Guide for Law Enforcement Personnel in Work Zones

U.S. Department of Transportation
Federal Highway Administration

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Introduction

Highway work zones can be dangerous to everyone involved. Passenger and commercial vehicles travel very close to highway workers and construction crews. Motorists often miss or purposely ignore regulatory and warning signs. Work zone crashes often involve highway workers and can be deadly. In an attempt to reduce work zone crashes, many state highway agencies use uniformed police officers to deter risky or unsafe driving.

The safety of workers and law enforcement personnel within the work zone is just as important as the safety of the traveling public. While they enable the efficient completion of highway work, work zones present constantly changing conditions road users do not expect. This increases the risk for workers and law enforcement personnel on or near the roadway.

This pocket guide explains work zone operations and outlines roles and responsibilities. It contains guidelines and concepts developed from the MUTCD and meetings of the work zone law enforcement training steering group. These guidelines are intended to help law enforcement and transportation agencies provide more efficient traffic control, prevent crashes and save lives.

This guide does not constitute a recommended procedure or regulation of any kind. Specific standards and procedures may apply to the use of law enforcement officers in your jurisdiction. You should supplement the information in this guide with applicable regulations, standards and requirements.

The primary objectives of temporary traffic control in highway work zones are to:

- Provide for the safe and efficient movement of road users, including motorists, pedestrians and bicyclists, through or around the work area
- Protect workers, equipment and law enforcement personnel.

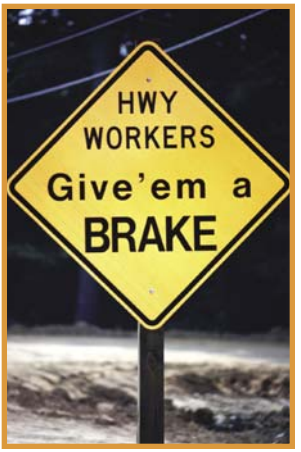
Road user safety, worker and officer safety and the efficiency of road user flow is integral to every work zone, from planning through completion.

Roles and Responsibilities

Safe and effective work zones result from good planning and execution. Several agencies may have roles and responsibilities in the process.

Typically, the project owner designs the work zone and hires a contractor to execute the work. The contractor may have workers and supervisors monitoring the field work and may use a traffic control services vendor to implement the traffic control plan. The contractor may also hire the services of law enforcement officers to assist with various tasks. The DOT may also have agreements with law enforcement agencies to use officers in work zones.

The table on the following page summarizes roles and responsibilities of typical work zone stakeholders.



Stakeholder	Typical Rules and Responsibilities
Project Owner (State department of transportation, county and/or city government)	• Conceive the project • Fund the project • Design the project (may outsource) • Develop and approve a traffic control plan (TCP) • Hire a contractor to execute the project • Require and hire (directly or indirectly) law enforcement officers (LEO), if needed • Supervise the project
Highway Contractor (Construction company) Contractor's POC)	• Execute the project • Ensure the work zone conforms to the approved plan each day • Perform temporary traffic control • Install/remove traffic control devices • Document the project • Designate a field point of contact (POC) • Ensure approved TCP is followed • Hire LEO if needed
Contractor's POC (Traffic control supervisor, foreman, highway agency inspector)	• Represent the contractor in the field • Make minor modifications to the approved TCP, if authorized • Supervise field workers • Communicate/coordinate with LEO • Inspect the work zone periodically • Be trained in safe traffic control • Be visible and alert

Stakeholder	Typical Roles and Responsibilities
Field Workers (Traffic control technicians, workers)	• Report to the work zone supervisor • Install and remove devices as instructed • Notify supervisor of problems and close calls • Understand and support the role of law enforcement • Be trained in safe traffic control • Be visible and alert
Law Enforcement Officers (State police agency, police department)	• Reduce likelihood of speeding through presence • Enforce traffic laws • Control traffic, if applicable • Communicate/coordinate with POC • Be visible and alert • Position officers and vehicles in safe and effective areas • Be informed about the project's objectives, schedule and progress • Drive through the work zone • Notify POC of potential problems • Be trained in safe traffic control

Most Common Law Enforcement Services in Work Zones

Law enforcement officers may provide various services when assigned to a highway work zone. It is important for officers to have a complete understanding of their role in a work zone.

The following table lists some law enforcement responsibilities.

Type of Service	Typical Activities
Presence	• Deter speeding and aggressive driving • Gain the attention of drivers • Protect workers • Presence…most common service in work zone • Usually off-duty officers • Presence officers are not primarily involved with traffic law enforcement.
Enforcement	• Actively enforce traffic laws in the work zone • May not be as common as presence • May be combined with presence • Usually involves on-duty officers
Traffic Control	• Control traffic where needed and where flaggers cannot (intersections, traffic incident areas, etc.) • May be used in detour situations • Direct traffic to keep it moving • Requires training and special equipment
Emergency Assistance	• Control traffic in and around the incident area • Minimize the probability of a secondary crash • Report accidents

The following table highlights tasks every law enforcement officer in a work zone should perform.

Necessary Task	Activities
Communicate	• Report to the POC at beginning of shift • Contact project engineer for clarification and directions • Remain in contact with local dispatc
Be Visible	• Emergency lights on,headlights off • If outside patrol vehicle and within work zone, must wear retroreflective vest
Be Alert	• Stay alert at all times • Avoid activities that may be distracting • Keep your eye on traffic
Drive Through	• Drive through in both directions and from all entry points • Become familiar with the work zone and its activities each shift • Determine safe places to investigate crashes and for enforcement • Identify hazardous conditions • Notify the POC of any possible deficiencies and/or potential problems
Investigate Crashes	• May investigate minor property damages crashes in work zone, if time to investigate is minimal • Do not abandon position if “presence” • Do not investigate crashes with injuries • Call for assistanceh

