


Overview: The FHWA Rule on Work Zone Safety and Mobility led to the development and implementation of a Policy Directive, as well as new procedures, specification changes and training requirements.

Context: The overall goal of FHWA's work zone program is to "make work zones operate better" and reduce congestion and crashes due to work zones.

The rule is only one tool for helping to achieve this goal by fostering the use of good work zone management strategies.



Topics

- New Rule Overview
- Why Update The Rule?
- What Changed?
- New Requirements
- New CDOT Policies & Procedures

Topics that will be covered are shown.



New Rule Overview

- Updates and Broadens 23 CFR 630, Subpart J
- Applies to All State and Local Governments That Receive Federal-aid Highway Funding
- Focuses On State-level Work Zone Policy Approach
- Addresses More Current Work Zone & Mobility Issues
- Facilitates Customer-focused Project Development

The rule updates and broadens the former regulation on “Traffic Safety in Highway and Street Work Zones”.

All state and local governments that receive federal-aid highway funding are affected by this rule and are required to comply with the provisions of this rule to avoid possible forfeiture of federal construction funds.

It focuses on a state-level work zone policy approach to institutionalize work zone processes and procedures.

It broadens the regulation to address more of the current issues affecting work zone “safety” and “mobility.”

And it facilitates customer-focused project development that includes a comprehensive consideration of “work zone impacts.”




Why Update the Rule?

- Many of Our Roads Are Facing Growing Traffic Volumes And Congestion
- Our Highways Are Approaching Middle Age
- A Growing Portion of Rehabilitation Work Done Under Traffic
- Work Zone Safety Is A Concern
- Travelers Are Not Happy With Work Zones

The reasons behind FHWA updating the rule are all too familiar to all of us:

- **Many of our roads are facing growing traffic volumes and congestion, and we all know that there will be very little growth in road miles.**
- **Our highways are approaching middle age, so more construction and repair are needed, which means more work zones.**
- **A growing portion of this work is rehabilitation done under traffic, which means more traffic exposed to work zones and more workers exposed to traffic. It also means compressed contractor schedules and an increasing amount of night work.**
- **Of course, work zone safety is also a concern. In 2010, there were 576 fatalities in construction and maintenance zones nationally, a reduction of 259 compared to 2007. However, 11 of these 576 fatalities occurred in Colorado.**




What Changed?

- New Rule More Flexible
- Three Primary Components:
 - Implement A State-level Policy
 - Develop/Implement State-level Processes & Procedures
 - Develop/Implement Project-level Procedures

The rule was written to be flexible, taking into account different project types.

It has three primary components:

- **POLICY** – To implement a state-level policy for the systematic consideration and management of work zone impacts.
(Note: CDOT Policy affects all projects entered into SAP, beginning November 1, 2008)
- **PROCESS** – To develop and implement state-level processes and procedures to implement and sustain the work zone policy.
- **PROJECT** – To develop and implement project-level procedures to assess and manage work zone impacts of individual project.



What Changed?

Process-Level Provisions


- **Process Reviews**
 - **Former Rule -**
 - Required States to conduct an annual process review of selected projects
 - Required the results of the review to be forwarded to the FHWA Division Administrator
 - **Updated Rule -**
 - Changes the requirement to bi-annual reviews <http://www.coloradodot.info/library/traffic/traffic-manuals-guidelines/lane-close-work-zone-safety/work-zone-safety-mobility/CDOT-Process-Review-Report-070511.pdf/view>
 - Ultimate objective is to enhance efforts to address safety and mobility on current and future projects
 - Does not require that the results of the review be forwarded to the FHWA Division Administrator for approval

For Process Reviews, the former rule:

- **Required States to conduct an annual process review of selected projects (our Traffic Control Reviews) for the purpose of assessing the effectiveness of its procedures.**
- **Required the results of the review to be forwarded to the FHWA Division Administrator for review and approval of the State's annual traffic safety effort.**

The updated rule:

- **Changes the requirement from annual reviews to bi-annual reviews, but CDOT will continue with the annual Traffic Control Reviews.**
- **States that the ultimate objective of the process reviews is to enhance efforts to address safety and mobility on current and future projects.**
- **Does not require that the results of the review be forwarded to the FHWA Division Administrator for approval, but does encourage the DOT to include FHWA in the review.**
- **Requires a biannual process review (e.g. Mini QAR) of the overall program which Staff Traffic will develop in conjunction with FHWA.**



What Changed?

