis of the same, or both.
- **Work Zone Impacts Management Strategies:** For the mainline and detour routes by construction staging, including TC strategies, PI strategies, and TO strategies. Findings and recommendations.
- **TMP Monitoring Requirements:** TMP monitoring requirements and what the evaluation report of the TMP successes and failures should include:
  - **Contingency Plans:** Potential problems and corrective actions to be taken, standby equipment or personnel
  - **TMP Implementation Costs:** Itemized costs, cost responsibilities/sharing opportunities, and funding source(s)
  - **Special Considerations:** As needed
  - **Attachments:** As needed

Figure 5 and Figure 6 present a categorized, non-exhaustive list of work zone management strategies designed to minimize delays, enhance mobility and safety, speed up construction, and maintain access.

Figure 5. Temporary Traffic Control and Public Information Strategies

Temporary Traffic Control (TTC)			Public Information (PI)	
Control Strategies	**Traffic Control Devices**	**Project Coordination, Contracting and Innovative Construction Strategies**	**Public Awareness Strategies**	**Motorist Information Strategies**
■ Construction phasing/staging ■ Full roadway closures ■ Lane shifts or closures - Reduced lane widths to maintain number of lanes (constriction) - Lane closures to provide worker safety - Reduced shoulder width to maintain number of lanes - Shoulder closures to provide worker safety - Lane shift to shoulder/median to maintain number of lanes ■ One-lane, two-way operation ■ Two-way traffic on one side of divided facility (crossover) ■ Reversible lanes ■ Ramp closures/relocation ■ Freeway-to-freeway interchange closures ■ Night work ■ Weekend work ■ Work hour restrictions for peak travel ■ Pedestrian/bicycle access improvements ■ Business access improvements ■ Off-site detours/use of alternate routes	■ Temporary signs - Warning - Regulatory - Guide/information ■ Changeable Message Signs ■ Arrow panels ■ Channelizing devices ■ Temporary pavement markings ■ Flaggers and uniformed traffic control officers ■ Temporary traffic signals ■ Lighting devices	■ Project coordination - Coordination with other projects - Utilities coordination - Right-of-way coordination - Coordination with other transportation infrastructure ■ Contracting strategies - Design-build - A+B bidding - Incentive/ disincentive clauses - Lane rental ■ Innovative construction techniques (precast members, rapid cure materials)	■ Brochures and mailers ■ Press releases/media alerts ■ Paid advertisements ■ public information center ■ Telephone hotline ■ Planned lane closure web site ■ Public meetings/hearings ■ Community task forces ■ Coordination with media/schools/ businesses/emergency services ■ Work zone education and safety campaigns ■ Rideshare promotions ■ Visual information (videos, slides, presentations) for meetings and web	■ Traffic radio ■ Changeable Message Signs ■ Temporary motorist information signs ■ Dynamic speed message sign ■ Highway Advisory Radio (HAR) ■ Extinguishable signs ■ 511 traveler information systems (wireless, handhelds) ■ Freight travel information ■ Transportation Management Center

Figure 6. Transportation Operations Strategies

Transportation Operations (TO)			
Demand Management Strategies	**Corridor/Network Management Strategies**	**Work Zone Safety Management Strategies**	**Traffic/Incident Management and Enforcement Strategies**
■ Transit service improvements ■ Transit incentives ■ Shuttle services ■ Ridesharing/carpooling incentives ■ Park-and-ride promotion ■ High-occupancy vehicle lanes ■ Toll/congestion pricing ■ Ramp metering ■ Parking supply management ■ Variable work hours ■ Telecommuting	■ Signal timing/coordination improvements ■ Temporary traffic signals ■ Street/intersection improvements ■ Bus turnouts ■ Turn restrictions ■ Parking restrictions ■ Truck/heavy vehicle restrictions ■ Separate truck lanes ■ Reversible lanes ■ Dynamic lane closure system ■ Ramp metering ■ Temporary suspension of ramp metering ■ Ramp closures ■ Railroad crossings controls ■ Coordination with adjacent construction site(s)	■ Speed limit reduction/variable speed limits ■ Temporary traffic signals ■ Temporary traffic barrier ■ Movable traffic barrier systems ■ Crash-cushions ■ Temporary rumble strips ■ Intrusion alarms ■ Warning lights ■ Automated Flagger Assistance Devices ■ Project task force/committee ■ Construction safety supervisors/inspectors ■ Road safety audits ■ TMP monitor/ inspection team ■ Team meetings ■ Project on-site safety training ■ Safety awards/incentives ■ Windshield surveys	■ ITS for traffic monitoring/management ■ Transportation Management Center ■ Surveillance (Closed-Circuit Television, loop detectors, lasers, probe vehicles) ■ Helicopter for aerial surveillance ■ Traffic screens ■ Call boxes ■ Mile-post markets ■ Tow/freeway service patrol ■ Photogrammetry ■ Coordination with media ■ Local detour routes ■ Contract support for incident management ■ Incident/emergency management coordinator ■ Incident/emergency response plan ■ Dedicated (paid) police enforcement ■ Cooperative police enforcement ■ Automated enforcement ■ Increased penalties for work zone violations