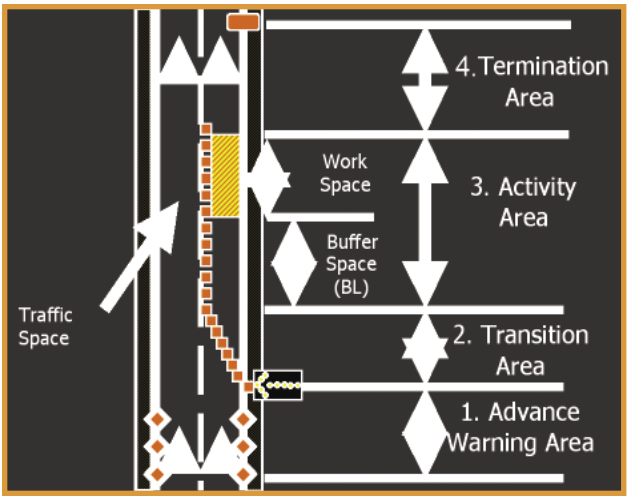
Necessary Task	Activities
Arrive Early and Leave Late (“*15-minute rule*”)	• Be present when traffic control devices are being installed or removed • Arrive at least 15 minutes before install • Leave 15 minutes after removal
Monitor Compliance with TCP	• May inspect the TCP for problems • Detect safety violations • Notify supervisor of possible problems

Understanding Work Zone Traffic Control

Not all work zones are the same. They vary depending on many factors, such as specific state requirements, duration and/or location of the work and other variables. Work zones do share some basic concepts and terms. For example, all work zones have an “advance warning area,” where motorists are warned, through the use of warning signs, about the conditions ahead.

Agencies use a “forgiving design” for work zones; that is, agencies anticipate driver safety issues and reduce the likelihood of injury.

Although work zones vary in design, the following figure illustrates components of a typical work zone.



Components of a Typical Work Zone

1. The Advance Warning Area

Advance warning area—
where drivers receive
information about the work zone.

1. Sign A alerts motorists.
2. Sign B shows restrictions.
3. Sign C tells how to move safely.

Portable changeable message signs—
Trailer-mounted signs with illuminated text.

- Optional; cannot replace standard signs.
- Generally placed before the advance warning area.

The following table lists some sign guidelines.

Minimum Sign Guidelines	
Size	48" x 48" in high speed highways 36" x 36" in moderate speed highway
Color	Orange in work zones Fluorescent pink in incident management areas (optional)
Material	Aluminum if post mounted Vinyl "rollups" if attended Mesh for daytime only
Height (*from elevation of pavement to bottom of sign*)	7' for post-mounted signs in urban areas 5' for post-mounted signs in rural areas 1' for signs mounted on temporary supports
Lateral Clearance (*from corner of the sign to travel surface*)	2'–4' in urban areas 6'–12' in rural areas May be used on both sides of highway facility
Spacing Between Signs	100' in low-speed urban areas* 350' in high-speed urban areas* 500' in rural areas 1000'–½ mile in freeways and expressways
Sign Covering	Cover or remove the sign completely if sign is not applicable, even for short periods of time Burlap is not permitted Covering only the legend is not permitted

* Individual states define "low speed" and "high speed," but the dividing line is generally 35–40 mph. Use your jurisdiction's rules and/or guidelines.

2. The Transition Area

Transition area—where road users are redirected out of their normal path. These usually involve tapers (gradual transitions).

- Lane closures require merging tapers in which traffic is required to merge from one lane to another.
- Transition areas are formed by traffic control devices such as cones, drums and barricades
- Long tapers help traffic maintain speed, eliminating congested conditions quickly.
- Short tapers encourage drivers to slow down. As a general rule, long tapers are better than short tapers.

IMPORTANT EXCEPTION

Flagging taper—When closing one lane of a two-lane road, the transition area requires short tapers (50'–100' maximum) and flaggers, who may need to stop traffic in one direction to prevent head-on collisions.

Work zones use traffic control devices to warn road users of the conditions created by the work activities and to provide the necessary guidance and control. The following table provides general guidelines for the use of various devices (may vary by jurisdiction).

Guidelines for Traffic Control Devices	
Cones*	Two white retroreflective bands for night use At least 28" in height for high-speed facilities
Drums*	Alternating orange and white stripes; may be supplemented with steady-burn warning lights when used to form a taper or tangent (straight line)
Barricades*	Diagonal stripes slope down to the traffic side
Arrow Panels*	Use in addition to signs, not instead of signs On the shoulder, displaying an arrow, for lane closures May be inside taper if no shoulder is available Not in buffer space Do not use on two-lane roads 50% dimming for nighttime use
Warning Lights*	Yellow lens At least 30" high Steady-burn for delineation (used in series along the taper and/or work areas) Flashing if used on signs or to draw attention to hazardous areas

* If used

Arrow Panels

Arrow panels (or arrow boards) can supplement static signs on lane closures.

- Some states require them for high-speed lane closures and high traffic density.
- When used for a lane closure on a multilane highway, place at the beginning of the transition, on the shoulder.
- If shoulder is not available or too narrow, place inside the taper as close as possible to the beginning of the taper.
- Do not use arrow panels (displaying arrows) on two-lane roads.

Tapers are critical to the effective operation of lane closures and other transitions. They are created using channelizing devices (cones, barricades or drums) and/or pavement markings to move traffic out of or into the normal path. Improper tapers may create unnecessary congestion and unsafe conditions.

The appropriate taper length (L), maximum channelizing device spacing and buffer length (BL) should be determined using the following table.

Taper Lengths and Device Spacing					
Speed Limit (mph)	Merging Taper, L (feet)	Shifting Taper, L (feet)	Device Spacing on Taper (feet)	Device Spacing past Tamper (feet)	Buffer Length, BL (feet)
< 25	125	63	25	50	55
30	180	90	30	60	85
35	245	123	35	70	120
40	320	160	40	80	170
45	540	270	45	90	220
50	600	300	50	100	280
55	660	330	55	110	335
60	720	360	60	120	415
65	780	390	65	130	485
70	840	420	70	140	585

Distance between devices < speed limit in mph
L—length of a merging taper
1/2 L—length of a shifting taper

Note: A merging taper generally reduces the number of lanes, while a shifting taper moves traffic over, maintaining the same number of lanes. Shifting tapers are used when a lateral shift is needed.

