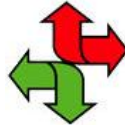


ARIZONA DEPARTMENT OF TRANSPORTATION



ARIZONA SUPPLEMENT TO THE 2003 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

September 1, 2004

Arizona MUTCD users are to modify the 2003 MUTCD as follows:

Section 4B.04 Alternatives to Traffic Control Signals

Guidance:

Since vehicular delay and the frequency of some types of crashes are sometimes greater under traffic signal control than under STOP sign control, consideration should be given to providing alternatives to traffic control signals even if one or more of the signal warrants has been satisfied.

Option:

These alternatives may include, but are not limited to, the following:

- A. Installing signs along the major street to warn road users approaching the intersection;
- B. Relocating the stop line(s) and making other changes to improve the sight distance at the intersection;
- C. Installing measures designed to reduce speeds on the approaches;
- D. Installing a flashing beacon at the intersection to supplement STOP sign control;
- E. Installing flashing beacons on warning signs in advance of a STOP sign controlled intersection on major- and/or minor-street approaches;
- F. Adding one or more lanes on a minor-street approach to reduce the number of vehicles per lane on the approach;
- G. Revising the geometrics at the intersection to channelize vehicular movements and reduce the time required for a vehicle to complete a movement, which could also assist pedestrians;
- H. Installing roadway lighting if a disproportionate number of crashes occur at night;
- I. Restricting one or more turning movements, perhaps on a time-of-day basis, if alternate routes are available;
- J. If the warrant is satisfied, installing multiway STOP sign control;
- K. Installing a roundabout intersection; and
- L. Employing other alternatives, depending on conditions at the intersection.

Guidance:

Neither signalization nor alternatives listed should be selected unless they can logically be expected to improve the overall safety and/or operations of the intersection.

Support:

Traffic control devices, including signals, offer potential advantages and disadvantages. Engineering judgment is needed to weigh the advantages and disadvantages, and compare to existing conditions to determine if changes are appropriate.

Crash experience in synchronized systems has shown both the number and severity of crashes typically rise following signalization.

Adding a new signal within a synchronized signal system will virtually always increase road user delay on both streets (total delay and delay per user). This occurs because the majority non-stop flow will be periodically stopped upon signalization. Even the minor street users (typically considered the beneficiary of signalization) will incur additional delay most hours of a 24-hour time period due to having to wait for the synchronized signal.

Clearance intervals are optional, and if used at urban intersections are most typically predicated on the posted speed limit.

Section 4D.10 Yellow Change and Red Clearance Intervals

Standard:

A yellow signal indication shall be displayed following every CIRCULAR GREEN or GREEN ARROW signal indication.

The exclusive function of the yellow change interval shall be to warn traffic of an impending change in the right-of-way assignment.

The duration of a yellow change interval shall be predetermined.

Guidance:

A yellow change interval should have a duration of approximately 3 to 6 seconds. The longer intervals should be

reserved for use on approaches with higher speeds. Excessively long clearance or change intervals should be avoided.

Option:

The yellow change interval may be followed by a red clearance interval to provide additional time before conflicting traffic movements, including pedestrians, are released.

Standard:

The duration of a red clearance interval shall be predetermined.

Guidance:

A red clearance interval, if used, should have a duration not exceeding 6 seconds. Excessively long clearance or change intervals should be avoided.

Section 4F.02 Design of Emergency-Vehicle Traffic Control Signals

Standard:

Except as specified in this Section, an emergency-vehicle traffic control signal shall meet the requirements of this Manual.

Guidance:

An Emergency Vehicle (W11-8) sign (see Section 2C.40) with an EMERGENCY SIGNAL AHEAD (W11-12p) supplemental plaque should be placed in advance of all emergency-vehicle traffic control signals based on engineering judgment. If a warning beacon is installed to supplement the W11-8 sign, the design and location of the beacon should conform to the Standards specified in Sections 4K.01 and 4K.03.

At least one of the two required signal faces for each approach on the major street should be located over the roadway.

The following size signal lenses should be used for emergency-vehicle traffic control signals: 300 mm (12 in) diameter for red and steady yellow signal indications, and 200 mm (8 in) diameter for flashing yellow or steady green signal indications.

Option:

An EMERGENCY SIGNAL (R10-13) sign may be mounted adjacent to a signal face on each major street approach (see Section 2B.45). If an overhead signal face is provided, the EMERGENCY SIGNAL sign may be mounted adjacent to the overhead signal face.

An approach that only serves emergency vehicles may be provided with only one signal face consisting of one or more signal sections.

Besides using a 200 mm (8 in) diameter signal indication, other appropriate means to reduce the flashing yellow light output may be used.

Section 6B.01 Fundamental Principles of Temporary Traffic Control

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control."

The State of Arizona and local jurisdictions maintain policy and/or procedure manuals that describe optional methods of controlling traffic within work zones. These manuals may be used in conjunction with Part VI of the MUTCD.

Examples of differences in traffic control application in work zones on city streets with lower speeds include:

1. Shadow vehicles are typically not necessary, and can aggravate congestion.
2. Vehicle mounted crash attenuators are typically not necessary, and can be counter-productive by lengthening the exposure of large vehicles at intersections.
3. Traffic control devices and lighting on breakaway and frangible supports in areas with pedestrian activity can create hazards due to debris and exposed electrical wires if struck by errant vehicles.
4. Crash cushions and temporary barriers are not typically appropriate.