Project-Level Provisions


- Traffic Control Plan (TCP) vs. Transportation Management Plan (TMP)
 - Former Rule -
 - Required The Development Of TCPs For Projects
 - Recognized That TCPs May Vary In Scope
 - Updated Rule -
 - Requires TMPs To Be Developed And Implemented
 - Possible Components That Constitute A TMP
 - Based On Whether Project Is A Significant Project Or Not

The former rule:

- **Required the development of TCPs for projects.**
- **Recognized that TCPs may vary in scope from a very detailed TCP designed solely for a project, to a reference to standard plans, a section of the MUTCD, or a standard highway agency manual; and that the degree of detail in the TCP would depend on the project complexity and traffic interference with construction activity.**

The update rule:

- **Requires Transportation Management Plans (TMPs) to be developed and implemented for projects based upon the expected work zone impacts.**
- **The possible components that constitute a TMP are: the Temporary Traffic Control (TTC) plan, the Transportation Operations (TO) component, and the Public Information (PI) component.**
- **The distinguishing factor in the TMP requirements for different projects is based on whether a project is a significant project or not.**



New Requirements

Traffic Engineers

- Designate projects as Significant or Non-Significant

	TMP Components		
	TCP	PI	TO
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' <u>Lane Closure Policy</u> (The Project must obtain written approval from the FHWA to be exempt from this requirement)
Non-Significant Projects	Required	If ANY of the following characteristics applies, a PI is REQUIRED: <ul style="list-style-type: none"> <input type="checkbox"/> High level of Public Interest <input type="checkbox"/> Significant impact on public/private access (e.g. businesses, communities, park & ride lots, schools, fire stations, etc.) <input type="checkbox"/> Project timing (e.g. special events, etc.) that will result in an increase in traffic volumes If NONE of the above apply, PI is Optional	Must comply with the requirements of the project region's <u>Lane Closure Policy</u> ^a

A significant project is defined as one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts at a location for three (3) or more consecutive days with either intermittent or continuous lane closures.

A significant project impacts the traveling public at the metropolitan, regional or the Interstate level and has a moderate to very high level of public interest. It will directly impact a moderate to very large number of travelers and will have moderate to very high user cost impacts.

For significant projects, the TMP consists of three components: a Traffic Control Plan (TCP), Traffic Operations (TO), and Public Information (PI).

For individual projects or classes of projects that are not classified as significant, the TMP, at a minimum, will consist of a TCP. The TO and PI components are optional but should always be considered.



New Requirements

Design and Maintenance Personnel

- NHI Advanced Work Zone Management and Design Training
- Identify Congestion Mitigation Strategies
- Projects Requiring a TO Component
- Projects Requiring a PI Component
- TMP Approval & Modification

The training requirements for Design and Maintenance Personnel who design traffic control plans for federal-aid projects are listed here:

- **Take the NHI Advanced Work Zone Management and Design training by January 1, 2010.**
- **Identify congestion mitigation strategies based on the project constraints, costs, and construction phasing plan.**
- **Projects requiring a TO component must specify the TO strategies to be utilized on the project in the general notes and include all contract language, plan sheets, and specifications required to implement the selected strategies.**
- **Projects requiring a PI component must utilize the Public Information Services specification worksheet.**
- **TMPs must be approved by the CDOT project engineer prior to implementation.**

The consultant and/or project designer may re-evaluate or modify components of the TMP due to alternate construction phasing or other recommended work zone management strategies. All TMP modifications must be approved by the CDOT project engineer prior to implementation.



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New Requirements

Construction and Maintenance Personnel

- Designation of “Responsible Person”
- TMP Implementation & Work Zone Performance Monitoring
- Post-project Contractor Evaluation Report

Law Enforcement

- Safe & Effective Use of Law Enforcement Training

Added responsibilities for certain Construction and Maintenance Personnel include:

- **The Designation of a trained person by both CDOT and the contractor at the project level who has the primary responsibility and sufficient authority for implementing the TMP and other safety and mobility aspects of the project (see pg. 9 of WZSM Procedures document). This will normally be the CDOT project engineer/manager and the contractor’s superintendent.**
- **During construction, implementation of the TMP and the performance of the work zone must be continuously monitored (per CDOT Standard Specification 630.10) to verify that the predicted impacts closely resemble the conditions in the field. Adjustments shall be made to the TMP as necessary and documented (see p. 23 of WZSM Procedures document).**
- **Prior to project acceptance, the contractor shall submit a report that contains an evaluation of the TMP. The post-project evaluation report shall contain successes and failures, changes made to the TMP and the results of those changes, public input, actual versus predicted measures, cost for implementation of the strategies, and suggested improvements (per CDOT Standard Specification 630.09).**
- **Law Enforcement who work in work zones are required to show proof that they have taken the Safe and Effective Use of Law Enforcement that is available through LTAP or within CSP.**



New CDOT Policies & Procedures

- PD 805.0 Work Zone Safety & Mobility Policy
- Work Zone Safety & Mobility Rule Procedures
- Two Revised Specifications
- Two New Training Requirements

http://www.coloradodot.info/library/traffic/traffic-manuals-guidelines/lane-close-work-zone-safety/work-zone-safety-mobility/WZSM_Procedures.pdf/view

The good news is that CDOT had previously implemented the vast majority of the items included in the rule.

The processes and procedures that were revised or developed to attain full compliance were:

- PD 1502.0, the Work Zone Safety and Mobility Policy
- The Work Zone Safety & Mobility Rule Procedures document, which contains the information that CDOT personnel and our consultant and contractor partners need to comply with the new rule.
- Two specifications were revised, one outlining the use of Public Information Services, and another concerning the development of the Transportation Management Plan.

There are two new training requirements:

- Safe and Effective Use of Law Enforcement Personnel in Work Zones which Staff Traffic, CSP, FHWA, and the LTAP Center will rollout to law enforcement officers statewide.
- Advanced Work Zone Management and Design, which is an NHI course that many of our designers have already taken. Staff Traffic is working with CDOT's Office of Organizational Learning & Development to offer the course 1-2 times in 2009.

All of the above documents are available at the URL shown.



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**New FHWA Final Rule on
Temporary Traffic Control Devices**

**CDOT's Implementation of Updates to
23 CFR Section 630, Subpart K**

HQ Safety & Traffic Engineering Branch

The image is a presentation slide with a blue background. On the left side, there is a vertical strip of four photographs showing various traffic control scenarios: a construction site at night with orange lights, a truck with traffic cones, a road with a large yellow sign, and a road with orange cones. At the top left of this strip is the DOT logo. The main text is centered on the right side of the slide.

This is the overview of subpart K of the new rule. The rule was issued in response to SAFETY-LU, Section 1110 Requirements.



SAFETEA-LU Section 1110 Requirements

Mandates rulemaking to establish conditions for appropriate use of, and expenditure of funds for:


1. Positive protective measures between workers and traffic;
2. Uniformed law enforcement officers;
3. Installation & maintenance of temporary traffic control devices

Mandates separate pay items in contracts to ensure projects include costs for these safety measures when the measures are necessary

The purpose of the rule is shown and emphasizes:

- **Positive protection between workers and motorized traffic..**
- **Uniformed law enforcement officers, and..**
- **Installing and maintaining temporary traffic control devices during construction, utility and maintenance operations.**

These items shall be funded as separate pay items in contracts.



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Work Zone Policy

The policy and guidelines established under Subpart K include consideration of road user and worker safety by addressing:

- Use of positive protection devices to prevent intrusions;
- Exposure control measures to minimize exposure;
- Other traffic control measures to minimize crashes;
- Safe entry/exit of work vehicles and equipment onto/from the travel lanes

The guidelines address safety with strategies that include the following:

- **Use positive protection to prevent motorist intrusions. Positive protection use shall be based on an engineering study (not necessary for every project).**
- **Consider exposure control measures to avoid or minimize exposure for workers and motorists.**
- **Other traffic control measures should be considered to reduce work zone crashes, risks and consequences of intrusions into the work space.**
- **Safe means for work vehicles and equipment to enter and exit traffic lanes, and for the delivery of construction materials to the work space should be addressed at the project level.**




Positive Protection

- Positive Protection can reduce risk to workers and travelers with the use of devices, which contain and redirect vehicles
- Use **shall** be based on an engineering study
- An engineering study **may** be used to develop positive protection guidelines, or to determine appropriate measures for an individual project
- The engineering study **should** be based on consideration of factors and characteristics

What is positive protection?