Approximating Distances

Pacing—Before creating a transition zone, determine the length of your stride and how many paces it would take you to cover the suggested taper and device spacing. Enter this information in the table below.

Approximate Distances in Strides					
Speed Limit (mph)	Merging Taper, L	Shifting Taper, ½ L	Cone Spacing on Taper	Cone Spacing past Tamper	Buffer Length, BL
< 25					
30					
35					
40					
45					
50					
55					
60					
65					
70					

Skip-Line—Upon arrival, determine the pattern of the skip lines.

- Most are on a “10–30” pattern: Painted lines are 10' and gap is 30'.
- 40 feet from beginning of one line to beginning of the next.

3. Activity Area

The table below describes the different areas within a work zone.

Activity Area	• Section of the highway where the work takes place. • Includes work space, traffic space and buffer space.
Work Space	• Area closed to road users and set aside for workers, materials, work equipment and work vehicles. • Usually marked off by cones, drums or other channelizing devices.
Buffer Space (BL)	• Separates road users from the work zone. • May provide recovery space for an errant vehicle. • Should be completely empty. Do not position a patrol vehicle in the buffer space. • A stopping sight distance table may be used as a guide for longitudinal buffer space distances (MUTCD Sec. 6C-06). • Some buffer is better than no buffer at all. • See taper table above for recommended buffer lengths (BL).
Traffic Space	• Area open to road users.

4. Termination Area

Termination area—used to return road users to their normal path.

- Extends past the work area to normal traffic.
- May include (optional) a termination taper (100' minimum) and an END ROAD WORK sign.

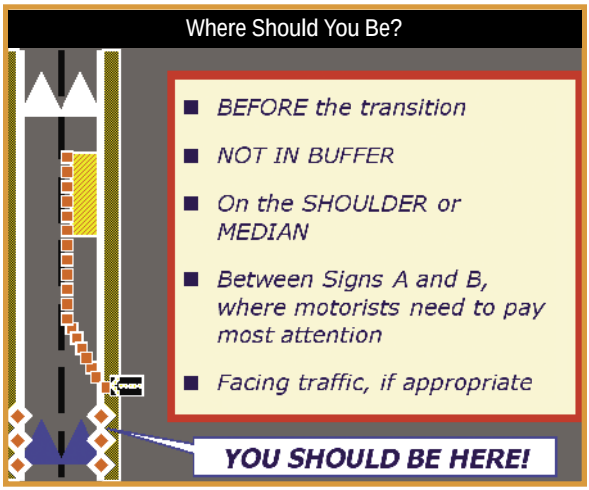
The following field checklist can be used to determine if appropriate law enforcement activities have been performed.

Field Checklist	
☐	I have a complete understanding of the work zone in which I have been assigned to work (type of work, duration, advance warning signs, tapers, buffers, etc.).
☐	I know and understand my role at this work zone.
☐	I have identified and contacted the point of contact in the field.
☐	I have driven through the work zone, from both directions and major entrance points, to familiarize myself with the work zone.
☐	If applicable, I have expressed concerns about my safety and I am satisfied with the resolution.
☐	I arrived at least 15 minutes before traffic control devices were installed, if applicable.
☐	I have identified the safest, most effective location to position my patrol vehicle.
☐	I have my patrol vehicle's headlights off.
☐	I have my emergency lights on.
☐	My patrol vehicle is as visible as it can be.
☐	My vehicle is facing traffic, if applicable.
☐	My patrol vehicle IS NOT parked in the buffer space or in an open lane of traffic.
☐	I am alert and paying complete attention to traffic.
☐	If traffic backs up, I have identified a relocation procedure.
☐	My patrol vehicle is positioned at least ¼ mile before the beginning of the queue of traffic.
☐	I have an approved retroreflective vest in case I need to be outside my patrol vehicle.
☐	I will leave the work zone at least 15 minutes after the traffic control devices are removed, if applicable.

Recommended Practices

The following recommendations may assist officers who are assigned to “presence” duty in a highway work zone.

- These are not standards or regulations
- Specific standards and procedures may vary from jurisdiction to jurisdiction
- Do not rely only on this information, but use it to develop your own specific procedures
- Obtain information about state-specific regulations, local requirements, best practices and successful lessons learned.



Recommended Practice During Highway Lane Closures

Stage	Recommended Activities

Before	• Attend the preconstruction conference, if possible
	• Familiarize yourself with the project
	• Identify POCs and establish communication with the:
	  • Project owner
	  • Field contact
	• Ask questions about your role
	• Voice concerns about your safety, if any

Upon Arrival	• 15-minute rule • Contact your POC • Identify your role and safest location • Gather information about the project • Drive through the work zone • Note signs in the advance warning area • Identify possible relocating procedures • Turn emergency light on and headlights off
During If WZ is Not Moving	• Be alert, paying constant attention to traffic • If applicable, face traffic • Be visible—Do not assume drivers see you • Expect the unexpected; be ready to react • Be in contact; contact POC for adjustments or deficiencies • Relocate with queues as necessary
If WZ is Moving	• Position vehicle on shoulder, between signs A and B in advance warning area • Do not park in buffer space • Relocate as needed, ¼ mile behind the end of the queue if it extends beyond your original position noted above
When Done	• Move with the work zone, if appropriate, depending on the speed of the work • If not facing traffic, pay as much attention to traffic as possible • Relocate as needed, ¼ mile in advance of the end of the queue • Stay at least 15 minutes after the work is completed to monitor traffic conditions

Typical Applications

The following example illustrations show typical applications of various highway work zones. These examples cover a variety of situations commonly encountered in work zones.

