



Guidelines



on
Use of Law
Enforcement
in
Work Zones



This document summarizes available guidance on the use of law enforcement in work zones. Work zone law enforcement can improve both traffic and worker safety by reducing speeding, speed variability, and undesirable driving behaviors such as tailgating and unsafe lane changes. Federal regulations (23 CFR 630 Subpart K) require all State highway agencies to have a policy in place regarding enforcement use in work zones on Federal-aid projects.

This document is organized into the following sections:

- Types of Work Zone Enforcement
- Deciding When and Where to Use Enforcement in Work Zones
- Deciding Where to Deploy Enforcement Within the Work Zone
- Recommended Stationary Enforcement Positions
- Recommended Enforcement Positions
- Administrative Considerations of Work Zone Enforcement
- Other Enforcement Considerations During Work Zone Planning and Design

Refer to <http://www.workzonesafety.org> for a copy of this document.

Guidelines on Use of Law Enforcement in Work Zones

Many agencies use law enforcement to improve traffic safety in certain work zones. Work zone law enforcement is very effective in reducing speeding, speed variability, and undesirable driving behaviors such as tailgating and unsafe lane changes, which improves both traffic and worker safety. The presence of work zone enforcement is also believed to raise driver awareness and overall level of alertness, further improving work zone safety. The provision of enforcement at a work zone does not eliminate the need for standard advance warning signs or other traffic control devices. Furthermore, law enforcement officers face many of the same types of hazards that highway workers face out on the roadway.

In many jurisdictions, normal enforcement agency funding and manpower are not sufficient to provide all the desired work zone enforcement. Highway agencies and/or contractors can typically supplement normal enforcement efforts through overtime employment of off-duty officers. However, such usage must be properly administered to ensure that it meshes with normal enforcement activities, that adequate funding for supplemental enforcement is in place, that the right work zones receive the enforcement (not all work zones need or will benefit significantly from enforcement), and that the work zone strategies used are appropriate for the type of work zone and hazards present. The information provided in this guide can help an agency develop or improve its policy and procedures regarding the use of law enforcement in work zones.

Background

Federal regulations do not require law enforcement in all work zones. However, Federal regulations (23 CFR 630 Subpart K) do require all State highway agencies to have a policy in place regarding enforcement use in work zones on Federal-aid projects. As stated in the regulation, a state's policy should address the following key points:

- basic interagency agreements between the highway agency and appropriate law enforcement agencies to address work zone enforcement needs;
- methods of 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;
- work zone safety and mobility training required for the law enforcement officers;
- procedures for interagency and project-level communications between highway agency and law enforcement personnel; and
- reimbursement agreements for law enforcement service.



Funds for the reimbursement of services of uniformed law enforcement in work zones may be included in the construction contract or be provided by direct reimbursement from the highway agency to the law enforcement agency. When payment is included through the construction contract, the contractor reimburses

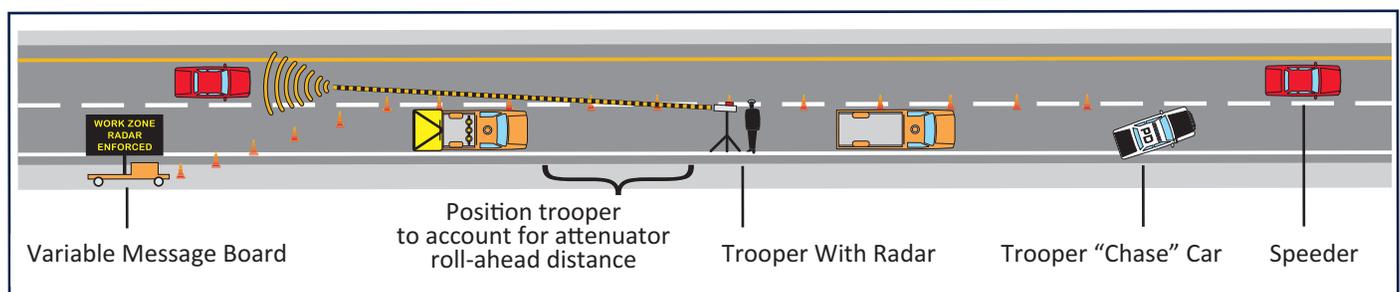
the law enforcement agency directly and recovers those costs through contract pay items. Those items may be either unit price or lump sum payments. When direct interagency reimbursement is used, the reimbursement may be made on a project-specific basis or on a program-wide basis that considers the overall level of services to be provided by the law enforcement agency.

Types of Work Zone Enforcement

Agencies use enforcement personnel and vehicles in several ways in a work zone. Officers can provide active enforcement support, identifying and pursuing traffic law violators in or around the work zone and then issuing citations. Enforcement personnel and vehicles can also calm traffic by simply being present at the work zone, sitting on the side of the road near the work area, or driving back and forth through the work zone. In some work zones, officers are needed temporarily to control traffic at an intersection or driveway. Finally, incidents that occur in a work zone may require officers to serve an emergency response role. Normally, active enforcement and enforcement presence (traffic calming) are used most commonly in work zones.

