

# Safety & Temporary Traffic Control in the Landscape Maintenance Zone



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Roadside vegetation maintenance work is hazardous. Using landscaping equipment and machinery is dangerous and roadside workers risk being hit by errant vehicles. Roadside work can also impact traffic safety and be hazardous to the public. Therefore, safety is the top priority and all staff and contractors doing roadside vegetation maintenance must take necessary precautions to protect themselves, other personnel, and the public from hazards and injuries.



## What safety standards do I follow for landscape maintenance work in highway rights-of-way?

You are required to observe all rules and regulations, including construction and traffic standards of federal, state, and local authorities having jurisdiction. At a minimum, these include:

- ▶ Hawaii Occupational Safety and Health Division (HIOSH)
- ▶ HDOT's Standard Specifications for Road and Bridge Construction
- ▶ Section 645 – Work Zone Traffic Control
- ▶ Manual on Uniform Traffic Control Devices (MUTCD)

All the relevant rules and regulations set forth by HIOSH, HDOT's Section 645 and MUTCD are not included in this manual.

This chapter highlights at the least the minimum safety requirements for compliance and is by no means a comprehensive roadside workers' safety guide.

The purpose of this chapter is to point out that HDOT staff and contractors are responsible for the safety of their workers while working on HDOT rights-of-way by following the current regulations of HIOSH, MUTCD and Section 645. Ask the Engineer which version currently applies.

The State of Hawaii, under an agreement with OSHA, operates an occupational safety and health program in accordance with Section 18 of the Occupational Safety and Health Act of 1970. The designated agency for the administration of this program is the Department of Labor and Industrial Relations (DLIR). Within the DLIR, the Hawaii Occupational Safety and Health Division (HIOSH) is responsible for both enforcement and consultation programs. HIOSH is headquartered in the State capital of Honolulu. The Hawaii State Plan applies to all private and public sector places of employment in the State, with the exception of federal employees, the United States Postal Service (USPS), private sector maritime, and land that is exclusive federal jurisdiction, which are subject to federal OSHA jurisdiction.

JARGON



## What are the safety requirements prior to start of work?

Contractors are required to submit a written Site Specific Health and Safety Plan (SSHASP) to the Engineer for review, acknowledgement and acceptance. The SSHASP must meet or exceed the minimum requirements of the Contract and applicable federal or state regulations and at a minimum include the following:

**1. Components.** Components of the SSHASP or Accident Prevention Program (APP) will address the following sections:

- ▶ Management Commitment – Safety policy with signature of company authorized representative (include printed title of the signee)
- ▶ Safety and Health Responsibilities: a) manager, b) supervisor and c) employee – also identify if any union(s) is(are) involved and their level of commitment
- ▶ Employee Participation: a) safety committee and b) employee safety meetings
- ▶ Hazard Recognition: a) recordkeeping, b) incident investigation, and c) safety inspections and procedures
- ▶ Hazard Prevention and Control: a) statement to eliminate workplace hazards, b) basic overall safety rules, and c) site-specific safety rules (based upon work/job tasks to be performed)
- ▶ Disciplinary Policy and Forms
- ▶ Equipment/Machinery Maintenance
- ▶ Emergency Preparedness and Action Plan: a) emergency notification phone tree and b) emergency spill response plan
- ▶ Safety and Health Training and Education

The Hawaii Occupational Safety and Health Division

<http://hawaii.gov/labor/hiosh>

U.S. Department of Labor Occupational Safety & Health Administration

<http://www.osha.gov/dcsp/osp/stateprogs/hawaii.html>

**2. Certification, Responsibility and Identification of Personnel.**

In the SSHASP identify a “Competent Person” (as required per applicable federal, state and/or local authority having jurisdiction) designated by the company as the safety person/officer who oversees, implements and enforces the SSHASP until Acceptance. Ensure that this “Competent Person” as defined by HIOSH is capable of identifying existing and predictable hazards and has the authority to take prompt corrective measures to eliminate hazards and to stop work. Add documentation of training provided to such “Competent Person,” including certifications received.

A “Competent Person” does not need documented qualification as compared to a “Qualified Person” who must prove their proficiency in any given field. However, under specific regulations/standards, a “Qualified Safety Person” may be needed (e.g., fall protection, scaffold safety, crane operation, etc.). Provide qualifications of a “Qualified Safety Person” including but not be limited to education, training, certifications and experience in developing SSHASP.



### TIP

HIOSH offers safety and health assistance to Hawaii’s employers through a voluntary on-site consultation program, a service free to businesses and which usually takes place on site. It is confidential; any unsafe and unhealthy working conditions will not be reported to the inspection staff. Any identified deficiency must be corrected immediately or within the specified timeframe agreed upon with HIOSH consultant. Any issue that is IDLH (Immediately Dangerous to Life and Health) and outside of HIOSH’s jurisdiction may be directed to the applicable federal, state, and/or local authority having jurisdiction; IDLH conditions must be corrected immediately while the HIOSH consultant is on the project site. Landscape industry employers interested in applying for this free service should contact the HIOSH Consultation Department at (808) 586-9100.

Provide a certification, executed by the qualified safety professional that developed the SSHASP, stating that the safety plan complies with the rules, regulations, standards and guidelines in effect at the time the work is in progress of HIOSH and other applicable federal, state and local regulatory agencies having jurisdiction.

**3. Additional Elements of the SSHASP.** Include information and procedures for the following elements:

- ▶ **Traffic Control Coordinator.** If the traffic control coordinator is separate from the supervisor or safety officer, then include his/her name and contact information. Ensure that the traffic control coordinator meets the requirements specified in Section 645 of the Standard Specifications.
- ▶ **Local Emergency Telephone Numbers.** Include police, fire, medical, and State Department of Health contacts for reporting release of hazardous substances. HEER (Office of Hazard Evaluation and Emergency Response): (808) 586-4249 (business hours) and (808) 247-2191 (after hours). Include HIOSH’s accident reporting line (808) 586-9102.

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- ▶ **Forms.** Include at least three years of “Recordkeeping”: OSHA Form 300, “Log of Work-Related Injuries and Illness” and OSHA Form 300A, “Summary of Work-Related Injuries and Illnesses.”
- ▶ **Security Policy Guidelines.** Provide a copy for the office and for the Project Limits.
- ▶ **Hazard Communication Program.** Provide the following:
  - The location of, and instructions for understanding, the MSDS (Material Safety Data Sheets). Ensure that the location and instructions are available to anyone within the Project Limits.
  - The person responsible for the hazard communication program and the method of informing personnel of the hazardous communication program. Include attendance sheets of hazard communication meetings.
- ▶ Contractors should complete and keep records of JHA (Job Hazard Analysis) or AHA (Activity Hazard Analysis) where specific safety topics can be identified based upon the work/job task to be performed.
- ▶ **Additional Requirements.** Provide additional procedures for project-specific topics, including:
  1. Compressed gas cylinders
  2. Confined spaces
  3. Cranes
  4. Electrical
  5. Equipment operators
  6. Fall protection
  7. Hand and power tools
  8. Hearing conservation
  9. Highway safety
  10. Lead
  11. Lock out/tag out
  12. Materials handling, storage, use and disposal
  13. Night work
  14. Personal protective equipment
  15. Project entry and exit
  16. Respiratory protection
  17. Sanitation
  18. Signs, signals and barricades
  19. Subcontractors
  20. Trenching

Within 15 days of receiving the SSHASP, the Engineer will determine if the safety program meets the requirements of the contract. If the safety program does not meet the requirements, the Engineer will return the safety program for revision. You should not begin contract work until the Engineer has reviewed, acknowledged and accepted the SSHASP.