In general, these illustrations show minimum solutions. The information can be adapted to a broad range of conditions.

These illustrations do not address the use of law enforcement officers in work zones. Additionally, officers should use judgment based on the traffic control setup, site characteristics, and location of adjacent driveways or parking lots.

They are intended as a guide to help you identify possible inappropriate and unsafe traffic control setups and conditions.

You must study the roles of law enforcement officers in work zones carefully on a case-by-case basis. State and local standards, guidelines and regulations may vary.

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Table 6H-2

Meaning of Symbols on Typical Application Diagrams

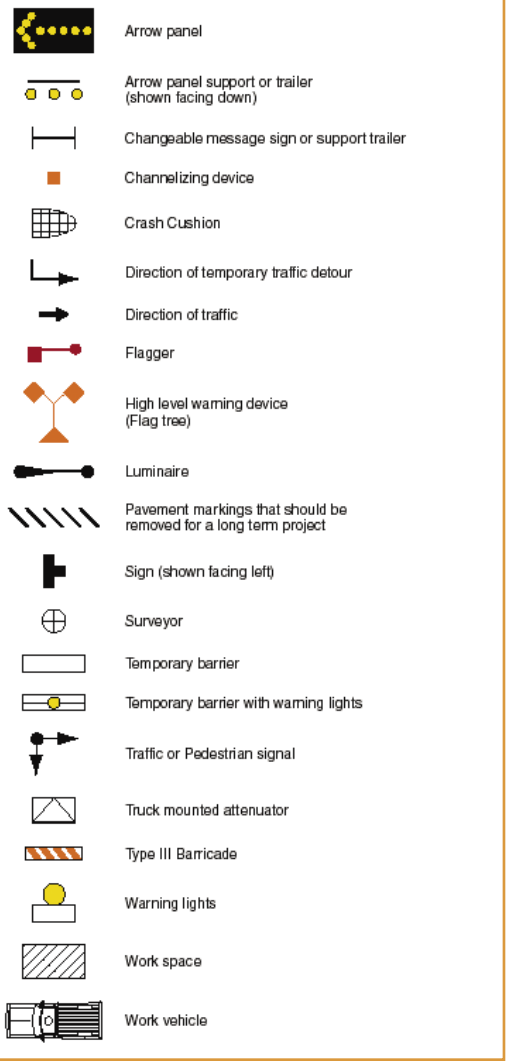
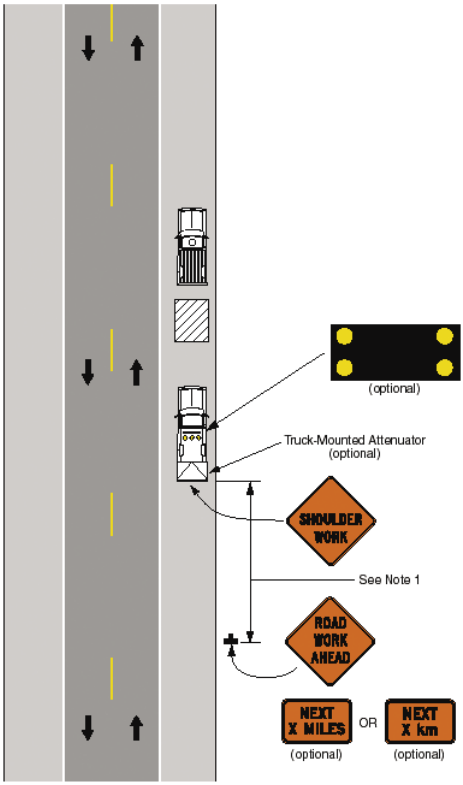
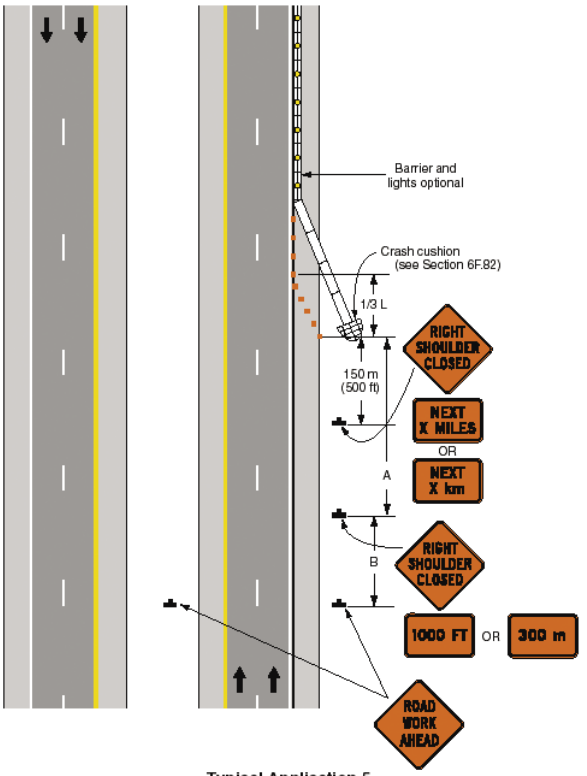


