



Problem-Oriented Guides for Police Series
No. 3

Speeding in Residential Areas

by
Michael S. Scott





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About the Guide Series

The *Problem-Oriented Guides for Police* summarize knowledge about how police can reduce the harm caused by specific crime and disorder problems. They are guides to prevention and to improving the overall response to incidents, not to investigating offenses or handling specific incidents. The guides are written for police—of whatever rank or assignment—who must address the specific problem the guides cover. The guides will be most useful to officers who

- Understand basic problem-oriented policing principles and methods. The guides are not primers in problem-oriented policing. They deal only briefly with the initial decision to focus on a particular problem, methods to analyze the problem, and means to assess the results of a problem-oriented policing project. They are designed to help police decide how best to analyze and address a problem they have already identified. (An assessment guide has been produced as a companion to this series and the COPS Office has also published an introductory guide to problem analysis. For those who want to learn more about the principles and methods of problem-oriented policing, the assessment and analysis guides, along with other recommended readings, are listed at the back of this guide.)
 - Can look at a problem in depth. Depending on the complexity of the problem, you should be prepared to spend perhaps weeks, or even months, analyzing and responding to it. Carefully studying a problem before responding helps you design the right strategy, one that is most likely to work in your community. You should not blindly adopt the responses others have used; you must decide whether they are appropriate to your local situation. What is true in one place may not be true elsewhere; what works in one place may not work everywhere.
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- Are willing to consider new ways of doing police business. The guides describe responses that other police departments have used or that researchers have tested. While not all of these responses will be appropriate to your particular problem, they should help give a broader view of the kinds of things you could do. You may think you cannot implement some of these responses in your jurisdiction, but perhaps you can. In many places, when police have discovered a more effective response, they have succeeded in having laws and policies changed, improving the response to the problem.
- Understand the value and the limits of research knowledge. For some types of problems, a lot of useful research is available to the police; for other problems, little is available. Accordingly, some guides in this series summarize existing research whereas other guides illustrate the need for more research on that particular problem. Regardless, research has not provided definitive answers to all the questions you might have about the problem. The research may help get you started in designing your own responses, but it cannot tell you exactly what to do. This will depend greatly on the particular nature of your local problem. In the interest of keeping the guides readable, not every piece of relevant research has been cited, nor has every point been attributed to its sources. To have done so would have overwhelmed and distracted the reader. The references listed at the end of each guide are those drawn on most heavily; they are not a complete bibliography of research on the subject.
- Are willing to work with other community agencies to find effective solutions to the problem. The police alone cannot implement many of the responses discussed in the guides. They must frequently implement them in partnership with other responsible private and public entities. An effective problem-solver must know how to forge genuine



partnerships with others and be prepared to invest considerable effort in making these partnerships work.

These guides have drawn on research findings and police practices in the United States, the United Kingdom, Canada, Australia, New Zealand, the Netherlands, and Scandinavia. Even though laws, customs and police practices vary from country to country, it is apparent that the police everywhere experience common problems. In a world that is becoming increasingly interconnected, it is important that police be aware of research and successful practices beyond the borders of their own countries.

The COPS Office and the authors encourage you to provide feedback on this guide and to report on your own agency's experiences dealing with a similar problem. Your agency may have effectively addressed a problem using responses not considered in these guides and your experiences and knowledge could benefit others. This information will be used to update the guides. If you wish to provide feedback and share your experiences it should be sent via e-mail to **cops_pubs@usdoj.gov**.



Acknowledgments

The *Problem-Oriented Guides for Police* series is very much a collaborative effort. While each guide has a primary author, other project team members, COPS Office staff and anonymous peer reviewers contributed to each guide by proposing text, recommending research and offering suggestions on matters of format and style.

The principal project team developing the guide series comprised Herman Goldstein, professor emeritus, University of Wisconsin Law School; Ronald V. Clarke, professor of criminal justice, Rutgers University; John E. Eck, associate professor of criminal justice, University of Cincinnati; Michael S. Scott, police consultant, Savannah, Ga.; Rana Sampson, police consultant, San Diego; and Deborah Lamm Weisel, director of police research, North Carolina State University.

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The Problem of Speeding in Residential Areas

This guide addresses the problem of speeding in residential areas, one of the most common sources of citizen complaints to the police. It is often the chief concern of community groups, largely because of the perceived risks to children. Yet because speeding must compete with other problems for police attention, problems that may appear far more serious, the police often do not devote a lot of resources to it.

Speeding in residential areas causes five basic types of harm:

- it makes citizens fear for children's safety;
- it makes pedestrians and bicyclists fear for their safety;
- it increases the risk of vehicle crashes;
- it increases the seriousness of injuries to other drivers, passengers, pedestrians, and bicyclists struck by a vehicle; and
- it increases noise from engine acceleration and tire friction.