Enforcement agencies employ a variety of techniques in work zones, depending on the needs and goals of the highway agency, enforcement agency, and contractor/field crews. Some of the most popular techniques are summarized below.

- **Stationary enforcement** — Stationary enforcement techniques where the officer and vehicle are parked on the shoulder or other area near the travel lanes are frequently used in or upstream of work zones. Typically, stationary enforcement will reduce average freeway speeds by 5 to 7 mph within one mile downstream of the enforcement vehicle and officer. Consequently, it is common to position an officer and vehicle a short distance upstream of where a speed reduction and improved driving behavior is desired, such as adjacent to workers located in or next to a travel lane. However, the exact amount of speed reduction at any location can be higher or lower than this, depending on site characteristics and other factors. Speed variability is also typically reduced.
- **Enforcement “packs”** — Pack enforcement uses one enforcement vehicle (marked or unmarked) and an officer positioned in a work zone to identify traffic law violators. The officer then calls out descriptions and license plate numbers of traffic law violators to one or more officers at a downstream location for apprehension and citation. This technique maintains a constant speed reduction and traffic calming effect of upstream enforcement presence while the active enforcement efforts downstream contribute to a lasting change in driving behavior. Some states have modified this approach by “camouflaging” a law enforcement officer with a flagger vest and positioning the officer within the work area on or near work equipment with a speed-measuring device (such as a LIDAR gun). The camouflaged officer identifies a violator and communicates the vehicle description and license plate to officers stationed downstream of the work zone who apprehend and cite the vehicle. This strategy is referred to as an “Operation Hard Hat” or “Operation Yellow Jacket” initiative by some agencies. The following figure illustrates how the initiative is deployed in New York.



Operation Hard Hat Deployment in New York

- **Traffic queue warning** — Another example of stationary enforcement use in work zones is to position the officer in a vehicle with its lights flashing approximately 0.25 miles upstream of lane closures where traffic queues are anticipated. The enforcement vehicle and officer serve a traffic-calming and attention-getting function to reduce the likelihood of high-speed rear-end crashes at the upstream end of the queue. Although considered a stationary enforcement technique, the officer does move the vehicle along the shoulder as needed to remain approximately 0.25 miles upstream of the queue if it grows or dissipates over time.



- **Police officer traffic calming** — In some work zones, officers are positioned outside of their vehicles standing near the work activity to reduce speeds and calming traffic. This might occur, for example, if there is not a convenient place to locate the enforcement vehicle near the work activity. The officer does not perform specific traffic control duties. Rather, the officer establishes eye contact with each driver and uses non-verbal communication techniques such as the “slow down” flagger hand signal with the approaching driver to reduce speeds and improve driver behavior past the work space. Federal regulations require law enforcement personnel, when positioned outside of their vehicles, to wear high-visibility safety vests meeting the performance requirements of the American National Standard for High-Visibility Public Safety Vests (ANSI/ISEA 207-2006) or American National Standard for High-Visibility Safety Apparel and Headwear (ANSI/ISEA 107-2004) whenever they are within a temporary traffic control zone.
 - **Circulating enforcement** — Circulating enforcement patrols are also used through a work zone. Agencies may use either unmarked or marked patrol vehicles and may focus on either active enforcement duties or serve strictly an enforcement presence role. For example, a circulating patrol traveling at the posted work zone limit on a two-lane roadway discourages passing by higher speed vehicles, and so can be a very effective traffic-calming strategy. Similar behavior will occur in work zones on multi-lane roadways as well.
- On freeway or multi-lane roadways, circulating patrols typically reduce speeds in the immediate vicinity of the enforcement vehicle which is moving along the roadway section. The average speed reductions achieved with this technique tend to be about 2 to 4 mph, although this can again vary depending on site characteristics or the frequency of the enforcement patrols.
- **Semi-automated speed enforcement** — A few states use semi-automated speed enforcement technology to electronically identify violators in work zones and to capture an image of the vehicle embedded with speed, location, date, and time information about the violation. The registered owner of the vehicle is then identified via the license plate number and receives a citation in the mail. This strategy eliminates the need for the vehicle to leave the work zone to pull over the violator and issue the citation immediately. However, specific legislation must be passed to allow this technology to be used. Examples of semi-automated enforcement vehicles are shown in the figures on the next page.

Tests indicate that speeds in the vicinity of the semi-automated enforcement vehicle reduce 3 to 6 mph. In these tests, the enforcement vehicle was positioned in clear view of the approaching traffic so that it served a presence (traffic-calming) role in addition to an active enforcement role. Advance warning signs to notify approaching drivers about the use of semi-automated enforcement may be required by legislation or agency policy. The semi-automated enforcement vehicle may also be equipped with a speed display sign to further aid in reducing speeds and calming traffic.