4.7. Implementation and Compliance

Conformance Review and Reassessment

FHWA Division Office staff provide oversight and support for agency conformance. This may include reviewing agency work zone policies and procedures for consistency with the Mobility Rule, supporting development or revision of agency procedures, and periodically reassessing implementation. The specific approach to FHWA oversight may vary based on applicable Federal-aid oversight arrangements and whether the agency administers Federal-aid projects directly or through CDOT.

Agencies are required to conduct a work zone process review at least every two years to assess the effectiveness of their work zone safety and mobility procedures. Process reviews should consider available work zone information, including field observations, crash data, operational data, and lessons learned from completed and active projects. Reviews may include evaluation of agency-level work zone data, review of selected projects, or a combination of approaches. Appropriate agency personnel and FHWA should participate in the review, with other stakeholders included as appropriate. Findings should be used to identify opportunities for improvement in work zone policies, procedures, data and information resources, training, and practices for managing safety and mobility on future projects. Reviews may also consider the agency's procedures for identifying significant projects and developing and implementing appropriate TMP strategies.

Incorporation in Stewardship Agreement

Stewardship agreements define how State DOTs and FHWA share oversight of Federal-aid highway programs. They specify applicable laws, regulations, and procedures for planning and programming, finance and accounting, environmental compliance, right of way, design, construction, maintenance, project and program approvals, monitoring, review, and closeout. Work zone requirements can be integrated into the relevant sections of these agreements.


STOP
EAST
70

5

Local Agency Best Practices, Reasonableness, and Flexibility

The responsibility for traffic control lies with the local agency, whether work is being performed by agency staff or by a contractor. While federal guidelines provide the baseline for temporary traffic control (TTC), many agencies have not defined how these standards should be scaled or adapted to different types of projects. Most adopt either the MUTCD directly or a state-specific version, such as the Colorado Supplement. In addition, agencies like CDOT offer general guidance and communication protocols for project delivery—for example, the 2022 CDOT Local Agency Manual.

To support more consistent and effective implementation, CDOT's Work Zone Best Practices Safety Guide offers a range of strategies tailored to different risk levels and project types. Additionally, this chapter of the guide provides local examples and strategies to encourage agencies to conduct a risk based assessment to determine which response strategies are most appropriate for each situation.

Traffic modeling should be considered to evaluate forecasted operations and safety impacts associated with lane reductions and other work zone elements. Additionally, CDOT's "Standard Forms" should be reviewed alongside Traffic Control Plan (TCP) requirements to ensure comprehensive traffic maintenance during construction activities.

5.1. Reasonableness, Scale, and Risk Management

Decisions about what traffic control devices to use, and to what extent should be based on a field inspection and assessment of real-world conditions. These decisions should be adjusted as necessary based on safety, visibility, road conditions, and drivability, not just project scope. For example, on a low volume road, a simple setup using cones and portable signage may be sufficient, and the plan could be prepared and implemented by in-house maintenance staff or a TCS, depending on the agency's internal guidance. In contrast, high-volume or multi-lane roadways may require certified oversight, crash protection, detailed staging, or even modeling. FHWA's Work Zone Impacts Assessment outlines the steps involved work zone impacts assessment during work system planning.