Speeding increases the risks of crashes and injuries for several reasons:

- the driver is more likely to lose control of the vehicle;
 - the vehicle safety equipment is less effective at higher speeds;
 - the distance it takes to stop the vehicle is greater;
 - the vehicle travels farther during the time it takes the driver to react to a hazard; and
 - crashes are more severe at higher speeds.¹
-



Related Problems

Speeding in residential areas is only one of many traffic-related problems the police must address. Other related problems that call for analysis and response include:

- aggressive driving (commonly referred to as "road rage"),
- speeding and traffic crashes on highways,
- speeding and traffic crashes on rural roads,
- running of red lights, and
- drunken driving.

Factors Contributing to Speeding in Residential Areas

Understanding the factors that contribute to your problem will help you frame your own local analysis questions, determine good effectiveness measures, recognize key intervention points, and select appropriate responses.

Even modestly higher speeds can spell the difference between life and death for pedestrians struck by a vehicle. The force of impact on the human body is more than one-third greater at 35 mph than at 30 mph.² Each 1-mph reduction in average speeds translates roughly to a 5 percent reduction in vehicle crashes.³

Speeders are disproportionately involved in vehicle crashes.⁴ Speeding is a contributing factor in about one-eighth of *all* crashes and in about one-third of all *fatal* crashes.⁵ Most crashes occur in urban areas, although most fatalities occur on more remote highways.⁶



Beliefs and Attitudes About Speeding

Many cultures heavily promote speeding, giving it a generally positive social image. Vehicle advertisements often show driving that would be unsafe for average drivers on real roads. Most drivers do not think speeding is a particularly serious or dangerous offense, except in areas where children might be present.⁷ Drivers tend to overestimate their driving skills and underestimate the risks of crashing.⁸ Speed-related vehicle collisions are more commonly thought of and referred to as "accidents" rather than "crashes," suggesting that collisions are not drivers' fault.

Many drivers admit to speeding in residential areas.⁹ Their reasons for speeding include being behind schedule and wanting to make up for lost time, being unaware of the speed limit, and trying to keep up with other traffic.¹⁰ The most important factor in determining speed is the driver's perception of the road environment and of what speed it is safe to drive.¹¹ † Whatever drivers' specific reasons, it appears they make calculated decisions to speed,¹² creating opportunities for the police to alter their calculations.^{††}

From a wider social policy perspective, reducing speed must be balanced with other goals such as promoting a healthy economy (which partly entails getting goods and services delivered quickly), reducing environmental pollution, and promoting healthy behavior (by encouraging walking, running and bicycling).¹³

† Traffic engineers take drivers' perceptions into account in setting speed limits. The common standard for a posted speed limit is the speed at which 85 percent of drivers travel at or below, known as the 85th percentile speed (National Highway Traffic Safety Administration 1997).

†† For detailed information on drivers' habits, attitudes and beliefs, see National Highway Traffic Safety Administration (1998); Department of the Environment, Transport and the Regions (1998); and Corbett and Simon (1992).



Understanding Your Local Problem

The information provided above is only a generalized description of speeding in residential areas. You must combine the basic facts with a more specific understanding of your local problem. Analyzing the local problem carefully will help you design a more effective response strategy.

Asking the Right Questions

The following are some critical questions you should ask in analyzing your particular problem of speeding in residential areas, even if the answers are not always readily available. Your answers to these and other questions will help you choose the most appropriate responses later on.

Crashes and Complaints

- How many crashes occur in residential areas? How many are crashes with other vehicles? Pedestrians? Bicyclists?
 - How serious are the injuries?
 - What percentage of crashes in residential areas are speed-related?
 - How, specifically, do the speed-related crashes occur? Single vehicle going off the road? Multiple vehicles crashing into one another? Head-on, rear-end, side-impact crashes?
 - Are there multiple factors involved, such as speeding to make it through yellow traffic signals?
 - How many complaints do police receive about speeding in residential areas? What, specifically, do citizens complain about? Actual crashes? Fear of walking or riding? Noise?
-



Speeders

- Who are the most frequent offenders? Area residents? Commuters? Visitors? Why do they say they speed?
- Who are the worst offenders? How fast do they drive?

Locations/Times

- On which specific streets or blocks is speeding a problem? On what days and at what times? (Computer mapping software can help you answer a number of questions about where and when the problem occurs.)
- Is the speed limit prominently posted?
- Is the speed limit proper for road conditions? Too high? Too low? What is the 85th percentile speed?
- What road conditions make speeding more likely? Can these conditions be modified?
- Do crashes occur at intersections, on straight roads or at curves?

Current Responses

- How much do officers conduct speed enforcement in the problem areas now? What factors determine where they conduct it? Are speed and crash studies conducted before targeting particular locations for enforcement?
 - What is the formal or informal tolerance range before officers issue citations? What do most drivers think it is?
 - Do officers give warnings in lieu of citations? Do they officially record those warnings? What criteria do they use in deciding to give warnings?
 - Does the law allow officers to use speed cameras?
-



- What are the typical fines and penalties for speeding in the problem areas? Do they seem to be meaningful consequences for offenders?
- Have officers used speed display boards in problem areas?
- Do officers work closely with road and traffic engineers to establish speed limits and identify and correct speed-related problems?