Figure 6H-4
Short-Duration or Mobile Operation on Shoulder



Typical Application 4

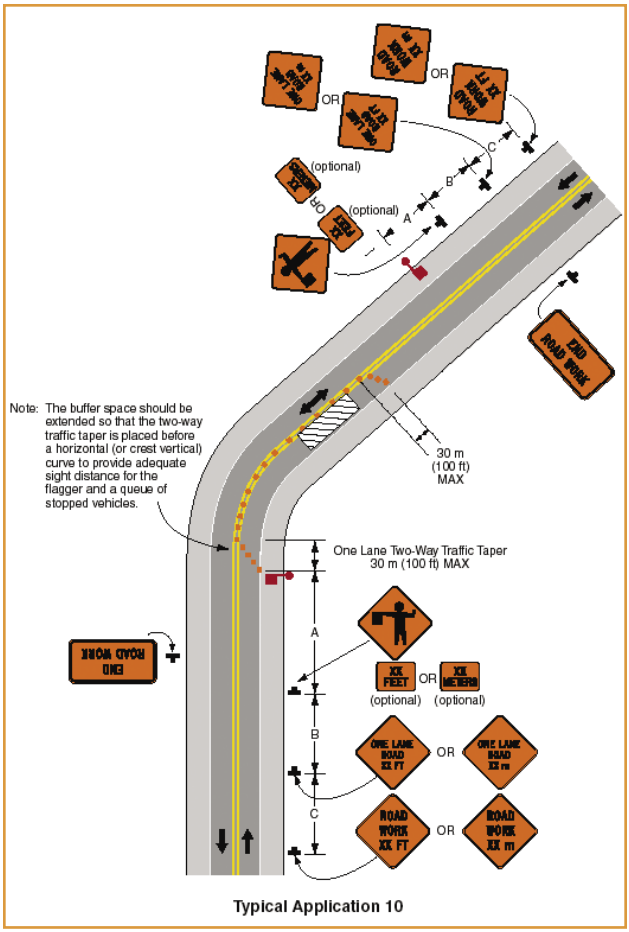
Figure 6H-5
Shoulder Closure on Freeway
(TA-5)



Typical Application 5

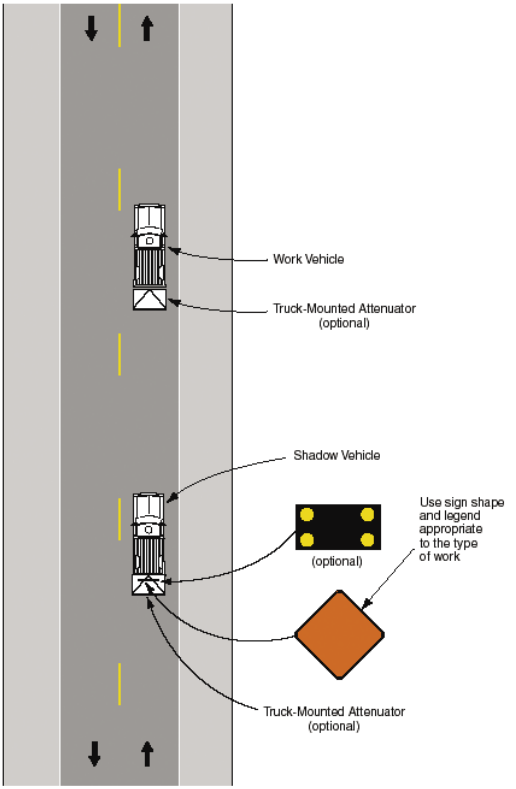
Figure 6H-10

Lane Closure on Two-Lane Road Using Flaggers (TA-10)



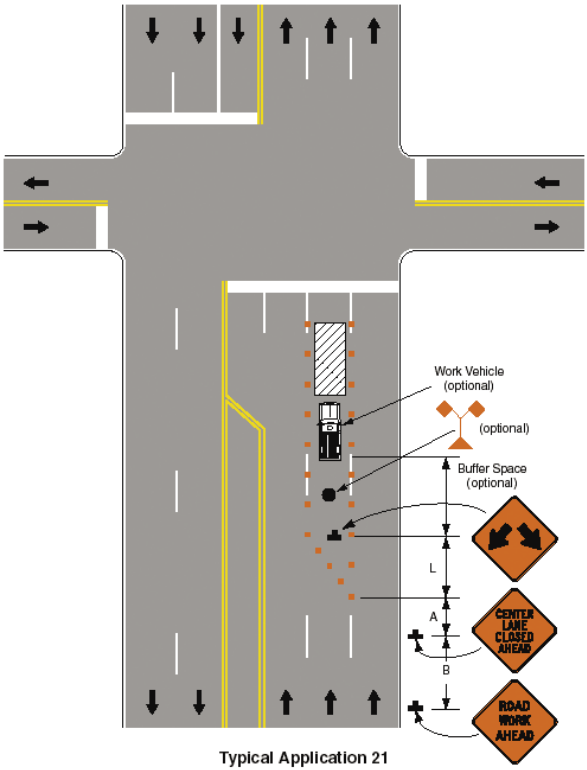
Typical Application 10

Figure 6H-17
Mobile Operations on Two-Lane Road
(TA-17)



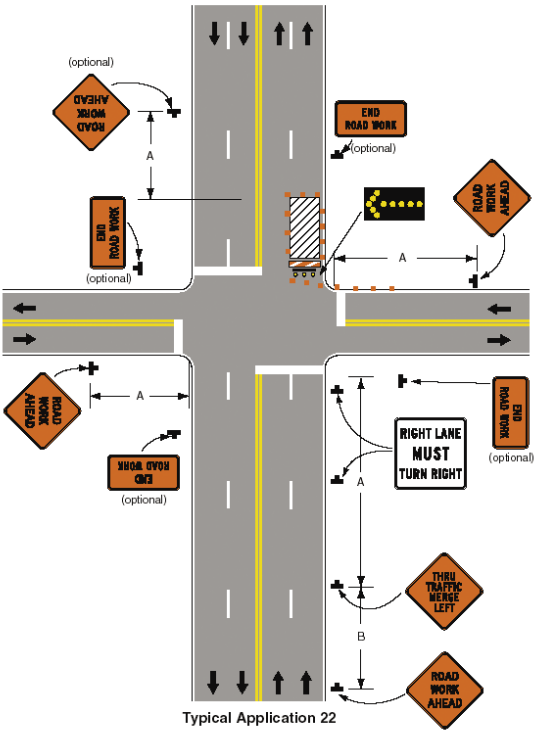
Typical Application 17

Figure 6H-21
Lane Closure on Near Side of Intersection
(TA-21)



