

Taper Length Calculations—Based on Speed Limit

40 MPH OR LESS $W \times S \times S / 60 = L$ taper length	45 MPH OR MORE $W \times S = L$ taper length
W = The width of the Lane is what we use. It stands for total amount of lateral shift	
S = the Speed Limit (Posted Speed Limit)	

Example 1: 12-foot lane with a 25 MPH speed limit - which formula? $W \times S \times S / 60 = L$
 $12 \times 25 \times 25 / 60 = 125$ ft taper

Example 2: 14-foot lane with a 55 MPH speed limit - which formula? $W \times S = L$
 $14 \times 55 = 770$ ft taper

SHOULDER TAPER—Find L first based on speed limit, then multiply by 0.33

Example 1: 12-foot lane with 25 MPH speed limit and shoulder closure - which formula 1st?
 $W \times S \times S / 60 = L$
 $12 \times 25 \times 25 / 60 = 125$ ft taper
 For the shoulder taper take (L) $125 \times 0.33 = 41.25$ ft

SHIFTING TAPER—Find L first based on speed limit, then multiply by 0.50

Example 1: 14-foot lane with a 55 MPH speed limit - which formula? $W \times S = L$
 $14 \times 55 = 770$ ft taper
 Shifting taper take (L) $770 \times 0.50 = 385$ ft

MULTIPLE LANE CLOSURE—Find L first based on speed limit, then use the length of one lane width for $W \times L + 2L + L = L$ (Total length of Taper for Multiple Lane Closure)

Example 1: 11-foot lane with a speed limit of 35 MPH - which formula? $W \times S \times S / 60 = L$
 $11 \times 35 \times 35 / 60 = 224.58$ ft round up to 225 ft
 $225 + 450 + 225 = 900$ ft
 $L + 2L + L = L$ (Total length of Taper for Multiple Lane Closure)

NUMBER OF DEVICES—The minimum number of devices is ALWAYS 5

To find the total number of devices needed in a Taper, take the total length of the taper and divide it by the speed limit, then add one. $L/S = \#$ of devices + 1

Example 1: Taper Length 770-feet | Speed Limit 55 Mph
 $770 / 55 = 14 + 1 = 15$ total devices needed at a minimum

Manual on Uniform Traffic Control Devices (MUTCD)

Has 9 parts in its entirety but **PART 6 stays on the job at all times**

Standard, Guidance, Option, and Support shall be defined as follows:

Standard—a statement of required, mandatory, or specifically prohibitive practice regarding a traffic control device. In limited, location-specific cases, the results of a documented engineering study (see Section 1D.03) might indicate a deviation from one or more requirements of a Standard provision to be appropriate. All Standard statements are labeled, and the text appears in bold type. The verb “shall” is typically used. The verbs “should” and “may” are not used in Standard statements. Standard statements are sometimes modified by Option statements.

Guidance—a statement of recommended practice in typical situations, with deviations allowed if engineering judgment or engineering study (see Section 1D.03) indicates the deviation to be appropriate. All Guidance statements are labeled, and the text appears in unbold italic type. The verb “should” is typically used. The verbs “shall” and “may” are not used in Guidance statements. Guidance statements are sometimes modified by Option statements.

Option—a statement of practice that is a permissive condition and carries no requirement or recommendation. Option statements sometimes contain allowable modifications to a Standard or Guidance statement. All Option statements are labeled, and the text appears in unbold type. The verb “may” is typically used. The verbs “shall” and “should” are not used in Option statements.

Support—an informational statement that does not convey any degree of mandate, recommendation, authorization, prohibition, or enforceable condition. Support statements are labeled, and the text appears in unbold type. The verbs “shall,” “should,” and “may” are not used in Support statements.

Seven Fundamental Principles of Temp Traffic Zones:

1. General plan or guidelines should be developed to provide
2. Road user movement should be inhibited as little as possible
3. Motorists, bicyclists and pedestrians should be clearly guided
4. To provide acceptable levels of operation, perform routine day and night inspections
5. Attention should be given to the maintenance of roadside safety
6. All workers should receive training
7. Good Public Relations should be maintained

Eight Typical Work Zone Problems:

1. Distracted Driving
2. Speed
3. Insufficient advance warning
4. Inadequate guidance through the work zone
5. Unprotected hazards
6. Poor work supervision and work area housekeeping
7. Distractions to motorists
8. Congestion and capacity problems

TTCD Five basic requirements –principles:

1. Fulfill a need
2. Command attention
3. Convey a clear simple meaning
4. Command respect from the road user
5. Give adequate time for proper response

FOUR COMPONENTS of every Traffic Control Zone

1. **Advanced Warning Area**—Where the signs are located
2. **Transition Area**—Where the Taper Occurs
3. **Activity Area**—Where the **Work Space** is located (which is workers are located and equipment)
4. **Termination Area**—Where the work zone ends

The five categories of work duration and their time at a location shall be:

- **Long-term stationary** is work that occupies a location more than 3 days.
- **Intermediate-term stationary** is 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** is daytime work that occupies a location for more than 1 hour within a single daylight period.
- **Short duration** is work that occupies a location up to 1 hour.
- **Mobile** is work that moves intermittently or continuously. **In South Carolina and Georgia, only those operations that move continuously at speeds of 3 MPH or greater are considered mobile. All other operating at speeds less than 3 MPH or intermittently are treated as short term stationary.**

CONSISTENCY is key to all plans and device placing.

