

Realistic Speed Limits, Stop Signs, Etc.

Speed limits can and should provide motorists, police and traffic courts with information on reasonable and safe speeds that will facilitate the safe, orderly flow of traffic under normal conditions.

The public should be encouraged to bring to the attention of public officials what they perceive to be speeding problems. But speed limits should not be set based on casual observations or unformed opinion. Public agencies have responsibility to establish speed limits based upon thorough traffic engineering surveys.

What factors are considered when establishing a speed limit?

Traffic engineers and police officers examine many traffic and road conditions to determine a reasonable speed limit. These include number and type of crashes, speed of vehicles and number of cars, pedestrians, and bicycles. Also considered are physical conditions of the road such as sidewalks, hills, curves, lanes, driveways, intersections, roadway surface, and traffic controls.

Isn't a lower speed limit always safer?

No, lower speed limits do not necessarily improve safety. The more uniform the speeds of vehicles in a traffic stream, the less chance there is for conflict and crashes. Posting speed limits lower or higher than what the majority of drivers are traveling produces two distinct groups of drivers - those attempting to observe the limit and those driving at what they feel is reasonable and prudent. These differences in speeds may result in increased crashes due to tailgating, improper passing, reckless driving, and weaving from lane to lane. Inappropriate established speed limits also foster disregard for other speed limits, traffic signs, and contribute to driver frustration.

Most drivers drive 5 to 10 mph over the speed limit. Why not establish the speed limit with this in mind?

While some drivers drive faster than the speed limit, this is not true of everyone. Experience shows that 85% of the drivers adhere to properly established speed limits which they feel are reasonable, comfortable, and safe for conditions at the time. This is what we call the 85th percentile speed. This is the speed at, or below which, 85% of the traffic moves. Police officers can then target their speed enforcement efforts at the remaining 15% of drivers who are not in compliance with the speed limit.

Why not simply post a lower speed limit and have the police enforce it?

Posting speed limits lower than the 85th percentile speed does not result in voluntary motorist compliance with the posted speed limit unless there is strict, continuous, and visible enforcement. Increased enforcement is effective only at the immediate time and in the area where the police officer is present. The availability of police officers is limited and their services must be shared with other police responsibilities. Since these lower speed limits cannot be properly enforced, they will be consistently violated and will breed disregard for speed limits in general.

How can speed enforcement be effective when it is limited to such a small portion of the drivers?

When the majority of drivers respect the posted speed limit, enforcement can be directed at drivers who exceed the speed limit. When enforcement is directed at these drivers, voluntary compliance increases, resulting in a lower percentage of violators.

Why not install 25 mph signs or "Children Playing" signs to make residential areas safer?

Installing signs is only effective if a hazard is not already obvious to the reasonably safe driver. Drivers are generally aware that they are in a residential area and do not require signs to notify them of this fact. Improper use of these signs conveys a false sense of security to residents and does nothing to improve safety.

Why not install stop signs, traffic signals, speed bumps, or some other device to reduce speeds?

Traffic control devices are designed and installed to solve a particular problem. When they are misused for speed control purposes, they are ineffective and may create a hazard. For example:

→ Stop signs are designed to control traffic at busy intersections. When used to reduce speed, motorists "roll" through them, then increase their speed between such signs.

Traffic signals are designed to control large volumes of traffic at very busy intersections or to reduce broadside crashes. When misused, they may cause drivers to speed up to "beat the light" and may increase crashes.

Speed bumps are hazardous to all vehicles especially emergency vehicles, bicyclists, motorcyclists, school buses, and snow plows.

Why wait until someone is seriously injured or killed before anything is done about speeding?

After a serious crash, speeding is often assumed to be the cause. This may not always be true. While crash experience is one of the factors considered in establishing speed limits, it is not the only one--or even the major one. The prevailing 85th percentile speed is the primary factor used to establish a proper speed limit, even if there have been no crashes.

I am only one person among thousands of other drivers. What can I do to reduce the speeding problem in my community?

Speed limits are based upon studies of driving speeds - yours, your neighbors, and a percentage of everyone traveling on a roadway. Please obey the speed limit, not only on your street but on all streets and highways.

STOP signs are not a solution for residential speed control.

Speeding on local streets is probably the most persistent problem facing residents and traffic officials alike.

Every traffic engineer has been shaken by the telephone caller who opens with, "If something isn't done about the speeders on our street someone is going to be killed and it will be your fault," followed by a demand for various traffic control measures, and threats of petitions with several hundred signatures.

Although there could be a flaw in the traffic engineering plan, most often the problem is one of perception. Residents who consider speeds excessive in their own neighborhood often consider the same speeds reasonable when they drive in other neighborhoods.

A resident's complaint usually includes the solve-all solution to the speeding problem-install STOP signs.

The traffic official's common response is that STOP signs don't work to control speeding because:

- research has shown that speeds often increase between the signs,
- they are frequently violated;
- they are detrimental to safety and,
- they are not warranted in the Manual on Uniform Traffic Control Devices (MUTCD).

The STOP sign as a trophy

When residents are told that stop signs are not the answer to the speeding problem, they often feel their only option is to write city hall to get them installed. In the confrontational relationship that results, the stop sign becomes a trophy that is awarded to the "winner." Solving the speeding problem becomes secondary to winning the trophy. The results of this process are usually unhappy citizens who continue to complain (and request more stop signs) and, quite often, approval for the sign installation in an attempt to temporarily bring the controversy to an end.

What the studies show

Experience and research show that speeding problems are usually not solved by the installation of a stop sign. Before-and-after studies show that stop signs increase mid-block speeds and create violators of motorists who feel the sign is unwarranted.