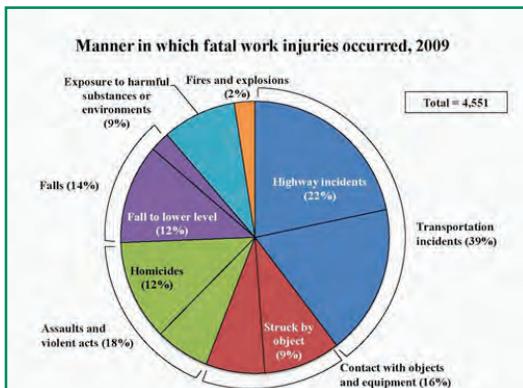
Any revisions to the SSHASP must be provided to HDOT prior to the implementation of these revisions/modifications/changes. HDOT will review these changes and notate the revision/modification/changes that will continue to provide a safe and healthful work site for the workers and comply with applicable standards/regulations. The contractor who will be implementing these changes must conduct a safety meeting with all workers who are directly and indirectly impacted by these modifications and provide a copy of the meeting to HDOT for recordkeeping purposes. The original should be kept with the contractor and part of the project document file for recordkeeping purposes.

Maintain a copy of the updated SSHASP, including the appropriate documentation associated with each element, within the Project Limits so that it is available to workers and other authorized persons entering the Project Limits. Provide copies of updates to the safety program to the Engineer.

Report all work-related health and safety incidents to the HDOT Engineer. Be aware that fatalities trigger the "within 8 hours" notification to HIOSH and the Police Department takes over the investigation.

### Fall Protection

Occupational fatalities caused by falls remain a serious public health problem. According to the U.S. Bureau of Labor Statistics, falls are one of the leading causes of fatal work injuries.



NOTE: Percentages may not add to totals because of rounding.

SOURCE: U.S. Bureau of Labor Statistics, U.S. Department of Labor, 2011.

Any walking or working surface could be a potential fall hazard. Identifying fall hazards and deciding how best to protect workers is the first step in reducing or eliminating fall hazards. Landscape maintenance contractors must include details on fall protection safety if the worker is likely to fall 6 ft. or more to a level lower than their work area. However, regardless of the fall distance, fall protection must be provided when working over dangerous equipment and machinery.



### What are some basic safety precautions on the worksite?

- ▶ Face oncoming traffic as much as possible, especially when working in places where the road edge meets the work area. Always stay alert for vehicles driven too close to the right-of-way and for out-of-control vehicles.
- ▶ Depending on the posted speed limit for a given stretch of the road adjacent to the right-of-way you will be working in, you are required to wear safety apparel that meets the ANSI 107-2004 requirements for Class 2 or 3 risk exposure to make you more visible to motorists (Section 6D.03 and 6E.02 of the MUTCD).

Speed Limit/Other Guidance	Safety Vest Details
<p>&lt; 45 mph OR Work activities take place in or near proximity to vehicle traffic. Your work diverts attention from approaching vehicle traffic.</p>	<div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p><b>Class 2</b> florescent orange color vest</p> </div> </div>
<p>&gt; 45 mph OR Worker/vehicle operator have high task loads, clearly placing the worker in danger. OR When the worker needs to be conspicuous through the full range of body motions at a minimum of 1,280 ft. and must be identified as a person; e.g., nighttime work.</p>	<div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p><b>Class 3</b> florescent orange color vest</p> </div> </div>

- ▶ Read and follow the label requirements for protective clothing if using herbicides or pesticides.
- ▶ When working in the sun, always protect yourself by wearing sunscreen, a hat and long-sleeved shirt.
- ▶ Wear leather gloves to protect your hands from cuts and nicks and lessen vibration when working with power tools.
- ▶ Wear safety glasses or goggles to protect your eyes from flying debris, especially when using machinery, such as brush cutters, mowers, chain saws, brush chippers, edgers and string trimmers (weed eaters).
- ▶ Wear hard hats to protect your head from falling branches or flying debris during cutting and clearing operations.
- ▶ Wear safety chaps when using a chain saw, weed eater or other dangerous tool.
- ▶ Use a dust mask during dusty activities, such as mowing.
- ▶ When applicable, ensure that you are equipped with fall protec-

While working, all employees shall wear OSHA-approved safety equipment, including: hardhat, vest, goggles, safety shoes and other equipment as required. Contractors on the job site shall wear a shirt or T-shirt with the company name. More safety measures specific to individual activities, such as pruning and mowing, are described in this manual.



## **Traffic Safety – What are the fundamental principles of Temporary Traffic Control (TTC)?**

- ▶ Make traffic safety and temporary traffic control an integral and high priority element of every landscape maintenance project.
- ▶ Inhibit traffic movement as little as possible. Not more than one lane in any direction should be closed.
- ▶ To enhance safety, you should conduct landscape maintenance work in off-peak traffic hours between 8:30 a.m. and 3:00 p.m. daily, except Saturdays, Sundays and holidays.

- ▶ Provide clear and positive guidance to drivers and pedestrians as they approach and travel through the TTC zone.
- ▶ Inspect traffic control elements routinely and make modifications when necessary.
- ▶ Pay increased attention to roadside safety in TTC zones.
- ▶ Train all persons that select, place and maintain TTC devices.
- ▶ Keep the public well informed.
- ▶ Remove traffic control devices when they are no longer needed.



## What factors affect traffic control?

Always use your best judgment, but consider the following when you make a decision about safe traffic control:

- 1. Visibility:** Drivers' and workers' visibility is key to ensure effectiveness of traffic control. Drivers must be informed using signs, message boards, etc. and guided in a clear manner without creating any confusion. Workers must always stay alert, face oncoming traffic and wear high visibility clothing. Factors that affect visibility include hills, curves, obstructions, shade/color contrast, weather, darkness, speed and traffic volume.

### Stopping Sight Distances as a Function of Speed

Speed (mph)	Distance (feet)	Speed (mph)	Distance (feet)
20	115	50	425
25	155	55	495
30	200	60	570
35	250	65	645
40	305	70	730
**45	360	75	820

\*\* A car travelling 45 mph is going at 66 feet per second.

- 2. Duration of Work:** Work duration will determine the degree of traffic control needed. Usually, the longer the operation lasts, the more traffic control devices will be needed. The following terminology is used by HDOT for duration of traffic control:

Long-Term Stationary	Work that occupies a location more than 3 days.
Intermediate-Term Stationary	Work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than 1 hour.
Short-Term Stationary	Daylight work that occupies a location for more than 1 hour within a single daylight period.
Short Duration	Work that occupies a location up to 1 hour.

