

TRAFFIC AND SAFETY INFORMATIONAL SERIES

FREQUENTLY ASKED QUESTION #13

WHY CAN'T WE HAVE STOP SIGNS TO REDUCE SPEEDING ALONG MY STREET?

One of the complaints that people have in residential areas is that vehicles constantly speed by the front of their house. They are concerned about the safety of their children. These residents frequently request the erection of additional stop signs. The addition of a stop sign, however, usually does not solve the problem.

WHY DON'T WE JUST INSTALL ANOTHER STOP SIGN?

A stop sign is an inconvenience to motorists. Because of this, stop signs should only be placed if they meet a *Manual on Uniform Traffic Control Devices* (MUTCD) warrant. Stop signs are frequently violated if unwarranted. Before warrants are even considered, however, less restrictive measures (such as a yield sign) are usually considered. In certain cases, the use of less restrictive measure or no control at all will accommodate traffic demands safely and effectively.

Warrants for a stop sign

Because a stop sign is an inconvenience to through traffic, it should be used only where needed. A stop sign may be warranted at an intersection where one or more of the following conditions exist:

- intersection of a less important road with a main road where application of the regular right-of-way rule is hazardous;
- street entering a through highway or street;
- unsignalized intersection in a signalized area;
- other intersections where a combination of high speed, restricted view, and serious accident record indicates a need for control by the stop sign.

A yield sign can also be considered where a full stop is not necessary. Existing sign installations should be reviewed to determine whether the use of a less restrictive control or no control at all could accommodate the existing and projected traffic flow safely and more effectively.

WHERE SHOULD A STOP SIGN BE INSTALLED?

Stop signs should be installed/located where the vehicles are to stop or as near to that point as possible. The sign may also be supplemented with a stop line and/or the word STOP on the pavement. A yield sign is erected in the same manner. Where there is a marked crosswalk, the stop or yield sign should be erected approximately four feet in advance of the crosswalk line.

When only one stop or yield sign is used on an intersection approach it should be on the right side of the roadway. At wide intersections, however, violations of the yield or stop sign may be reduced by the erection of an additional sign on the left side of the approach. If two lanes of traffic exist on an approach, at least one stop sign should be visible to each lane of traffic.

CAN STOP SIGNS CONTROL SPEED?

Many studies have shown that stop signs are not an effective measure for controlling or reducing midblock speeds. In fact, the overuse of stop signs may cause drivers to carelessly stop at the stop signs that are installed. In stop sign observance studies approximately half of all motorists came to a rolling stop and 25 percent did not stop at all. Stop signs can give pedestrians a false sense of safety if it is assumed that all vehicles will come to a complete stop at the proper location. A study conducted by Beaubien also showed that placing stop signs along a street may actually increase the peak speed of vehicles, because motorists tend to increase their speed between stop signs to regain the time spent at the stop signs.

WHAT CAN WE DO INSTEAD OF INSTALLING A NEW STOP SIGN?

There are many alternatives to stop signs. For example, a concept called *traffic calming*, the combination of physical controls and community support, might be a good alternative for some communities. Calming measures can be installed as part of an areawide traffic management plan or on a single street and involve local law enforcement, emergency and maintenance officials, engineers, and the community.

Some communities also start interneighborhood programs to address the problem of the speeding and safety in their neighborhood areas. Often times, the true problem stems mostly from drivers that live in the neighborhood. By simply raising awareness of the issue, drivers in the neighborhood may adjust their driving and decrease their speeds.

Unfortunately, there is no general solution to the problem of speeding traffic. There will always be drivers that speed through residential areas. It is important for residents in a neighborhood to be aware of this issue.

For more information

For more information, please contact _____.

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FREQUENTLY ASKED QUESTION #13

Can we have stop signs placed at intersections in our neighborhood to reduce speeding?

We get many complaints from people in residential areas about cars speeding in their neighborhoods. They often ask us to install more stop signs. This concern is very understandable. Unfortunately, adding stop signs may not be the best solution. In fact, you may be surprised to learn, adding stop signs can sometimes make the problem worse. Here is why:

Stop signs don't always slow traffic

Strange as it may seem, installing stop signs may not result in reduced traffic speeds. Studies have shown that stop signs are not effective at controlling drivers' speeds between intersections. In fact, motorists sometimes drive even faster between stop signs to make up for time "lost" while stopped—actually increasing peak speeds and potentially making neighborhoods more dangerous.

Installing stop signs can do more harm than good

Too many stop signs may also actually discourage good driving habits. Studies have shown that if stop signs are overused or are located where they don't seem to be necessary, some drivers become careless about stopping at them. This can be especially dangerous for pedestrians and bicyclists who may have a false sense of safety from the existence of a stop sign.