Figure 7 outlines the steps to take a project from alternatives to preliminary engineering.

Step 1

Gather preliminary project information such as scope, traffic characteristics, policy requirements, and site constraints to quickly gauge potential work-zone impacts, flag any major issues or policy provisions, and determine whether in-depth data collection is needed for later traffic control strategy development.

Step 2

Conduct an initial, qualitative screening of each project alternative's work zone impacts, identifying likely construction and traffic control approaches, safety and capacity constraints, community and coordination issues, and the geographic extent of impacts to flag significant projects for more detailed traffic management planning.

Step 3

This optional step provides targeted quantitative analysis for projects, especially those flagged as significant or ambiguous, to measure and compare work-zone impacts (safety, mobility, societal, user costs), refine traffic-control strategies, and support funding or strategy-selection decisions.

Step 4

Conceptually identify appropriate work zone management strategies, including TTC, TO, PI, and coordination approaches, and develop high-level cost estimates to support programming, alternative comparison, and final selection.

Step 5

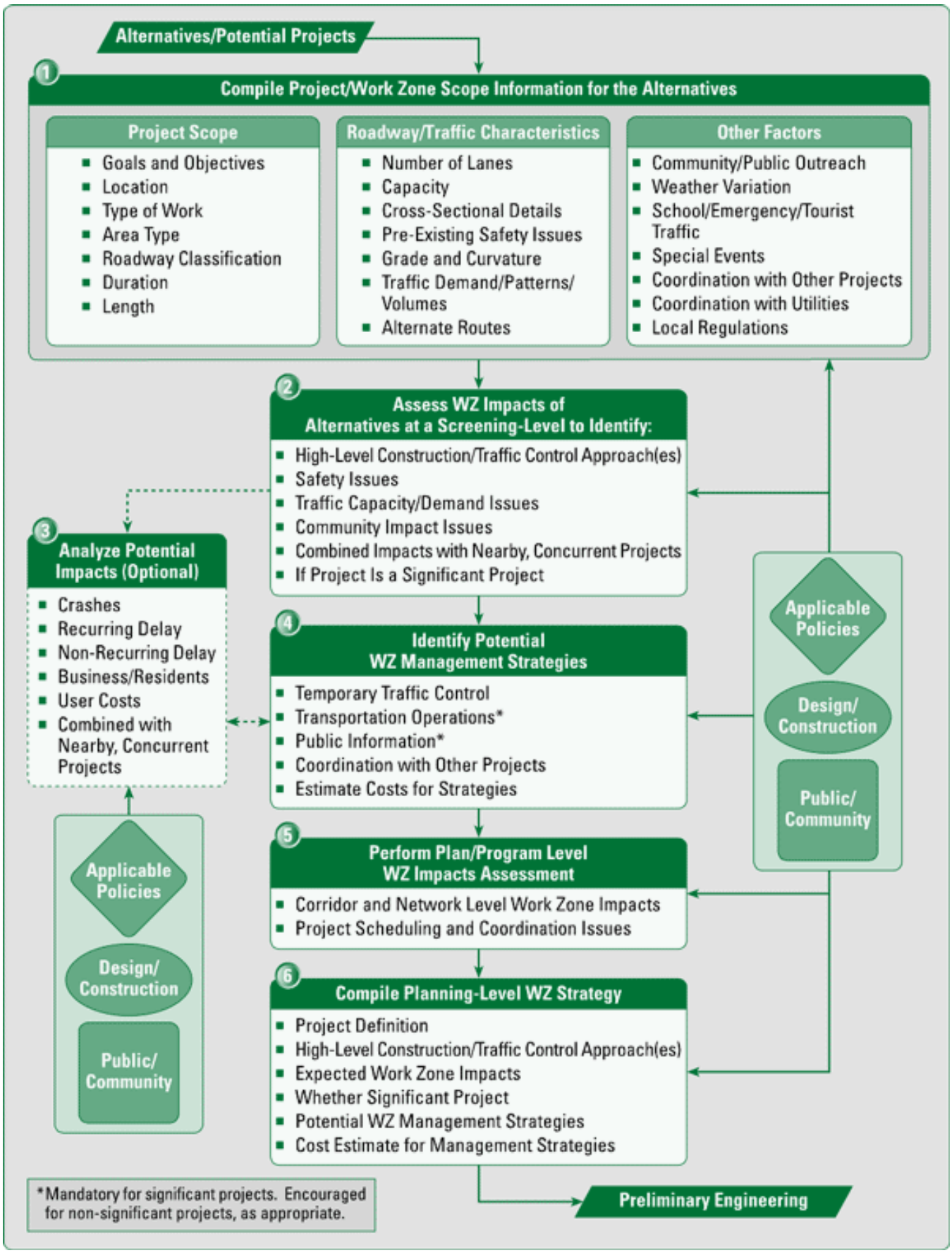
Assess combined work-zone impacts across all programmed projects, identifying interdependencies, scheduling conflicts, and aggregation opportunities, so that transportation plans can be adjusted, coordinated, and budgeted to minimize corridor and network level disruption.