For everyday work you must NOT close traffic lanes or slow down traffic during peak hours.

Morning Peak Hours                      5:30 a.m. to 8:30 a.m.  
 Afternoon Peak Hours                    3:00 p.m. to 6:00 p.m.



**Remember**

If your work occurs during peak hours, you **MUST** get permission from the Engineer.

- 3. Location of Work:** Whether the roadside you are working on is a two-lane or multi-lane road and whether you will be working on the shoulder or the roadway are some site factors that will affect the planning of temporary traffic control. In general, the closer the work is to road users (including bicyclists and pedestrians) the more temporary traffic control devices you will need. Do not block bicycle or pedestrian access.



**What is a Traffic Control Plan (TCP)?**

A Traffic Control Plan (TCP) is a document/drawing that shows a plan view of the roadway where construction or maintenance activity is going to occur. It must be a detailed drawing that shows the various components of a traffic control zone (see below), number of lanes, width of shoulder, location of sidewalks, and any other pertinent information, such as location of pedestrian crosswalks and driveways. A TCP plays a vital role in providing continuity of safe and efficient road user flow when a work zone, incident, or other event temporarily disrupts normal road user flow. All information on a TCP must be clear and legible.

### Remember

In addition to a Safety Plan you must submit a TCP to the Engineer at least 15 days prior to start of contract work. All TCPs must meet the Hawaii Standard Specifications for Road and Bridge Construction; Section 645 – Work Zone Traffic Control.



### Temporary Traffic Control (TTC) zone and work zone

A **Temporary Traffic Control**, or TTC zone, is an area of a highway where road user conditions are changed through the use of TTC devices, uniformed law enforcement officers, or other authorized personnel, usually because of a work zone or incident.

A **work zone** is the highway area where construction, maintenance or utility work activities are carried out. A work zone is typically marked by signs, channelizing devices, barriers, pavement markings and/or work vehicles. It extends from the first warning sign or high-intensity rotating, flashing, oscillating or strobe lights on a vehicle to the END ROAD WORK sign or the last TTC device where traffic is no longer affected. The primary function of TTC is to provide safe and effective movement of road users through or around TTC zones while reasonably protecting road users, workers and responders to traffic incidents and equipment.

The five basic components of a temporary traffic control zone are:

1. Advance Warning Area – Where road users get information.
2. Transition Area – Moves traffic out of normal path.
3. Buffer Space – Recovery area for errant vehicles.
4. Work Space – Where all work, material and equipment are situated.
5. Termination Area – Lets traffic resume normal operations.

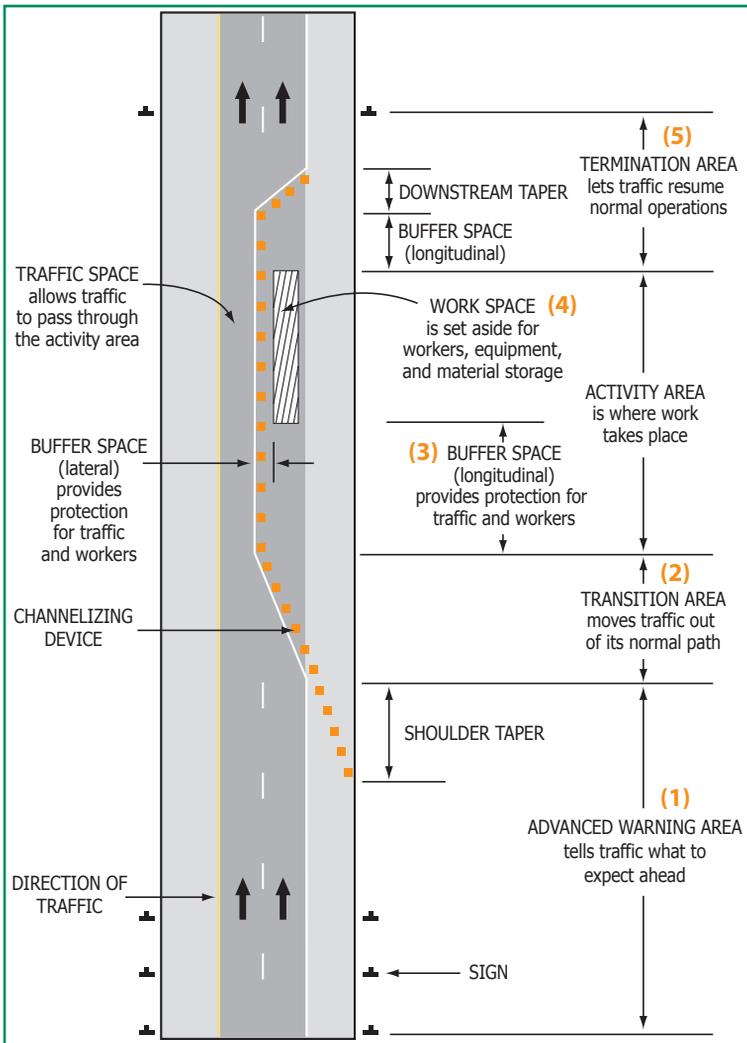
**Lane closures** may be needed for certain work along the roadside. Short-duration work along the roadside does not usually need lane closures unless unacceptable risks are created. Always check with the Engineer in advance if you think a lane closure is necessary for your work situation. Carrying out lane closures correctly can be complicated, but the Engineer can advise you on this matter.

**HDOT has contractors** to manage lane closures; these contractors can manage the whole operation or advise you of the necessary steps.

Vegetation maintenance contractors may use this service in coordination with the Engineer. Meetings are held weekly to organize the required lane closures for the whole week.

**Contact the Engineer** in advance to coordinate and plan work that may require lane closure support. Contractors may need to pay the cost of the lane closure services.

