

*Controlling Road Rage:  
A Literature Review and Pilot Study*

*Prepared for the*

The AAA Foundation for Traffic Safety

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## **Executive Summary**

This report discusses results of a literature review and pilot study on how to prevent aggressive driving and road rage. The study "*Controlling Road Rage: A Literature Review and Pilot Study*" defines road rage as "an incident in which an angry or impatient motorist or passenger intentionally injures or kills another motorist, passenger, or pedestrian, or attempts or threatens to injure or kill another motorist, passenger, or pedestrian." It must be emphasized that "road rage" and "aggressive driving" are not synonymous. Road rage is uncontrolled anger that results in violence or threatened violence on the road; it is criminal behavior. Aggressive driving does not rise to the level of criminal behavior. Aggressive driving includes tailgating, abrupt lane changes, and speeding, alone or in combination. These potentially dangerous behaviors are traffic offenses, but are not criminal behavior.

This report discusses results of a literature review and three surveys. The literature review identified recent legislation to combat aggressive driving and road rage. On the state level, only Virginia and Arizona have enacted specific legislation for this purpose. A national survey and a follow-up detailed survey identified three organizations with highly rated road rage interventions that included rigorous evaluation components. These are the New York City Police Department, the New Jersey State Police Department, and the West Valley City Police Department. The New Jersey program was the only one that responded to a request for more information. Indications are that the New Jersey program may be a good model for other jurisdictions.

A supplemental survey on road rage characteristics asked U.S. law enforcement personnel about actual road rage incidents. Most respondents say road rage is a problem in their area. Although based on a small sample, there appears to be a slightly higher incidence of road rage incidents during the Friday afternoon peak travel times, during fair weather, under moderately congested conditions, and in urban areas. Incidence does not appear to be influenced by proximity to holidays. However, alcohol and/or drugs were found to be associated with one quarter of incidents.

Enforcement and education are the most commonly used interventions to prevent aggressive driving and road rage. Legislation is another avenue, but so far the enactment of statutes has been impeded by existing laws that address this issue and by concerns about ambiguous wording. Results suggest that enforcement efforts should be accompanied by public information campaigns. Cooperative programs were found to be effective for distributing resources and creating invisible patrol boundaries. Interagency liaisons also offer economies of scale to smaller jurisdictions that have smaller advertising budgets. Intelligent transportation systems also show promise for deterring aggressive driving and road rage, mainly through the use of intersection cameras.

## **I. Introduction**

Concern over aggressive driving and road rage has swept the United States in the final decade of the 20<sup>th</sup> century. While still relatively infrequent, the number of incidents appears to be growing. The apparent randomness of the victims and perpetrators frightens the public, yet motorists who wish to avoid confrontations are ill informed about the precursors leading to aggressive driving or how to defuse potentially dangerous traffic situations. Likewise, little practical information exists on how organizations can intervene to curb road rage.

Definitions of road rage vary and too often go unstated. In this study, road rage is defined as an incident in which “an angry or impatient motorist or passenger intentionally injures or kills another motorist, passenger, or pedestrian, or attempts or threatens to injure or kill another motorist, passenger or pedestrian.” In this sense, road rage incidents can be distinguished from other traffic incidents by their willful and criminal nature. They are serious crimes that just happen to occur within the roadway environment.

Law enforcement agencies, the transportation community, and other organizations concerned with roadway safety have responded to the perceived “road rage epidemic” in various ways. In March 1998, the AAA Foundation for Traffic Safety awarded a contract to the InterTrans Group to conduct a literature review and pilot study on aggressive driving and road rage.

The literature search was aimed at identifying promising interventions. A survey was faxed to law enforcement and transportation organizations in the fifty largest metropolitan areas nationwide. A second, detailed survey was designed to elicit more in-depth information from national survey respondents who indicated they had implemented aggressive driving programs. To determine the conditions under which road rage incidents are most likely to occur, a third supplemental survey on the characteristics of road rage incidents was also faxed to recipients of the national survey.

Promising interventions are identified based on the literature search and the first two surveys. The results of the third survey and a portion of the second survey, on characteristics of road rage incidents, were tabulated and a profile of typical road rage conditions is presented. Specific recommendations are then developed for organizations wishing to implement programs, and finally, suggestions for further research are provided.

## II. Methodology

### A. Literature Search

A literature search was conducted to identify strategies that have been implemented in the United States and other countries to combat aggressive driving and road rage. Sources include the Internet, proprietary databases such as Dow Jones News/Retrieval, Pro-Quest, The New York Times @ OnDisc, Uncover web, TRIS, and periodicals, public information brochures, books, videotapes, and newspapers. The search was not intended to be comprehensive; rather its aim was to provide an overview of interventions currently in use to combat aggressive driving.

### B. National Survey

The first survey was designed to identify organizations that have implemented programs to combat aggressive driving. The survey was faxed to law enforcement organizations and to public works and traffic engineering departments. Between May 1<sup>st</sup> and 15<sup>th</sup> 1998, surveys were sent to organizations in 504 randomly selected jurisdictions in the fifty largest metropolitan areas. A total of 139 surveys were returned for a response rate of 28 percent. Responses to the survey were tabulated and organizations that have implemented programs to curb road rage were identified.

### C. Detailed Survey

A second, detailed survey was developed for respondents of the initial national survey who indicated that their organizations had implemented programs to curb road rage. The purpose of the survey was to identify interventions that are being evaluated and appear to reduce aggressive driving incidents. An added part of the survey, Question 15 and its subparts, was designed to obtain information about actual road rage incidents from law enforcement and traffic professionals.

The survey was faxed between July 22 and August 18, 1998, to the 37 respondents to the first survey who reported that their organizations had taken active measures. A total of 16 surveys were returned for a response rate of 43 percent. Three jurisdictions that appeared to be monitoring road rage interventions with appropriate outcome measures were selected. Through contact with the organizations, additional information was solicited to more completely evaluate their programs.

### D. Survey on Characteristics of Road Rage Incidents

A third survey entitled "Characteristics of Road Rage Incidents" was faxed to the 139 respondents of the first survey and later to 150 non-respondents to the first survey. In total, 25 surveys were returned, reporting on a total of 57 incidents. This survey consisted only of Question 15 from the detailed survey. This question asked about the conditions under which actual road rage incidents occur. This survey was not included in the original research design, but it was added to boost the number of cases. The

results of the survey (N=57) were combined with responses to Question 15 from the detailed survey, resulting in 80 separate occurrences of road rage.

