Controlling Speeds on Residential Streets

BY RICHARD F. BEAUBIEN

Complaints of speeding on residential streets are a continuing problem for local traffic engineers and police departments. The observations in this article describe the experiences of Troy, Michigan, in dealing with this problem over the past decade. Comparisons of 1975 speed study and observance study results with 1985 and 1986 results at the same locations are included.

The Nature of the Problem

Because the complaints of speeding in residential areas are often emotional, it is important to put the problem into perspective. By understanding the nature of the problem, we may be able to arrive at better solutions for our citizens.

The problem is partly social and partly political. Elected officials confronted with a citizen request for a stop sign might find it easy and inexpensive to grant the request, thus demonstrating their "compassion" and "concern for local needs." Although this demonstration of compassion is inexpensive in terms of immediate capital costs, its long-term impact can be detrimental to public health, safety, and welfare. Studies have shown that unwarranted stop signs are ineffective in controlling speeds; such signs are often disregarded, leading to a lack of respect for traffic control devices.[1]

In 1987, 90% of all accidents and 96% of the injury accidents in Troy occurred on arterial, rather than residential, streets. This suggests that transportation professionals should be spending more than 90% of their time dealing with the problems of accidents on arterial streets. However, because the speeding problem in residential areas is "close to home," traffic engineers and police departments spend a disproportionate amount of their time addressing problems on local streets, which are not connected to accident experience.

Speeding on residential streets is a seasonal problem. In northern climates, such as in Michigan, the complaints of speeding on residential streets virtually disappear during the months of November through March; when residents spend less time out doors, the problem or perceived problem seems to disappear.

A 25-mph speed limit may be unreasonably low in new subdivision areas with adequate street design standards. The national basic speed limit recommended in the *Uniform Vehicle Code* is 30 mph. In Michigan, the lowest speed limit permitted under state law (except in park areas) is 25 mph. Naturally, residents insist that the speed limit be as low as possible in their neighborhood, although the design speed on their street may exceed 25 mph. Motorists who travel local streets every day tend to travel closer to the design speed than the speed limit, and this creates observed speeds in excess of the posted speed limit. This condition is viewed with alarm by neighborhood residents, but it may not actually be a traffic safety problem because the design speed may be greater than 25 mph.

The speeding problem on residential streets tends to become associated with the problem of through traffic in residential areas. The through traffic is, in part, a symptom of inadequate capacity on major arterial streets. If adequate capacity were available on the arterial streets, "outsiders" would stay on arterial streets rather than seek alternate paths through residential areas.

Stop Signs Not Effective

Many citizens, particularly those concerned about the safety of their children, suggest that "maybe a stop sign will slow traffic on our street."

Before-and-after speed studies conducted in the City of Troy indicate that stop signs are not effective in controlling speeds. Compliance with these stop signs is very poor, and over a period of years the compliance degrades to a point where motorists behave as if the sign were not present at all. This degradation is shown in Table 1, which compares the compliance rates for stop signs installed to control speeds on residential streets in Troy. The locations of these stop signs in relation to the surrounding street system are shown in Figures 1 and 2.

Tables 2, 3, and 4 compare the results of 1975 speed studies on streets with unwarranted stop signs to 1986 study results on the same streets. Sample sizes for these speed studies were limited because of the relatively low volumes present on these residential streets. Observers were instructed

to collect as much data as possible in a 30- to 60-minute time period. As a result, samples were generally in the size range of 40 to 100. In all cases the sample size was greater than 40.

Two-way daily traffic volume is approximately 1500 on Anvil Drive, 2700 on Niagara Drive, and 1100 on Robinwood Street. Peak hour volumes are approximately 170 on Anvil Drive, 300 on Niagara Drive, and 120 on Robinwood Street.

All of the intersection study sites were relatively flat in terrain, so there were no sight distance restrictions resulting from vertical curves. Horizontal alignment of these streets has a minimal impact on available sight distance. On Anvil Drive, horizontal alignment is relatively straight for a distance of 500 feet to the north and south of Forge Drive. It is also straight for a distance of 900 feet north and 700 feet south of Kettle Drive. On Niagara Drive, horizontal alignment is straight for a distance of 600 feet to the west and 300 feet to the east of Eagle Drive. On Robinwood Street, horizontal alilgnment is straight for a distance of 300 feet to the west and 1000 feet to the east of Van Courtland Street. Intersection sight distance at all locations is limited by houses at the corners. Houses at the Anvil/Forge intersection are 40 feet from the edge of the pavement, and houses at the Niagara/Eagle intersection are 40-50 feet from the edge of the pavement. Houses at the Robinwood/Van Courtland intersection are 30 feet from Van Courtland Street and 50 feet from Robinwood Street.