Step 6

Compile the outputs of prior assessments into a planning-level work zone strategy defining project scope, anticipated impacts, management approaches, significant project status, and high-level cost estimates, to support budgeting, programming, and transition into design.

By applying principles of reasonableness, scale, and risk management, local agencies can tailor their traffic control approaches to the specific conditions and safety needs of each project. However, because project environments vary widely, such as low-volume rural roads to complex, high-speed arterials, establishing tiered expectations becomes essential. Tiered expectations provide a criteria to align the level of TCP based on functional classification and roadway context.

Figure 7. Construction Traffic Control Documentation Pre-Con Meeting Process



5.2. Tiered Expectations

Various agencies distinguish traffic control requirements based not only on functional classification (e.g., local, collector, or arterial), but also on roadway context such as speed limits, number of travel lanes, expected mobility demand, and accessibility needs. These criteria help determine the level of review, the scope of temporary traffic control (TTC), and whether enhanced technologies are appropriate. Key factors to be considered in tiering should include:

- **Functional Classification:** Higher functional classes like arterials typically require more formal review and stricter control measures.
- **Speed Environment:** Higher-speed roads demand longer taper lengths, more signage, and greater separation for worker safety.
- **Lane Count:** Roads with three or more lanes may require phased closures, crash protection, or detailed staging plans.
- **Accessibility:** Areas near schools, hospitals, or transit routes require TTC setups that ensure ADA compliance and safe pedestrian routing.
- **Mobility & Volume:** High traffic corridors, especially those serving freight or commuter flows, may benefit from traffic modeling and real-time traffic management tools.

5.3. Local Examples

The following section reviews local examples from various Colorado agencies and highlights how other municipalities tailor TCP, permitting, and implementation through their guidance documentation and standards.

5.3.1. City of Aurora

City of Aurora assigns different review requirements and allowable work hours based on road classification. Arterials and collectors are restricted to 8:30 a.m. to 3:30 p.m. and generally do not allow overnight or peak-hour closures. Aurora also provides TCP templates for local streets and alleys to simplify compliance and permitting for lower risk projects (City of Aurora, Public Improvement Permit Instructions, p. 1).

5.3.2. City of Boulder

City of Boulder requires a TCP prepared by a certified TCS for all right-of-way work. TCPs must include accommodation for all travel modes, including pedestrians, bicycles, and ADA users. Boulder typically restricts lane closures during peak hours on major arterials and requires that TTC devices meet MUTCD standards. Work cannot proceed without an approved plan (City of Boulder, Design and Construction Standard, p. 215).

5.3.3. Colorado Springs

Colorado Springs requires a certified TCS for work on roadways classified as major residential collectors and higher and may require engineered TCP drawings for arterials. In contrast, moving operations (under 30 minutes) may not require a permit but they must still follow MUTCD compliant setups (City of Colorado Springs, Work Zone Traffic Control Manual, p. 8).

5.3.4. City of Lakewood

The City of Lakewood restricts lane closures on arterials and collectors during peak commuting hours (7:00 to 9:00 a.m. and 3:30 to 6:00 p.m.) without special approval. The city provides standard TCP templates for different road types. Multilane street templates include peak hour restrictions and guidance on taper lengths and device spacing (City of Lakewood, Traffic Control Templates).