Five basic components of a temporary traffic control zone



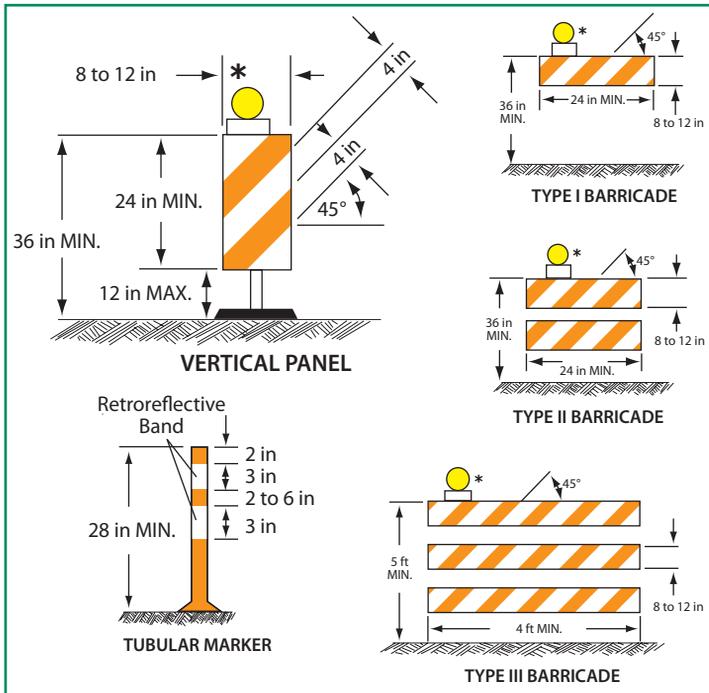


## What are traffic control devices?

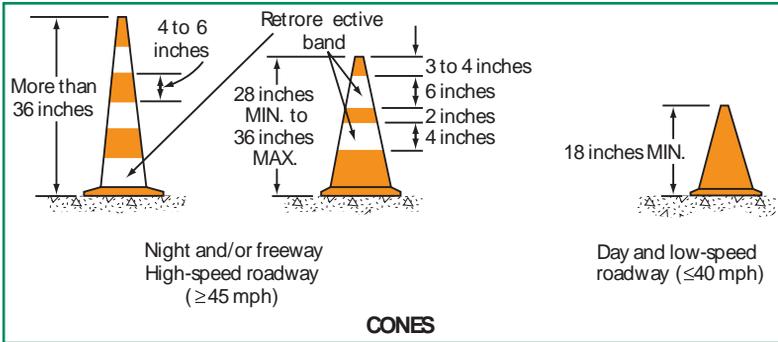
Traffic control devices are signs, signals, markings and other devices used to regulate, warn or guide road users; they are placed on, over or adjacent to a street, highway, private roads open to public travel (see definition in Section 1A.13 of MUTCD), pedestrian facility, or bikeway by authority of a public body or official having jurisdiction.

Traffic control devices used in work zone traffic control include:

- ▶ Signs
- ▶ Channelizing devices
- ▶ Warning lights
- ▶ Arrow panels
- ▶ Portable changeable message signs



*Illustrated are examples of traffic control devices used to facilitate work zone traffic control.*



## Where do I get traffic control devices?

If you are an HDOT employee, use the signs available from your base-yard. If you do not have a sign you require, contact the Engineer. HDOT does not provide traffic control devices to contractors who are required to purchase or rent traffic control devices from an authorized dealer.

## Signs

Warning signs are used extensively in street and highway construction and maintenance work zones. Warning signs give notice of a situation that might not be readily apparent.

### Remember

**Crashworthy** is a characteristic of roadside equipment that has been successfully crash tested in accordance with a national standard, such as the National Cooperative Highway Research Program Report (NCHRP) 350.



HDOT requires that all traffic control devices, including signs and channeling devices, such as cones, delineators, vertical panels and tubular markers, are certified to be NCHRP 350 compliant. When requested by the Engineer, the contractor should furnish a self-certified NCHRP Report 350 compliant letter from vendors for each type of Category 1 traffic control device, as defined in NCHRP Report 350.

HDOT also requires that all traffic control devices conform to the American Traffic Safety Services Association (ATSSA), Quality Standards for Work Zone Traffic Control Devices and the MUTCD.

**Placing signs**

Signs need to be placed so they are not an obstruction or hazard to others. As a general rule, warning signs are placed on the right-hand side of the street or highway. Warning signs give notice of conditions or potential conflict to traffic. Normally, the first sign used is the ROAD WORK AHEAD. The UTILITY WORK AHEAD or WORKERS sign may be substituted where appropriate. Where signs are used to indicate the end of the work zone, the END ROAD WORK sign may be used as appropriate. Remove signs when not in use.

**Sign color and size**

Warning signs are normally diamond shaped and have a black symbol or message on an orange or fluorescent orange background. The size of advance warning signs shown in the HDOT detailed drawings is generally 48 inches x 48 inches. A minimum size of 36 inches x 36 inches may be used (see Part 6, Chapter 6F of the MUTCD).

**Sign spacing**

The table below lists the spacing of advance warning signs per HDOT.

**Channelizing devices**

SPACING & DISTANCES FOR TRAFFIC CONTROL DEVICES							
POSTED SPEED LIMIT (M.P.H.)	SIGN SPACING (D) (FEET)	TAPER LENGTH (T) (FEET)		LONGITUDINAL BUFFER SPACE (B) (FEET)	SPACING OF CONES OR DELINEATORS (FEET)		
		W = 12' OR LESS *	W = GREATER THAN 12' *		TAPER	TANGENT	WORK AREA
20	250	200	W x 17	35	20	20	Determined in advance and approved by Engineer
25	250	200	W x 17	55	25	25	
30	250	250	W x 20	85	30	30	
35	250	250	W x 20	120	35	35	
40	500	350	W x 30	170	40	40	
45	500	550	W x 45	220	45	45	
50	1000	600	W x 50	280	50	50	
55	1000	700	W x 55	335	55	55	

\* W = width of lane or shoulder

Channelizing devices warn road users of conditions created by work activities in or near the roadway and guide road users. These devices include cones, tubular markers, vertical panels, barricades and barriers.

Cones are most commonly used for short-duration maintenance and utility work. Tubular markers have less visible area than other devices

and should be used only where space restrictions do not allow for use of other more visible devices.

The use of ballast to stabilize channelizing devices should be minimized and should not be placed on top of the channeling devices.

### **Spacing channelizing devices**

Channelizing devices should be spaced to clearly indicate that the roadway or work area is closed to traffic. There are several rules of thumb to guide you in the proper spacing of channelizing devices.

- ▶ The maximum spacing between devices in a taper should be a distance, in feet, which is approximately equal to the speed limit in mph. For example, if the taper is on a street with a 35 mph speed limit, devices should be spaced about 35 ft. apart.
- ▶ In urban areas, shorter spacing between devices in the buffer and work area may be more appropriate. For example, the spacing used in tapers could be used in buffers and work areas. At driveways, use channelizing devices to prevent vehicles from entering a closed lane.
- ▶ If you are using cones or tubular markers to channelize pedestrians, place them so there are no gaps between the bases of the devices to create a continuous bottom. The height of each individual cone or tubular marker shall not be less than 36 inches to be detectable to all users.

Once you have figured out the taper length (T), then based on the spacing of the devices, calculate the number of devices you will need in the taper. The number of channelizing devices in the tangent will depend on the length of the work area.



## **What are some typical roadside applications I must know?**

You must use the standards specified in HDOT's Section 645 when developing your traffic control plans. These typical applications are not intended as a substitute for sound judgment and should be altered to fit the conditions of a particular site. The MUTCD Guidance and Options pertaining to the applications are also discussed so you can make appropriate alterations when preparing traffic control plans.

The diagrams are not to scale, and the number of channelizing devices shown may not be the number needed at your work site. Use the table in the section above (“Spacing & Distances for Traffic Control Devices”) for guidance on the sign spacing (D), taper lengths (T), longitudinal buffer space (B), and to determine the spacing and number of channelizing devices for tapers and tangents.

