

Tech Notes

STOP SIGN INSTALLATION

Tech Note #56



BACKGROUND

STOP signs are traffic control devices that drivers come across regularly. The function of a STOP sign is to improve the safety and operation of intersections by defining who has the right-of-way. Since STOP signs have considerable control over traffic, they should be installed only where necessary. The *Manual on Uniform Traffic Control Devices (MUTCD)* provides guidelines for the installation of STOP signs. Unwarranted STOP signs may create problems either at the intersection or along the roadway itself by:

-  Encouraging motorists to drive faster between intersections in order to save the time lost by stopping.
-  Encouraging violation of traffic laws. For example, if STOP signs are installed at a location where the driver does not perceive a need for them, the rate of STOP sign violations tends to increase at that and other locations.
-  Encouraging the use of alternate, often more local, routes by drivers trying to get around the STOP sign.
-  Increasing the chance that drivers will disregard conflicting vehicles and pedestrian traffic, thus increasing the risk of collisions and injuries.

STOP SIGN REGULATIONS

In accordance with the *MUTCD*, a STOP sign shall be an octagon with white legends and border on a red background, and include only the word STOP. A “4-WAY” supplemental plaque or an “ALL WAY”

Did you know?

STOP sign compliance studies show that when all-way stop control was installed, but not warranted, an average of 30% of the motorists approaching the intersection do not come to a complete stop.

Source: City of Fargo, ND -- Stop Sign Facts

plaque may be necessary when more than two directions are controlled by STOP signs. STOP signs shall be located on the right side of the roadway, however, a secondary STOP sign can be installed on medians or on the left side of the road to supplement the sign on the right side if the road is very wide. The STOP sign shall be installed as close as practical to the intersection and should be visible to the driver as soon as possible. A STOP line or the word STOP on the pavement may be used along with a STOP sign. STOP signs and YIELD signs shall not be mounted on the same post. In addition, no sign should be mounted to the back of a STOP sign other than a DO NOT ENTER sign so the octagon shape of the STOP sign is always visible. Where two roads intersect at an angle, the sign should be placed out of view to the other roadway. A STOP sign in rural areas should be located 6 feet from the shoulder, or if there is no shoulder, 12 feet, and the height from the roadway to the bottom of the sign shall be a minimum of 5 feet. In urban areas, a lesser lateral clearance is



permissible as necessary (i.e., 1 foot clearance from the curb is allowable), and the height shall be a minimum of 7 feet from the ground to the bottom of the sign.

TECHNICAL INFORMATION

The *MUTCD* provides technical information and guidelines for the usage of STOP signs. The sections below highlight some of the more critical guidelines from it.

For two-way stop control, the *MUTCD* indicates that STOP signs should be used if engineering judgment justifies that one or more of the following exist:

- A. Intersection of a less important road with a main road where application of the normal right-of-way rule would not be expected to provide reasonable compliance with the law;
- B. Street entering a through highway or street;
- C. Unsignalized intersection in a signalized area; and/or
- D. High speeds, restricted view, or crash records indicate a need for control by the STOP sign.



A different application of the STOP sign is multiway control, which is limited to intersecting roads of relatively equal volume and characteristics. In accordance with the *MUTCD*, the following criteria should be considered in an engineering study for a multiway STOP sign installation:

A. A traffic signal is going to be installed and the intersection needs a temporary solution to control the traffic.

B. Within 12 months, at least five crashes have occurred at the intersection that could have been prevented by STOP signs.

C. Minimum volumes:

1. The vehicular volume entering the intersection from the major street approaches averages at least 300 vph for any 8 hours of the day.
2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour.
3. If the 85th percentile approach speed of the major street exceeds 40 mph, the minimum vehicular volume warrants are 70% of the above values.

D. Where no single criterion is satisfied, but where criteria B, C.1 and C.2 are all satisfied to 80% of the minimum values.