Other solutions

Fortunately, there are other ways to encourage traffic to slow down. Sometimes even a simple neighborhood awareness program can be effective.

For more information

For more information, please contact _____.

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

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TRAFFIC AND SAFETY INFORMATIONAL SERIES FREQUENTLY ASKED QUESTION #14

Wouldn't installing a four-way stop reduce accidents at an intersection?

Adding four-way stop signs may seem like it would slow drivers down and make the streets safer, but additional stop signs do not necessarily increase safety. In fact, in some cases, especially when they are not really needed, the overuse of signs can lead to them being ignored by drivers. Therefore, traffic engineers make careful decisions concerning the use of four-way stop signs. Here are some of the factors they consider:

Too many signs can lead to ineffectiveness

Studies have shown that when stop signs are placed at intersections where they are not really needed, some motorists become careless about stopping. Moreover, overuse of four-way stop signs can contribute to the number of frustrated and impatient drivers on the streets, and these drivers may start driving recklessly.

Where four-way stop signs are used

Four-way stop signs are often used at the intersection of two roadways that contain similar traffic volumes. The intersection must, however, meet at least one of the following conditions:

- a traffic signal is going to be installed and the intersection needs a temporary solution to control the traffic;
- within 12 months at least five crashes have occurred at the intersection that could have been prevented by stop signs;
- relatively high volumes and/or high major-street vehicle speeds exist.

Other solutions may provide just as much safety

To make travel efficient and safe, four-way stop signs are usually installed only where they are absolutely necessary. Before four-way stop signs are installed, other solutions should be considered. Here are a few examples:

- Relocate the line where vehicles stop to improve visibility at the intersection.
- Limit the number of driveways in close proximity to an intersection since unexpected movements to/from these driveways sometimes cause drivers to suddenly stop or swerve, resulting in crashes.
- Install flashing lights before or at the intersection to warn drivers or to supplement existing stop signs, respectively.
- Install roadway lighting to reduce the frequency of crashes at night.

For more information

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TRAFFIC AND SAFETY INFORMATIONAL SERIES

FREQUENTLY ASKED QUESTION #15

WHAT IS THE HARM IN INSTALLING AN UNWARRANTED TRAFFIC CONTROL DEVICE?

Installing stop signs or traffic signals where they are not needed can cause significant disruption of traffic flow and increase intersection delay for drivers. The induced delay increases travel time and annoys drivers, and the additional starts and stops result in increased fuel consumption and the consequent production of carbon monoxide, nitrous oxide, particulate matter, and other pollutants.

WHAT IS THE HARM IN INSTALLING A STOP SIGN?

Two-way stop signs assign the right-of-way at an intersection. The warrants for the installation two-way stop signs in the *Manual for Uniform Traffic Control Devices* (MUTCD) are listed below. Because a stop sign causes substantial inconvenience to motorists, it should be used only where warranted. It may be warranted where the following conditions exist:

1. the intersection of a less important road with a main road where the applications of the normal right-of-way rule is hazardous;
2. a street entering a through highway or street;
3. an unsignalized intersection in a signalized area;
4. other intersections where a combination of high speed, restricted view, and serious accident record indicates a need for control by the stop sign.

The amount of delay created by the stop sign depends on both major and minor street flows. The gaps in the major flow traffic stream must be adequate to allow the stopped traffic to execute the through, right, or left movement through the intersection. The term "critical gap" is often used to describe the median gap accepted by drivers for specific turning maneuvers and roadway characteristics. According to the 1997 *Highway Capacity Manual*, typical critical gaps are 6.2 to 6.9 seconds for right turns from a minor roadway and 7.1 to 7.5 seconds for left turns from a minor roadway. Left-turning movements take longer, and left-turning drivers must cross more traffic streams. Additional delay for minor street vehicles is also determined by the vehicle arrival rate. The arrival rate of vehicles on the minor street is related to how long drivers will wait in the queue to get to the stop line.

The delay times at stopped approaches can become excessive if either major or minor flow is high. The advantage of a two-way stop is that the major flows do not have to stop and they incur almost no delay at the intersection (i.e., the majority of the traffic does not have to stop).

Four-way stop control is often controversial as it can often confuse motorists and can cause more average delay than other types of control. The multiway stop sign should only be used where the volume on all approaches to the intersection is approximately equal and the traffic volumes are relatively low. However, the four-way stop sign alternative can be quite useful in unusual situations where two-way stop control has not solved the safety problems but where signalization is not yet warranted.