Unwarranted stop signs were placed on Anvil and Niagara in 1975. In 1979 the Anvil/Forge intersection was converted to a four-way stop, despite the fact that warrants for a multi-way stop were not met. Unwarranted stop signs were placed on Robinwood in 1964; they were removed for a brief trial period in 1975. In each case, the average speed in 1986 was higher than in 1975 at the same location. Although the differences may not be statistically significant, it seems apparent that the passage of time does not make stop signs effective in controlling speeds.

Speed studies were made using a radar unit on an unmarked city car. The highest speed observed for each vehicle for a distance of approximately 500 feet either side of the intersection was the speed recorded.

Stop signs installed in the City of Troy that do not meet the warrants established in the *Manual on Uniform Traffic Control Devices* are considered to be legal and enforceable. The signs were installed pursuant to an ordinance adopted by the Troy City Council, the local legislative body. There is no known case law in Michigan that would force the removal of unwarranted stop sign installations.

The Solution...in Parts

There is no one, simple answer to the problem of speeding in residential areas. The traffic engineering department in the City of Troy has suggested to residents that the neighborhood itself must take some responsibility for the solution. A majority of the speeding violations issued in residential areas go to residents of that street or to streets in the immediately surrounding area. Residents of the immediate area can thus address the problem by increasing the awareness of the problem in the neighborhood and by assisting the police department.

A program in which license plate number reports are used to identify the owners of vehicles found to be speeding has been somewhat successful in controlling speeds. In that program, neighborhood residents report license plate numbers of speeding

Table 1. Stop Sign Observance on Selected Residential Streets in Troy

Location	1975 (%)	1985 (%)
Anvil Drive		
Full stop	25	13
Roll stop	64	60
No stop	11	27
Niagara Drive		
Full stop	51	21
Roll stop	34	74
No stop	15	5
Robinwood Street		
Full stop	26	16
Roll stop	48	65
No stop	26	19

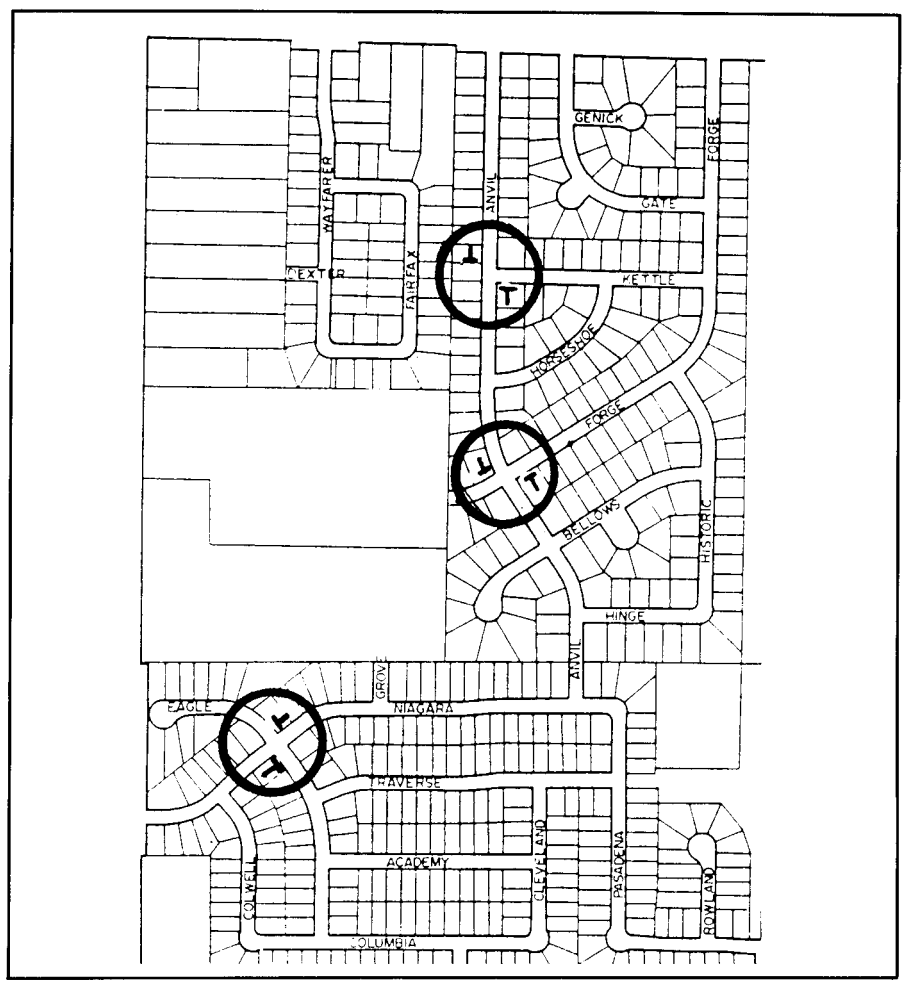

Figure 1. Street plan showing Anvil and Niagara study sites.

vehicles to the police department and the police department locates the vehicle owner through the secretary of state's records; the police department then writes to the vehicle owner, requesting safe driving practices and compliance with local traffic ordinances. One of the positive effects of this program has been to convert many of Troy's younger drivers into pedestrians: These younger drivers found that a vehicle was no longer available to them after the vehicle owner (a parent) learned how it was being used.