Typical Application 21

Figure 6H-22
Right Lane Closure on Far Side of Intersection
(TA-22)



Typical Application 22

Figure 6H-23
Left Lane Closure on Far Side of Intersection
(TA-23)

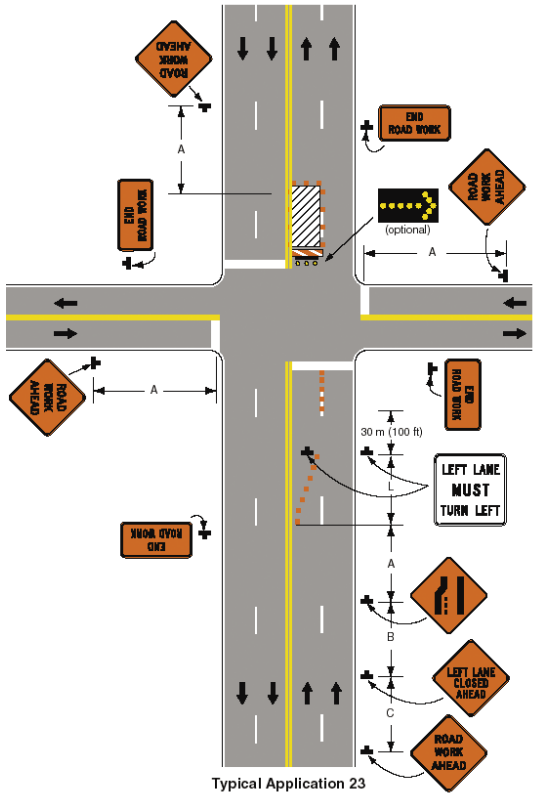


Figure 6H-26
Closure in Center of Intersection
(TA-26)

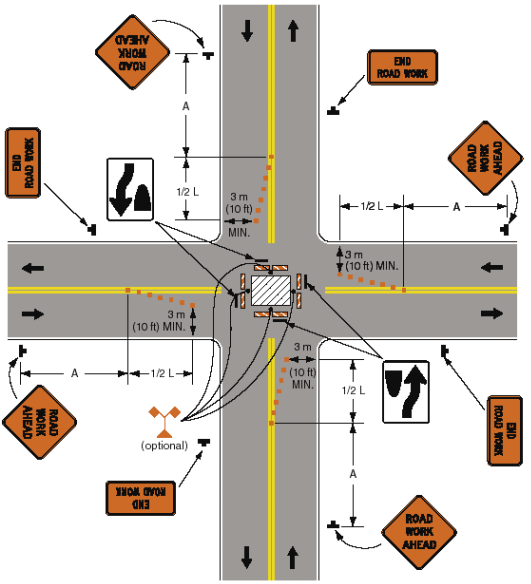


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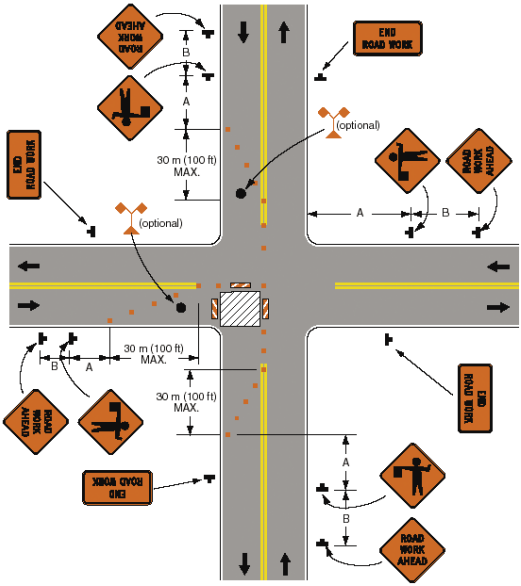
Figure 6H-27
Closure at Side of Intersection
(TA-27)



Typical Application 27

Figure 6H-30
Interior Lane Closure on Multi-Lane Street
(TA-30)

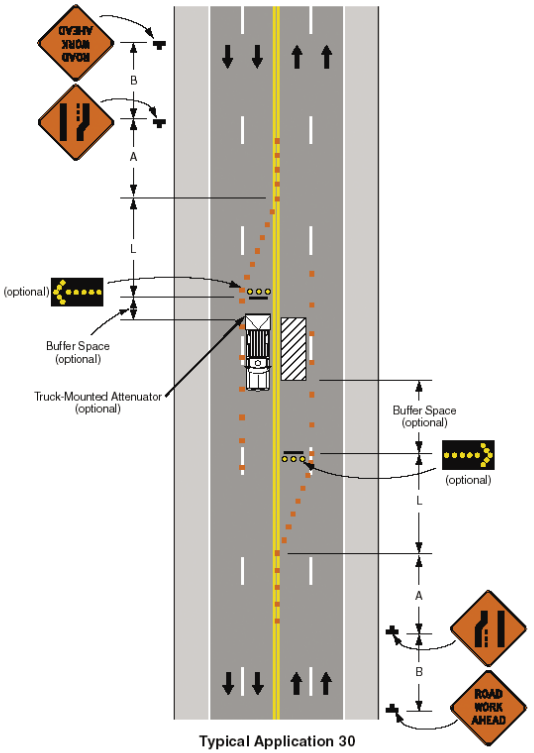
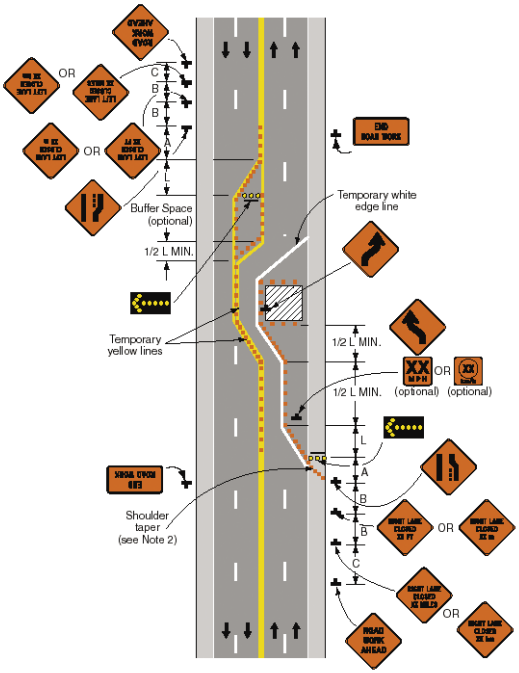
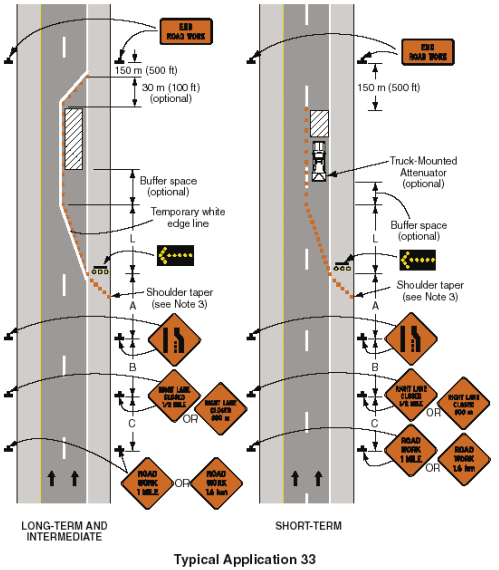