### III. Results

#### A. Literature Review

##### 1. Legislation

Legislation directed at controlling road rage has actually been introduced in 17 states and many other bills are under development (5). Definitional problems and concerns about conflicts with current traffic laws are barriers to passing aggressive driving legislation. Many of these statutes are perceived as unenforceable due to ambiguous wording that allows for too much interpretation by law enforcement officers (35)(42)(12)(43)(37)(48). The Mid-America Research Institute conducted a series of focus groups for the National Highway Traffic Safety Administration. Group participants included judges, prosecutors, public defenders, defense attorneys and police; none of the groups believed that specific legislation was needed to address road rage (30).

Proposed legislation targets aggressive driving and road rage in several ways, including developing legal definitions and recommended penalties. Other interventions include enhanced enforcement, expanded driver education programs, and authorization of studies to examine modifications to existing laws, rules, or policies. Studies of the effectiveness of existing measures and, in one state, leveraging insurance premiums to require aggressive driver education are additional interventions.

##### a. Recent Legislation

In 1998, nine states introduced 26 aggressive driving bills. To date, only two of these have been enacted: Arizona's aggressive driving bill and the Virginia Driver's Education Requirement (12)(19).

All nine of the states that introduced legislation in 1998 defined aggressive driving as a separate charge from other driving offenses. The majority of the bills that focus on increased penalties distinguish violent driving acts, or road rage, from aggressive driving by charge (felony and misdemeanor, respectively), and class, so road rage incidents are most often considered to be degrees of aggressive driving. Illinois' HB2509, however, defines separate offenses for road rage and aggravated road rage. Six states introduced legislation that provided specific penalties for aggressive driving.

Bills that focused on educational efforts include either mandatory re-education for convicted offenders (3 states) or the inclusion of aggressive driving in driver education courses (3 states). Many states (such as Arizona's HB2311) have included penalties and mandatory education within the same bill.

In addition to increased penalties and expanded driver education programs, some of the proposed legislation encourages developing new aggressive driving interventions and evaluating existing measures (3 states). Nebraska's LR373 calls for a study of options for penalties and enforcement, while another bill (LR391) proposes to study ways in which laws, rules and regulations can be modified to address aggressive

driving or road rage. New York's law (AB9173) proposes a public education campaign and another bill (AB10037) provides for an evaluation of the effects of driver education on traffic violations and road rage.

The most frequently proposed penalties for aggressive driving are fines, mandatory re-education, suspension or revocation of driver's licenses, and points deducted for offenses.

The salient features of the bills introduced in 1998 are summarized in Table 1. The information is current as of December 1998.

**Table 1. Legislation Introduced in 1998**

State	Bill(s)	Description (s)
Arizona	HB2311	The bill adds a section to the existing code and defines aggressive driving as an offense. It classifies a violation as a class 1 misdemeanor. In addition to fines and/or other penalties, it requires that offenders attend driver training and education and allows for a license suspension of 30 days. A second offense within 24 months results in a class I misdemeanor charge and a one-year license revocation, in addition to other penalties. Approved May 26, 1998 (19)(40)(12).
Connecticut	HB5267  HB5675	The bill created a penalty for, and defined, aggressive driving. The penalty was not to exceed \$250 and a 30-day license suspension. This bill died in the Judiciary Committee (19).  The bill allows the Commissioner of Motor Vehicles to require a driver with two or more moving violations in one year to attend an aggressive driving class. It required class attendance for reckless driving and failure to stop when directed by a police officer. This bill died in the Judiciary Committee (19).
Hawaii	SB2054	The bill creates and defines a separate offense for aggressive driving punishable by not less than a \$200 fine or more than \$2,500 and incarceration for not less than one month or more than one year. It establishes a mandatory minimum jail sentence, where applicable, and a point system applied to driver's licenses. In Judiciary Committee (19).
Illinois	HB2509	The bill creates and defines separate offenses for road rage and aggravated road rage. This bill passed the House on March 27, 1998 and is pending in the Senate (19)(42)(6)(16)(43).

**Table 1. Legislation Introduced in 1998 (continued)**

State	Bill(s)	Description(s)
Maryland	HB292	The bill creates and defines the offense of aggressive driving. The bill is in the Commerce and Government Matters Committee (19).
	HB294	The bill requires driver improvement courses to include aggressive driving in the curriculum. In Commerce and Government Matters Committee (19).
	HB989	Requires the Motor Vehicle Administrator to assess points for multiple violations of aggressive driving. In Commerce and Government Matters Committee (19).
Nebraska	LB1188	Amends the definition of reckless driving. In Transportation Committee (19)(62).
	LR 373	Studies various options for penalties and enforcement against aggressive driving. In Transportation Committee (19)(62).
	LR 391	Creates a committee to study ways that the state can address aggressive driving or road rage through modification of laws, rules, regulations and other programs. In Transportation Committee (19)(62).
New York	AB8817/SB5959	The bill creates the offense of aggressive driving and defines and classifies aggressive driving as a class E felony. It also requires an aggressive driving education curriculum. In Codes Committee (19)(22)(50).
	AB9713	Authorizes the governor's Traffic Safety Committee to cooperate with other agencies in the development of a public education campaign. In Transportation Committee (19)(22)(50).
	AB10037	Authorizes the Department of Motor Vehicles, in consultation with the American Automobile Association (AAA), to study the effects of driver training programs on occurrences of traffic violations and road rage. In Transportation Committee (19)(22)(50).
	SB6956/AB11118	Requires pre-licensing and defensive driving courses to devote a minimum of 15 minutes to the topic of road rage. Passed Senate and referred to Assembly Transportation Committee (19)(22)(50).
	SB 7328	Directs state police to establish the Stop Aggressive Vehicular Encounters Program and provides for increased enforcement. In Finance Committee (19)(22)(50).
	SB 7451/AB10968	Creates and classifies crimes of criminal aggressive driving. It requires pre-licensing education on aggressive driving and suspends or revokes licenses for violators. It also prohibits insurance premium reductions for courses that do not address aggressive driving. In Codes Committee (19)(22)(50).

**Table 1. Legislation Introduced in 1998 (continued)**

State	Bill(s)	Description(s)
Virginia	HB895	The bill creates and defines a separate offense for aggressive driving and establishes penalties. Carried over to next session (19).
	HB1309/SB546	Creates and defines a separate offense for aggressive driving and establishes penalties. HB 1309 was killed in the Transportation Committee; however, SB546 carried over to the next session (19).
	HB896	Requires school driver education programs to include aggressive driving. Signed by the governor on March 13, 1998 (19).
	HJR169	Calls for a subcommittee to define aggressive driving and recommend penalties. This bill was killed in Rules Committee but the Committee has urged the Transportation Committee to study the issue (19).
Washington	SB6708	Creates, defines and establishes penalties for aggressive driving. This bill died in the Rules Committee (19)(36).

