[PP 04/02/2017 - 04/15/2017]
Vehicle Traffic Control

Standard traffic control devices as presented in Part 6 the Manual on Uniform Traffic Control Devices (MUTCD[1]) are particularly important during roadway construction. Because of changing and unexpected traffic conditions, drivers are more dependent on traffic control devices to guide them safely through what would otherwise be a hazardous area.

The effectiveness of traffic control devices in temporary traffic control zones depends on their ability to satisfy the driver's need for information. Both the message content and the placement of traffic control devices is important. The positive guidance principles of providing clear and simple standard messages that command driver's attention at a point where they have adequate time to properly respond are the basis of any good traffic control plan.

Past experience indicates that the most serious failures to meet driver needs result from:

1. Contradictory information.
2. Misleading information.
3. Messages with incorrect distances.
4. Non-standard traffic control devices.
5. Incorrect signs.
6. Transitions that are too short or are curved too sharply.

Basic Safety Principles

Section 6B.01 of the MUTCD is a good statement of basic safety principles as paraphrased below:

1. **Recognize Priority** - Make motorist and worker safety an integral and high-priority element of every temporary traffic control zone.

2. **Normalize Design and Operations** - Apply the basic safety principals governing normal roadways and roadsides to the design and operation of temporary traffic control zones.

3. **Minimize Traffic Interruptions** - Inhibit traffic movement as little as practical. Minimize the time that work activities occupy the roadway. Recognize that drivers will not reduce their speed unless they perceive a real need to do so. Employ flaggers only when all other traffic control methods are inadequate.

[1] MUTCD is currently not approved by City of Los Angeles but contains very good reference material.

4. **Design for Positive Guidance** - Avoid frequent or abrupt changes in geometrics that will surprise drivers. Guide drivers with traffic control devices that give a clear and positive message. Remove traffic control devices that are inconsistent with the intended path.

5. **Monitor Operations** - Observe both heavy and light traffic, during day and night, and under varying weather conditions to make sure all traffic controls are operating effectively. Analyze traffic collisions that might indicate a need for changes in traffic control.

6. **Train Personnel** - Only assign people who are trained in proper traffic control practices to the responsibility of selecting, placing, and maintaining temporary traffic control devices. Also train every person whose actions affect safety, from upper-level managers to fieldworkers, in those principles consistent with the job decisions they are required to make.

7. **Maintain Clear Roadside Recovery Areas** - Maintain a roadside recovery area free of equipment and materials.

Work Area Traffic Control Handbook

6-2 LOW SPEED (40 MPH OR LESS) TTC ZONES

When the posted or observed speed is 40 MPH or less, the TTC zone is defined as "low speed". TTC safety in low speed TTC zones should not be compromised by using fewer devices simply because the traffic is slower and activity operations are for short durations and/or frequently change locations.

The following TIC device guidelines shall be used in "low speed "zones:

a) Flashing wanting lights and/or flags may be used to call attention to the advance warning signs.
b) A work vehicle with high intensity rotating, flashing, oscillating, or strobe lights may be used. An arrow board should be use for each lane closed.
c) The minimum height of cones used should be 28 inches, 18-inch high traffic cones may be used during daylight hours.
d) Workers shall wear (minimum) high visibility Class 3 safety apparel.
e) The minimum size for Advance Warning Signs shall be 36 inches by 36 inches.
f) A minimum of two advanced warning signs shall be posted for lane closures.

Typically, short duration mobile activities consist of utility operations, potholing, tree trimming and litter cleanup activities.

On low speed, low volume streets during short duration work, it often takes longer to set up and remove the TTC zone than it takes to perform the work.
Considering the fact that workers face hazards in setting up and taking down the TTC zone, simplified TTC procedures maybe warranted for short duration work only. A reduction in the number of devices may be offset by the use of more dominant devices such as "high intensity" rotating, flashing, strobe lights, or arrow boards on work vehicles up to one-half hour work duration.
Flaggers may also be used for short duration/mobile operations which often involve frequent short stops.
Vehicle hazard warning signals shall not be used instead of the vehicle's high intensity rotating, flashing, strobe lights or arrow panels.

6-3 HIGH SPEED (GREATER THAN 40 MPH) TTC ZONES

When the posted or observed speed is greater than 40 MPH, the TTC zone is defined as high speed, high volume. TTC zones require additional wanting signs, devices and safety enhancements. The following TTC device guidelines shall be used in high speed zones:

a) One arrow board shall be used for each closed lane.
b) The minimum height for all traffic cones shall be 28 inches.
c) A minimum of three advance warning signs shall be posted for lane closures. The first sign shall be a ROAD WORK AHEAD (W20-I). The remaining two signs can be either LANE CLOSED AHEAD (C20) or Lane Ends symbol (W4-2) or a combination of one LANE CLOSED AHEAD (C20) and one Lane Ends symbol (W4-2).
d) A LANE CLOSED (C30) sign shall be posted in a buffer area.
e) Flashing warning lights and/or flags may be used to call attention to the warning signs.
f) Workers in the roadway shall wear Class 3 high visibility safety apparel.
g) The minimum size for Advance Warning Signs shall be 48 inches by 48 inches.

ANSI Type O, Class 1 - Performance Class 1 offers the minimum amount of high visibility materials to differentiate the wearer from non-complex work environments and is only appropriate for off-road environments.

ANSI Type R or P, Class 2 - Performance Class 2 is considered the minimum level of protection for workers exposed to roadway rights-of-way and temporary traffic control (TTC) zones. Garments will have additional amounts of high-visibility materials that allow for better definition of the human form.

ANSI Type R or P, Class 3 - Performance Class 3 provides more visibility to the wearer in both complex backgrounds and through a full range of movement by the required placement of background, retroreflective, and combined performance materials on the sleeves and pant legs (if present). Garments have an even a greater minimum level of high visibility material the apparel must contain. A garment or vest without sleeves worn alone is NOT considered Class 3 protection.

The standard establishes three types:

- Type O ("off-road")
- Type R ("roadway")
- Type P ("public safety")

Class	Description	Minimum Amount of Background Fabric	
		Type R Environment	Type P Environment
1	Minimum amount of high-visibility material to differentiate wearer from non-complex work environments.**	N/A	N/A
2	Allows for better definition of the human form. The minimum level of protection for workers exposed to roadway rights-of-way and temporary traffic control (TTC) zones.	775 sq. in.	450 sq. in.
3	Offers greater visibility to the wearer in complex backgrounds and through a full range of body movements.	1240 sq. in.	775 sq. in.

***While not appropriate for R or P environments, Class 1 Type O garments are required to have a minimum of 217 sq. in. of background material.*