Figure 6H-32
Half Road Closure on Multi-Lane, High-Speed Highway (TA-32)



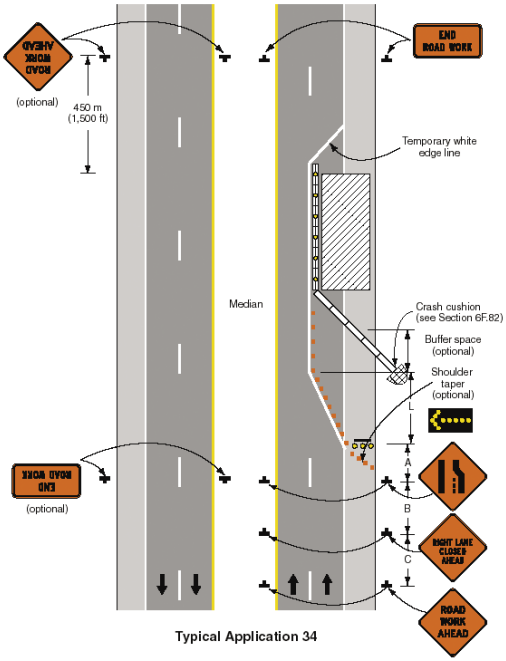
Typical Application 32

Figure 6H-33
Stationary Lane Closure on Divided Highway
(TA-33)



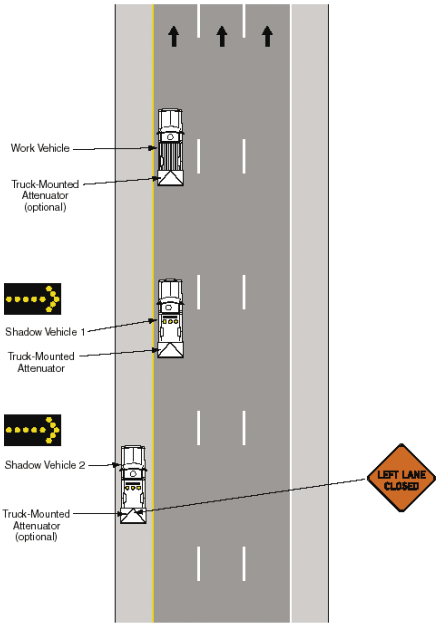
Typical Application 33

Figure 6H-34
Lane Closure with Temporary Traffic Barrier
(TA-34)



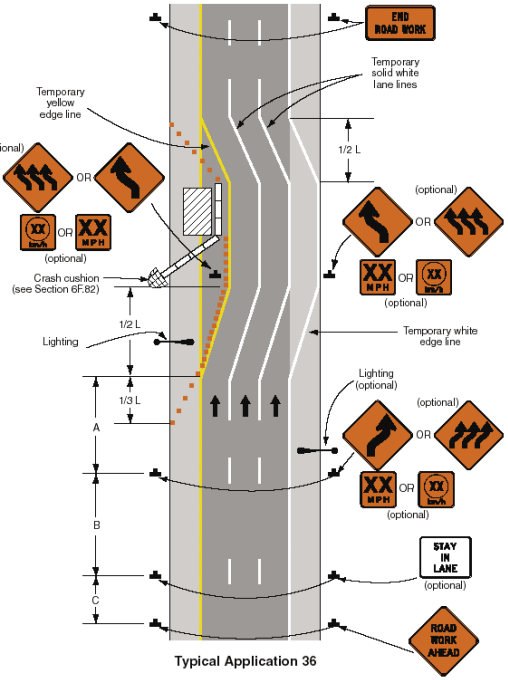
Typical Application 34

Figure 6H-35
Mobile Operation on Multi-Lane Road
(TA-35)



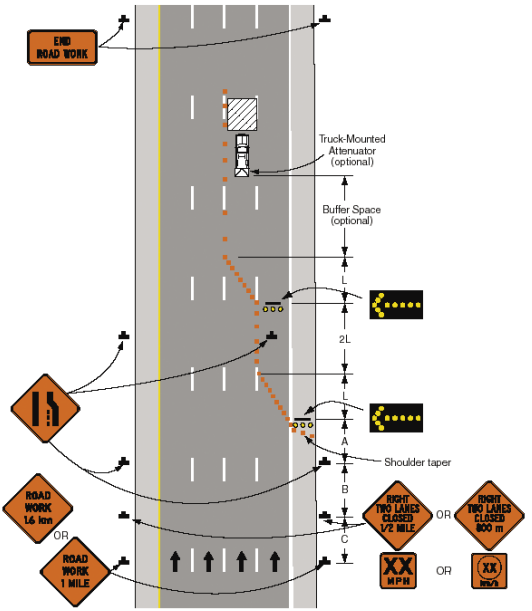
Typical Application 35

Figure 6H-36
Lane Shift on Freeway
(TA-36)