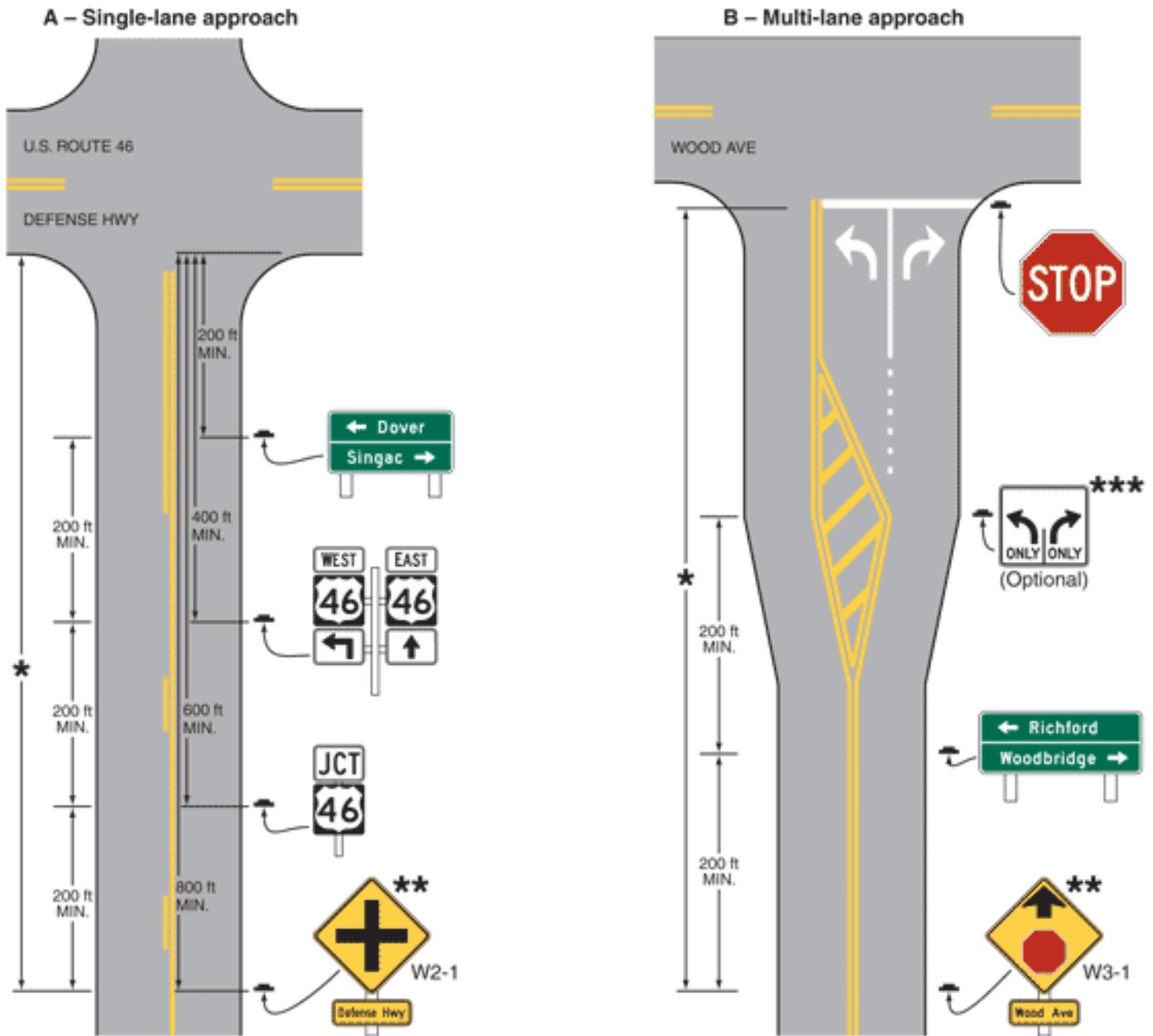
Additional criteria that may be considered in an engineering study related to installation of multiway stop control is available in *MUTCD* Section 2B.07.

Once the decision has been made to install a stop sign, there are several critical elements to consider regarding the placement of the sign. Specifically, the *MUTCD* lists three standards governing the placement of a STOP sign as follows:



The STOP sign shall be installed on the right side of the approach to which it applies.

Figure 2A-4. Relative Locations of Regulatory, Warning, and Guide Signs on an Intersection Approach



Note: See Chapter 2D for information on guide signs and Part 3 for information on pavement markings

- ★ See Table 2C-4 for the recommended minimum distance
- ★★ See Section 2C.46 for the application of the W2-1 sign and Section 2C.36 for the application of the W3-1 sign
- ★★★ See Section 2B.22 for the application of Intersection Lane Control signs

Source: Manual on Uniform Traffic Control Devices 2009 Edition, December 2009

When the STOP sign is installed at this required location and the sign visibility is restricted, a STOP AHEAD sign shall be installed in advance of the STOP sign.



The STOP sign shall be located as close as practical to the intersection it regulates, while optimizing its visibility to the road user it is intended to regulate.



STOP signs and YIELD signs shall not be mounted on the same post.

ADDITIONAL CONSIDERATIONS

Many traffic safety problems are complex and cannot be resolved by installing a STOP sign. For example, STOP signs should not be used to reduce speed or cut-through traffic. In fact, the improper use of STOP signs in these instances may have unintended and adverse impacts which may be opposite of the original intent. In addition, another consideration may be cost. Although the physical installation of a STOP sign is relatively inexpensive, other costs that need to be considered relate to its maintenance, and to extra fuel consumption, increased air and noise pollution and lost driver time. If a STOP sign is not necessary, other countermeasures may be considered. For example, trees and bushes can be trimmed or parking restrictions can be installed to increase visibility at the intersection. YIELD or warning signs, police enforcement, or traffic calming measures may also be effective strategies for consideration.

RESOURCES

Massachusetts Traffic Safety Toolbox Series

This series of fact sheets provides information on safety improvements that can be implemented at the local level. Information on problem areas, possible countermeasures, and implementation considerations is included in each fact sheet which can be found at: www.mass.gov/mhd/safetytoolbox/.

The Manual on Uniform Traffic Control Devices (MUTCD)

Published by the FHWA, the *MUTCD* defines the standards used by transportation professionals nationwide to install and maintain traffic control devices on all streets and highways. The most recent version (December 2009) can be found at: <http://mutcd.fhwa.dot.gov>.

Did you know?

According to the San Jose DOT, stopping 5,000 vehicles per day generates 15 tons of additional pollutants per year.

NEW IDEAS



*Enhancing the visibility of unsignalized intersections with flashing beacons has the potential to reduce the number of crashes associated with drivers' lack of awareness at such intersections as seen in this example of a standard overhead flashing beacon. Three types of flashing beacons--intersection control beacons, beacons mounted on STOP signs, and actuated beacons--were considered collectively at stop controlled intersections during the FHWA Low-Cost Safety Improvements Pooled Fund Study. The safety effectiveness of these strategies has not been thoroughly documented but the study was an attempt to provide an evaluation through scientifically rigorous procedures. Source: *Safety Evaluation of Flashing Beacons at Stop-Controlled Intersections (FHWA-HRT-08-048)*, FHWA, Washington, DC, 2008.*



An inexpensive way to bring attention to new signs.