Read all notes and tables before using these diagrams. For further information on HDOT standards, refer to Section 645. For additional guidance and options, refer to the MUTCD Chapter 6H, Typical Applications.

## **Work *Beyond* the Shoulder**

### **Standard:**

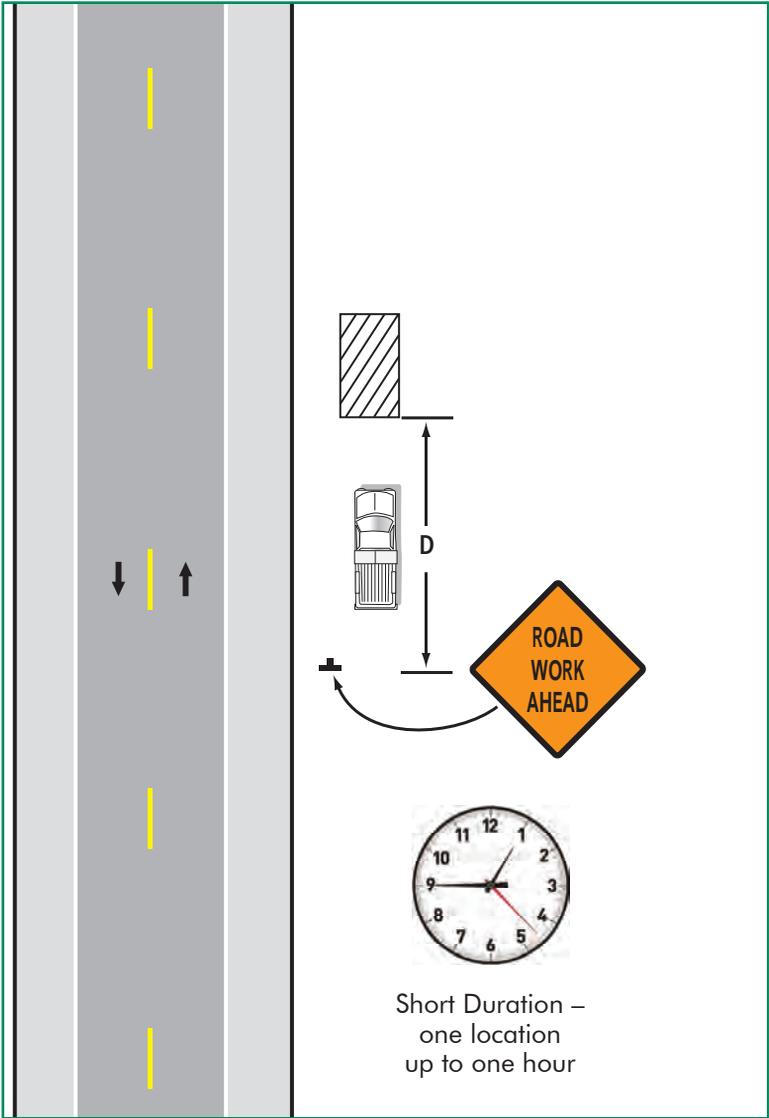
- This plan may be applied only if all the road work, including equipment and workers, are beyond the shoulder.

### **MUTCD Guidance:**

- If the work space is in the median of a divided highway, you should also place an advance warning sign on the left side of the directional roadway.

### **MUTCD Option:**

- For short-term, short-duration (1 hour or less) or mobile operation, all signs and traffic channelizing devices are not required if you are using a vehicle with activated high-intensity rotating, flashing, oscillating or strobe lights.
- Use vehicle hazard warning signals only as a supplement to high-intensity rotating, flashing, oscillating or strobe lights.
- The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
- The ROAD WORK AHEAD sign may be omitted where the work space is behind a barrier, more than 24 inches behind the curb, or 15 ft. or more from the edge of any roadway.
- The use of strobe lights mounted on vehicle may be used to offset the number of TTC devices.



-  Sign
-  Direction of Traffic
-  Work Vehicle
-  Work Space

## Work On the Shoulder

### **Standard:**

- This plan may be applied only if all the road work, including equipment and workers, are off the travelway.
- Engineer will determine if an “Advisory” speed sign is necessary.
- Signing is not required if the work area, including equipment and workers, is outside the Landscape Maintenance Zone (LMZ).
- Advance warning sign (48 inches x 48 inches) is required for posted speed limits of 45 mph or greater.
- Contractor should provide necessary adjustments to accommodate bicyclists and pedestrians.
- Vehicle hazard warning signals shall not be used instead of the vehicle’s high-intensity rotating, flashing, oscillating or strobe lights.
- When paved shoulders having a width of 8 ft. or more are closed, at least one advance warning sign shall be used. In addition, channelizing devices shall be used to close the shoulder in advance to delineate the beginning of the work space and direct vehicular traffic to remain within the travelway.

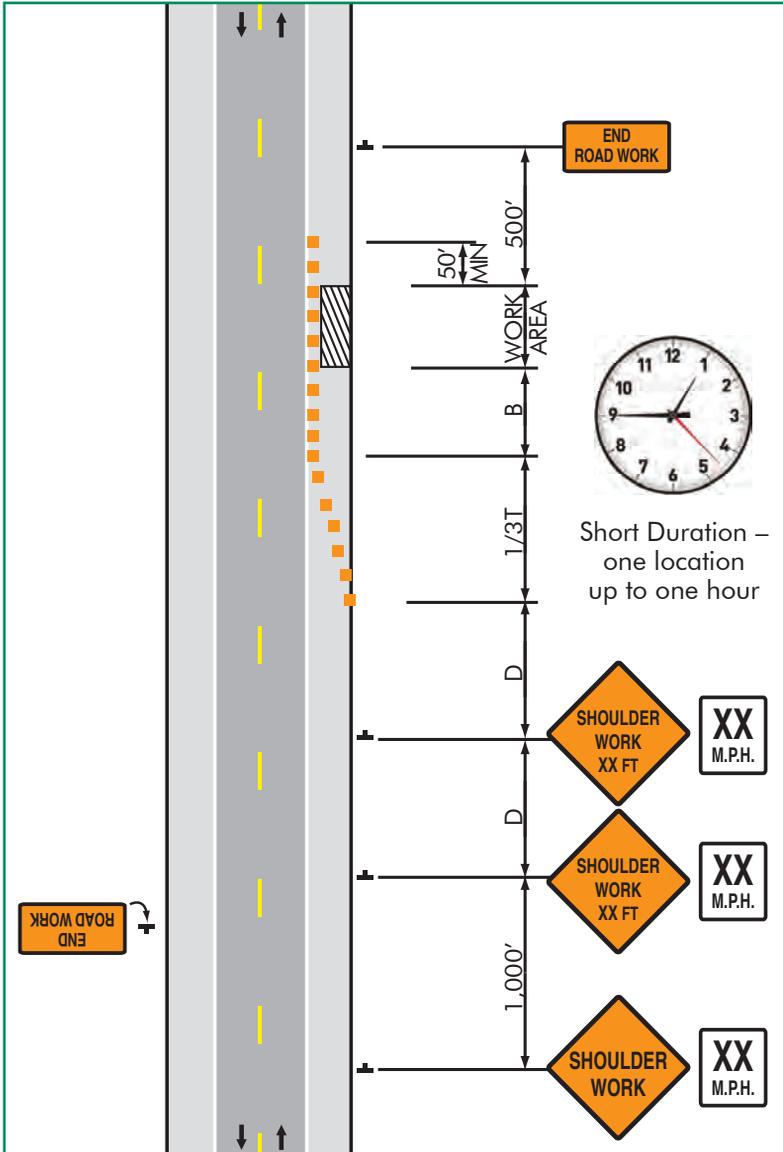
### **MUTCD Guidance:**

- A SHOULDER WORK sign should be placed on the left side of the roadway for a divided or one-way street only if the left shoulder is affected.