Examples of Semi-Automated Work Zone Speed Enforcement Vehicles

Deciding When to Use Enforcement in Work Zones

Federal regulations (23 CFR 630 Subpart K) list a number of potential conditions for which work zone enforcement may be a valuable addition to the standard traffic controls required by the national MUTCD (*Manual on Uniform Traffic Control Devices*). These include:

- frequent worker presence adjacent to high-speed traffic without positive protection devices;
- traffic control set up or removal that presents significant risks to workers and road users;
- complex or very short term changes in traffic patterns with significant potential for road user confusion or worker risk from traffic exposure;
- night work operations that create substantial traffic safety risks for workers and road users;
- existing traffic conditions and crash histories that indicate a potential for substantial safety and congestion impacts related to the work zone activity, and that may be mitigated by improved driver behavior and awareness of the work zone;
- work zone operations that require brief stoppage of all traffic in one or both directions;
- high-speed roadways where unexpected or sudden traffic queuing is anticipated, especially if the queue forms a considerable distance in advance of the work zone or immediately adjacent to the work space; and
- 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 zone enforcement needs represent an additional burden on enforcement agency manpower and equipment resources in a region. Therefore, if enforcement is to be used, it should be to address specific hazards, and the strategy used should be capable of minimizing those hazards.

Work zone hazards can be grouped into two general categories: hazards that exist during hours of work activities, and hazards related to the geometrics and alignment of the work zone design. Properly identifying what hazards are being targeted through enforcement in a particular work zone is important.

- **Work activity hazards** — Work activity hazards are present in a work zone only for limited times and at specific locations. The desired enforcement effect for these types of hazards is an immediate reduction in speed and an increase in driver attention in the vicinity of the hazard. Work activity-related hazards include:

- temporary closures of shoulders or travel lanes during the work shift (including the creation of any traffic queues that may develop due to the reduction in roadway capacity);
- work activities in close proximity to travel lanes (including the set up and takedown of other temporary traffic control devices);
- work activity materials and work equipment located close to travel lanes; and
- locations where work vehicles move into and out of the work area from the travel lanes.

For these situations, highly-visible stationary enforcement operating in a presence (traffic-calming) role just upstream of the hazard is used most often. In some cases, the pack enforcement strategy described previously may be employed so that some level of active enforcement is being performed as well. A few agencies will ask the stationary enforcement officer to pursue and cite violators. However, this strategy means that the officer leaves the hazard from time to time when performing the enforcement duties, which eliminates the traffic-calming benefits of visible enforcement at the hazard during those times.

■ **Work zone design hazards** — These types of hazards are present for extended periods of times and may exist at multiple locations throughout the work zone. Work zone design hazards include:

- narrowed or closed shoulders;
- narrowed or long-term closures of travel lanes;
- pavement edge drop-offs;
- irregular pavement surfaces and/or uneven joints;
- lane shifts; and
- horizontal curvature at median crossovers or temporary diversions designed to a lower design speed below the prevailing or expected travel speeds.

First and foremost, the use of proper temporary traffic control is critical to warn drivers of these types of work zone design hazards. Some work zones may then also need supplemental enforcement to further improve safety if crash or other data suggests such a safety problem exists. The goal of enforcement is to encourage safer driving (improved compliance to speed limits and improved attention) at all times and all locations in the work zone, even during those times when enforcement personnel cannot be present at the work zone. This requires a shift in driver behavior and expectations about the potential for enforcement to be in the work zone to apprehend and cite drivers if they were to violate a speed limit or other traffic law. To accomplish such a shift, an initial period of intense enforcement is required to establish an expectation of increased enforcement within the work zone. This emphasis will then lead to a continuous change in driving behaviors at all times, including those times when enforcement is not present.