Measuring Your Effectiveness

Measurement allows you to determine to what degree your efforts have succeeded, and suggests how you might modify your responses if they are not producing the intended results. You should take measures of your problem *before* you implement responses, to determine how serious the problem is, and *after* you implement them, to determine whether they have been effective. All measures should be taken in both the target area and the surrounding area. (For more detailed guidance on measuring effectiveness, see the companion guide to this series, *Assessing Responses to Problems: An Introductory Guide for Police Problem-Solvers*.)

Speeding, unlike so many other problems the police must address, allows for precise measurement—of speeds, crashes, causes, complaints, etc. Measures of the effectiveness of responses to speeding problems, therefore, can and should be reliable and accurate. The following are potentially useful measures of the effectiveness of responses to speeding in residential areas:

- the average speeds of vehicles (taken in mid-blocks),
 - the percentage of vehicles speeding,
-



- the percentage of vehicles exceeding the speed limit by various amounts,
- the number of vehicle crashes,
- the number of injuries caused by vehicle crashes,
- the severity of injuries caused by vehicle crashes, and
- the volume of citizen complaints about speeding.

The number of citations issued is *not* an appropriate measure of the impact of your responses; it merely provides information about police enforcement levels. Pay attention to the possible displacement effects of your efforts: drivers may divert to adjoining areas or roads, with positive or negative results.



Responses to the Problem of Speeding in Residential Areas

Your analysis of your local problem should give you a better understanding of the factors contributing to it. Once you have analyzed your local problem and established a baseline for measuring effectiveness, you should consider possible responses to address the problem.

The following response strategies provide a foundation of ideas for addressing your particular problem. These strategies are drawn from a variety of research studies and police reports. Several of these strategies may apply to your community's problem. It is critical that you tailor responses to local circumstances, and that you can justify each response based on reliable analysis. In most cases, an effective strategy will involve implementing several different responses. Law enforcement responses alone are seldom effective in reducing or solving the problem. Do not limit yourself to considering what police can do: give careful consideration to who else in your community shares responsibility for the problem and can help police better respond to it. Regardless of which responses you prefer, it is strongly recommended that you consult with affected citizens and transportation authorities before implementing the responses. Much common wisdom about how to reduce speeds is wrong, but unless citizens are properly informed and consulted about what is and is not effective and acceptable, they will not likely support your actions.

Engineering Responses

1. Using traffic calming. *Traffic calming* describes a wide range of road and environment design changes that either make it more difficult for a vehicle to speed or make drivers



† Road (or speed) *humps* are different from speed *bumps*. Speed *humps* are about 12 feet wide and 2 to 3 inches high, and can be crossed safely at 20 to 30 mph. Properly designed, they can accommodate large vehicles such as fire trucks. Speed *bumps* are shorter and narrower, and can be crossed safely only at lower speeds. They can damage large vehicles. They are more appropriately installed in parking lots than on roads.

believe they should slow down for safety. The measures are also intended to make roads easier and safer for pedestrians and bicyclists to use. Traffic calming measures are particularly effective at reducing speeds in residential areas.¹⁴ Some of the more common traffic calming measures are:

- narrowing the road,
- putting bends and curves in the road,
- installing road humps,[†]

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Although the street sign describes them as "street bumps," these "speed humps" can be crossed safely by cars traveling 20 to 30 mph.

- adding chicanes (traffic deflections that narrow or redirect the road),
- marking the road to create the illusion that it is narrowing,
- adding pedestrian crosswalks that are raised or made from distinctive materials,
- planting trees and other foliage along roadsides,



- building traffic circles[†] and roundabouts,^{††}

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Traffic circles, of varying sizes, reduce speeds and crashes in residential areas.

[†] The city of Seattle has installed over 600 traffic circles, mainly in residential neighborhoods where they are popular among residents. The circles have helped reduce traffic crashes and resulting injuries dramatically (National Highway Traffic Safety Administration 1999). See www.usroads.com/journals (TranSafety) for detailed descriptions of traffic circles.

- building traffic islands (for pedestrians crossing a wide road),
- installing gateways to residential neighborhoods,

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Neighborhood gateways remind drivers that they are entering residential areas where lower speeds are appropriate.

^{††} It is essential that vehicles traveling *in* the roundabouts have the right-of-way, rather than those *entering* the roundabouts, for them to be effective in reducing crashes (National Highway Traffic Safety Administration 1999).

^{†††} The speed reductions achieved by permitting parking must be offset against the increased risk to pedestrians who dart into the road from between parked vehicles.