### **MUTCD Option:**

- The WORKERS sign may be used instead of SHOULDER WORK signs.
- The SHOULDER WORK AHEAD sign on an intersecting roadway may be omitted where drivers emerging from that roadway will encounter another advance warning sign prior to this activity area.
- For short duration operations of 60 minutes or less, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity rotating, flashing, oscillating or strobe lights is used.

 Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating or strobe lights.



-  Direction of Traffic
-  Channelizing Device
-  Work Space
-  Sign

## Short Duration or Mobile Operation on a Shoulder

### **Standard:**

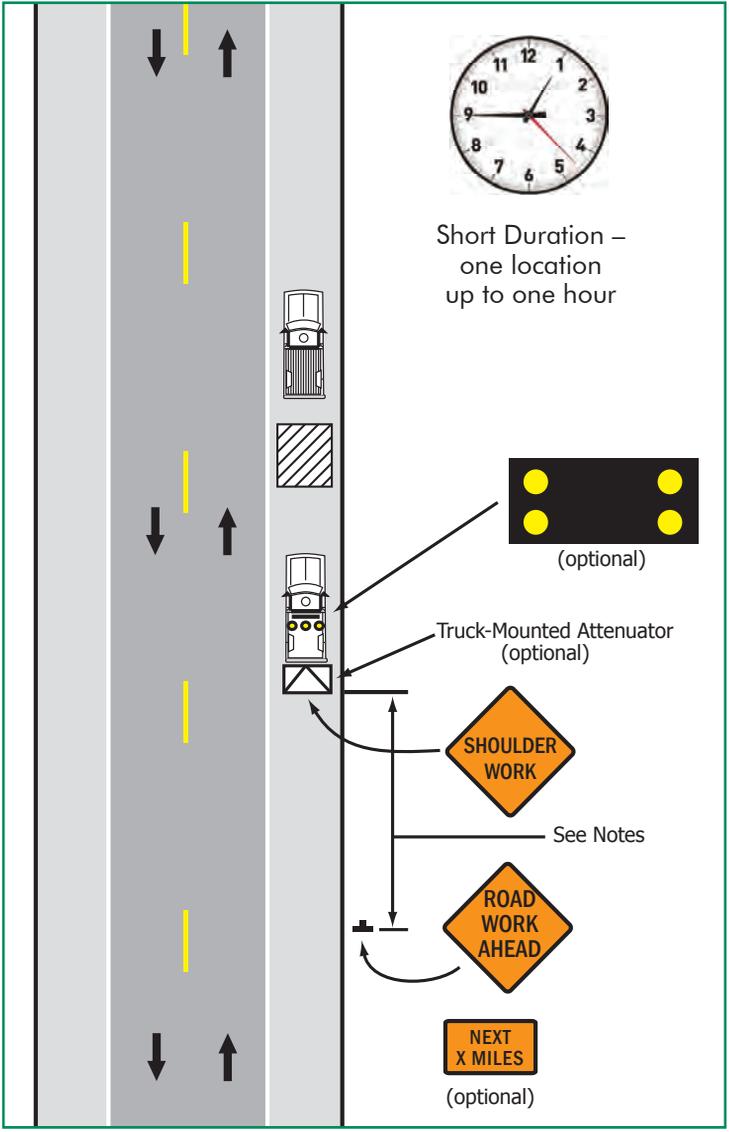
- Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating or strobe lights.
- If an arrow board is used for an operation on the shoulder, the caution mode shall be used.
- Vehicle-mounted signs shall be mounted so that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.

### **MUTCD Guidance:**

- In those situations where multiple work locations within a limited distance make it practical to place stationary signs, the distance between the advance warning sign and the work should not exceed 5 miles.
- In those situations where the distance between the advance signs and the work is 2 miles to 5 miles, a Supplemental Distance plaque should be used with the ROAD WORK AHEAD sign.

### **MUTCD Option:**

- The ROAD WORK NEXT XX MILES sign may be used instead of the ROAD WORK AHEAD sign if the work locations occur over a distance of more than 2 miles.
- Stationary warning signs may be omitted for short duration or mobile operations if the work vehicle displays high-intensity rotating, flashing, oscillating or strobe lights.
- Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating or strobe lights.



- |  |  |  |                          |
|--|--|--|--------------------------|
|  | Direction of traffic                               |  | Truck-Mounted attenuator |
|  | Arrow panel support or trailer (shown facing down) |  | Work space               |
|  | Channelizing device                                |  | Work vehicle             |
|  | Sign   |  |                          |

## Shoulder Work with Minor Encroachment:

### **Standard:**

- Vehicle-mounted signs shall be mounted so that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.
- Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating or strobe lights.
- Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating or strobe lights.

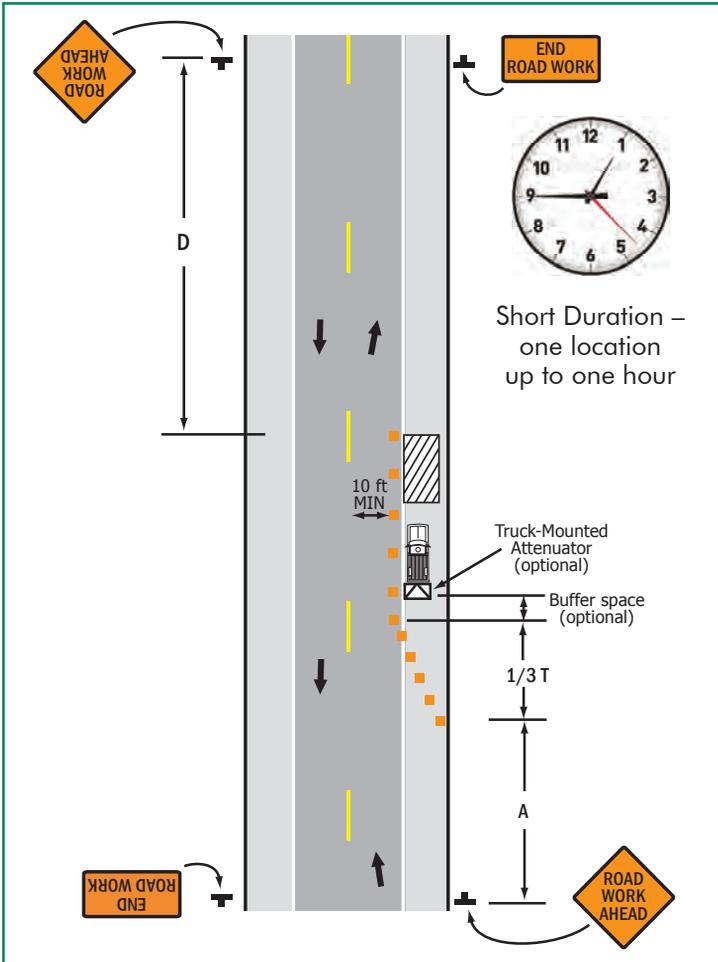
### **MUTCD Guidance:**

- All lanes should be a minimum of 10 ft. in width as measured to the near face of the channelizing devices.
- The treatment shown should be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be used.