WORK ZONE BEST PRACTICES

- Clearly define the traffic control responsibility in the contract.
- Provide sufficient arrangements for payment of the maintenance and protection of traffic control devices being used.
- Require contractors to obtain approval for traffic control plans before the work is started, usually through a permit
- Require all revisions to the temporary traffic control plan be approved by the governing agency that has responsible charge of the area. Keep the plan current and identifiable
- Hold pre-construction conferences between the public agency and contracting personnel.
- Assure that procedures set forth in the MUTCD and other designated manuals are followed.
- Conduct inspections after the traffic control devices have been installed or modified.
- Maintain photographic and/or video documentation of the site and detours after the TTCD's are in place.
- Make sure that proper maintenance is provided to ensure that the TTCD's at the work site are properly working.
- Inspect the project at regular intervals, both daytime and night time, to ensure that reasonable maintenance does exist.
- Maintain a record or diary of all inspections of the project.
- Store material and equipment in protected areas or safe distances from the traffic way.
-

Conduct standardized activity

- Install devices moving with traffic
- Remove devices in reverse direction
- Inventory TCD on regular basis
- Keep records on damage, replacement & changes

Traffic Control Devices get removed downstream to upstream and placed upstream to downstream. In other words, you place traffic control devices down with the flow of traffic and take them up against the flow of traffic.

Pedestrian Considerations (6C.02)

Standard:

If the TTC zone affects the movement of pedestrians, adequate pedestrian access and walkways shall be provided.

- Pedestrians should not be led into conflicts with vehicles, equipment, and operations.
- Pedestrians should not be led into conflicts with vehicles moving through or around the worksite.
- Pedestrians should be provided with a convenient and accessible path that replicates as nearly as practical the most desirable characteristics of the existing sidewalks or footpaths.
- A pedestrian route should not be moved for non-construction activities such as parking for vehicles and equipment.

Standard:

The various TTC Provisions for pedestrian and worker safety set forth in Part 6 shall be applied by knowledgeable persons after appropriate evaluation and engineering judgment. Advance notification of sidewalk closures shall be provided by the maintaining agency.

If the TTC zone affects the movement of pedestrians, adequate pedestrian access and walkways shall be provided. If the TTC zone affects an accessible and detectable pedestrian facility, the accessibility and detect ability shall be maintained along the alternate pedestrian route.

Accessibility Considerations (6C.03)

Standard:

When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. A barrier that is detectable by a person with a vision disability traveling with the aid of a long cane shall be placed across the full width of the closed pedestrian facility.

- Maintaining a detectable, channelized pedestrian route is preferred by pedestrians with visual disabilities.
- Audible information devices should be used to inform pedestrians with visual disabilities of closed walkways, or alternate crossings.
- Devices that provide speech messages in response to passive pedestrian actuation are the most desirable.
- Devices that continuously emit a message, or that emit a message in response to a pushbutton, are also acceptable.
- Audible information devices might not be needed if detectable Channelizing devices make an alternate route of travel evident to pedestrians with visual disabilities.

Design Features of Traffic Control Devices

1. Shape
2. Size
3. Color
4. Composition
5. Retroreflectorization
6. Contrast

Channelizing Devices (MUTCD 6K.01)

The function of channelizing devices is to warn and alert drivers of conditions created by work activities, in or near the traveled way, to protect workers in the temporary traffic control zone, and to guide drivers and pedestrians safely. Spacing of channelizing devices should not exceed a distance in feet, equal to the speed when used for the taper channelization, and a distance in feet of twice the speed when used for tangent channelization. The suggested maximum spacing for channelizing devices is 50 feet when used in the taper and 100 feet when used for the tangent section.

Pedestrian Channelization Devices (MUTCD 6K.02)

- Devices indicate a suitable path of pedestrian travel around or through the work zone.
- Should be provided when work activities impact sidewalks or other pedestrian facilities or when the design of the temporary pedestrian facility does not otherwise include accessibility features consistent with the features in the existing pedestrian facility.
- Pedestrian channelizing devices shall be crashworthy.
- Devices used to channelize pedestrians shall be detectable to users of long canes and visible to pedestrians with vision disabilities.
- When used as a sidewalk closure, the device shall cover the entire width of the sidewalk.
- Pedestrian channelizing devices shall have continuous detection plates and hand-trailing edges (see figure 6K.2).

Cones (MUTCD 6K.03)

- Convenient for storage and use.
- Minor impedance to traffic.
- Little effect on capacity.
- Cannot be damaged easily.
- Well recognized and understood.
- Require extra maintenance due to tendency to be displaced.

Tubular Markers (MUTCD 6K.04)

- Tubular markers shall be a minimum of 28 inches in height.
- For nighttime use, tubular markers shall be retroreflectorized.
- Do not give enough visual area to be used for pedestrian Channelization.
- Have less visible area than other devices so their use should be where space is restricted.

Vertical Panels (MUTCD 6K.05)

May, where space is limited, be used to channelize vehicular traffic, divide opposing lanes, or replace barricades.