- permitting parking on both sides of residential streets,^{†††}
- timing traffic signals for vehicles traveling the desired speed,
- erecting mid-block barriers that create two cul-de-sacs, and
- adding mid-block build-outs (sidewalk area extensions into the road).



The U.S. Department of Transportation prepares traffic advisory leaflets that provide illustrations and technical details about many road design features.

The Dutch pioneered the redesign of residential areas in ways that blend driving and nondriving activities. Roads are designed as extensions of the public space used for walking, riding and playing rather than as separate avenues for vehicle travel.¹⁵ In the United States, Seattle; Portland and Eugene, Ore.; and West Palm Beach and Sarasota, Fla., have used traffic calming measures extensively.

Traffic calming measures can be expensive, however, so their cost-effectiveness must be determined over the long term. Traffic calming measures work best if they are understood and accepted by the public, take into account the special requirements of emergency response vehicles, and are reinforced with adequate levels of police enforcement.¹⁶ Properly designed, traffic calming measures can also reduce noise levels by reducing vehicle acceleration. Without traffic calming measures, it is difficult for police to reduce average vehicle speeds below 25 mph.¹⁷

2. Posting warning signs and signals. Painting speed limits or "SLOW" on the road surface, in combination with posting roadside signs, can help reduce speeds.¹⁸ Transverse pavement markings create the illusion of high speed, and when placed ahead of traffic hazards, have been shown to cause drivers to slow down.¹⁹ Strobe light signals, flashing signals and warning signs painted in eye-catching fluorescent colors can improve drivers' awareness of special hazards and reduced speed limits.²⁰ Where there are many other signs and sights competing for drivers' attention, it is not easy to get drivers to notice speed warnings. Warning signs and signals are more effective if they convey the reason that drivers should slow



down (e.g., curve ahead, school zone, road construction).²¹ Other signs, such as those that warn of children in the area, are not known to effectively reduce speeds.²²

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Warning signs such as these pedestrian crossing and school zone signs remind drivers to slow down.

Education Responses

The goal of education responses is to make speeding socially unacceptable. But given the current acceptability of speeding, there is the potential for a negative backlash against anti-speeding campaigns.²³

3. Conducting anti-speeding public awareness campaigns. Anti-speeding public awareness campaigns have been recommended, even though their effects may not be immediate and substantial; they help change the social acceptability of speeding and alter drivers' beliefs that they are better and safer than other drivers.²⁴ Public awareness campaigns need not be overtly accusatory, but should convey facts about the dangers and consequences of speeding so as to debunk common myths about speed and driving. Because many drivers say they speed merely to keep up with traffic,



encouraging voluntary compliance with speed limits can help slow down those drivers who consciously or subconsciously follow the lead of other drivers.

A twist on the conventional public awareness campaign that *discourages* speeding is a campaign that *encourages* obeying the speed limit. In some campaigns of this sort, police have achieved positive results by stopping drivers and thanking them for obeying the speed limit; in others, signs have been posted indicating the percentage of drivers obeying the speed limit.²⁵

An interesting method for making the public aware of the hazards of speeding in school zones comes from Lithuania. There, drivers are required to keep their headlights on at all times during the first week school is in session as a reminder to one another to drive carefully where children are present.

Some public awareness campaigns are professionally developed, using television, radio and billboards. These campaigns typically convey official, government-sanctioned messages about speeding risks. Anti-speeding campaigns developed at the grass-roots level are potentially even more effective than official campaigns. Using simple lawn signs, speed display boards, warning letters, or personal appeals to speeders who have been stopped, these campaigns can convey more heartfelt messages to speeders about the risks they create.

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Grass-roots anti-speeding signs convey more heartfelt messages to speeders.



4. Informing complainants about actual speeds.

Complainants do not always estimate vehicle speeds accurately. Vehicle speed almost always seems faster to a stationary pedestrian than to a moving motorist. Where you suspect that complainants' concerns may be exaggerated, you might have a police officer monitor speeds with complainants present. Some complainants may be surprised to learn that vehicles are in fact traveling the speed limit. This does not necessarily mean that speeds are appropriate for the conditions, but at a minimum it helps complainants better understand what responses might be most appropriate to remedy the problem.

5. Providing realistic driver training. Realistic driver training similar to what police officers receive can help drivers better appreciate the effects of speed on their ability to control a vehicle.²⁶ Proper realistic training courses require skilled instructors, special safety equipment and protected driving areas.

Enforcement Responses

6. Enforcing speeding laws. Long-term changes in drivers' attitudes toward speeding depend on drivers' perceived risk of being stopped.²⁷ However, a considerable investment of resources is required to significantly increase the risk of getting caught.²⁸ The public generally supports speed enforcement, especially in residential areas and other areas where there are children.²⁹ Speed enforcement works best if

- drivers believe it will occur;
 - it has meaningful costs to offenders;
 - police apply it generally, rather than at specific times and locations; and
-



- drivers are not tipped off by cues as to when it is or is not happening.³⁰

† The Silverthorne, Colo., Police Department surveyed the community to determine the thresholds at which the public believed the police should issue speeding citations at specific locations. The police issued the survey results to drivers stopped for speeding, thereby enhancing police authority to enforce speeding laws and minimizing citizen complaints about speed enforcement.

