Baystate Roads Program

Tech Notes

Won't a 'Traffic Signal' Reduce Crashes at Our Intersections?

Traffic signals don't always prevent crashes. In many instances, the total number of crashes and injuries increase after they're installed.

Where signals are used unnecessarily, the most common results are a reduction in right-angle collisions but an increase in total crashes, especially the rear-end type collision. In addition, pedestrians are often lulled into a false sense of security.

In deciding whether a traffic signal will be an asset and not a liability, traffic engineers evaluate the following criteria:

Does the number of vehicles on intersection streets create confusion or congestion?

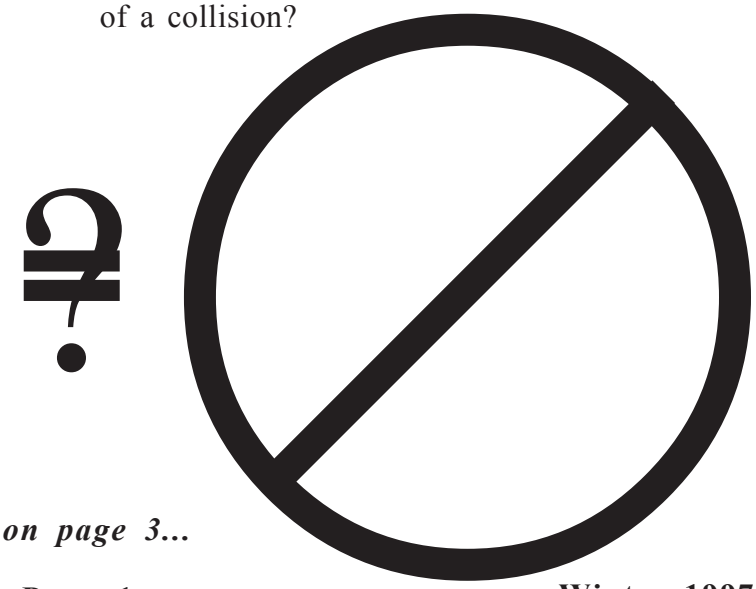
Is traffic on the main street so heavy that drivers on the side street will try to cross when it is unsafe?

Does the number of pedestrians trying to cross a busy main street create confusion, congestion or hazardous conditions?

Does the number of school children crossing a street require special controls for their protection? If so, is a traffic signal the best solution?

Will the installation of a signal allow for continuous, uniform traffic flow with a minimum number of vehicle stops?

Does an intersection's crash history indicate that a signal will reduce the possibility of a collision?



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Where Should a 'Stop Bar' (line) and 'Stop Sign' be Placed at an Intersection?

In Massachusetts, as in most states, the standard for signs, signals and pavement markings is the Manual on Uniform Traffic Control Devices (MUTCD). This publication by the U.S. Department of Transportation serves as the standard for the installation of all traffic control devices.

The MUTCD indicates that a stop bar (line) is a solid white line, normally 12 to 24 inches wide, extending across all approach lanes to a STOP sign or traffic signal. A stop bar should be placed parallel to the centerline of the intersection street. A stop bar should be used in both rural and urban areas where it is important to indicate the point, behind which vehicles are required to stop, in compliance with a STOP sign, traffic signal, officer's direction, or other legal requirement.

A stop bar, when used, should ordinarily be placed 4 feet in advance of and parallel to the nearest crosswalk line. In the absence of a marked crosswalk, the stop bar should be placed at the desired stopping point and in no case more than 30 feet or less than 4 feet from the nearest edge of the intersecting roadway.

When a stop bar is used in conjunction with a STOP sign, it should be placed in line with the STOP sign. However, if the STOP sign cannot be located exactly where vehicles are expected to stop, the stop bar should be placed at the desired stopping point.