When not required to stop by cross street traffic, only 5 to 20% of all drivers come to a complete stop, 40 to 60% will come to a rolling stop below 5 mph, and 20 to 40% will pass through at higher speeds. Signs placed on major and collector streets for the purpose of speed reduction are the most flagrantly violated. Stop signs placed for right-of-way assignment are more likely to be obeyed, whereas stop signs that do not meet the standard warrants tend to be ignored by drivers.

Effect on traffic volume

The basic purpose of a stop sign is to assign right-of-way at intersections. Regardless of their intended purpose, stop signs are persistently requested by citizens with the expectation that the signs will control speed or reduce traffic volume in residential neighborhoods.

- Stop signs do little to reduce traffic volume when local streets offer significant avoidance of congestion points on major and collector routes. However, when a local street offers only a slight

advantage over other routes, the time lost at additional stop signs may be enough to shift traffic.

Two-way stop

This is used to assign right-of-way to traffic on one of two intersecting streets by requiring traffic on one street to come to a complete stop.

A two-way stop is suitable:

- Where one street is a major street;
- Where sight distances approaching the intersection are substandard and traffic approaching under the general rules for uncontrolled intersections would run a strong risk of being involved in collisions;
- Where a crash pattern exists that could be corrected by right-of-way controls, yet conditions do not require traffic on both streets to stop.

Four-way stop

Four-way stops are more common in the United States than in other countries. They are intended for use where two collector or major streets intersect and traffic volumes do not warrant a traffic signal. They have often been used in response to complaints by the public about excessive speeds, but this application has produced questionable results.

Effect on traffic speed

The general conclusion from many studies on the effectiveness of stop signs as a speed control measure is that they have little overall effect on speed, except within about 150 feet of the stop sign. They are reported to have little or no effect in controlling mean (average) or 85th percentile speeds at mid-block. (The 85th percentile speed is that speed at which 85% of the traffic is traveling at, or below.)

A stop sign observance study of unwarranted four-way stops in Troy, Michigan, found that the percentage of no-stops or roll-stops was significant after the installation of unwarranted stop signs, and there was no significant change in 85th percentile speeds.

A study in Star City, West Virginia, showed an increase in no-stops from 14.1 % to 25.1 % when two-way stops were converted to four-way stops each summer for pedestrian safety. The mean speed was not significantly affected by the presence of the four-way stops, and the recommendation of this particular study was to end the practice of using four-way stops for speed control.

Effect on traffic noise, air quality, and energy consumption

When stop signs cause traffic to stop, there is a noticeable noise increase in the vicinity of an intersection from acceleration and braking. Additionally, deceleration, idling, and acceleration of vehicles increases air pollutant emissions and fuel consumption.

Effect on traffic safety

Stop signs that are not warranted by traffic volume or specific site safety conditions tend to increase

traffic crashes because they introduce a general disregard of stop signs. Motorists who violate unwarranted traffic controls tend to carry this behavior to intersections where traditional warrants for stop sign installation were actually met, thereby creating a dangerous situation and increasing the potential for accidents.

Uniform standards and warrants

Warrants for stop sign installations are included in the MUTCD. These warrants relate to right-of-way assignment and respond to site safety conditions. The manual specifically states that "Stop signs should not be used for speed control". Those may be harsh words to a resident who files a complaint, but when accompanied with some explanation of the engineering principles involved and the results of studies and actual experience, it should be possible to work out a more appropriate solution.

Adapted in part from "Solving the Speedway Problem," The Bridge, Vol.6, No.3, Michigan's Local Technical Assistance Program; Speed Control in Residential Areas, Office of Highway Safety Planning, Michigan Department of State Police; and Speed Control on Local Streets in Residential Areas, the Michigan Traffic Engineering and Environment Coordinating Committee.

Community solutions to residential speed control

⇒ A good way to eliminate confrontational relationships between residents and traffic officials and avoid knee-jerk reactions to traffic engineering is to develop a process that involves both traffic officials and affected community members.

Some communities have successfully employed a standing committee, normally referred to as the "Citizen Traffic Committee", to deal with traffic-control issues. The committee members need to educate themselves on aspects of traffic engineering, but are also advised by non-voting staff experts who provide input and send recommendations to the decision-making body.

Another option is the "ad hoc" or advisory committee. An ad hoc committee is formed when a community seeks help in dealing with a specific traffic control problem. The committee identifies the problem and sets quantifiable goals that it hopes to reach. Traffic engineering staff collects data for the identified problems, presents it to the committee, identifies options, presents alternatives, and then explains the pros and cons, costs, etc., of each option. The committee and the staff discuss the alternatives until they agree on a solution to be recommended to the decision making body and the community at large.

Advantages of a community committee:

- It hears-out neighborhood traffic control concerns.
- It may be perceived as more objective than official staff.
- It acts as a buffer between the decision-making body and citizens.
- It creates an understanding of traffic engineering principles among lay persons.
- It builds a relationship between staff and community that can be used when working on future problems.
- It dampens the adversarial relationship that often develops between the citizen and staff.

Disadvantages of a community committee:

- It can consume considerable time and effort of the engineering staff.
- It might divide the neighborhood if a consensus cannot be reached.
- It can become all unwieldy process if not handled skillfully by staff.

Citizen input can be used to solve problems of all kinds - not just traffic control problems. So whenever possible, consult your community. Think of it as talking to your boss, because they are in fact your employer.



GEO 530 Webmaster: Cameron Lovett

Email me with questions or problems with the web page at 34eocto@cmich.edu

Last Modified April 18, 1998