## 2. Implemented Programs at the Regional, State and Local Levels

Numerous programs have been implemented at the regional, state, and local levels to combat aggressive driving. Efforts identified in the literature tend to include both enhanced enforcement and media efforts. In addition to expanded enforcement efforts, a number of jurisdictions are adding notes to tickets indicating that a driver has been observed driving aggressively. There is some evidence that, even where specific legislation is lacking to impose stiffer penalties on aggressive drivers, the courts are making this distinction. In King County, Washington, Prosecutor Norm Maleng stated, in his filing of assault second degree charges against two motorists, that “road rage is a threat to us all and it will not be tolerated (10).”

Table 2 outlines the components of programs identified in the literature search that have been implemented in the U.S. and Canada:

**Table 2. Regional, State and Local Programs in the U.S. and Canada**

State	Program Description
Arizona	This state program is the longest running in the U.S. and relies on both enforcement and a media campaign. Several aggressive driving patrols are scheduled each week and there is zero tolerance for the aggressive driver (63)(15). Arizona is one of only two states that has specific aggressive driver legislation in place.
California	California initiated the long-running media campaign known as “Smooth Operator”- a name also adopted by the Washington, D.C. Metropolitan Area. Enforcement activity was also expanded, including programs for red-light running (63)(4). At the municipal level, a number of cities have adopted San Francisco’s program, known as STOP, which impounds cars of unlicensed drivers (26).

**Table 2. Regional, State and Local Programs in the U.S. and Canada (continued)**

State	Program Description
Colorado	Colorado's program began in late 1997 and features an extensive media program as well as enhanced enforcement. Known as ADAPT (Aggressive Drivers are Public Threats), the program relies on unmarked cars, motorcycles, and aircraft (63)(49).
Connecticut	The program, which began in 1997, uses unmarked cars in conjunction with marked patrol cars. A 911 system is available for cellular phone callers to report aggressive drivers (63)(37).
Delaware	Delaware's program, known as "Take It Easy," started in 1997 and features unmarked and nontraditional vehicles in conjunction with marked patrol cars. A media campaign with public service announcements is also being conducted (63).
Florida	The St. Petersburg Police Department program, referred to as "Where's Jockers?" uses a variety of non-traditional vehicles and a plain-clothes officer to record violations with a radar unit and to relay information to patrol vehicles in the area (63).
Illinois	The Illinois program, started in 1997, is a decentralized effort that relies on individual districts using a variety of tactics. These can include enforcement teams, catch cars, targeted patrols, air operations, covert operations and speed enforcement (63). Notes are being added to tickets to indicate aggravated behavior (49).
Maryland	Maryland is one of three participants (the others are Virginia and Washington, D.C.) in the Smooth Operator program conducted in the Washington metropolitan area. The Maryland state police program, known as ADVANCE (Aggressive Driver Video and Non-Contact Enforcement), started in 1997 and uses digital video cameras and lasers to record violations on the National Capital Beltway. Added features include a televised public information campaign and letters and photos mailed to aggressive driving offenders (59)(63)(49).
Massachusetts	This program, started in 1997, is known as the "3D Program (for Drunk, Drugged and Dangerous). It includes a special unit that uses video-equipped, unmarked cars (63).
Michigan	Michigan's effort consists of a media campaign combined with enhanced enforcement efforts (including the use of unmarked cars) in two existing programs: Operation C.A.R.E. and Campaign Safe & Sober (63)(33).
Missouri	The Missouri program targets typical problem areas and relies on cooperation between the State Highway Safety Office for media efforts, and police agencies throughout the state for enforcement. The Highway patrol uses aircraft, unmarked patrol cars and non-conventional vehicles to spot aggressive drivers. The state is adopting a zero tolerance policy and enforcement officers are placing notes on tickets to indicate aggressive driving behavior (63)(55).
New Jersey	New Jersey utilizes semi-marked patrol cars as well as unconventional vehicles in a multi-agency enforcement program. The program includes toll free and cellular telephone numbers (63)(9)(28).
New Mexico	The City of Albuquerque program is known as "Safe Streets," and uses intensive enforcement to focus on violent offenders and areas with high numbers of violent felonies (63).
New York	Begun in July 1998, the program features enforcement and education components and has been expanded to local law enforcement jurisdictions. Efforts rely on non-conventional vehicles and unmarked cars, some with video cameras (63)(21)(22)(50).

**Table 2. Regional, State and Local Programs in the U.S. and Canada (continued)**

State	Program Description
Ohio	Started on July 4, 1997, the Ohio Highway Patrol statewide program is known as TRIAD (Targeting Reckless & Intimidating Aggressive Drivers). The program uses thirteen aircraft along with ground units from the Highway Patrol and other local organizations (63)(60).
Pennsylvania	The Pennsylvania State Police Program is known as "Ticket the Aggressive Driver," and uses unmarked cars, aircraft and DOT vehicles in conjunction with some plain-clothes officers (63). Operation Centipede establishes police speed zones (46).
Rhode Island	Rhode Island State Police began their program in 1997. It features a media campaign and unmarked cars dedicated to an aggressive driving patrol (63).
South Carolina	Started in 1997 by the Greer Police Department, the program is known as "Targeting the Aggressive Driver." It features a thorough education component to promote community awareness and an enforcement component (63).
Texas	Begun in 1997 by the cities of Arlington and Fort Worth, efforts include increased attention to aggressive drivers by patrol officers and teams of marked patrol cars and motorcycles. A motorist call-in program has also been implemented, along with follow up letters and investigations, when warranted (63).
Utah	The Utah Highway Patrol began its aggressive driver program in Salt Lake City, in response to congestion resulting from freeway construction. The program uses unmarked cars and non-conventional vehicles in addition to a training program (63).
Virginia	The Commonwealth is a participant in the regional "Smooth Operator" program. Coordinated by the Fairfax County Police Department, the effort includes Maryland and the District of Columbia in a multi-jurisdictional effort that utilizes coordinated enforcement waves in a fifteen-agency effort. A special cellular phone number has been provided for direct reporting to law enforcement organizations (63)(65).
Washington	Washington State has initiated a stepped-up law enforcement program and Aggressive Driver Apprehension Team that uses motorcycles and unmarked vehicles to apprehend aggressive drivers. The state has begun compiling road rage statistics (63)(41).
District of Columbia	The District is a participating agency in the "Smooth Operator" effort along with Maryland and Virginia (63).
British Columbia	Begun as a speed enforcement program in 1995, this effort combines enforcement and public information to target aggressive drivers in British Columbia. It uses lasers and radar. Enforcement schedules are posted on the Ministry of Attorney General Internet site (44).
Ontario	The Peel Regional Police Department began their efforts in June 1996, which includes a media campaign and intensive enforcement effort. They have also installed a data collection system to monitor aggressive driving. The Provincial Police conduct a separate program in Toronto-area highways (63). This program includes roadside counseling and the use of on-the-spot surveys (24).

