

TRAFFIC AND SAFETY INFORMATIONAL SERIES FREQUENTLY ASKED QUESTION #14

WHY CAN'T WE HAVE A FOUR-WAY STOP TO REDUCE ACCIDENTS?

Four-way stop signs are not always the answer to reducing intersection crashes. Crash analysis is very complicated and usually identifies multiple causes. Stop signs delay drivers, and many times the drivers become impatient. Impatient drivers may cause crashes. Not all four-way stop intersections are dangerous, but they must be warranted and other less-restrictive options should be considered before they are installed.

WHAT IS REQUIRED FOR THE INSTALLATION OF FOUR-WAY STOP CONTROL?

The addition of four-way stop control is an inconvenience to all the drivers using the intersection. For this reason, three warrants have been developed and are listed in the *Manual on Uniform Traffic Control Devices* (MUTCD). A multiway stop control installation may be warranted at an intersection if any of the following conditions exist:

1. Traffic signals are warranted and urgently needed, and the multiway stop signs are an interim measure that can be installed quickly to control traffic while arrangements are being made for the signal installation.
2. A crash problem, as indicated by five or more reported accidents of a type susceptible to correction by a multiway stop installation in a 12-month period. Such accidents include right- and left-turn collisions as well as right-angle collisions.
3. Minimum traffic volumes. (a) The total vehicular volume entering the intersection from all approaches must average at least 500 vehicles per hour for any eight hours of an average day; and (b) the combined vehicular and pedestrian volume from the minor street or highway must average at least 200 units per hour for the same eight hours, with an average delay to minor street vehicular traffic of at least 30 seconds per vehicle during the maximum hour; but (c) when the 85-percentile approach speed of the major street traffic exceeds 40 miles per hour, the minimum vehicular volume warrant is 70 percent of the above requirements.

A four-way stop installation should only be used when traffic volumes on the intersecting roadways are approximately equal. However, if volumes are particularly large a traffic signal may be more appropriate (see informational series answer to "What is the harm in installing an unwarranted traffic control device?" for signal warrant). Investigating the warrants listed above will require an extensive traffic engineering study. This study may indicate whether or not a multiway stop control installation is appropriate.

WON'T CRASHES BE REDUCED IF A STOP SIGN IS INSTALLED?

One of the multiway stop control warrants is crash related. If an intersection meets this requirement (see above) and it has approximately equal approach volumes, a multiway stop control installation may be warranted for safety purposes. However, the overall

results of the traffic engineering study and the professional judgement of the engineer should also be considered. In fact, research has shown that under certain conditions other traffic control measures may be more effective and safer than the addition of a multiway stop sign (other options are discussed below). A study conducted by the city of Irvine, California, indicated that simply improving intersection visibility can sometimes be a successful approach to crash reduction at intersections.

WHAT CAN BE DONE OTHER THAN TO ADD STOP SIGNS?

Every intersection has unique characteristics. A thorough analysis of the traffic, safety, and geometric characteristics of an intersection is required to provide the validity of certain traffic control measures at a specific location. The following are some of the less restrictive alternatives that can be considered at an intersection before the installation of a multiway stop sign or traffic signal:

- install warning signs and/or flashing beacons along the major roadway to warn users approaching the intersection;
- relocating the stop line(s) to improve sight distance and visibility at the intersection;
- installing a flashing beacon at the intersection to supplement the existing stop signs;
- adding one or more lanes on a minor roadway approach to reduce the number of vehicles per lane on the approach;
- installing roadway lighting to reduce the frequency of accidents at night;
- restricting one or more turning movements;
- limiting the number of driveways in close proximity to an intersection, since unexpected movements from these driveways could cause vehicles on the street to suddenly stop.

Four-way stop signs are needed in certain situations, and careful studies must be made before any installation is approved. There are countermeasures available (see above) that do not include the addition of stop signs. The ultimate goal is to provide a safe intersection for vehicles, pedestrians, and bicyclists.

For more information

For more information, please contact _____.