### **MUTCD Option:**

- For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 ft. may be used.
- Where the opposite shoulder is suitable for carrying vehicular traffic and of adequate width, lanes may be shifted by use of closely spaced channelizing devices, provided the minimum lane width of 10 ft. is maintained.
- Additional advance warning may be appropriate, such as a ROAD NARROWS sign.
- Temporary traffic barriers may be used along the work space.
- The shadow vehicle may be omitted if a taper and channelizing devices are used.

- A truck-mounted attenuator may be used on the shadow vehicle.
- For short-duration work, the taper and channelizing devices may be omitted if a shadow vehicle with activated high-intensity rotating, flashing, oscillating or strobe lights is used.
- Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating or strobe lights.



	Channelizing Device		Truck-Mounted Attenuator
	Direction of Traffic		Work Space
	Sign		Work Vehicle

## Lane Closure on a Two-Lane Road Using Flaggers

### Qualifications for flaggers (Section 6E.01 of the MUTCD):

Website for HIOSH's traffic and flaggers requirements:

<http://plonedev.hawaii.gov/labor/hiosh/pdf/standards/part3/12-119.2.pdf>

Flaggers are responsible for public safety. They are the highway workers who have the most direct contact with the public, and should be trained in safe traffic control practices and public contact techniques.

Flaggers should satisfactorily demonstrate the following abilities:

- Receive and communicate specific instructions clearly, firmly and courteously.
- Move and maneuver quickly to avoid danger from errant vehicles.
- Control signaling devices (such as paddles and flags) to provide clear and positive guidance to drivers approaching a TTC zone in frequently changing situations.
- Understand and apply safe traffic control practices, sometimes in stressful or emergency situations.
- Recognize dangerous traffic situations and warn workers in sufficient time to avoid injury.

#### **Standard:**

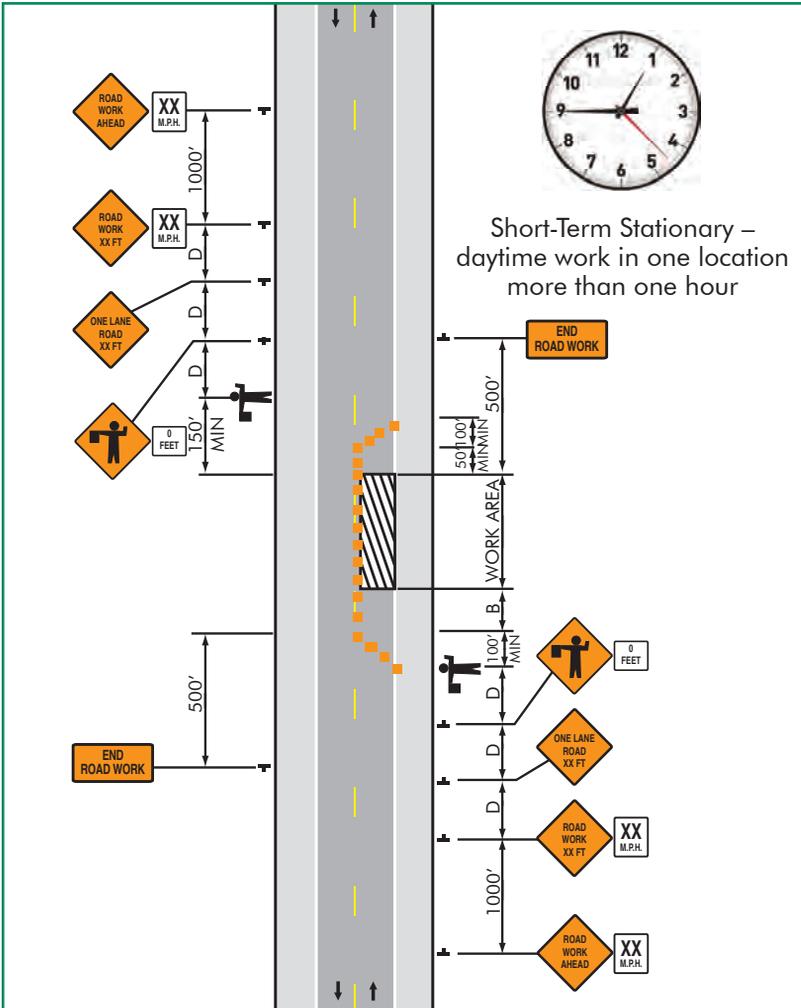
- Illuminate flagger stations at night, except in emergencies.

#### **Option:**

- For low-volume situations with short-work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger positioned to be visible to road users approaching from both directions may be used (see MUTCD, Chapter 6E).
- The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short-duration operations.
- Flashing warning lights and/or flags may be used to call attention to the advance warning signs. A BE PREPARED TO STOP sign may be added to the sign series.