### 3. Reported methods to prevent road rage

#### a. Education

Many public and private organizations have launched education campaigns to teach drivers about their own behavior and how to deal with aggressive behavior of other drivers. For example, education campaigns have been developed by government agencies such as the National Highway Traffic Safety Administration, by the National Safety Council, and by the AAA Foundation for Traffic Safety. Citizen groups, such as Citizens Against Speeding and Aggressive Driving, and insurance companies, such as State Farm and Allstate, have also launched education campaigns (45)(11).

The National Highway Traffic Safety Administration provided funding for the Smooth Operator project in the Washington National Capital region. This includes an intensive public awareness campaign with distribution of educational materials, self-tests, and public service announcements. A companion effort will study enforcement techniques. Citizens Against Speeding and Aggressive Driving, active in the Washington, D.C. metropolitan region, is focusing efforts on public awareness and citizen involvement in transportation legislation. The National Safety Council has developed a widely used driver education curriculum for aggressive driving offenders (20). The subject of driver education is discussed more completely in Section H.

The media is a willing partner in educating the public about aggressive driving and road rage. Radio and television public service announcements, such as the ones developed by the AAA Foundation for Traffic Safety and by the Colorado State Patrol, are popular ways to increase public awareness. In a local example, the Nashville Tennessean provided readers with a list of alternate routes to ease driver frustration and reduce road rage incidents during construction (38).

Determining the independent effect of these educational efforts is complicated by the simultaneous use of other methods for combating aggressive driving. For instance, it is difficult to separate out the impact of education from that of enforcement or self-help materials.

#### b. Increased Enforcement

Enhanced law enforcement is another method to combat road rage at the regional, state, and municipal levels. Common enforcement methods include using unmarked cars, plain-clothes police officers, helicopters, airplanes, video cameras, motorcycles, radar, and non-conventional vehicles. Pooling resources across jurisdictions appears to be an effective strategy. One such multi-jurisdictional effort, the "Smooth Operator" campaign, involves 15 separate organizations in Maryland, Virginia, and the District of Columbia (49).

Program evaluations of these efforts seem promising however most have been conducted by the implementing organizations themselves. Maryland's enforcement program, which is combined with a public information campaign, is said to have reduced the state's fatality rate by 22 percent since 1995 (49). Pennsylvania's TAG-D

program reportedly resulted in a 24 percent drop in total crashes including fatalities (46). Since 1995, San Francisco's STOP program has reportedly resulted in an 80 percent reduction in crashes involving injuries and a 44 percent reduction in hit-and-runs (26). A report released by New Jersey State Attorney General Peter Verniero claims an 18 percent reduction in traffic fatalities throughout the six-county area selected for enhanced enforcement activity (9). New York's Campaign Safe and Sober reports that 6,805 aggressive driving moving violations were recorded during the week of August 6-11, 1997. However, the impact of this operation on fatalities and crashes was not available (23).

Notwithstanding the glowing results just reported, the effectiveness of enhanced enforcement is difficult to distinguish from other efforts. In addition, most evaluations are done in-house, so it is possible that favorable outcomes reflect the implementing organizations' perceived need to demonstrate success. Moreover, the results generally do not distinguish true road rage incidents from other types of incidents. Consequently, extrapolation on the effectiveness of increased law enforcement from these incidents is difficult.

### c. Self-help Methods

Self-help methods, using a variety of media, are aimed at helping drivers increase their driving awareness, reduce personal stress levels, and thereby avoiding aggressive driving. Self-help methods include tapes; books; seminars; classes in anger management; surveys and self-tests.

An audiocassette produced by Dr. John Larson, for example, is intended to reduce stress levels through relaxation techniques and breathing exercises. Dr. Larson is also the author of a book that includes a driver stress profile to educate readers on causes and remedies for roadway anger (32). Dr. Leon James has posted an extensive listing of self-help materials on his Internet Web site at [www.aloha.net/~dyc](http://www.aloha.net/~dyc). Psychologist Arnold Nerenberg offers an 18-page road rage "10-Step Compassion Program" designed to combat "road rage disorder" that includes visualization techniques for drivers (27). The AAA Foundation for Traffic Safety has developed the video "Preventing Road Rage: Anger Management for Drivers." This video teaches motorists about anger management and provides advice for avoiding conflicts with other drivers (1).

Seminars and classes in anger management are provided by numerous organizations, and self-administered and face-to-face surveys are available. In Ontario's enforcement program, officers of the Provincial Police provide roadside counseling and administer surveys to drivers who appear aggressive. The United Kingdom's Department of Transport is providing a laminated, glove box-sized card that provides motorists with advice on how to avoid stressful situations and what to do when they are encountered (53). Similarly, the Coalition for Consumer Health and Safety (CCHS) in the U.S. has distributed wallet-sized cards for drivers that list courteous driving tips (57). Informational brochures and publications are widely available from a number of organizations, both public and private.

#### d. Increased Penalties for Offenders

Legislation introduced in 1998 to address aggressive driving focused primarily on its definition as an act distinct from reckless driving, and most of the bills included provisions for the classification of offenses and their penalties. These included higher fines, mandatory driver education and re-education programs and penalty points assessed to drivers' licenses. Mandatory jail time, loss of license, and insurance penalties were also proposed in some states. Finally, many states also allow law enforcement officials to send warning letters and radar camera photos to offenders.

Only Arizona has enacted statutes that allow for increased penalties to drivers found guilty of aggressive driving. The state has not yet released an evaluation of the effectiveness of the new laws.

#### e. Call-in Cellular and Other Telephone Systems

A number of telephone hotlines allow citizens to report aggressive driving incidents directly to local law enforcement officers. Special cellular telephone numbers and other motorist call-in programs have been introduced in a number of jurisdictions (8). However, with at least 23 "magic" numbers nationwide, motorists may be confused about which number to call (see Appendix A).