- **It is a strategy to reduce the risk to workers. A typical example is concrete barrier. You have to weight the cost and benefits. If it's a short-term project, it may not be warranted to have concrete barrier, as the installation of barrier may increase exposure between workers and motorists; whereas on a long-term project, concrete barrier is a must!**
- **Use of positive protection is to be based on an engineering study, but not necessarily for each project. An engineering study may be used to develop positive protection guidelines for an agency. Thus, the strategies and devices to be utilized may be determined by a project-specific engineering study or determined from agency guidelines that define strategies and approaches to be used, based on project and highway characteristics and factors.**




Positive Protection

Factors and Characteristics to Consider:

1. Project scope and duration;
2. Anticipated traffic speeds through the work zone;
3. Anticipated traffic volume;
4. Vehicle mix;
5. Type of work (as related to worker exposure and crash risks);
6. Distance between traffic and workers, and extent of worker exposure;
7. Escape paths available for workers to avoid a vehicle intrusion into the work space;
8. Time of day (e.g., night work);

Factors and characteristics to consider when using positive protection. Always look to your peers and Region personnel for new strategies or common standards that you should consider. At a minimum, you should consider:

- 1. Project scope and duration.**
- 2. Anticipated traffic speeds through the work zone.**
- 3. Anticipated traffic volume.**
- 4. Vehicle mix.**
- 5. Type of work.**
- 6. Distance between traffic and workers, and extent of worker exposure.**
- 7. Escape paths available for workers to avoid a vehicle intrusion into the work space.**
- 8. Time of day (night time, twilight, etc.)**




Positive Protection

Factors and Characteristics to Consider :

9. Work area restrictions (including impact on worker exposure);
10. Consequences from/to road users resulting from roadway departure;
11. Potential hazard to workers and road users presented by device itself and during device placement and removal;
12. Geometrics that may increase crash risks (e.g., poor sight distance, sharp curves);
13. Access to/from work space;
14. Roadway classification;
15. Impacts on project cost and duration; and
16. Roadside hazards that remain in place overnight or longer.


Other factors and characteristics to consider include:

- 9. Work area restrictions**
- 10. Consequences from/to road users resulting from roadway departure.**
- 11. Potential hazard to workers and road users presented by device itself and during device placement and removal.**
- 12. Geometrics that may increase crash risks, such as poor sight distance, sharp curves, and other obstructions.**
- 13. Access to/from work space.**
- 14. Roadway classification.**
- 15. Impacts on project cost and duration.**
- 16. Roadside hazards that remain in place overnight or longer.**




Positive Protection Devices

Use of positive protection shall be considered where workers are at increased risk from traffic and where positive protection devices offer the highest potential for increased safety



You shall ALWAYS consider using positive protection on your projects. SAFETY FIRST!



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Positive Protection Devices

Examples of positive protection devices:

- Barrier
- Truck Mounted Attenuators (TMA's)
- Intrusion Alarms
- Mobile Barrier
- Flagger Paddles with Air Horns
- Personal Alarms

Examples of positive protection devices include:

- **Concrete or water-filled barrier.**
- **TMA's protect errant vehicles from entering the work zone.**
- **Intrusion Alarms, like those that sit on cones; emit an alarm when cones tip over.**
- **Mobile Barrier are currently being used by Maintenance and are ideal for mobile operations when doing shoulder work.**
- **Flagger Paddles with Air Horns may be used for a way for flaggers to warn other workers of possible dangers.**
- **Personal Alarms are similar to the old-fashion beepers that simultaneously warn all workers of possible dangers.**



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Exposure Control Measures

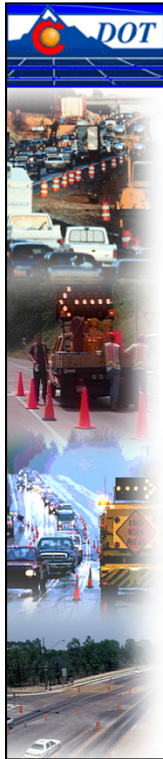
Exposure control measures **should** be considered to avoid or minimize exposure for workers and road users

- Full road closures
- Ramp closures
- Median crossovers
- Full or partial detours or diversions
- Protection of WZ setup and removal using rolling road blocks
- Performing work at night or during off-peak periods
- Accelerated construction techniques

Exposure control is also a way to increase safety. One good example is full road closures; where in some cases, the public may prefer a two-month closure versus a 12-month phased construction project. It is important to do your homework and work with your Public Information Office when considering closures or detours.