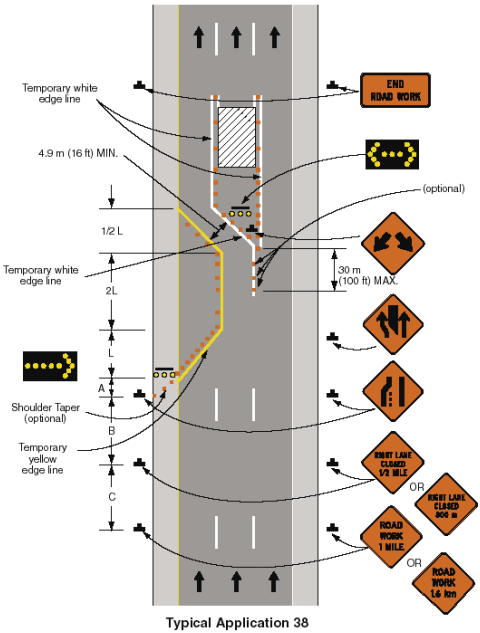
Typical Application 36

Figure 6H-37
Double Lane Closure on Freeway
(TA-37)



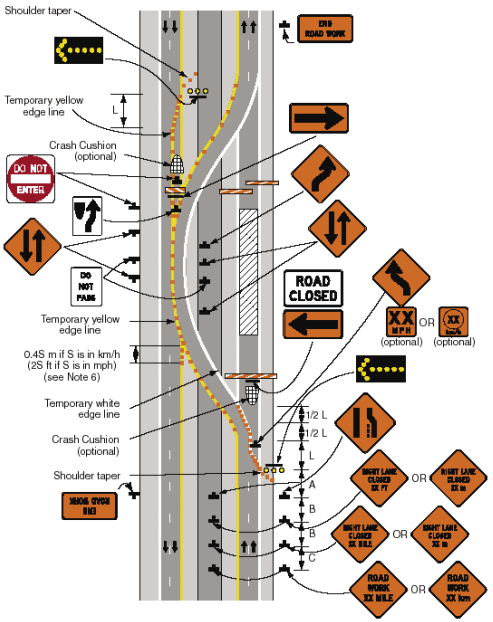
Typical Application 37

Figure 6H-38
Interior Lane Closure on Freeway
(TA-38)



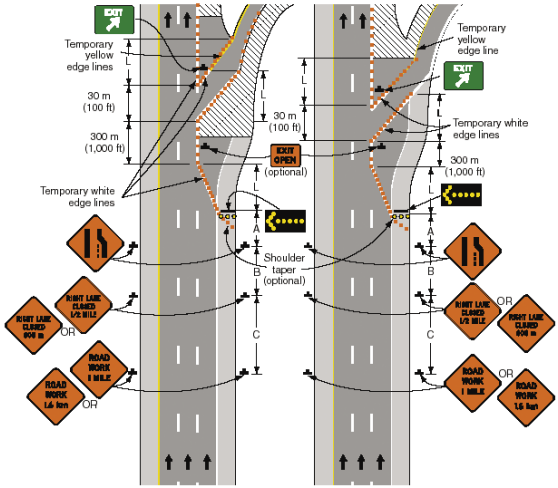
Typical Application 38

Figure 6H-39
Median Crossover on Freeway
(TA-39)



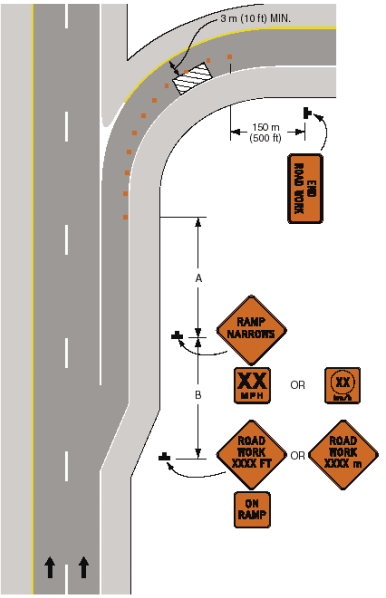
Typical Application 39

Figure 6H-42
Work in Vicinity of Exit Ramp
(TA-42)



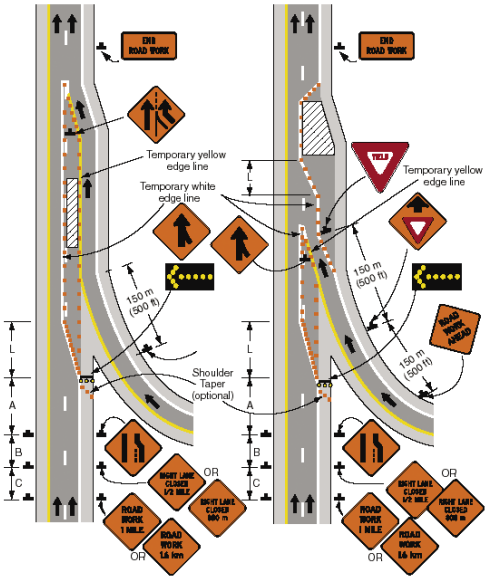
Typical Application 42

Figure 6H-43
Partial Exit Ramp Closure
(TA-43)



Typical Application 43

Figure 6H-44
Work in Vicinity of Entrance Ramp
(TA-44)



Typical Application 44


YIELD
STOP
DO NOT
ENTER
END
AD WORK
ROAD
CLOSED
CONTACT INFORMATION HERE
CLOSED
NOT A

TEMPLATE for Cutting Corners