Most areas do not have enabling legislation allowing citations to be issued solely based on a citizen complaint without a supporting observation from a law enforcement officer. This does not diminish the popularity of aggressive driving hotlines, however. Colonel David Mitchell of the Maryland State Police reports that the special toll-free number established for Maryland drivers to report aggressive drivers receives about 300 calls a day (34).

#### f. Intelligent Transportation Systems and Photo Enforcement

Red light runners and speeders are captured on camera in some domestic jurisdictions as well as in some European countries and Australia. The Maryland State Police are developing a new photo imaging technology that will capture aggressive driving incidents (48). This method makes it possible to detect traffic violators without the physical presence of a law enforcement officer. One study of New York's camera program concluded that compliance with the law was significantly improved during the three-year pilot program (3). However, before using this type of automated enforcement, enabling legislation must usually be passed. Privacy, distribution of ticket revenue, ticketing procedures, and the effectiveness of enforcement are common issues (61). In addition, if violations are detected but not enforced the credibility and effectiveness of enforcement suffers (58). Using cameras looks promising given its documented effectiveness in detecting and deterring other types of violations.

#### g. The Internet

The World Wide Web contains abundant resources for those wishing to increase their awareness about their own driving behavior, as well as those wishing to publicize instances of aggressive driving and road rage that they have encountered. Resources include "Report it" Web sites, driver improvement pages and self-assessment quizzes. The Iowa Department of Transportation's Internet Web site, for example, includes an informational section on road rage that provides a list of common roadway irritants as well as tips for drivers (54). One Canada jurisdiction, the Township of King, has provided a form for citizens to file complaints (51).

The Internet also provides an excellent means of distributing bibliographic and reference lists. Examples of reference lists dedicated to the topics of aggressive driving and road rage are provided by the Center for the Advanced Study of Public Safety and Injury Prevention at the University of Albany and by the Washington State Library (2)(52).

#### h. Driver Education

Driver education may be required for all potential licensees, or for the rehabilitation of traffic offenders. School or defensive driving programs may be more specifically focused to include segments on aggressive driving. Many of these programs are voluntary. New York's Point and Reduction Program, for example, offers New York drivers a 10 percent annual auto insurance reduction for attending defensive driving class (25).

Virginia is the only state that has enacted specific legislation to address aggressive driving through driver education. During a House Subcommittee hearing on Surface Transportation in July 1997, it was stated that a 1994 Massachusetts study of the effectiveness of the National Safety Council's Course "Attitudinal Dynamics of Driving" was very effective. The evaluation of the course for drivers facing license suspensions in Massachusetts, Mississippi, and New Hampshire indicated a 70 percent decrease in crashes and violations among those drivers in the following year.

#### i. Other Countries

Countries besides the U.S. and Canada are also addressing road rage, including England, Australia, Ireland, Japan, Scotland, and New Zealand. Approaches to the problem vary, reflecting the different cultural norms of the implementing countries.

For example, Japan's Ichihara Prison was founded to punish dangerously irresponsible drivers, such as those guilty of vehicular homicide, drunk driving, fleeing the scene of an accident and other crimes. Strict by western standards, it boasts a recidivism rate of only 7% (13). In Australia, Police Minister Russell Cooper has drafted legislation that would allow for up to two years jail term for road rage perpetrators and Victorian magistrates are seeking the power to suspend licenses and require driver re-education for drivers convicted of road rage offenses (57)(29). Most countries, however, are still in the process of evaluating the extent of the problem. New Zealand's Transport

Minister Jenny Shipley has called for both community action and media efforts to combat road rage (56). In Great Britain, efforts have thus far concentrated on collecting information on the frequency of violent roadway incidents (8)(7)(31).

#### 4. Literature Search on Characteristics of Road Rage Incidents

The literature search on the precursors to road rage yielded little solid information. Ellison *et al*, cite studies that correlate aggressive driving behavior with ambient temperature (Kenrick & McFarlane), social class (Deaux, 1971) and the presence of aggressive stimuli (Turner, Layton & Simons, 1975). Ellison's own study relates aggressive behavior to driver anonymity (14). There is abundant anecdotal evidence relating the frequency of aggressive acts to levels of congestion: however, empirical evidence to support this assumption was not discovered in the literature.

#### B. Results of the National Survey

The national survey conducted for this study was faxed to 504 randomly selected jurisdictions in the fifty largest metropolitan areas in the U.S between May 1 and 15, 1998. Its purpose was to determine which organizations and jurisdictions have implemented programs to address road rage and to provide a basis for the second, detailed survey, which would then identify and characterize individual efforts that seem promising. The survey also provided general information about the current activities and perceptions of implementers nationwide, as well as information on planned activities.

**Figure 1. Respondents by Organization**

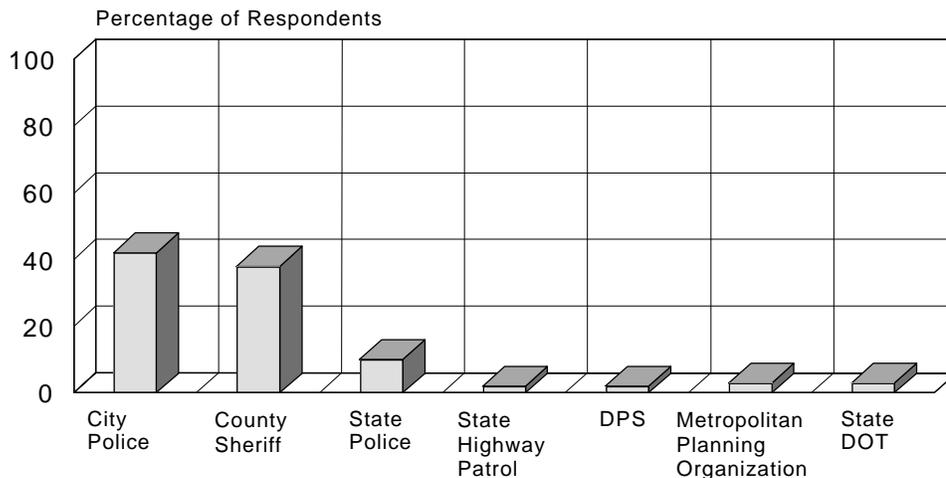


Figure 1 shows a breakdown of respondents by organization type. A total of 139 surveys were returned for a response rate of 28 percent. The survey instrument is included in Appendix B.