5.3.5. City of Greeley

The City of Greeley restricts work on arterials to 8:30 a.m. to 4:30 p.m. and may impose additional restrictions near schools. Through lane closures require arrow boards and certified on-site supervision for complex zones. Significant closures require at least 7 days of public notice and may include public outreach responsibilities (City of Greeley, Permitting Requirements for Activities within Public Space and/or Land Grading Activities, p. 9).

It is noted that some larger municipalities may develop their own supplement for transportation standards and detail, such as the City and County of Denver.

5.4. Scaling Your Project's TTC

The level of detail and complexity in a TMP should reflect the scope, duration, and potential impact of each project. Local agencies often face challenges in determining how much planning, coordination, and resources to devote to TTC—particularly when balancing limited staff and budgets with safety and mobility goals. This section provides guidance from FHWA's Work Zone Modeling and Simulation Guide for Decision Makers on how agencies can scale their TMP strategies appropriately based on the stage of the project as key stages in the decision-making process influence decisions on scheduling, application, and TMPs. To support locality planning, the following FHWA defined stages should be reviewed to help scale project needs on a locality basis:

1. **Planning Stage:** Involves identifying transportation needs and constraints, evaluating alternatives, and developing preliminary strategies. Key decisions focus on construction applications and scheduling, influenced by financial and institutional factors. At this stage:
    - Decisions are broad and exploratory.
    - Interactions between scheduling, applications, and TMP are high-level and tentative.
    - Analytical tools can assess feasibility early, balancing constraints like funding and mobility impacts.

2. **PE/Design Stage:** Refines decisions, narrowing options as designs progress. Final decisions on applications and scheduling shape TMP development. At this stage:
    - Scheduling becomes more detailed (e.g., project duration, start dates).
    - Interconnection between applications and scheduling constrains TMP options.
    - TMP details, like equipment placement and temporary traffic control, are defined.

3. **Construction Stage:** Decisions on applications and scheduling are primarily final, but adjustments may occur due to unforeseen circumstances. At this stage:
    - TMPs are implemented but can be adapted if required (e.g., contractor input, weather).
    - Collaboration between scheduling and TMP teams is critical to minimize traveler impact.
    - Flexibility is limited to avoid disrupting timelines or budgets.

5.5. Significant vs. Non-Significant Projects

To support more consistent application of TTC strategies, agencies should consider providing additional guidance on how to scale requirements based on whether a project is classified as significant or non-significant. Clear criteria and examples can help local agencies determine which elements of the TMP—such as TCP, PI, and TO—are necessary depending on project type, duration, and maintenance activity. Table 1 provides a breakdown of significant or non-significant projects so that resources are appropriately allocated without compromising safety or mobility. Table 2 and Table 3 breakdown the minimum requirements for different levels of TMP and how these items align based on example project types.

Analytical tools can also aid in determining a project's significance. They help determine if there is sufficient capacity to handle anticipated traffic volumes and assess the likelihood and timing of traffic queues. Additionally, these tools can predict the impact of projects on surrounding areas, such as alternative routes and local access points. These tools also aid in formulating and assessing work zone management strategies, including adjustments to allowable work hours during a project. The types of analytical tools include:

1. **Sketch-planning and Systems Planning Analysis Tools:**
    - **Travel Demand Modeling Tools:** Predict future travel demand based on various factors like population growth, economic conditions, and transportation policies, helping agencies plan capacity.
    - **ITS Deployment Analysis System (IDAS):** Evaluates the benefits and costs of deploying Intelligent Transportation Systems, assessing their impact on traffic flow and safety.
2. **Higher-level Project Impacts Analysis Tools:**
    - **Highway Capacity Manual (HCM)-based Tools:** Evaluate the capacity and level of service of various roadway types, providing detailed analysis of traffic operations under different conditions.
    - **QuickZone:** Estimates the delay and cost impacts of work zones, helping in the planning and management of construction impacts.
    - **QUEWZ:** Estimates traffic conditions with and without closures, and additional road user costs like travel time, vehicle operation, and excess emissions, as well as queuing impacts.
    - **Micro-BenCost:** Analyzes cost-benefit scenarios of transportation projects over time, considering impacts on road users.
3. **Operational-level Traffic Analysis and Simulation Tools:**
    - **VISSIM:** Models urban and freeway corridors, allowing detailed analysis of complex traffic scenarios and testing traffic management strategies.
    - **PARAMICS:** Provides detailed, animated visualizations of traffic flows, aiding in the assessment of various traffic conditions and management strategies.
    - **CORSIM and NETSIM:** Analyze traffic operations and control systems on highways and urban streets, providing insights into traffic dynamics and control effectiveness.