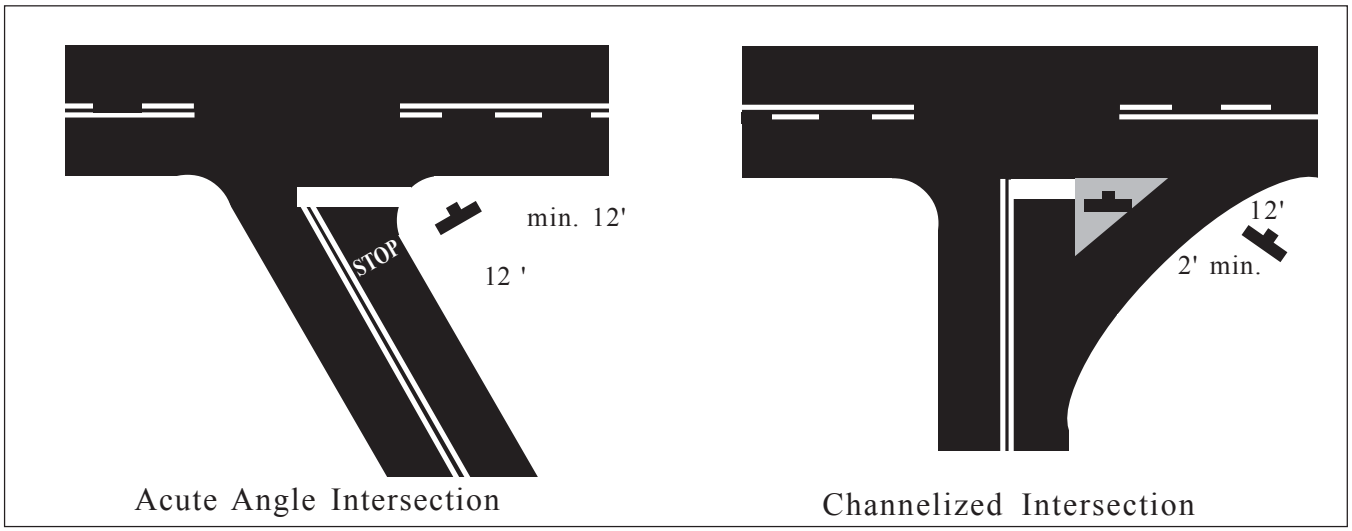
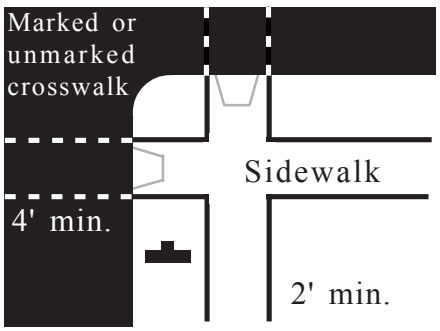
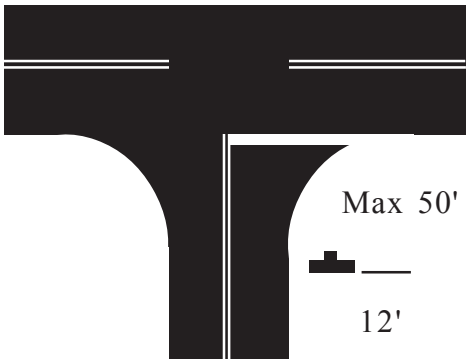


Figure 2-2 from MUTCD

In general, a STOP sign should be located to optimize nighttime visibility and minimize mud splatter. In addition, a STOP sign should be located so that it is not obscured by other signs or hidden from view by roadside objects and vegetation. In order to provide adequate lateral clearance for the motorists who may leave the roadway in rural areas and strike the sign support, a STOP sign should be located at least 6 feet from the edge of the shoulder or, if there is no shoulder, 12 feet, with a



Urban Intersection
(Ramps with ADA compliance)



Wide Throat Intersection

Figure 2-2 from MUTCD

maximum of 14 feet from the edge of the traveled way. The height to the bottom the STOP sign in rural areas should not be less than 5 feet or more than 8 feet above the edge of the roadway.

In urban areas a lesser lateral clearance may be used where necessary. Although 2 feet is recommended as a working minimum, a clearance of 1 foot from the curb face is permissible where sidewalk width is limited or where existing poles are close to the curb. The height to the bottom of a STOP sign in urban areas should not be less than 7 feet or more than 8 feet above the top of the curb.

Portable or part-time STOP signs shall not be used except for emergency purposes.

Warrant

Definition from the American Heritage College Dictionary - Third Edition - 1993

To provide adequate grounds for; justify.

First published in 1935, The Manual on Uniform Traffic Control Devices (MUTCD) contains traffic control standards practiced by all states. Application of this manual provides consistency for users on every U.S. highway open to public travel.

Massachusetts General Law allows cities and towns to warrant and install stop signs and lines on their roads. **MHD approval is needed if a state road is involved at an intersection.**

Thanks to Charles F. Sterling, III, at the Massachusetts Highway Department, for his help with this tech note.

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Traffic engineers compare the existing conditions against nationally accepted minimum standards established after many years of studies throughout the country. At intersections where standards have been met, the signals generally operate effectively with good public compliance. Where not met, compliance is generally reduced resulting in additional hazards. While a properly placed traffic signal improves the flow and decreases crashes, an unnecessary one can be a source of danger and annoyance to all who use an intersection: pedestrians, cyclists and drivers.

What are the "Warrants" for Multiway Stop Signs?

In order to insure multiway stop signs are installed only when necessary, warrants have been developed by the U.S. Department of Transportation and accepted by traffic engineers throughout the country.

The MUTCD describes the conditions that may warrant a multiway stop sign installation. Multiway stop signs should only be used when traffic volumes on intersecting roads are approximately equal.

Warrant	All Approaches Average Vehicles/ Hour for the Highest 8 hours.	Minor Street Vehicles/Hour + Pedestrians/Hour during same 8 hours
1. At intersections where traffic signals are already warranted prior to actual signal installation	--	--
2. 5 or more reported crashes (right turn, left turn, right angle) in a 12 month period	--	--
3. Minimum traffic volumes	500	200 + 30 sec./vehicle delay during maximum hour
4. When 85 percentile speeds exceed 40 MPH, the minimum traffic volume warrant is 70% of the normal warrant	350	140 + 30 sec./vehicle delay during maximum hour

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