**Figure 2: Do you think road rage is a problem in your area?**

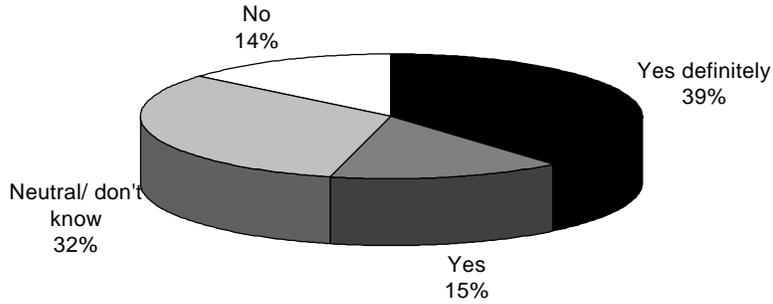
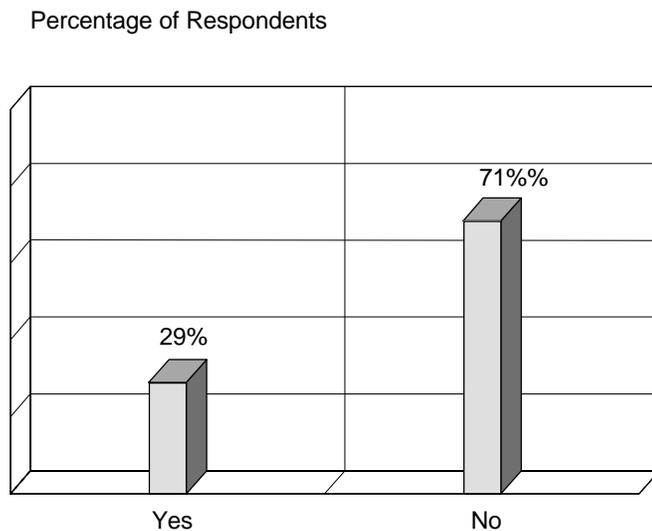


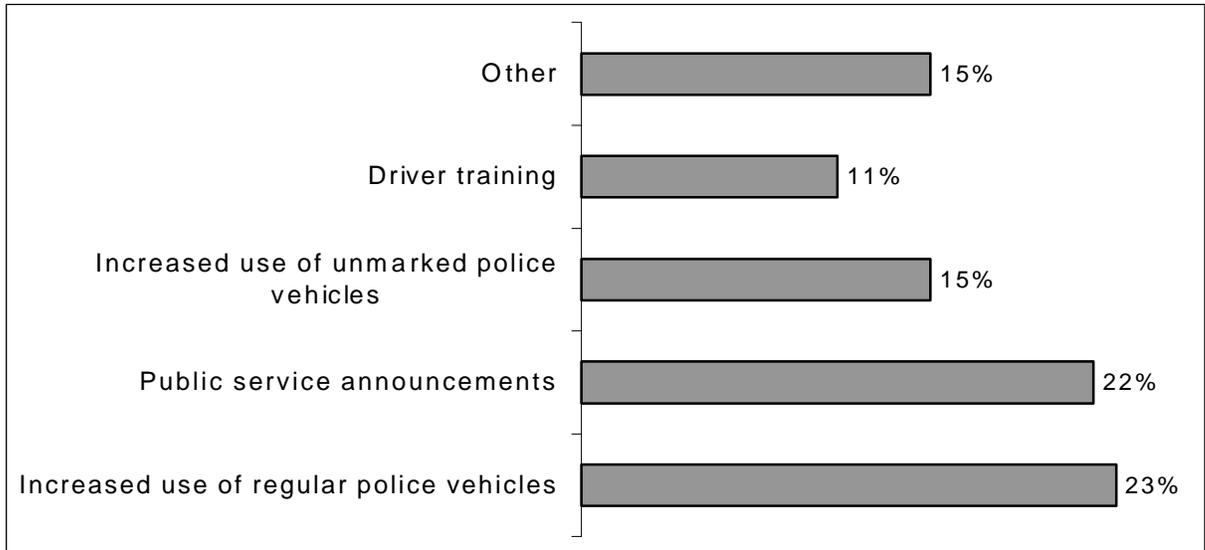
Figure 2 shows that 39 percent of survey respondents indicated that road rage is definitely a problem in their area and another 15 percent believe that it is a problem. Nearly one-third (32%) did not know if road rage is a problem, or were neutral as to its status, and 14 percent do not believe that it is a problem in their area.

**Figure 3. Has your organization implemented any initiatives over the past 5 years to curb road rage?**



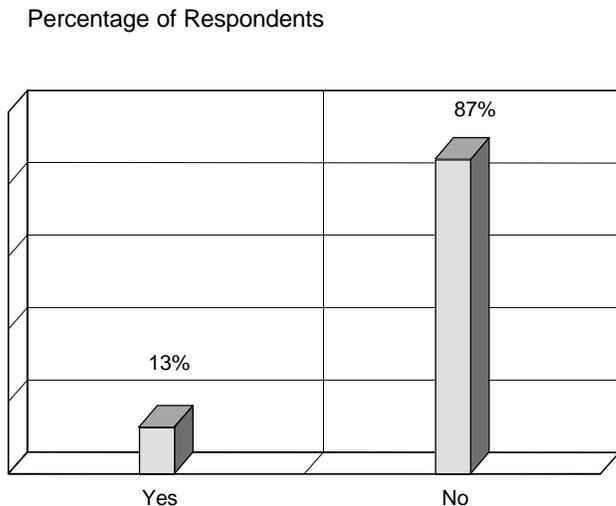
Only 29 percent of the respondents to this question indicated that their organizations have implemented any initiatives to curb road rage in the recent past.