†† An Australian study concluded that posting police officers in marked police vehicles on randomly selected stretches of road at random times generally is a cost-effective way to maximize deterrence and reduce traffic crashes (Leggett 1997).

With respect to the last condition above, you must balance making the public aware of the enforcement campaign against allowing drivers to anticipate precisely where and when officers are conducting enforcement. For example, you might consider advertising on the radio that the police will be enforcing speeding laws on particular roads on particular days, but not give visual cues to drivers of the exact location of the speed detection devices and officers. This will enhance the deterrent effect for drivers listening to the radio, without reducing the deterrent effect for those who are not. The enforcement times and locations should be varied enough so that drivers do not become confident that they can avoid detection. Advance publicity of enforcement campaigns also increases public support for enforcement by establishing a sense of fairness to drivers. Explaining why police have targeted particular locations for enforcement (e.g., high rate of crashes or citizen complaints) also increases public support.[†] Enforcement should be conducted both at problem locations and at randomly selected locations to maximize deterrence.^{††} Stationary marked police vehicles are more effective than moving marked police vehicles in reducing speed.³¹

Police enforcement is expensive to maintain consistently, and it quickly loses its effect where the enforcement effort is not visible to drivers.³² Intensive speed enforcement also loses its effectiveness because of the typical incentive system for traffic officers—they are rewarded for issuing citations rather than for maintaining reduced average speeds. Consequently, as soon as the enforcement effort has the positive effect of reducing speeds, there are fewer violations and traffic officers move on to other locations, after which speeds quickly resume their pre-enforcement levels.³³



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Drivers should not be able to easily detect when and where speed enforcement is occurring.

7. Enforcing speeding laws with speed cameras. Speed cameras, also referred to as *photo radar*, are cost-effective in reducing speeds, crashes, injuries, and fatalities, particularly when detected violations are prosecuted.³⁴ Speed cameras, used in conjunction with other responses, were determined to have been effective in reducing the percentage of speeders, vehicle crashes, injuries, and fatalities in Victoria, Australia.³⁵ There, speed cameras were mounted either in unmarked police vehicles or on tripods along the roadside, without advance warnings to drivers about the cameras' location. The police could move the cameras around so drivers could not predict where they were placed. Most were placed along roads with 60-kilometer-per-hour (37.2-mph) speed limits, and so the results from this test do not necessarily apply to residential roads. However, there is little reason to assume cameras will not work on such roads. Some drivers slow down when approaching speed cameras, but quickly speed up once they pass.³⁶ This can be countered by hiding the cameras



better and otherwise preventing drivers from knowing exactly where they are. In some jurisdictions, the relatively inexpensive protective boxes in which speed cameras are placed are mounted in many locations, leaving drivers uncertain as to which boxes actually contain cameras at any particular time.

The public has generally accepted the use of speed cameras, especially in high-risk zones, although there are some strong objections to the invasion of privacy and preferences for personal interactions with enforcers.³⁷ Speed cameras were first authorized by law in the United Kingdom in 1991; they are now used by all British police forces. Norway has used them effectively since 1988.³⁸ Not all U.S. jurisdictions have specifically authorized speed cameras for prosecution, and some states and municipalities have specifically rejected proposals for their use. You should first gauge public support for speed cameras before formally attempting to use them. There are also a number of issues regarding the fees charged by companies that install and operate speed cameras, and how the revenue generated from fines is to be used.

The first generation of speed cameras required that the film be taken manually from the cameras, to be processed. More advanced technology allows for more efficient remote image processing.³⁹

8. Using speed display boards. Speed display boards measure oncoming vehicles' speeds and prominently display the speeds to drivers. Speed display boards have been shown to reduce speeds and crashes, and appear to be at least as effective as speed cameras in reducing speeds, and to do so more cost-effectively.⁴⁰ Speed display boards are particularly effective with drivers who are not paying attention to their



speed. They are more effective when supplemented with police enforcement—in this combination, the effect can last several weeks after they are removed. Unattended display boards, however, are vulnerable to vandalism.

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Speed display boards are a cost-effective way to reduce speeds.

† The Glendale, Ariz., Police Department (1998) used this response as part of a comprehensive strategy to reduce speeding. The police department's custodial arrest policy was specifically authorized under state law.

9. Arresting the worst offenders. As one method for changing public attitudes toward speeding, some police agencies have amended their arrest policies and placed serious offenders (those driving much higher than the speed limit) in custody rather than merely releasing them with a citation. The intent is to convey a strong message that driving well over the speed limit is a seriously dangerous offense and not a harmless technical infraction.[†] This response may require special legislation and policies.