Other exposure control measures include:

- **Ramp closures.**
- **Median crossovers.**
- **Full or partial detours or diversions.**
- **Protection of WZ setup and removal using rolling road blocks.**
- **Performing work; night or off-peak periods.**
- **Accelerated construction techniques.**




Other Traffic Control Measures

Other traffic control measures **should** be considered to reduce WZ crashes and risks and consequences of intrusions into the work space.

1. Effective, credible signing;
2. Changeable message signs;
3. Arrow panels;
4. Warning flags and lights on signs;
5. Longitudinal and lateral buffer space;
6. Trained flaggers and spotters;
7. Intrusion alarms;
8. Rumble strips;
9. Pace or pilot vehicle;
10. High quality work zone pavement markings and removal of misleading markings;

Some traffic control to consider include:

- 1. Effective and credible signing.**
- 2. Changeable message signs.**
- 3. Arrow panels.**
- 4. Warning flags and lights on signs.**
- 5. Longitudinal and lateral buffer space.**
- 6. Trained flaggers and spotters.**
- 7. Intrusion alarms.**
- 8. Rumble strips.**
- 9. Pace or pilot vehicles.**
- 10. High quality work zone pavement markings and removal of misleading markings.**



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Other Traffic Control Measures (continued)

11. Channelizing device spacing reduction;
12. Longitudinal channelizing barricades;
13. Work zone speed management (including changes to the regulatory speed and/or variable speed limits);
14. Law enforcement;
15. Automated speed enforcement (where permitted by State/local laws);
16. Worker and work vehicle/equipment visibility;
17. Worker training;
18. Public information and traveler information; and
19. Temporary traffic signals.

Other traffic control measures to consider include:

- 11. Channelizing device spacing reduction.**
- 12. Longitudinal channelizing barricades.**
- 13. Work zone speed management.**
- 14. Law enforcement.**
- 15. Automated speed enforcement, where allowed by state and/or local laws.**
- 16. Worker and work vehicle, or equipment, visibility.**
- 17. Worker training.**
- 18. Public information and traveler information, and**
- 19. Temporary traffic signals.**




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Uniformed Law Enforcement

Each agency, in partnership with the FHWA, **shall** develop a policy addressing the use of uniformed law enforcement on Federal-aid highway projects. The policy may consist of processes, procedures, and/or guidance.

As a result, CDOT worked with FHWA to develop Policy Memo 30 – Utilization of Law Enforcement in Work Zones

- **Basic interagency agreements between the highway agency and appropriate law enforcement agencies to address work zone enforcement needs;**
- **Guidelines for interaction between highway and law-enforcement agency during project planning and development;**
- **Conditions where law enforcement involvement in work zone traffic control may be needed or beneficial, and criteria to determine the project-specific need for law enforcement;**
- **General nature of law enforcement services to be provided, and procedures to determine project-specific services;**
- **Appropriate work zone safety and mobility training for the officers, consistent with the training requirements in 23 CFR 630.1008(d);**
- **Procedures for interagency and project-level communications between highway agency and law enforcement personnel, and**
- **Reimbursement agreements for law enforcement services.**



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Uniformed Law Enforcement

- In general, the need for law enforcement is greatest on projects with high traffic speeds and volumes, and where the work zone is expected to result in substantial disruption to or changes in normal traffic flow patterns.
- Specific project conditions should be examined to determine the need for or potential benefit of law enforcement.
- Another aspect of law enforcement is to determine whether active or passive enforcement is best for your work zone.

- **The greatest need for law enforcement is on projects with high traffic speeds and volumes, and where the work zone is expected to cause substantial interruptions or changes in normal traffic flow patterns.**
- **Project conditions should be examined....**
- **Another aspect of law enforcement is to determine whether active or passive enforcement is best suited for your work zone.**



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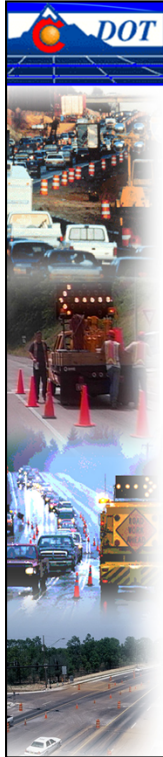
Uniformed Law Enforcement

Factors to be considered when determining the need for active law enforcement include:

- Nighttime operations that create traffic safety risks for workers and road users;
- Operations requiring a slow down or brief stoppage of traffic in one or both directions;
- High-speed roadways where sudden traffic queuing is anticipated;
- Traffic control setups or removals that present significant potential risks to workers and road users;
- Frequent worker presence adjacent to high-speed traffic without positive protection devices;
- Other work site conditions where traffic presents a high risk for workers and road users, such that the risk may be reduced by improving road user behavior and awareness.