Table 1. Definition and Minimum TMP Requirements for Significant and Non-Significant Projects

	Traffic Control Plan	Public Information Plan	Traffic Operations
Significant Projects	**Required**	**Required** (The Project must obtain written approval from the FHWA to be exempt from this requirement)	**Required** Comply with the requirements of the project regions Lane Closure Policy (The Project must obtain written approval from the FHWA to be exempt from this requirement)
Examples	» MHTs » Road diet on major corridors » Detour plans impacting multiple jurisdictions	» Dedicated project website and branding (e.g., "I-25 South Gap Project") » Weekly construction updates via email/text » Public meetings and pop-ups in impacted communities » Coordination with news outlets and emergency responders	» Connected Work Zone deployment (queue detection, Dynamic Message Sign alerts) » Real-time traffic monitoring with Closed Circuit Television, Bluetooth readers, or Waze data » Coordination with Traffic Management Centers and incident response teams
Non-Significant Projects	**Required**	If any of the following characteristics applies, a PIP is **Required**: » High level of public interest » Significant impact on public/private access (e.g., businesses, communities, park-and-ride lots, schools, fire stations, etc.) » Project timing (e.g., special events, etc.) that will result in an increase in traffic volumes. If none of the above apply, PIP is **Optional**.	Must comply with the requirements of the project region's Lane Closure Policy[1]
Examples	» Shoulder closures for guardrail repair » Temporary flagging for tree trimming or utility pole replacement » Mowing operations with advance warning signs		» Lane closure tracking for compliance with region's Lane Closure Policy » Temporary signal turn-offs for maintenance » Use of portable message signs for local detour guidance

1 A full TO Analysis is required if the Region does not have a lane closure policy

Table 2. Minimum Requirements for Roadway Types

	Devices	Planning Tools
Basic TMP	» Cones » Delineators » Portable » Barricades, etc.	» Minimal traffic analysis or modeling required » Preapproved detour plans if road closures are necessary
Intermediate TMP	» Portable concrete/water-filled barriers » Arrow boards » Lane closures, etc.	» Basic traffic modeling tools (Synchro, HCS, etc.) are needed to assess delays and Level of Service » Outreach plans for public notifications, especially in urban areas
Major TMP	» Crash attenuators and truck-mounted attenuators » Variable Message boards » Police detail » Other smart systems (e.g., queue warning systems, speed enforcement devices, etc.)	» Basic traffic modeling tools (Synchro, HCS, etc.) or advanced traffic analysis (VISSIM, Transmodeler) are needed to assess delays and Level of Service » Coordination with agencies (e.g., Government entities, RTD, emergency services) » Comprehensive public information campaigns

Table 3. Scaled TMP Requirements by Roadway Type and Project Significance

		Typical Roadway / Project Type	Traffic Operation Planning tools	Traffic Control Plan Work Items	Public Information Plan	Examples
Non-Significant Project	Basic TMP	» Local streets » Short duration or low volume work zones	» Minimal traffic analysis » Pre-approved detour plans if needed	**Required** » Cones » Delineators » Portable barricades etc.	**Optional** » Required only if public interest or access is significantly affected	» Shoulder closure for guardrail repair » Flagging for tree trimming or utility pole replacement » Moving operations with advance signage
	Intermediate TMP	» Collector roads » Projects with lane closures, moderate delays, or work near sensitive land uses	» Basic modeling (Synchro, HCS) » Delay and Level of Service estimation	**Required** » Lane closures » Arrow boards » Water-filled barriers etc.	**Required if:** » Near businesses, schools, fire stations » Generates public concern or overlaps with events	» Lane closures on multi-block segments » Detours that change bus routing » Work requiring day-to-day public access impacts
Significant Project	Major TMP	» Arterials or significant regional corridors » High profile or multi-jurisdictional projects	» Lane closures » Arrow boards » Water-filled barriers	**Required** » Crash or truck-mounted attenuators » Police detail » Connected Work Zone systems » Variable message signs	**Required** » Dedicated communications (e.g., websites, text/email updates, pop-up outreach)	» Road diets on arterials » Projects requiring Connected Work Zones » Multi-day full closures impacting multiple jurisdictions (e.g., I-25 South Gap Project)