10. Having citizen volunteers monitor speeding. Some police agencies have recruited and trained citizen volunteers to operate speed detection devices in residential areas.⁴¹ The volunteers record the vehicle speeds and license plate



† The Wisconsin Transportation Information Center (1999) published a guide for setting speed limits on local roads. Although it specifically refers to Wisconsin, much of the information applies to any jurisdiction.

numbers and turn them over to the police. Police then send official warning letters to the registered vehicle owners. Other police agencies, such as the Madison, Wis., Police Department, have had citizens join police officers on traffic stops to explain the community's concerns about speeding to drivers.

Responses With Limited Effectiveness

11. Reducing speed limits. Speed limits alone have little effect on actual vehicle speeds. Reducing posted speed limits will typically decrease actual average vehicle speeds by only one-fourth of the reduction.⁴² So, for example, reducing the posted speed limit from 30 to 25 mph will reduce actual average vehicle speeds by only a little more than 1 mph. When speed limits are set lower than what most drivers consider safe (typically, the 85th percentile), the net effect is to cause many drivers to ignore those speed limits, as well as other posted speed limits;⁴³ if police enforcement of the reduced limits fails to establish a credible deterrent, drivers may increasingly lose respect for all speed limits. In some jurisdictions, a posted speed limit lower than the 85th percentile speed may constitute a legal defense to enforcement. Careful speed studies should be conducted before speed limits are changed. Similar roads should have similar speed limits so drivers do not come to believe that speed limits are set arbitrarily.^{44,†}

Traffic and road engineers may inadvertently increase vehicle speeds when they build extra safety margins into the road design and speed limit.⁴⁵ For example, if they want vehicles to travel 25 mph along a particular road, they might set the speed limit at 25 mph, but design the road using accepted guidelines for 30-mph travel, thinking this will provide an extra safety margin. However, the accepted guidelines already



have a safety margin factored into them, so the result is a double safety margin that actually makes the road seem safe for travel at 35 to 40 mph. Because most drivers travel at what they perceive are safe speeds rather than the posted speed limit, they will end up driving 10 to 15 mph faster than the engineers originally intended. This unintended effect reflects an underlying tension in road safety—a desire on the one hand to build roads that encourage drivers to drive at slower, safer speeds, and a desire on the other hand to make roads safe enough for drivers who choose to drive faster. Road and traffic engineers have often tried to resolve this tension by making roads wider, straighter and more obstruction-free. More recent trends have been in the opposite direction, to get drivers to slow down.

12. Increasing fines and penalties. Higher fines and penalties, beyond the threshold that offenders consider meaningful, do not continue to reduce speeds.⁴⁶

13. Erecting stop signs. Many aggrieved citizens believe that erecting stop signs along residential roads will force drivers to slow down. They pressure elected officials and traffic engineers to erect new stop signs. However, the most common effect on actual driving behavior is that drivers speed up mid-block to make up for lost time, thereby keeping average speeds high, increasing acceleration noise and decreasing fuel efficiency.⁴⁷

14. Installing speed bumps or rumble strips. Speed *bumps*, as opposed to speed *humps*, do not effectively reduce speeds, and can be hazardous.⁴⁸ Rumble strips—intermittent series of bumps across the road—do not reduce speeds directly; they merely serve to warn drivers of a hazard ahead.⁴⁹



15. Reengineering vehicles. New vehicle technology holds some potential to control speeding, but most features are not yet standard or widely accepted by the public.⁵⁰ *Speed limiters* prevent a vehicle from going faster than a set speed. Speed limiters can be programmed to receive electronic signals from transmitters along the road and adjust maximum speeds automatically. So-called *smart cards* can electronically record a vehicle's speed and report it automatically to enforcement authorities. *Electronic speed indicators*, reading electronic roadside signals, can warn drivers they are speeding, or speed indicators in the vehicle can electronically trigger roadside warning signals.



Appendix: Summary of Responses to Speeding in Residential Areas

The table below summarizes the responses to speeding in residential areas, the mechanism by which they are intended to work, the conditions under which they ought to work best, and some factors you should consider before implementing a particular response. It is critical that you tailor responses to local circumstances, and that you can justify each response based on reliable analysis. In most cases, an effective strategy will involve implementing several different responses. Law enforcement responses alone are seldom effective in reducing or solving the problem.