The City of Troy has a committee of citizens appointed to advise the City Council on proposed traffic regulations. This Traffic Committee gives a "first hearing" to neighborhood traffic problems and recommends new traffic regulations for City Council approval. Traffic Committee involvement is important because it allows the light of objectivity to shine on the problem before the political decision is made.[2] Discussions between committee members and citizens concerned about speeding on their neighborhood streets are helpful in achieving an understanding that stop signs are not a panacea and that there is no one easy solution. This discussion itself is part of the solution to the social and political aspects of the problem.

References

1. Beaubien, Richard F. "Stop Signs for Speed Control?" *Traffic Engineering* 46(November 1976): 26-28.

2. Beaubien, Richard F. "Citizen Participation in Traffic Safety." *ITE Journal* 52(March 1982):29-31. ■

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Table 2. Speed Studies, Anvil Drive

Speed (mph)	Without Stop Signs, 1975	With Stop Signs, 1975	With Stop Signs, 1986
Low	15	15	18
Average	24.1	24.6	26
85th Percentile	28	28	30
High	38	35	34

Table 3. Speed Studies, Niagara Drive

Speed (mph)	Without Stop Signs, 1975	With Stop Signs, 1975	With Stop Signs, 1986
Low	15	15	20
Average	23.8	25.2	26
85th Percentile	26	29	29
High	34	34	33

Table 4. Speed Studies, Robinwood Street

Speed (mph)	Without Stop Signs, 1975	With Stop Signs, 1975	With Stop Signs, 1986
Low	10	13	21
Average	23.4	24.4	30
85th Percentile	30	30	34
High	38	38	42

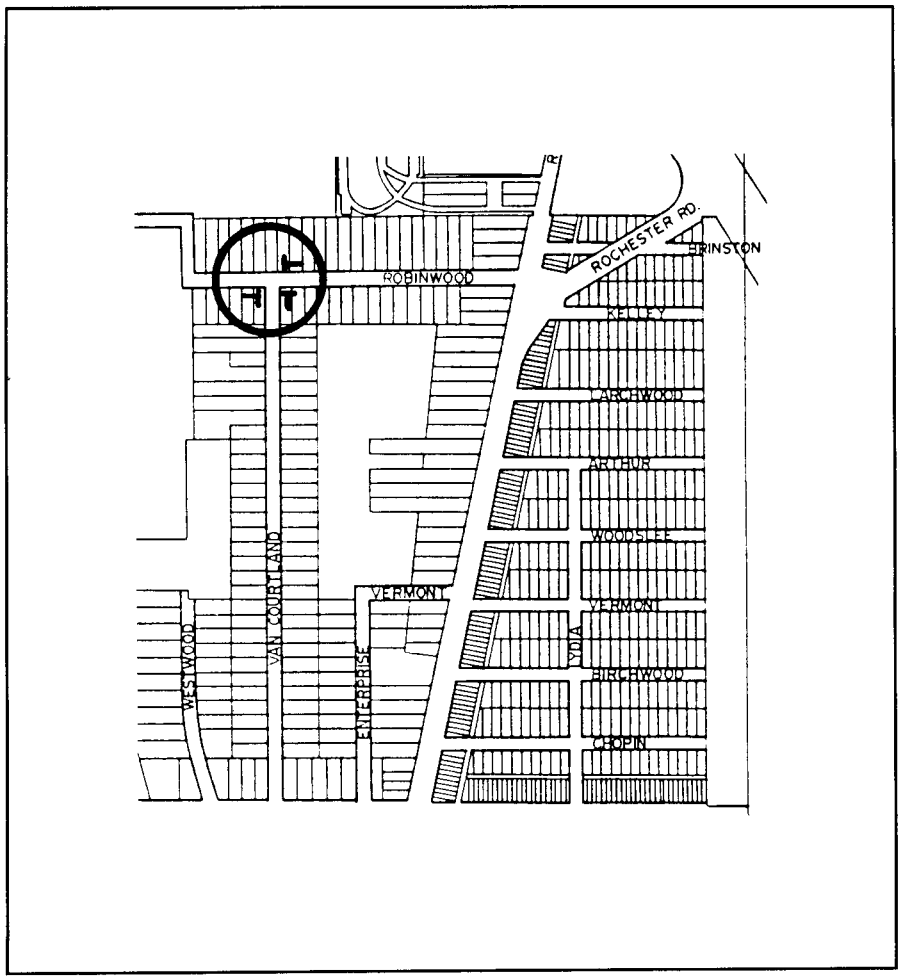

Figure 2. Street plan showing Robinwood study site.