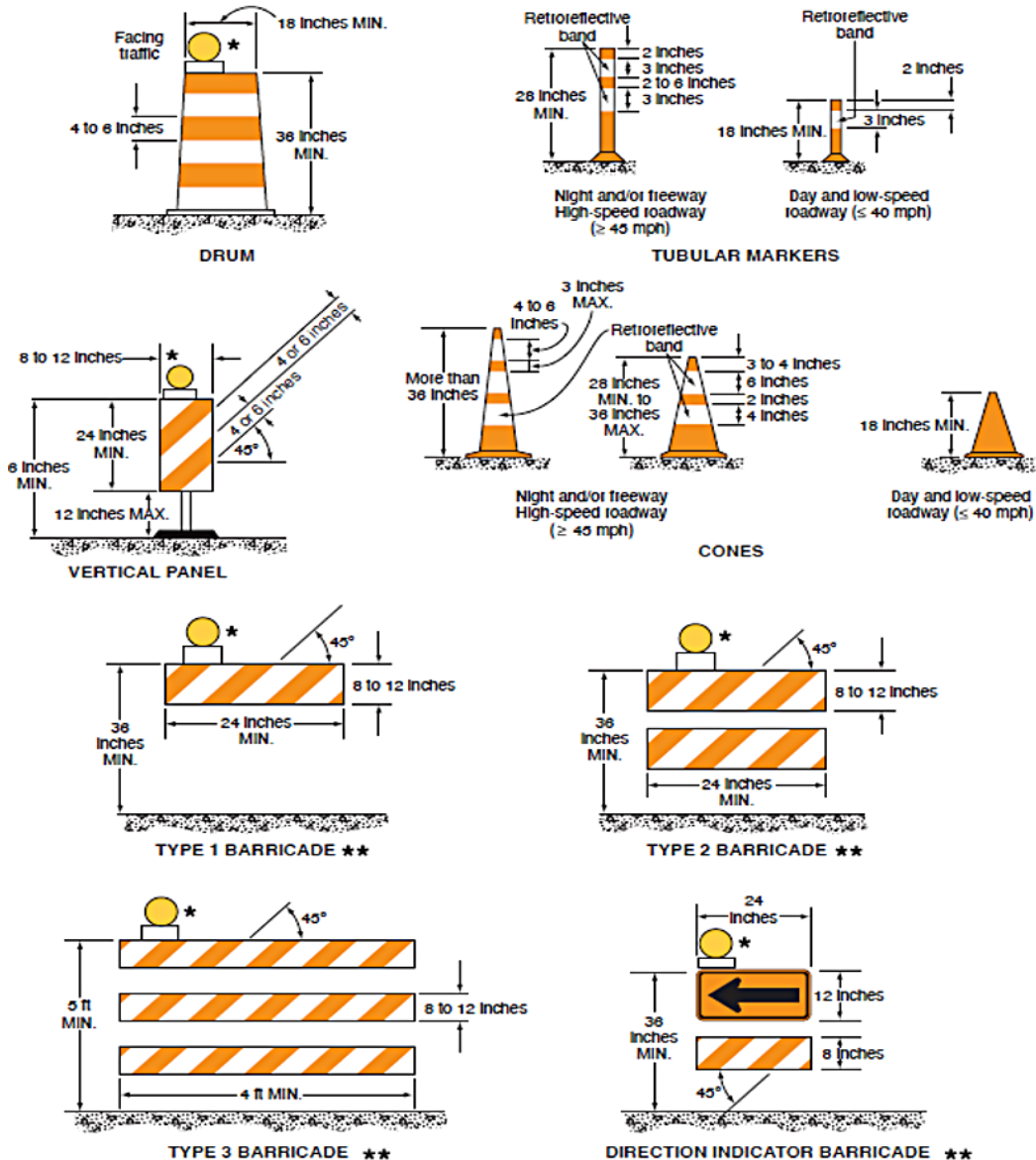
Drums (MUTCD 6K.06)

- Have a lower mobility and can be used for longer durations.
- Appear to be formidable obstacles.
- Effective in repelling vehicles for the damage perceived that would occur if hit.
- May not stay in place if hit or balance is upset.
- May take up too much space.
- May be hard to store and manage.

Type 1, 2, or 3 Barricades (MUTCD 6K.07)

- These provide a significant target area and command respect as formidable objects in the road environment.
- Provide a highly reflective area to enhance attention grasping of the motorist and pedestrian.
- Effectively close off work areas.
- Command respect from pedestrians.
- Make good locations for the display of flashing lights and signs.
- Can physically barricade a roadway, pavement end, bridge out, or when other abrupt termination is present.

EXAMPLES OF CHANNELIZING DEVICES



* Warning lights (optional)
** Rail stripe widths shall be 6 inches, except that 4-inch wide stripes may be used if rail lengths are less than 38 inches. The sides of barricades facing traffic shall have retroreflective rail faces.

Temporary Lane Separators (MUTCD 6K.11)

Temporary lane separators may be used to channelize road users, to divide opposing vehicular traffic lanes, and to divide lanes when two or more lanes are open in the same direction. At pedestrian crossing locations, temporary lane separators shall have an opening or be shortened to provide a pathway that is at least 60 inches wide for crossing pedestrians.