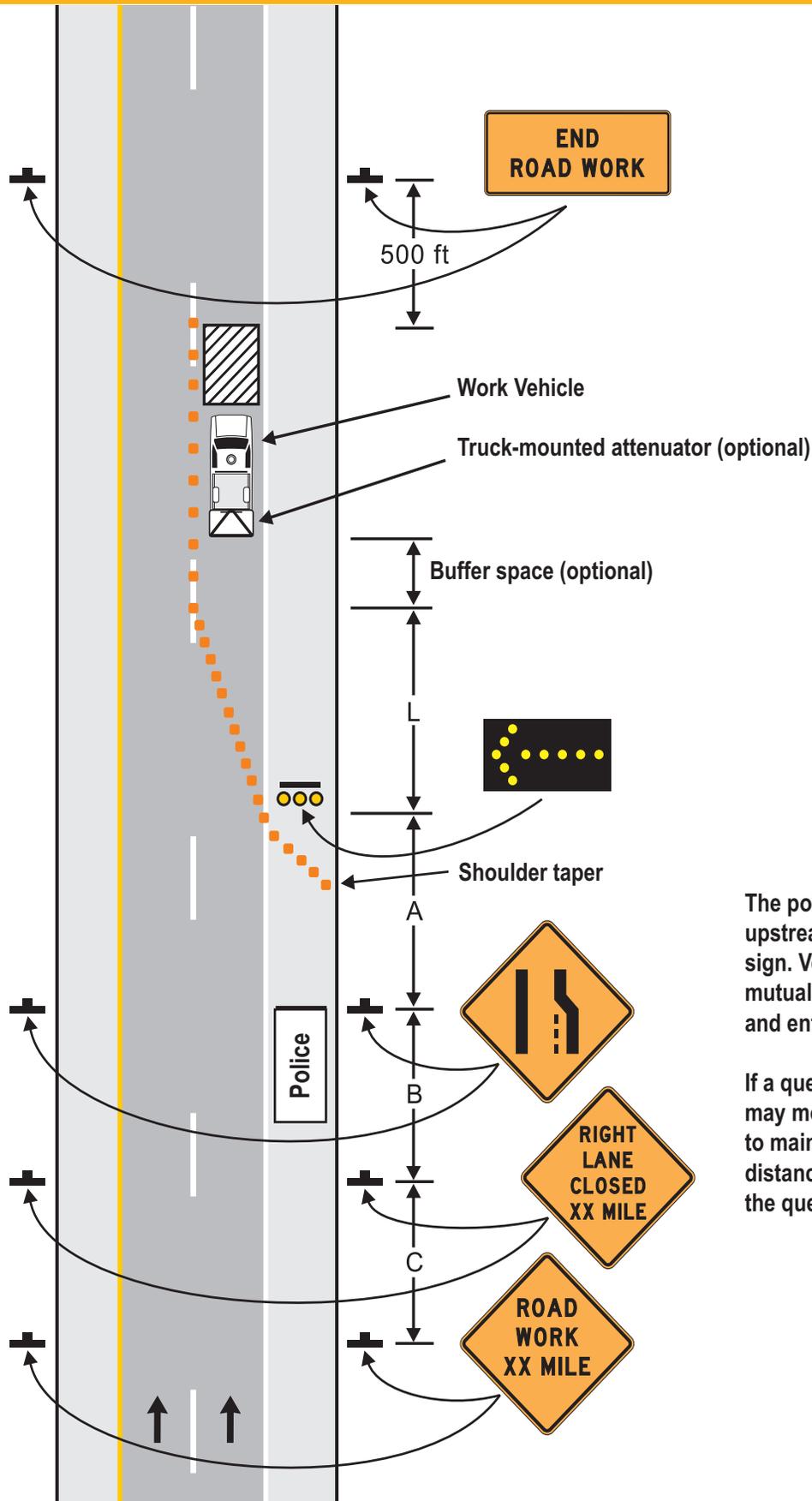
Once this expectation is established, the amount of enforcement provided can be reduced, but still must be maintained at some minimal level to keep drivers from reverting back to pre-enforcement behavior.

Deciding Where to Deploy Enforcement Within the Work Zone

The determination of where enforcement will be positioned during a work activity should be discussed prior to each work shift. When the enforcement vehicles are stationary or moving at low speeds (i.e., 20 mph or more below the normal speed of traffic), they should generally be located on the shoulder or in a closed travel lane beyond the buffer area of a merging taper or protected by a shadow vehicle (preferably with a truck-mounted attenuator). Ideally, the enforcement vehicle will also be positioned so that motorists have adequate time to detect and react to the presence of enforcement prior to making path changes required by the work zone.

Examples of how officers should be deployed are provided in the following figures.

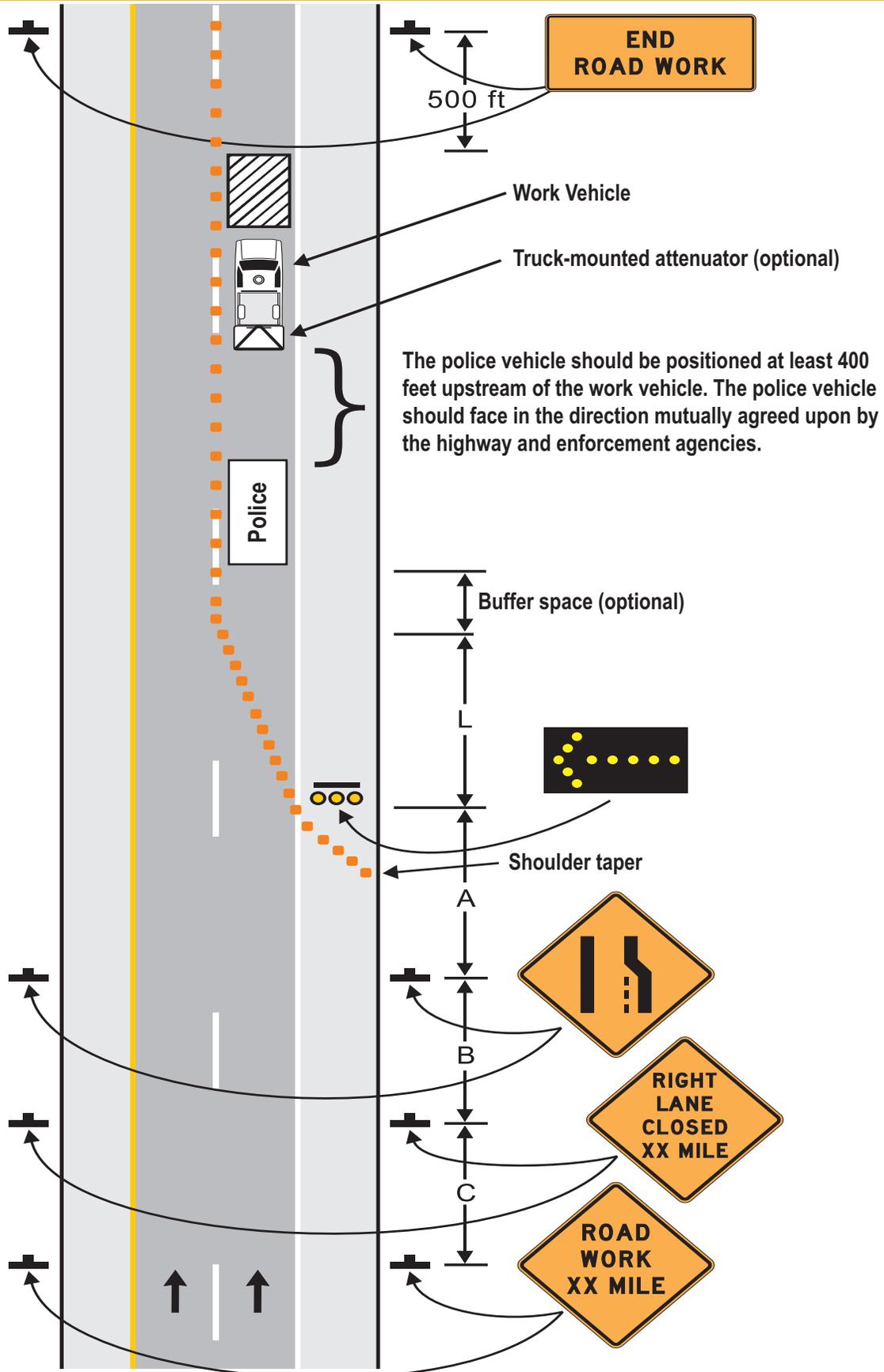
Recommended Stationary Enforcement Position: Lane Closure with Work Activity Area Less Than 1 Mile from the Merging Taper