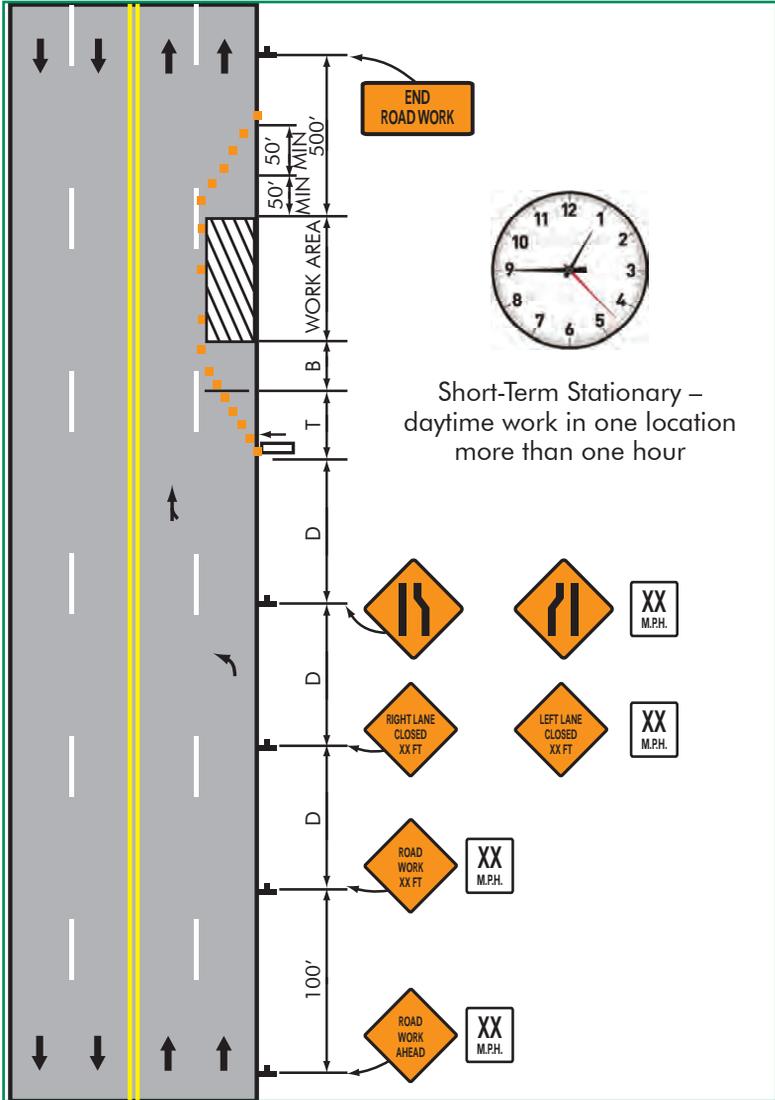
**Guidance:**

- The buffer space should be extended so that the two-way traffic taper is placed before a horizontal (or crest vertical) curve to provide adequate sight distance for the flagger and a line of stopped vehicles.



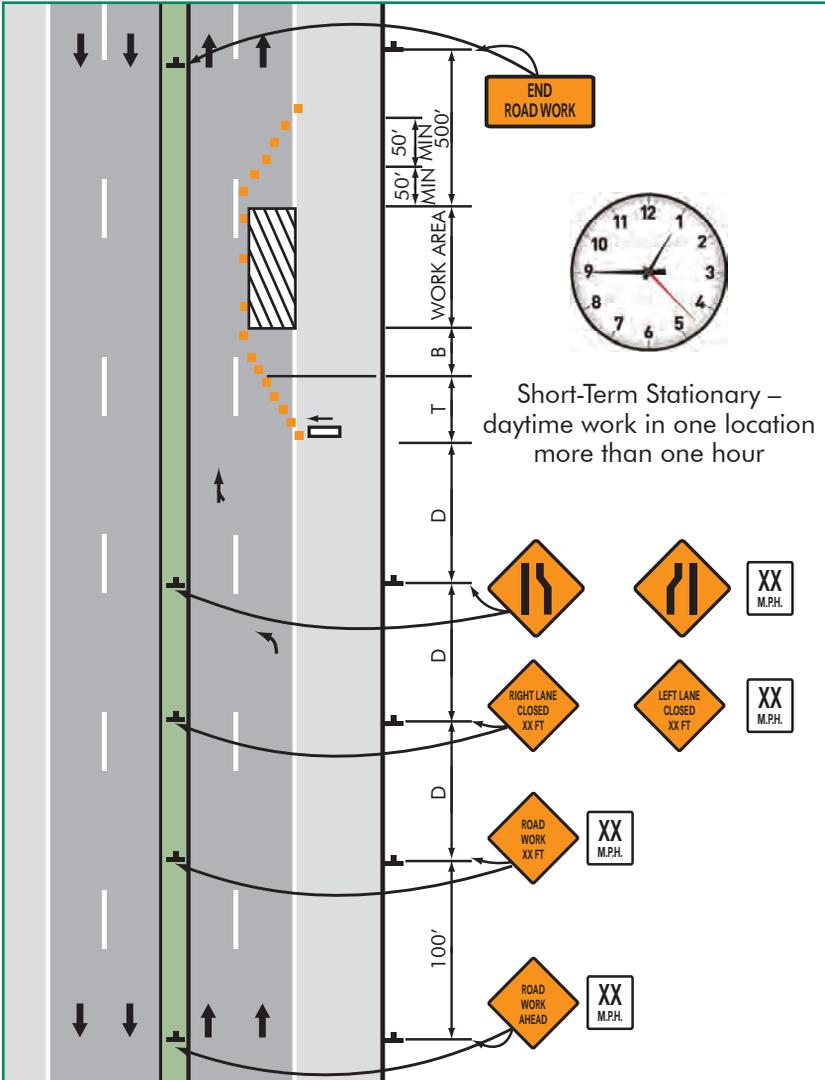
	Channelizing Device		Work Space
	Direction of Traffic		Work Vehicle
	Sign		Police Officer/Flagger

## Right Lane Closure on a Multi-lane Undivided Highway



- Cone or Delineator
- Direction of Traffic
- ⊕ Sign
- ⚡ Flashing Arrow Signal
- ▨ Work Space

## Right Lane Closure on a Multi-lane Divided Highway



- Cone or Delineator
- Direction of Traffic
- ⊣ Sign
- ⏏ Flashing Arrow Signal
- ▨ WorkSpace



## Where can I get more safety information?

Minimize traffic and work zone accidents by accessing the following:

- HDOT's Section 645 – Work Zone Traffic Control.
- Traffic control vendors provide training; ask your vendor.
- HDOT provides traffic control training; ask the Engineer.
- Federal Highway Administration. 2007. Vegetation Control for Safety: A Guide for Local Highway and Street Maintenance Personnel. Report No. FHWA-SA-07-018. 48 pp. Available at [http://safety.fhwa.dot.gov/local\\_rural/training/fhwas07018/](http://safety.fhwa.dot.gov/local_rural/training/fhwas07018/)
- Federal Highway Administration, U.S. DOT. 2009. Manual on Uniform Traffic Control Devices (MUTCD). Washington, D.C. Contains current information on temporary traffic control, including typical applications. Available at <http://mutcd.fhwa.dot.gov/pdfs/2009/mutcd2009edition.pdf>
- Hawaii DOT and Hawaii Local Technical Assistance Program. June 2006. Guidelines for Temporary Traffic Control. Request from the Engineer.
- The Strategic Highway Safety Plan, Implementation Guides. Available at <http://safety.transportation.org/guides.aspx>

## Reporting & Inspection

Report any personnel and public hazards and injuries, observed safety violations, and faulty equipment. See Chapters 14 and 15.



### In a Nutshell

1. You are required to observe all rules and regulations, including construction and traffic standards of the federal, state, and local authorities having jurisdiction.
2. Contractors are required to include a written Site Specific Healthy and Safety Plan (SSHASP) to the Engineer when submitting the bid.
3. Hawaii DOT has adapted and incorporated parts of the MUTCD in Section 645. You must follow Section 645 for temporary traffic control. Most landscape work will entail shoulder traffic control.
4. Always protect yourself, other personnel, and the public from hazards and injuries while engaged in roadside vegetation maintenance work.