Response No.	Page No.	Response	How It Works	Works Best If...	Considerations
<i>Engineering Responses</i>					
1.	9	Using traffic calming	Makes it more difficult for vehicles to speed, or makes drivers believe they should slow down for safety	...road and environment changes are made in compliance with recommended specifications, the affected public supports the changes, and potential negative impacts are considered and minimized	Some changes to the environment require high capital expenditures; cost-effectiveness must be considered over the long term
2.	12	Posting warning signs and signals	Encourages drivers to slow down by reminding them of the speed limit and calling their attention to hazards on the road ahead	...the signs or signals stand out from other road signage, they convey the reason for the reduced speed, and they are supplemented by police enforcement	Where there are many other signs and sights competing for drivers' attention, it is not easy to get drivers to notice speed warnings



Response No.	Page No.	Response	How It Works	Works Best If...	Considerations
<i>Education Responses</i>					
3.	13	Conducting anti-speeding public awareness campaigns	Intended to change the social acceptability of speeding	...they are carefully tailored for various target audiences (e.g., commuters, young male drivers)	The effects are usually not immediate and substantial; the messages need not be overtly accusatory, but may convey facts about the dangers and consequences of speeding to debunk myths about speed and driving
4.	15	Informing complainants about actual speeds	Improves complainants' understanding of the exact nature of the problem	...you suspect that complaints are exaggerated or unrealistic	Proving that vehicles are traveling the speed limit does not necessarily mean that speeds are appropriate for conditions, but might suggest that responses other than enforcement are more appropriate
5.	15	Providing realistic driver training	Helps drivers better appreciate the effects of speed on their ability to control a vehicle	...drivers can actually feel the effects of speed on their driving skills	Requires skilled instructors, special safety equipment and protected driving areas
<i>Enforcement Responses</i>					
6.	15	Enforcing speeding laws	Increases drivers' risks of being stopped	...drivers believe it will occur, it has meaningful costs to offenders, police apply it generally rather than only at specific times and	Requires a lot of resources initially to change drivers' perceived risks of getting stopped; giving the public advance notice must be balanced against



Response No.	Page No.	Response	How It Works	Works Best If...	Considerations
6. (cont'd)				locations, and drivers are not tipped off by cues as to when enforcement is or is not happening	not allowing drivers to anticipate where and when enforcement is occurring; expensive to maintain consistently
7.	17	Enforcing speeding laws with speed cameras	Significantly increases the level of speed monitoring and enforcement, thus increasing drivers' perceptions of the risk of getting caught speeding and serving as a deterrent	... camera placement is not too obvious, and locations are changed periodically	Drivers slow down when they know they are approaching a speed camera, but quickly speed up once they have passed it; some strong public concerns about invasions of privacy and absence of personal interaction in enforcement; usually requires special legislative authorization for cameras' use as evidence in prosecution; financial issues related to fees and uses of fine revenue
8.	18	Using speed display boards	Encourages drivers to slow down by measuring vehicle speeds and prominently displaying them	... a high percentage of drivers speed inadvertently, and the speed display boards are supplemented by police enforcement	Unattended speed display boards are vulnerable to vandalism
9.	19	Arresting the worst offenders	Helps change the common belief that speeding is not a serious offense	...there is sufficient public support	May require special legislative and policy authorization



Response No.	Page No.	Response	How It Works	Works Best If...	Considerations
10.	19	Having citizen volunteers monitor speeding	Enhances informal social disapproval of speeding	...citizens who are directly affected by the speeding participate	Citizens must be properly trained for the specific tasks
<i>Responses With Limited Effectiveness</i>					
11.	20	Reducing speed limits	Intended to slow drivers' speeds through posted signs and police enforcement	...there are adequate levels of police enforcement	Reducing speed limits by itself will reduce average speeds only by small amounts; some speed limits are too low rather than too high, inviting disrespect for them; careful speed studies should be conducted before changing speed limits
12.	21	Increasing fines and penalties	Creates meaningful consequences for speeders, thereby deterring all drivers, generally, and those who are cited, specifically	...the fines and penalties are set high enough to get drivers' attention, but not so high as to compromise public support for them	Beyond a certain threshold, higher fines and penalties do not continue to reduce speeds
13.	21	Erecting stop signs			The effects are to increase speeds mid-block and increase noise from vehicle acceleration



Response No.	Page No.	Response	How It Works	Works Best If...	Considerations
14.	21	Installing speed bumps or rumble strips			They do not reduce speeds directly, but merely warn drivers of hazards ahead
15.	22	Reengineering vehicles	Technological devices can restrict vehicles' maximum speed, automatically notify authorities that vehicles are speeding, or trigger warning signals to drivers when they are speeding	...consumers are willing to accept this technology and pay for it	To date, few vehicles or roads are equipped with this technology, and public support for it is not yet certain



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Michael S. Scott is an independent police consultant based in Savannah, Ga. He was formerly chief of police in Lauderhill, Fla.; served in various civilian administrative positions in the St. Louis Metropolitan, Ft. Pierce, Fla., and New York City police departments; and was a police officer in the Madison, Wis., Police Department. Scott developed training programs in problem-oriented policing at the Police Executive Research Forum (PERF), and is a judge for PERF's Herman Goldstein Award for Excellence in Problem-Oriented Policing. He is the author of *Problem-Oriented Policing: Reflections on the First 20 Years*, and coauthor (with Rana Sampson) of *Tackling Crime and Other Public-Safety Problems: Case Studies in Problem-Solving*. Scott holds a law degree from Harvard Law School and a bachelor's degree from the University of Wisconsin-Madison.