Portable Changeable Message Signs- PCMS (MUTCD 6L.05)

Portable Changeable Message signs (PCMS) are Temporary Traffic Control devices installed for temporary use. In most cases, PCMS follow the same provisions for design and application as those given for Changeable message signs in Chapter 2L. They are used most frequently on high-density urban freeways, but they have applications on all types of highways where alignment, road user routing problems, or other pertinent conditions require advance warning and information.

PCMS are very useful because they are capable of:

- A.** Conveying complex messages,
- B.** Displaying real-time information about conditions ahead and,
- C.** Providing information to assist road users in making decisions prior to the point where action must be taken.

Arrow Boards (MUTCD 6L.06)

For a stationary lane closing, the arrow display should be located on the shoulder, at the beginning of the taper. The bottom of the sign shall be a minimum of seven feet above the pavement surface, except on vehicle-mounted panels, which should be as high as practicable. Typically, Arrow Boards as described in Figure 6L-3 of Part 6 in the MUTCD, are used only when a lane is closed on a multi-lane highway. Arrow Boards are not to be used on two-lane, two-way highways when traffic operations are for temporary one-lane operation unless being used in caution mode. These latter conditions require appropriate signing, flagging, and/or pilot cars as necessary.

Crash Cushions (6M.05)

Crash cushions are systems that mitigate the effects of errant vehicles that strike obstacles, either by smoothly decelerating the vehicle to a stop when hit head-on, or by redirecting the errant vehicle. The two types of crash cushions that are used in TTC zones are stationary crash cushions and truck-mounted attenuators. Crash cushions in TTC zones help protect the drivers from the exposed ends of barriers, fixed objects, shadow vehicles, and other obstacles.

Temporary Markings (MUTCD 6J.02)

May be used as authorized in the traffic control plan and may be maintained until covered by a subsequent paving course. Over painting with paint or liquid asphalt is never acceptable as a means of eliminating temporary markings. Temporary pavement marking materials can consist of paint, pressure sensitive traffic marking tape and/or removable raised pavement markers.

- Painting over existing pavement markings with black paint or spraying with asphalt is not allowed in most states as an accepted substitute for removal or obliteration.
- Markings no longer applicable may cause confusion in the minds of motorist and pedestrians, and should be removed or obliterated as soon as practical.
- Virtually all DOT's have prepared specifications that define conditions for required temporary pavement marking on resurfacing and construction projects. These requirements dictate type markings necessary on daily basis.

Temporary Raised Pavement Markers (MUTCD 6J.03)

If used, the color and pattern of the raised pavement markers shall simulate the color and pattern of the markings for which they substitute.

If temporary raised pavement markers are used to substitute for broken line segments, a group of at least three retroreflective markers equally spaced at no greater than 5 feet shall be installed every 40 feet.

If temporary raised pavement markers are used to substitute for solid lines, the markers shall be equally spaced at no greater than 10 feet, with retroreflective or internally illuminated units at a spacing no greater than 20 feet.

They shall be used as required in the traffic control plan or the project proposal to:

- Supplement lane lines
- Supplement a double, solid yellow line
- Supplement ramp gore lines
- Supplement other lines as directed by the engineer

Temporary Traffic Control Signals

Temporary traffic control signals (see Section 4D.11) used to control road user movements through TTC zones and in other TTC situations shall comply with the applicable provisions of Part 4. Temporary traffic control signals are typically used in TTC zones such as temporary haul road crossings; temporary one-way operations along a one-lane, two-way highway; temporary one-way operations on bridges, reversible lanes, and intersections.

Standard: (4D.11)

Advance signing shall be used when employing a temporary traffic control signal. A temporary traffic control signal shall:

- A. Meet the physical display and operational requirements of a conventional traffic control signal;**
- B. Be removed when no longer needed; and**
- C. Except as provided in Paragraph 5 of this Section, be placed in the flashing mode during periods when it is not desirable to operate the signal in the steady mode, or the signal heads shall be covered, turned, or taken down to indicate that the signal is not in operation.**

Support:

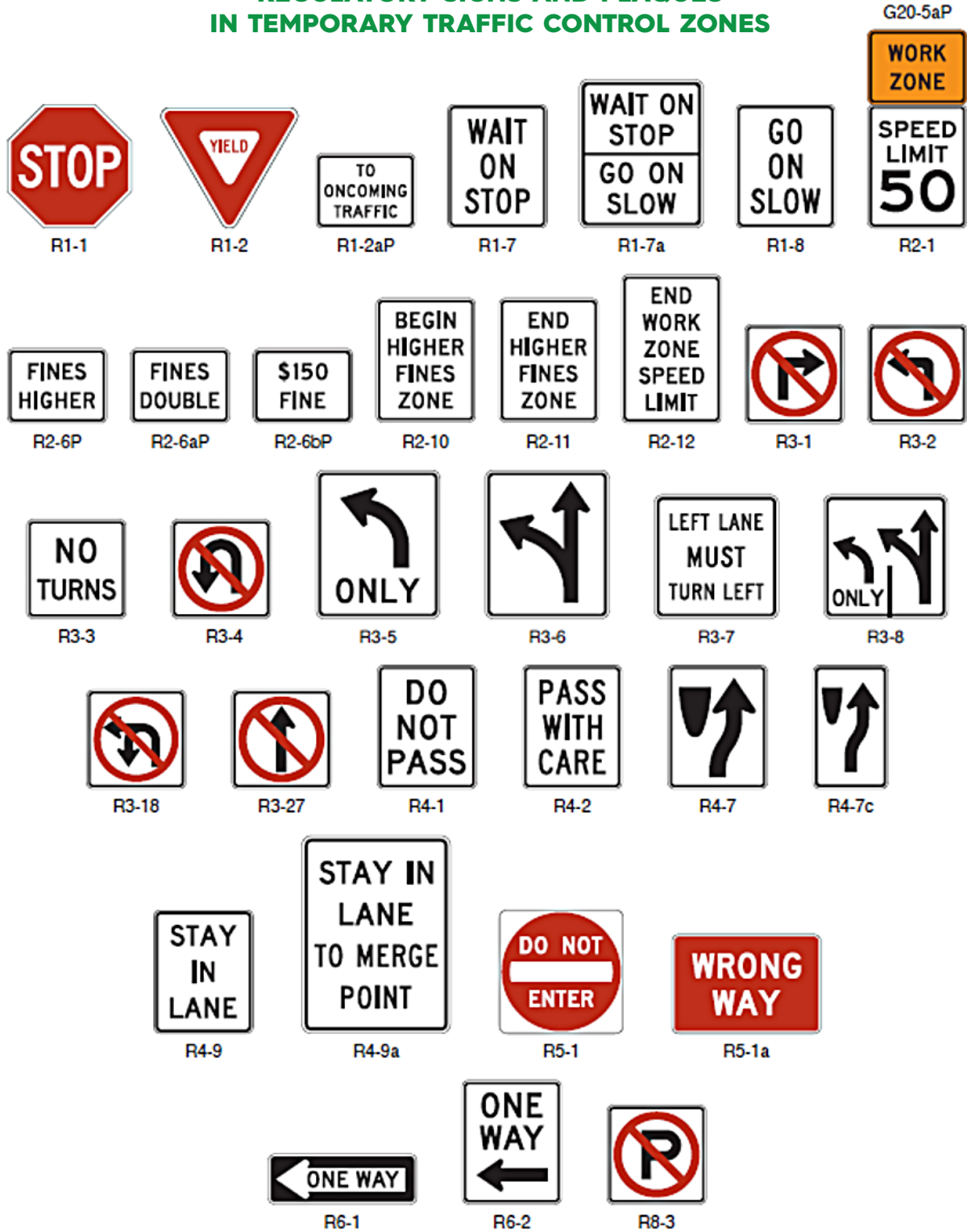
Factors related to the design and application of temporary traffic control signals include the following:

- A. Safety and road user needs;**
- B. Work staging and operations;**
- C. The feasibility of using other TTC strategies (for example, flaggers, providing space for two lanes, or detouring road users, including bicyclists and pedestrians);**
- D. Sight distance restrictions;**
- E. Human factors considerations (for example, lack of driver familiarity with temporary traffic control signals);**
- F. Road-user volumes including roadway and intersection capacity;**
- G. Affected side streets and driveways;**
- H. Vehicle speeds;**

- I.** The placement of other TTC devices;
- J.** Parking;
- K.** Turning restrictions;
- L.** Pedestrians;
- M.** The nature of adjacent land uses (such as residential or commercial);
- N.** Legal authority;
- O.** Signal phasing and timing requirements;
- P.** Full-time or part-time operation;
- Q.** Actuated, fixed-time, or manual operation;
- R.** Power failures or other emergencies;
- S.** Inspection and maintenance needs;
- T.** Need for detailed placement, timing, and operation records; and
- U.** Operation by contractors or by others.

Regulatory Signs:

**REGULATORY SIGNS AND PLAQUES
IN TEMPORARY TRAFFIC CONTROL ZONES**



TEMPORARY TRAFFIC CONTROL ZONE REGULATORY SIGN AND PLAQUE SIZES

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway	Minimum
Stop	R1-1	6G.02	30 x 30*	—	—
Stop (on Stop/Slow Paddle)	R1-1	6D.02	18 x 18	—	—
Yield	R1-2	6G.02	36 x 36 x 36*	—	30 x 30 x 30
To Oncoming Traffic (plaque)	R1-2aP	6G.02	36 x 30	48 x 36	24 x 18
Wait on Stop	R1-7	6L.03	24 x 30	24 x 30	—
Wait on Stop - Go on Slow	R1-7a	6G.03	30 x 36	30 x 36	—
Go on Slow	R1-8	6L.03	24 x 30	24 x 30	—
Speed Limit	R2-1	6G.08	24 x 30*	36 x 48	—
Fines Higher (plaque)	R2-6P	6G.08	24 x 18	36 x 24	—
Fines Double (plaque)	R2-6aP	6G.08	24 x 18	36 x 24	—
SXX Fine (plaque)	R2-6bP	6G.08	24 x 18	36 x 24	—
Begin Higher Fines Zone	R2-10	6G.08	24 x 30	36 x 48	—
End Higher Fines Zone	R2-11	6G.08	24 x 30	36 x 48	—
End Work Zone Speed Limit	R2-12	6G.08	24 x 36	36 x 54	—
Movement Prohibition	R3-1,2,3,4	6G.02	24 x 24*	36 x 36	—
Mandatory Movement Lane Control - Turn Only	R3-5	6G.02	30 x 36	—	—
Optional Movement Lane Control - Thru and Turn	R3-6	6G.02	30 x 36	—	—
Right (Left) Lane Must Turn Right (Left)	R3-7	6G.02	30 x 30*	—	—
Advance Intersection Lane Control (2 lanes)	R3-8	6G.02	30 x 30	—	—
Movement Prohibition - No U or Left Turn	R3-18	6G.02	24 x 24*	36 x 36	—
Movement Prohibition - No Straight Through	R3-27	6G.02	24 x 24*	36 x 36	—
Do Not Pass	R4-1	6G.02	24 x 30	36 x 48	—
Pass With Care	R4-2	6G.02	24 x 30	36 x 48	—
Keep Right	R4-7	6G.02	24 x 30	36 x 48	—
Narrow Keep Right	R4-7c	6G.02	18 x 30	—	—
Stay in Lane	R4-9	6G.07	24 x 30	36 x 48	—
Stay in Lane To Merge Point	R4-9a	6G.07	36 x 48	36 x 48	—
Do Not Enter	R5-1	6G.02	30 x 30*	36 x 36	—
Wrong Way	R5-1a	6G.02	36 x 24*	42 x 30	—
One Way	R6-1	6G.02	36 x 12*	48 x 18	—
One Way	R6-2	6G.02	24 x 30*	36 x 48	—
No Parking (symbol)	R8-3	6G.02	24 x 24*	36 x 36	—
Pedestrian Crosswalk	R9-8	6G.09	36 x 18	—	—
Sidewalk Closed	R9-9	6G.10	24 x 12	—	—
Sidewalk Closed, Use Other Side	R9-10	6G.10	24 x 12	—	—
Sidewalk Closed Ahead, Cross Here	R9-11	6G.10	24 x 18	—	—
Sidewalk Closed, Cross Here	R9-11a	6G.10	24 x 12	—	—
Bike Lane Closed	R9-12	6P.01	24 x 12	—	—
Stop Here on Red	R10-6	6L.04	24 x 36	—	—
Road Closed	R11-2, 2a, 2b, 2c	6G.04	48 x 30	—	—
Road Closed - Local Traffic Only	R11-3, 3a, 3b, 4	6G.05	60 x 30	—	—
Weight Limit	R12-1, 2	6G.06	24 x 30	36 x 48	—
Weight Limit	R12-5	6G.06	24 x 36	36 x 48	—
Turn Off 2-Way Radio and Cell Phone	R22-2	6G.11	42 x 36	42 x 36	—
Work Zone (plaque)	G20-5aP	6G.08	24 x 18	30 x 24	—

Larger signs may be used wherever necessary for greater legibility or emphasis.
Dimensions are shown in inches and are shown as width x height.