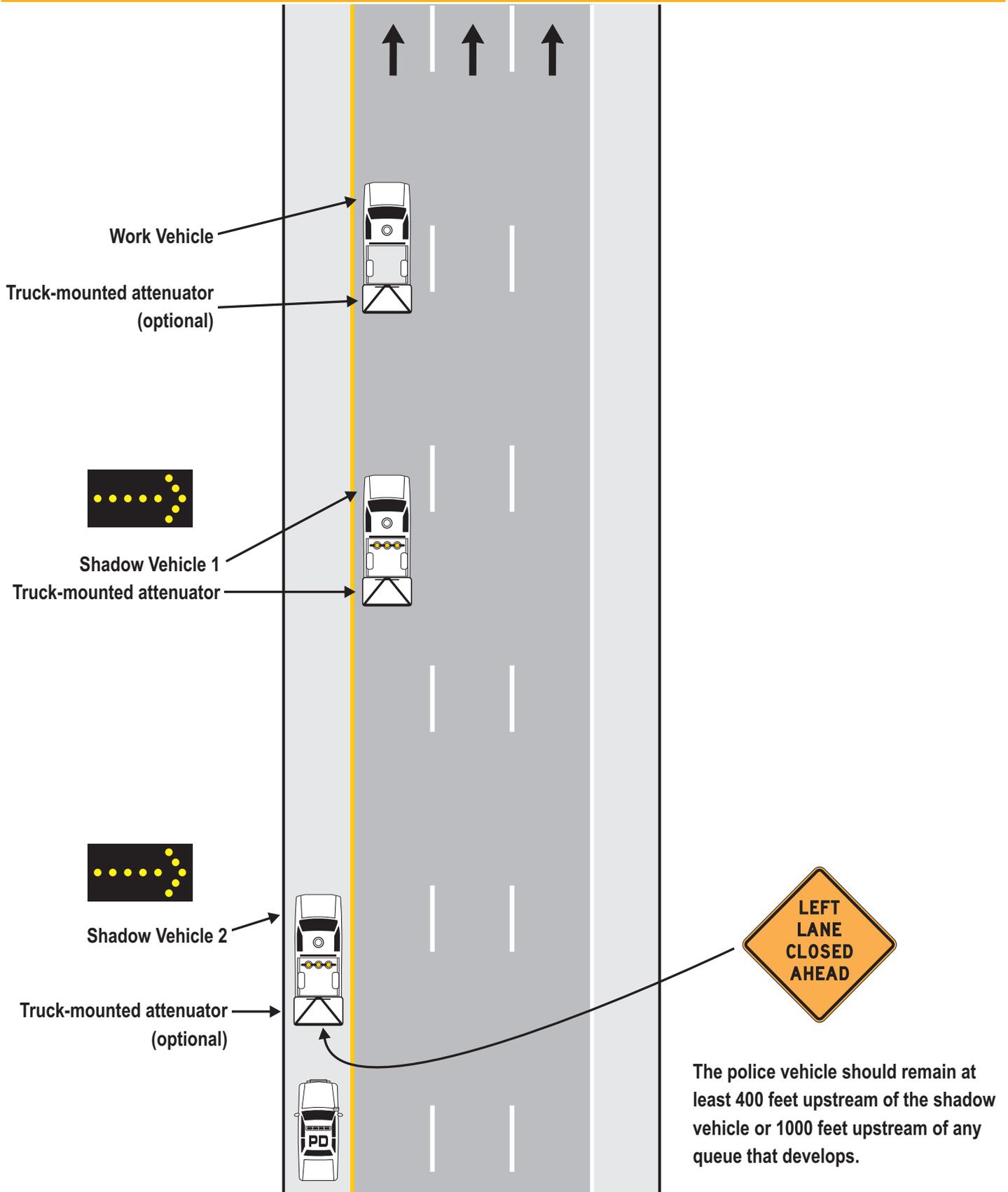
The police vehicle should be positioned upstream of the last advance warning sign. Vehicle should face in the direction mutually agreed upon by the highway and enforcement agencies.