**Figure 4. Which methods have been implemented/organized by your organization over the past 5 years to curb road rage?**



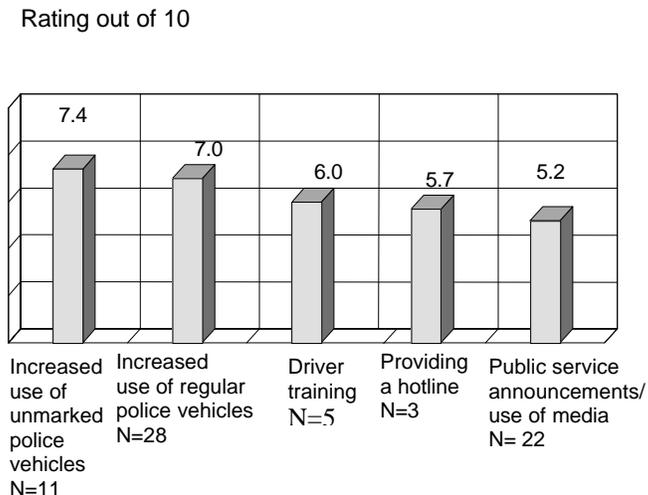
Of the 29 percent of respondents who indicated that their organization had undertaken initiatives to combat road rage, the highest percentage, or 23 percent, indicated that their organization had increased their use of regular police vehicles and 15 percent indicated the use of unmarked police vehicles (see Figure 4). Public Service Announcements were reported by 22 percent of respondents, followed by driver training at 11 percent. Other methods were reported by 15 percent of respondents. Many of these methods were used in combination.

**Figure 5. Has your organization conducted efforts to monitor the effectiveness of these initiatives/methods?**



Only 13 percent of respondents answered “Yes” to this question.

**Figure 6. How do you rate each of the techniques that your organization has implemented/organized in terms of its ability to reduce road rage incidents?**



Respondents were asked to rate methods on a scale of one to 10. Ratings for each method were then averaged to give each method a score (Figure 6). Techniques that received less than three ratings are not shown. Respondents to this question rated the increased use of unmarked police vehicles the highest, at 7.4, followed closely by the increased use of regular police vehicles – rated 7.0. Driver training ranked third at 6.0 and the provision of a hotline was rated at 5.7. The lowest rating was given to public service announcements/use of media at 5.2.

**Table 3. Measures to be undertaken within the next two years.**

Measure to be Undertaken	Number	Percent
Enforcement	40	56
Media and Education	23	32
Research	13	18
Traffic Monitoring Technology	7	9
Congestion Measures	2	3
Officer Training	3	4
Hotlines	2	3
Legislation	1 (Virginia)	1
Grant Programs	3	4

The 71 respondents that listed a specific measure or measures to be undertaken in the near future provided the above responses, with many indicating more than one response.

The Michigan Department of Transportation has a unique approach; they provide incentives to contractors on high-impact projects to minimize construction time and thus lessen driver frustration. Three other respondents reported using “Drive Friendly” signs, providing classes for county residents, and considering traffic calming measures.

It is an interesting contradiction that, while public service announcements and the use of the media were given the lowest effectiveness rating by respondents to Question 5 (at a rating of 5.2), the use of the media and education is the second most frequently reported planned activity in Question 6. Several reasons seem possible including: actual small returns on media and education investments; bias by the law enforcement community (the majority of respondents to all questions) in favor of enforcement methods; and the inability to distinguish specific effectiveness between components of a multi-faceted program.

### C. Results of the Detailed Survey

The purpose of the detailed survey was to identify programs that either appear to be reducing aggressive driving and road rage or at least are being thoroughly evaluated. The detailed survey was sent to organizations that indicated in the national survey that they had implemented measures to combat road rage. The evaluation of Question 15 and its subparts (addressing conditions under which incidents have occurred), is included in Section D, Results of the Survey “Characteristics of Road Rage Incidents.”

The definition of road rage was provided to all survey recipients. Validation of individual incidents was not possible, however. The survey instrument and summary of responses are included in Appendix C.

All 16 respondents to the detailed survey were in the law enforcement field. They provided the following information in response to the survey questions.

#### 1. Please specify method

Eleven agencies indicated that efforts to combat road rage included increased patrols, dedicated hours, or special teams. Ten of the responding agencies indicated that they included the use of unmarked or semi-marked vehicles in their programs. Other methods included special tracking codes, videos, radar, aircraft, red light cameras, speed boards, and vans. One agency, the Arlington, Texas Police Department, has implemented a commuter hotline intended to provide angry drivers with an alternative to violent behavior. Other measures included increased media coverage in one agency and the use of press conferences by another.

#### 2. Which agency/organization applied this method?

All of the respondents worked for law enforcement agencies. However, six of the respondents said their programs were conducted in cooperation with other entities. Three mentioned only that efforts were cooperative, two reported state and local combined efforts and one operation was performed in conjunction with a public works department.

3. Why did you apply this particular method?

All respondents indicated that the method was selected because they believed it to be the best technique for addressing the problem. Of the other reasons provided, five indicated cost-effectiveness or affordability, three indicated that the technology was either the most appropriate or available, and four indicated that political pressure and public or media visibility were factors. One respondent indicated that the method enhanced other efforts while another suggested it was the best for achieving long-term results. Answers to questions 1 and 3 reveal a strong reliance on enforcement methods, not too surprising given the respondent's backgrounds. Results of the survey should be viewed accordingly.

4. Please provide the approximate date (month and year) when implementation of this technique started.
5. Please provide the approximate date (month and year) when implementation of this technique ended.

These two items were intended to identify programs that had been in operation for sufficient time to allow "before-and-after" studies. Of special interest to the researchers was the identification of programs that were up and running and had been monitored prior to recent public interest in road rage. This would allow for some evaluation of the effects of this interest. Interestingly, only one program has been in operation since prior to 1997: the City of Falls Church, Virginia began its program in 1994.

All respondents to this question reported their programs as currently in operation.

6. How widely was this technique implemented?

The question was intended to discern whether responses to the question regarding the location of incidents, were likely to be influenced by the scale of program implementation. For example, if all respondents had reported state and regional efforts, it is more likely that incidents would have been reported on interstate highways than on local roads. The following breakdown, however, reflects a more even distribution of responses. Still, it should be noted that the surveys were sent to organizations in the 50 largest metropolitan areas, which may have influenced the responses regarding location and roadway type in both this survey and its successor on incident characteristics. The total exceeds the number of respondents because some provided more than one response.

**Table 4. Scale of Program Implementation**

<b>Scale</b>	<b>Number of Responses</b>
Regional	4
Regional	4
State	3

County	3
City/Municipal	4
Borough	1
Local	2
Specific Location	1

7. Please indicate all the resources that were used to plan and apply this technique.
8. Please rate the effectiveness of the technique to reduce road rage.
9. Please indicate what your rating is based on.

The subparts of Question 7 were intended to determine if some measure of cost-effectiveness could be gleaned from survey responses as they were compared to the respondents' assessment of program effectiveness (Question 8). Question 9 is especially important in determining effectiveness because increases in the number of citations or violations reported are not considered evidence of effectiveness in preventing aggressive driver behavior.