Recommended Readings

- *A Police Guide to Surveying Citizens and Their Environments*, Bureau of Justice Assistance, 1993. This guide offers a practical introduction for police practitioners to two types of surveys that police find useful: surveying public opinion and surveying the physical environment. It provides guidance on whether and how to conduct cost-effective surveys.
 - *Assessing Responses to Problems: An Introductory Guide for Police Problem-Solvers*, by John E. Eck (U.S. Department of Justice, Office of Community Oriented Policing Services, 2001). This guide is a companion to the *Problem-Oriented Guides for Police* series. It provides basic guidance to measuring and assessing problem-oriented policing efforts. Available at www.cops.usdoj.gov.
 - *Conducting Community Surveys*, by Deborah Weisel (Bureau of Justice Statistics and Office of Community Oriented Policing Services, 1999). This guide, along with accompanying computer software, provides practical, basic pointers for police in conducting community surveys. The document is also available at www.ojp.usdoj.gov/bjs.
 - *Crime Prevention Studies*, edited by Ronald V. Clarke (Criminal Justice Press, 1993, et seq.). This is a series of volumes of applied and theoretical research on reducing opportunities for crime. Many chapters are evaluations of initiatives to reduce specific crime and disorder problems.
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- ***Excellence in Problem-Oriented Policing: The 1999 Herman Goldstein Award Winners.*** This document produced by the National Institute of Justice in collaboration with the Office of Community Oriented Policing Services and the Police Executive Research Forum provides detailed reports of the best submissions to the annual award program that recognizes exemplary problem-oriented responses to various community problems. A similar publication is available for the award winners from subsequent years. The documents are also available at www.ojp.usdoj.gov/nij.
 - ***Not Rocket Science? Problem-Solving and Crime Reduction,*** by Tim Read and Nick Tilley (Home Office Crime Reduction Research Series, 2000). Identifies and describes the factors that make problem-solving effective or ineffective as it is being practiced in police forces in England and Wales.
 - ***Opportunity Makes the Thief: Practical Theory for Crime Prevention,*** by Marcus Felson and Ronald V. Clarke (Home Office Police Research Series, Paper No. 98, 1998). Explains how crime theories such as routine activity theory, rational choice theory and crime pattern theory have practical implications for the police in their efforts to prevent crime.
 - ***Problem-Oriented Policing,*** by Herman Goldstein (McGraw-Hill, 1990, and Temple University Press, 1990). Explains the principles and methods of problem-oriented policing, provides examples of it in practice, and discusses how a police agency can implement the concept.
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- ***Problem-Oriented Policing: Reflections on the First 20 Years***, by Michael S. Scott (U.S. Department of Justice, Office of Community Oriented Policing Services, 2000). Describes how the most critical elements of Herman Goldstein's problem-oriented policing model have developed in practice over its 20-year history, and proposes future directions for problem-oriented policing. The report is also available at www.cops.usdoj.gov.
 - ***Problem-Solving: Problem-Oriented Policing in Newport News***, by John E. Eck and William Spelman (Police Executive Research Forum, 1987). Explains the rationale behind problem-oriented policing and the problem-solving process, and provides examples of effective problem-solving in one agency.
 - ***Problem-Solving Tips: A Guide to Reducing Crime and Disorder Through Problem-Solving Partnerships***, by Karin Schmerler, Matt Perkins, Scott Phillips, Tammy Rinehart and Meg Townsend (U.S. Department of Justice, Office of Community Oriented Policing Services, 1998) (also available at www.cops.usdoj.gov). Provides a brief introduction to problem-solving, basic information on the SARA model and detailed suggestions about the problem-solving process.
 - ***Situational Crime Prevention: Successful Case Studies***, Second Edition, edited by Ronald V. Clarke (Harrow and Heston, 1997). Explains the principles and methods of situational crime prevention, and presents over 20 case studies of effective crime prevention initiatives.
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- ***Tackling Crime and Other Public-Safety Problems: Case Studies in Problem-Solving***, by Rana Sampson and Michael S. Scott (U.S. Department of Justice, Office of Community Oriented Policing Services, 2000) (also available at www.cops.usdoj.gov). Presents case studies of effective police problem-solving on 18 types of crime and disorder problems.
 - ***Using Analysis for Problem-Solving: A Guidebook for Law Enforcement***, by Timothy S. Bynum (U.S. Department of Justice, Office of Community Oriented Policing Services, 2001). Provides an introduction for police to analyzing problems within the context of problem-oriented policing. Available at www.cops.usdoj.gov.
 - ***Using Research: A Primer for Law Enforcement Managers***, Second Edition, by John E. Eck and Nancy G. LaVigne (Police Executive Research Forum, 1994). Explains many of the basics of research as it applies to police management and problem-solving.
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