If a queue develops, the police vehicle may move upstream on the shoulder to maintain an approximate 1000-foot distance between the vehicle and the queue.

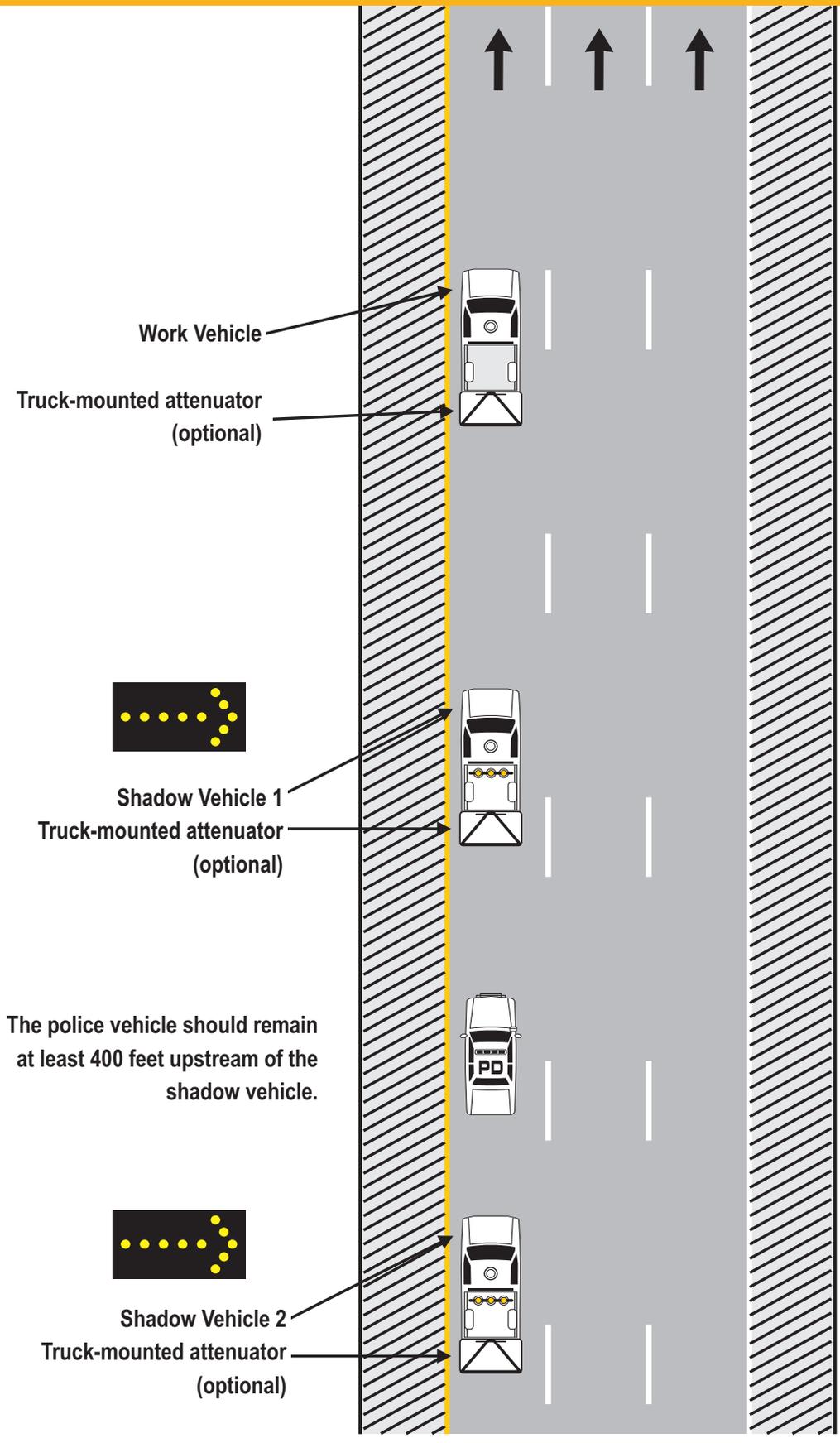
Recommended Stationary Enforcement Position: Lane Closure with Work Activity Area More Than 1 Mile from the Merging Taper



Recommended Enforcement Position: Mobile Operation Convoy When Continuous Shoulder Is Available for Travel



Recommended Enforcement Position: Mobile Operation Convoy When No Continuous Shoulder Is Available for Travel



Work Vehicle
Truck-mounted attenuator (optional)

Shadow Vehicle 1
Truck-mounted attenuator (optional)

The police vehicle should remain at least 400 feet upstream of the shadow vehicle.