5.6. Flexibility and Field Changes

Decisions about what traffic control devices to use, and to what extent should be based on a field inspection and assessment of real-world conditions. As discussed in the previous section, these decisions should be adjusted as necessary based on safety, visibility, road conditions, and drivability, not just project scope.

The TCS and government entity project administrators inspect the job site to ensure the MHT is followed for each construction phase. If field changes are made to the Traffic Control setup, immediately update the MHT to reflect those changes accurately. All changes to any MHT must be approved through the normal chain of approval. Throughout the project, the work zone review and analysis should respond to new sources of risk that can be introduced by changes in conditions, changes in the scope of work, and phasing in the construction activity. Effective risk management can only be accomplished through continual reviews of conditions, planning, re-planning, and coordination.

The following are items that should be noted when considering field changes and changes to work zones:

1. Deviations from the Colorado M&S Standards and MUTCD typical examples shall be reviewed and approved by LTC OPS I (for Maintenance Projects) or the Project Engineer and Prime Contractor (for Engineering Projects) before implementation.
2. All projects shall adhere to the provisions of section 630.13 of CDOT's Standard Specification for Road and Bridge Construction for the removal of signs when conditions no longer require traffic control devices.
3. The LTC OPS I (for Maintenance Projects) or higher can approve any other speed reductions. Interstate and multi-lane freeways shall not lower speeds below 55 mph and all other highways shall not be lowered below 40 mph without Regional Traffic Engineer approval.
4. Full road closures require documentation from LTC OPS I or CDOT's Project Engineer to Regional Traffic for approval.
5. Design considerations should be reviewed to support work zone flexibility and a thorough understanding of potential impacts.

COLORADO
Department of Transportation

Appendix

1. LTAP Programs
2. CDOT Flagger Program
3. CDOT TCS Program
4. CDOT Field Guide on Installation and Removal of Temporary Traffic Control for Safe Maintenance and Work Zone Operations
5. CDOT Lane Closure Strategy
6. CDOT Work Zone Safety and Mobility Rule Procedures Document
7. CDOT Work Zone Safety Guidelines Chief Engineer Memo
8. CDOT Region Lane Closure Strategy
9. Connected Work Zone (CWZ) and Smart Work Zone (SWZ) Pilot Project Special Provisions
10. CDOT SWZ Decision Tool
11. CDOT Local Agency Manual
12. CDOT Standard Specifications for Road and Bridge Construction
13. CDOT M&S Standards
14. Denver Public Works Transportation Standards and Details for the Engineering Division
15. Colorado Work Zone Best Practices Safety Guide
16. Colorado Contractor's Association
17. Colorado Supplement to the Federal MUTCD
18. City of Aurora Public Improvement Permit Instructions
19. City of Boulder Design and Construction Standard
20. City of Colorado Springs Work Zone Traffic Control Manual
21. City of Lakewood Traffic Control Templates
22. City of Greeley Permitting Requirements for Activities within Public Space and/or Land Grading Activities
23. City and County of Denver Transportation Standards and Details for the Engineering Division
24. Western Colorado Contractors Association
25. National Safety Council
26. Manual of Uniform Traffic Control Devices (MUTCD)
27. FHWA TMP Development, Implementation, and Assessment
28. FHWA Work Zone Modeling and Simulation Guide for Decision Makers
29. FHWA Work Zone Intelligent Transportation Systems Implementation Guide
30. Public Right-of-Way Accessibility Guidelines

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