WORK ZONE SIGNS: Orange background with black letters



W8-2



W8-3



W8-4



W8-5



W8-6



W8-7



W8-8



W8-9



W8-11



W8-12



W8-14



W8-15



W8-15aP



W8-16



W8-17



W8-17P



W8-18



W8-23



W8-24



W8-25



W9-1



W9-2a



W9-3



W9-5a



W11-10



W12-1



W12-2



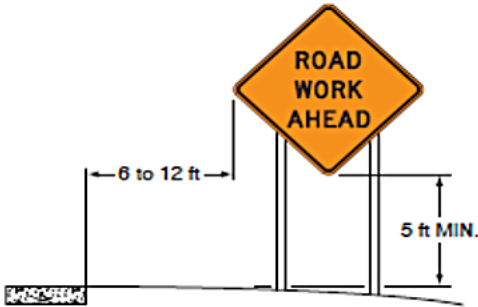
W13-1P

TEMPORARY TRAFFIC CONTROL ZONE WARNING SIGN AND PLAQUE SIZES

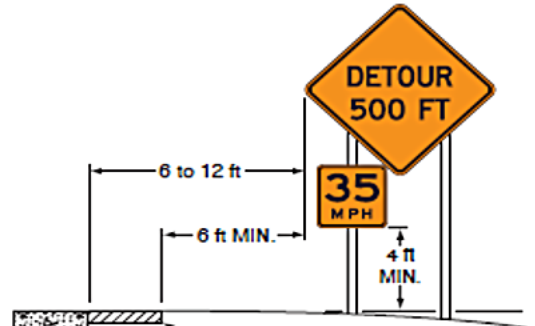
Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway	Minimum
Bicycles Merging	W9-5a	6P.01	30 x 30	—	18 x 18
Grade Crossing Advance Warning	W10-1	6H.01	36 dia.	48 Dia.	—
Truck	W11-10	6H.21	36 x 36	48 x 48	24 x 24
Double Arrow	W12-1	6H.01	30 x 30	36 x 36	—
Low Clearance	W12-2	6H.01	36 x 36	48 x 48	30 x 30
Advisory Speed (plaque)	W13-1P	6H.32	18 x 18	24 x 24	18 x 18
On Ramp (plaque)	W13-4P	6H.09	36 x 36	36 x 36	—
No Passing Zone (pennant)	W14-3	6H.01	48 x 48 x 36	64 x 64 x 48	40 x 40 x 30
XX Feet (2-line plaque)	W16-2P	6H.01	24 x 18	30 x 24	—
Road Work (with distance)	W20-1	6H.03	36 x 36	48 x 48	30 x 30
Path Work (with distance)	W20-1b	6P.01	36 x 36	—	30 x 30
Detour (with distance)	W20-2	6H.04	36 x 36	48 x 48	30 x 30
Bike Detour (with distance)	W20-2a	6P.01	36 x 36	—	30 x 30
Bike Diversion (with distance)	W20-2b	6P.01	36 x 36	—	30 x 30
Road Closed (with distance)	W20-3	6H.05	36 x 36	48 x 48	30 x 30
Path Closed (with distance)	W20-3a	6P.01	36 x 36	—	30 x 30
One Lane Road (with distance)	W20-4	6H.06	36 x 36	48 x 48	30 x 30
Lane(s) Closed (with distance)	W20-5.5a	6H.07	36 x 36	48 x 48	30 x 30
Bike Lane Closed (with distance)	W20-5b	6P.01	36 x 36	—	30 x 30
Flagger (symbol)	W20-7	6H.15	36 x 36	48 x 48	30 x 30
Flagger	W20-7a	6H.15	36 x 36	48 x 48	30 x 30
Slow (on Stop/Slow Paddle)	W20-8	6D.02	18 x 18	—	—
Workers	W21-1.1a	6H.18	36 x 36	48 x 48	30 x 30
Fresh Oil	W21-2	6H.19	36 x 36	48 x 48	30 x 30
Road Machinery Ahead	W21-3	6H.20	36 x 36	48 x 48	30 x 30
Slow Moving Vehicle	W21-4	6N.05	36 x 18	—	—
Shoulder Work	W21-5	6H.22	36 x 36	48 x 48	30 x 30
Shoulder Closed	W21-5a	6H.22	36 x 36	48 x 48	30 x 30
Shoulder Closed (with distance)	W21-5b	6H.22	36 x 36	48 x 48	30 x 30
Survey Crew	W21-6	6H.23	36 x 36	48 x 48	30 x 30
Utility Work (with distance)	W21-7	6H.24	36 x 36	48 x 48	30 x 30
Mowing Ahead	W21-8	6N.05	36 x 36	48 x 48	30 x 30
Blasting Zone Ahead	W22-1	6H.25	36 x 36	48 x 48	30 x 30
End Blasting Zone	W22-3	6H.25	42 x 36	42 x 36	36 x 30
Slow Traffic Ahead	W23-1	6H.11	48 x 24	48 x 24	—
New Traffic Pattern Ahead	W23-2	6H.14	36 x 36	48 x 48	30 x 30
Double Reverse Curve (1 lane)	W24-1	6H.31	36 x 36	48 x 48	30 x 30
Double Reverse Curve (2 lanes)	W24-1a	6H.31	36 x 36	48 x 48	30 x 30
Double Reverse Curve (3 lanes)	W24-1b	6H.31	36 x 36	48 x 48	30 x 30
All Lanes (plaque)	W24-1cP	6H.31	24 x 18	30 x 24	—
Road Work Next XX Miles	G20-1	6H.35	36 x 18	48 x 24	—
End Road Work	G20-2	6H.36	36 x 18	48 x 24	—
Pilot Car Follow Me	G20-4	6H.37	36 x 18	—	—

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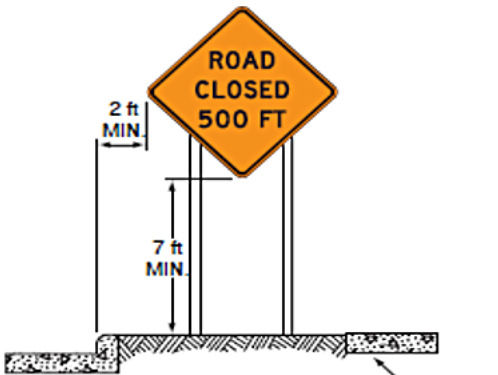
HEIGHT AND LATERAL LOCATION OF SIGNS-TYPICAL INSTALLATIONS



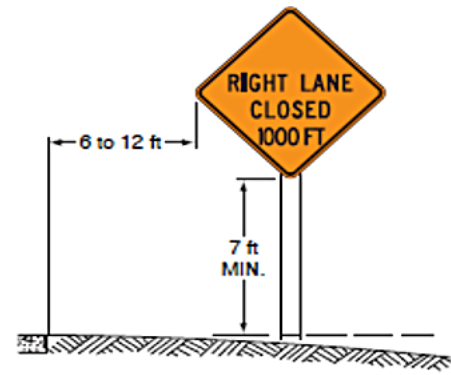
A – Rural area



B – Rural area with advisory speed plaque



C – Business, commercial, or residential area



D – Business, commercial, or residential area (without curb)

Table 6H-3. Meaning of Letter Codes on Typical Application Diagrams

Road Type	Distance Between Signs**		
	A	B	C
Urban (Low Speed)*	100 feet	100 feet	100 feet
Urban (High Speed)*	350 feet	350 feet	350 feet
Rural	500 feet	500 feet	500 feet
Expressway / Freeway	1,000 feet	1,500 feet	2,640 feet
Interstate			1 MILE

* Speed category to be determined by the highway agency

FLAGGERS

Because flaggers are responsible for public safety and make the greatest number of contacts with the public of all highway workers, they should be trained in proper traffic control practices and public contact techniques.