Shadow Vehicle 2
Truck-mounted attenuator (optional)

Administrative Considerations of Work Zone Enforcement

Three key steps are needed in order to properly set up and administer a work zone enforcement program:

- define the roles and responsibilities, lines of authority and communication, and other administrative details between the highway and enforcement agency through the establishment of an interagency agreement such as a memorandum of understanding (MOU);
- determine how work zone enforcement needs will be funded; and
- determine how work zone enforcement efforts will be paid.

Guidance on each of these steps is provided below:

- **Interagency Agreement/Memorandum of Understanding (MOU)** — An MOU typically specifies the roles of each agency, the intent to coordinate and cooperate, the lines of authority and communication that will be followed, and other details. Although specific wording used between agencies will vary, a properly designed MOU for work zone enforcement usually contains details on the following major items:
 - estimated amount of funding expected to be available for enforcement accomplished under the agreement;
 - types of costs allowed to be charged;
 - billing information requirements; and
 - names and contact information of key responsible persons in each agency.

In addition, highway and enforcement agencies may choose to incorporate one or more of the following topics into the agreement:

- specific officer responsibilities during each shift;
 - right to terminate agreement;
 - minimum notification time to schedule enforcement support;
 - minimum notification time to cancel a request;
 - law enforcement agency right of first refusal for providing support;
 - payment schedule;
 - required law enforcement participation in pre-construction meetings;
 - officer training requirements;
 - officer work documentation requirements; and
 - cooperative enforcement support to be provided by the enforcement agency.
- **Funding of work zone enforcement** — The costs for extra work zone enforcement (efforts other than those normally expected in and around highway problem areas requiring routine or ongoing enforcement) are eligible for reimbursement through the Federal-aid program. The regulations allow enforcement services to be funded on a project-by-project basis as part of the individual construction contracts, or on an overall program-wide basis by setting aside a portion of the overall construction budget of the agency for enforcement activities. Examples of both types exist across the country. In addition, a few states have enacted legislation that returns a portion of the fines received from work zone enforcement efforts to fund future work zone enforcement. The preferred funding approach for a particular agency depends on a number of factors, the most significant of which are summarized in the following table.

Advantages and Disadvantages of Available Work Zone Enforcement Funding Approaches

Funding Method	Advantages	Disadvantages
Program-wide enforcement funding	<ul style="list-style-type: none"> ● Administrative and support staff costs needed to manage the program can be recouped by the highway agency ● Can improve the degree of enforcement consistency across projects regionally or statewide ● Gives contractor flexibility to increase enforcement use at a project due to unforeseen circumstances 	<ul style="list-style-type: none"> ● Management and support staff manpower requirements to administer a program can be substantial ● Some of the funding is used for administrative purposes, reducing the number of officer hours that can be funded with a given amount of funding ● Enforcement application can be inconsistent from project to project
Project-by-project enforcement funding	<ul style="list-style-type: none"> ● Administrative costs are generally lower, resulting in more officer hours on site for a given level of funding ● Decisions on when and where to use enforcement can be made more quickly 	<ul style="list-style-type: none"> ● Can be more difficult to accommodate an increased need for enforcement (beyond that originally budgeted) if unforeseen circumstances arise
Revenues generated from citations issued in work zones used to pay for work zone enforcement	<ul style="list-style-type: none"> ● The impact of providing work zone enforcement on the overall highway agency construction budget is reduced 	<ul style="list-style-type: none"> ● Usually, specific state legislation is required authorizing the use of the work zone citation revenues for this purpose ● Use of enforcement for traffic-calming purposes in the work zone is viewed less favorably, since this strategy does not result in citations being issued