Here are factors that should be considered when looking to include law enforcement on the project:


- **Nighttime operations that create traffic safety risks for workers and road users.**
- **Operations requiring a slow down or brief stoppage of traffic in one, or both, directions.**
- **High-speed roadways where sudden traffic queuing is anticipated.**
- **Traffic control setups or removals that present significant potential risks to workers and road users.**
- **Frequent worker presence adjacent to high-speed traffic without positive protection devices.**
- **Other work site conditions where traffic presents a high risk for workers and road users, such that the risk may be reduced by improving road user behavior and awareness.**



Work Vehicles and Equipment

The agency processes, procedures, and/or guidance established under Subpart K should also address safe means for work vehicles and equipment to enter and exit traffic lanes and for delivery of construction materials to the work space, based on individual project characteristics and factors.

CDOT's guidance with respect to work vehicles and equipment is addressed in CDOT Specification 630.09, and guidance is available ATSSA's Field Guide on Installation and Removal of Temporary Traffic Control for Safe Maintenance and Work Zone Operations, that can be found at the CDOT's WZSM website.




Payment

- Payment for traffic control features and operations **shall** not be incidental to the contract, or included in payment for other items of work not related to traffic control and safety
- Separate pay items **shall** be provided for major categories of traffic control devices, safety features, and WZ safety activities
- For method-based specs, unit price pay items, lump sum pay items, or a combination thereof may be used
- Specs should include provisions to require and enforce compliance with implementation and maintenance of the project TMP and related traffic control items


CDOT utilizes pay items contained in our Specifications, NOT lump sum items.

A TCS helper specification is now available for those projects who may need the additional personnel.



Quality Guidelines

- Each agency shall develop and implement quality guidelines to help maintain the quality and adequacy of the temporary traffic control devices for the duration of the project
- A level of inspection necessary to provide ongoing compliance with the quality guidelines shall be provided



With regard to guidelines governing the quality of temporary traffic control devices, CDOT uses PD 1505.1 to enforce MUTCD standards, specification 630.08 (general) and employs ATSSA's Quality Standards for Work Zone Traffic Control Devices.




In Summary

Rule specifically addresses:

- Appropriate consideration of positive protection devices, exposure control measures, and other traffic control measures in order to help reduce WZ fatalities and injuries.
- A policy addressing the use of uniformed law enforcement on Federal-aid projects.
- Specifications for appropriate payment and quality assurance for necessary safety features.
- Quality guidelines, along with appropriate level of inspection.

In summary, the Rule addresses:

- **Appropriate consideration of positive protection devices, exposure control measures, and other traffic control measures in order to help reduce work zone fatalities and injuries.**
- **A policy addressing the use of law enforcement on Federal-Aid projects.**
- **Specifications for appropriate payment and quality assurance for necessary safety features.**
- **Quality guidelines along with appropriate level of inspection.**



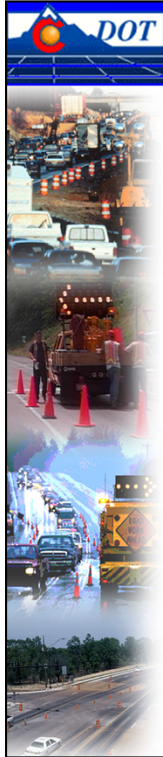
CDOT Policies & Procedures

- Policy Memo 30 – Utilization of Law Enforcement in Work Zones
- Guidelines for the Use of Positive Protection in Work Zones
- Two Revised UTC Worksheets
- Photo Radar in Work Zones

http://www.coloradodot.info/library/traffic/traffic-manuals/guidelines/lane-close-work-zone-safety/work-zone-safety-mobility/CO_Guidelines_Positive_Protection_122809.pdf/view

Here is a summarized list of CDOT Policies and Procedures developed in support of this Rule:

- **Policy Memo 30**
- **Guidelines for the use of positive protection in work zones.**
- **Revised UTC Worksheets**
- **Photo Radar in work zones.**



Questions?

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