Flaggers should be able to satisfactorily demonstrate the following abilities:

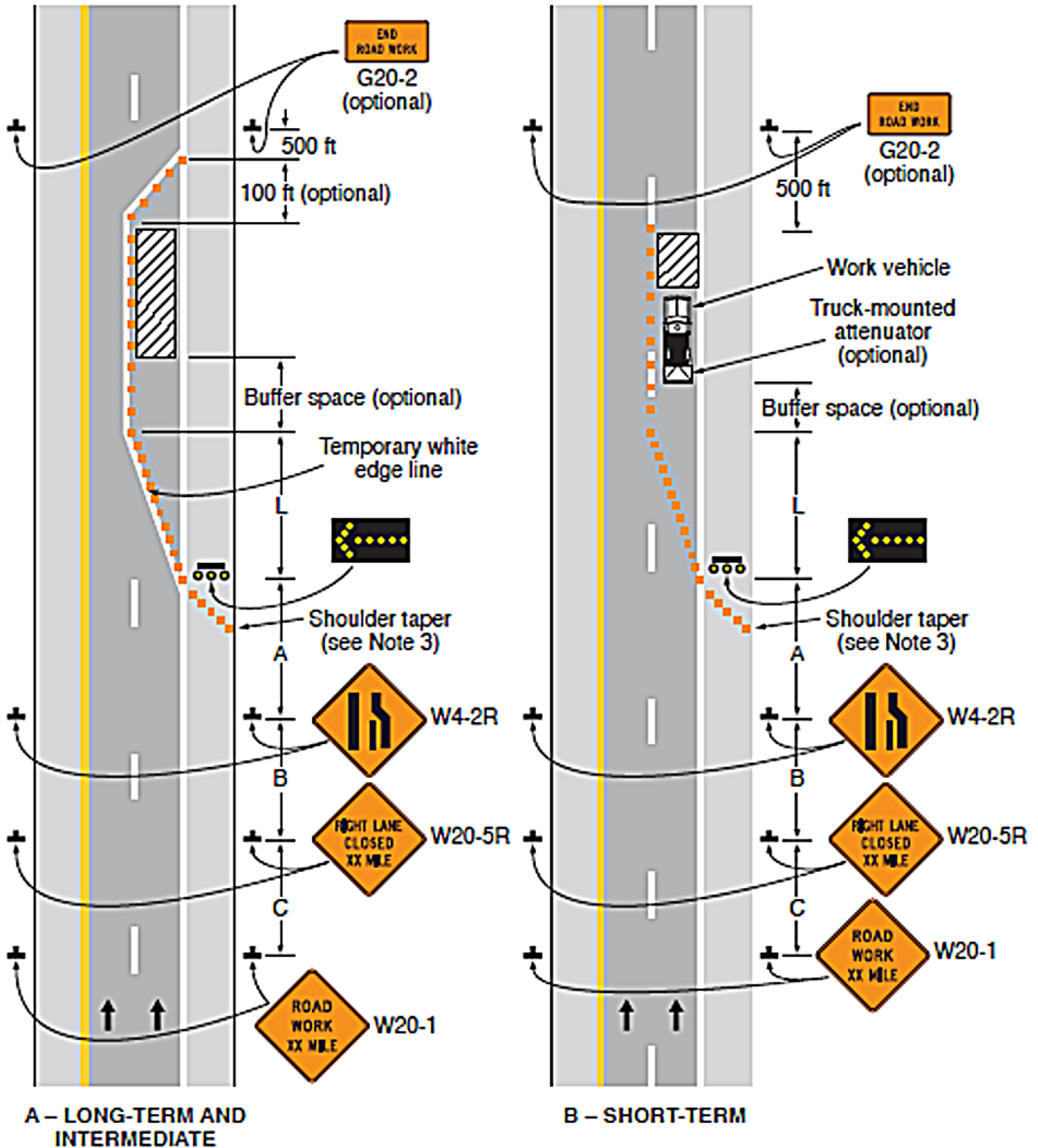
- Ability to receive and communicate specific instructions clearly, firmly, and courteously;
- Ability to move and maneuver quickly in order to avoid danger from errant vehicles;
- Ability to control signaling devices (such as paddles and flags) in order to provide clear and positive guidance to drivers approaching a TTC zone in frequently changing situations;
- Ability to understand and apply proper traffic control practices, sometimes in stressful or emergency situations; and
- Ability to recognize dangerous traffic situations and warn workers in sufficient time to avoid injury.

The use of Stop/Slow Paddles and Flags and Proper Work Apparel

The Stop/Slow paddle should be the primary and preferred hand-signaling device because the STOP/SLOW paddle gives road users more positive guidance than red flags. It is optimal to place the STOP/SLOW paddle on a rigid staff that is tall enough that when the end of the staff is resting on the ground, the message is high enough to be seen by approaching or stopped traffic. It is RECOMMENDED that a minimum height of 7 feet be considered. Use of flags should be limited to emergency situations Only.

It is required that a flagger wear High-Visibility safety apparel which is now required for all workers working within Public Right-of-Ways.

STATIONARY LANE CLOSURE ON A DIVIDED HIGHWAY (TA-33)



MOBILE OPERATION ON A MULTI-LANE ROAD (TA-35)