Other Enforcement Considerations During Work Zone Planning and Design

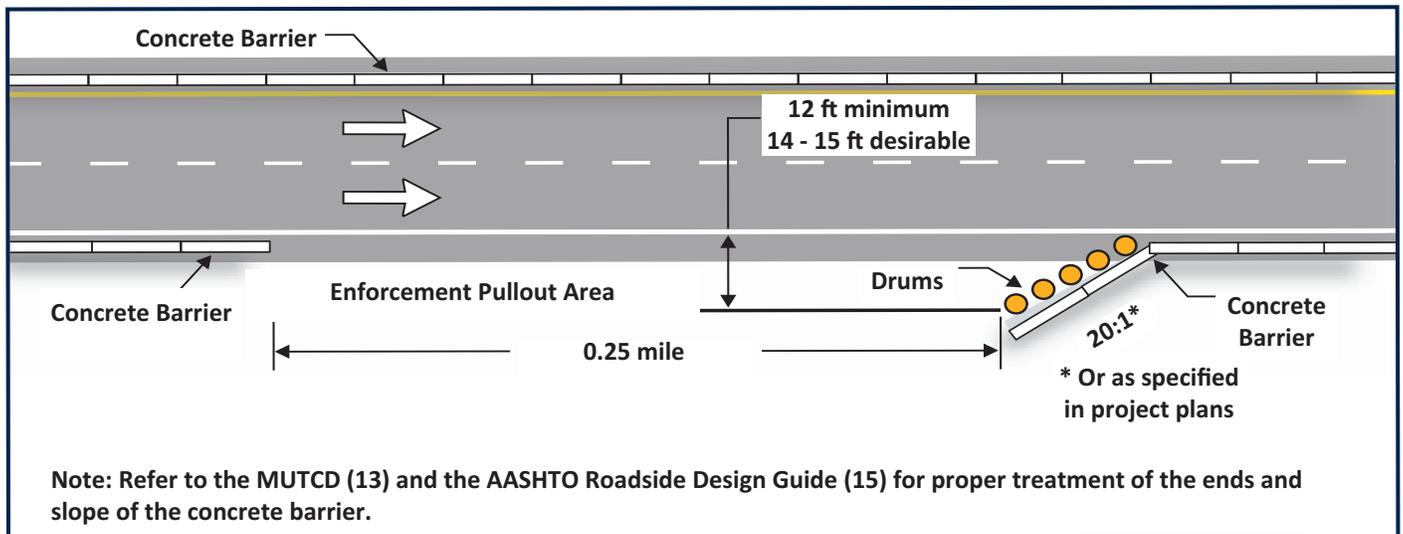
The extent to which enforcement can be effectively used in a work zone is dependent upon the design and traffic control characteristics of the work zone itself. Several work zone geometric design features can significantly affect the ability of enforcement personnel to function either in an active enforcement or in a traffic-calming role within the work zone (or both). Similarly, choices regarding regulatory and advisory work zone speed limits, supplemental traffic control devices to manage speeds and raise driver awareness, and motorist notification of enforcement efforts can likely benefit or constrain enforcement effectiveness.

The following key points should normally be considered as part of the work zone planning and design when the use of law enforcement is anticipated:

- establish realistic design speeds and speed limits;
- limit the length of shoulder closures;
- consider the need for enforcement pullout areas;
- consider speed management alternatives and supplements to enforcement;
- consider public awareness efforts regarding work zone enforcement; and
- consider motorist notification efforts regarding work zone enforcement.

Highway agencies have varying policies, guidelines, and standards for establishing work zone speed limits. In some states, traffic laws require speed limit reductions in work zones when workers are present, or during other specific conditions. Sometimes, the design speed through the work zone is used to determine the speed limit to be posted. Reduced speeds should only be posted in the vicinity of work being performed or where necessitated by road conditions. Depending on state law, it may also be appropriate to post a reduced speed limit only during times of actual work activity (if the work activity itself is what constitutes the need for reduced speeds), and cover or remove the signs when work is not active.

If used, shoulder closures should be kept as short as possible to minimize their adverse effects on enforcement activities. Generally speaking, such shoulder closures should be limited to three continuous miles or less. Limiting shoulder closure lengths also improves overall traffic safety and flow, ensuring that there will be opportunities for disabled vehicles to find refuge on a shoulder section instead of stopping in an active travel lane. In some cases, it may not be possible to limit shoulder closures to three miles. In these instances, consideration should be given to including periodic enforcement pullout areas within the work zone. Enforcement pullout areas must be adequately designed to allow them to be properly used by enforcement personnel and motorists. The width of enforcement pullout areas should be at least 12 feet to allow adequate space to stand by a vehicle to issue a citation. Where possible, pullout areas should be located on the right side of the roadway to avoid creating driver expectancy problems, and should preferably be 0.25 miles long to allow adequate space for an enforcement vehicle and the stopped vehicle to safely pull into the area, and have enough space left to safely pull out of the area once the enforcement activity has been concluded. Pullout areas spaced approximately every 3 miles are an effective compromise between enforcement needs and those of the highway contractor completing the work.



Example of Work Zone Enforcement Pullout Area

For work zones where traffic demands do not justify the use of enforcement or where enforcement needs exceed enforcement resources, other speed management technologies and supplements can be considered for implementation in the work zone.

How Can I Locate More Information Regarding This Topic?

Ullman, G.L., M.A. Brewer, J.E. Bryden, M.O. Corkran, C.W. Hubbs, A.K. Chandra, and K.L. Jeannotte. Guidelines on the Use of Traffic Law Enforcement in Work Zones. Forthcoming NCHRP Report, TRB, National Research Council, Washington, DC. 2010.

Safe and Effective Use of Law Enforcement in Work Zones. FHWA, U.S. Department of Transportation, Washington, DC. Accessible at http://safety.fhwa.dot.gov/wz/law_enforce/.

Use of Police Traffic Services in Work Zones. Maryland State Highway Administration. August 2005. Accessible at <http://www.roads.maryland.gov/OOTS/01Police.pdf>

Code of Federal Regulations, Title 23, Chapter 1, Part 630 Subpart K. Revised December 5, 2007. Accessible at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2007_register&docid=fr05de07-6.

Temporary Traffic Control Devices Final Rule, 23 CFR 630 Subpart K Questions and Answers (Updated February 29, 2008). Accessible at http://ops.fhwa.dot.gov/wz/resources/temptraf_qa.htm





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