Responses to Question 7 varied widely, from the addition of an extra person dedicated to a task to the addition of thousands of man-hours, pieces of equipment, and dollars. Most efforts were reportedly modest in size, ranging from 1 to 10 man-hours. However, because only three respondents indicated units of time, rate comparisons are necessarily difficult. The complete breakdown of responses is included in Appendix C. Responses to Question 8 are shown in Table 5.

**Table 5. Program Effectiveness Rating**

Effectiveness Rating	Number of Respondents
1	0
2	0
3	1
4	2
5	9
6	2
7	1
8	8
9	1
10	1
N/A	5

The respondent who rated his operation a 10 was from the New Jersey State Police, where cost data revealed the operation of 15 unmarked vehicles at \$1750/vehicle. The rating was based on enforcement data. Similarly, the effectiveness rating of 9 came from the Connecticut State Police and related to the use of 10 unmarked vehicles as a cost-effective technique to reduce crashes. The rating was based on experience only.

Eight programs were given effectiveness ratings of 8. All of these programs report data collection on moving violations. Only two, the New Jersey State Police and the Connecticut State Police, report data collection on collisions and accident reduction, respectively, as indicated in their responses to Question 9. Only the respondent from the New Jersey State Police based his rating on a reduction in the number of fatalities and collisions.

- 10. Are you currently, or did you in the past, collect before-and-after data to monitor the effectiveness of this technique?
- 11. What kind of data are you collecting?
- 12. Over which time period were the before-and-after data collected?

These questions were intended to get at the duration and rigor of program monitoring. To evaluate program effectiveness, respondents needed to collect data prior to implementation. The data should reflect a meaningful measure of program success and collection should be continued after program implementation.

Of the respondents to these questions, four organizations report collecting data for the “before” condition and have continued to monitor their programs. Of these four, three organizations rated their programs 7 or higher in effectiveness: the New York City Police Department, the New Jersey State Police Department, and the West Valley City Police Department.

- 13. In your opinion, how have the following factors changed since you began collecting data?

This question was intended to identify variables that could be used to evaluate programs. All respondent answers are included in Appendix C. The table below summarizes the three organizations that rated their programs effective, collected before-and-after data, and used a measure that has face validity in evaluating program effectiveness.

**Table 6. External Variables for the New York City Police Department, New Jersey State Police and West Valley City (Utah) Police Department**

Agency	13a. Media Pressure	13b. Level of Congestion	13c. Traffic Volumes	13d. Accidents	13e. Speeding Citations	13f. Reckless Driving Citations	13g. Political Pressure	13h. Legislation Directed at Road Rage
New York City Police Department	Same	Increase Somewhat	Same	Same	Same	Same	None	None
New Jersey State Police	Same	Same	Same	Decrease	Increase Somewhat	Same	Decrease	Same
West Valley City Police Department	Same	Increase Sig.	Increase Sig.	Increase Sig.	Increase Sig.	Increase Somewhat	Increase	Same

Respondents reported no perceivable increase in media pressure during the data collection period. Increased congestion should be considered, however, in the

interpretation of data for these agencies. For instance, indications are that West Valley City may have experienced unusual population and economic growth, or land development conditions that could seriously affect results.

14. In your opinion, what do you consider to be the most effective technique to curb road rage? Reasons?

All answers to this question are included in Appendix C. The primary emphasis was placed on enhanced enforcement; however, many respondents also considered public awareness and education. Of particular interest are the responses by the New York City Police Department and the New Jersey State Police. The New York City Police Department's program "focuses on prevention of incidents." In describing its cooperative effort, the New Jersey State Police provide the following reason for considering their program to be effective:

"This method provided maximum saturation of an area without impacting any single agency in a negative manner. It also allowed many smaller agencies the opportunity to participate in a program that could not be initiated at their level."

The researchers conducted follow-up telephone calls to solicit information from the three selected organizations. Only one of these responded with supplemental information: the New Jersey State Police.

*New Jersey State Police: 1997 Aggressive Driver/Aggressive Enforcement Program*

New Jersey's program began in April of 1997, with the goal of reducing fatal and serious motor vehicle accidents caused by aggressive drivers. An aggressive driver is defined as "anyone who operates a motor vehicle in an offensive, hostile, or belligerent manner, thereby creating an unsafe environment for the remainder of the motoring public." The following violations of New Jersey's traffic regulations are classified as aggressive driving: speeding; following too close; unsafe lane changes; driving while intoxicated; reckless; careless or inattentive driving; disregard of traffic signs and signals; improper passing; and driving while suspended.

The program targets offenders through the use of both unmarked and marked patrol cars. In addition, troopers are assigned to units that operate stationary and mobile radar to enforce speed limits, and state and municipal police have joined forces to conduct roving drunk driving patrols and establish sobriety checkpoints to detect drunk drivers. The effort is publicized through a public awareness and outreach effort that has produced public information, brochures, and bumper stickers, and includes #77 cellular and 1-888-SAF-ROAD hotline numbers. It is a cooperative effort, involving numerous enforcement agencies at the state, county, and municipal levels.

The Aggressive Driver/Aggressive Enforcement Report issued by the New Jersey State Police, with statistics compiled by the New Jersey State Police Traffic Bureau and the Division of Highway Traffic Safety, indicate an 18% decrease in highway fatalities in the six-county area where aggressive driver patrols were concentrated. A breakdown of incidents by county is provided in Appendix D. The monitored period

extended from April 1, 1997 (the program start-up date) through December 31, 1997, and the number of fatalities was compared with the same time period in 1996 to arrive at the 18 percent figure. Statistics for 1998 are not available yet.

#### D. Results of the Survey “Characteristics of Road Rage Incidents”

The results of Questions 15a through 15e on the detailed survey were combined with identical Questions 1-8 on the third, supplemental survey titled “Characteristics of Road Rage Incidents.” The supplemental survey results are included in Appendix E. From responses to these questions about actual road rage incidents, characteristics of the “typical” road rage incident were identified.

##### *Time of Day*

Table 7 shows that 10.5% of the observed road rage incidents occurred between 6:00 and 8:00 AM, which generally correspond with AM peak travel times. During the PM peak hours, however, this figure jumps to 15.8% in the 2:00 to 4:00PM timeframe, and to 25.0% during the 4:00 to 6:00 PM travel peak, dropping back to 11.8% in the hours between 6:00 and 8:00 PM. In this small sample, road rage incidents were more likely to occur during peak travel times and one in four occurred during the 4:00 to 6:00 PM travel peak.

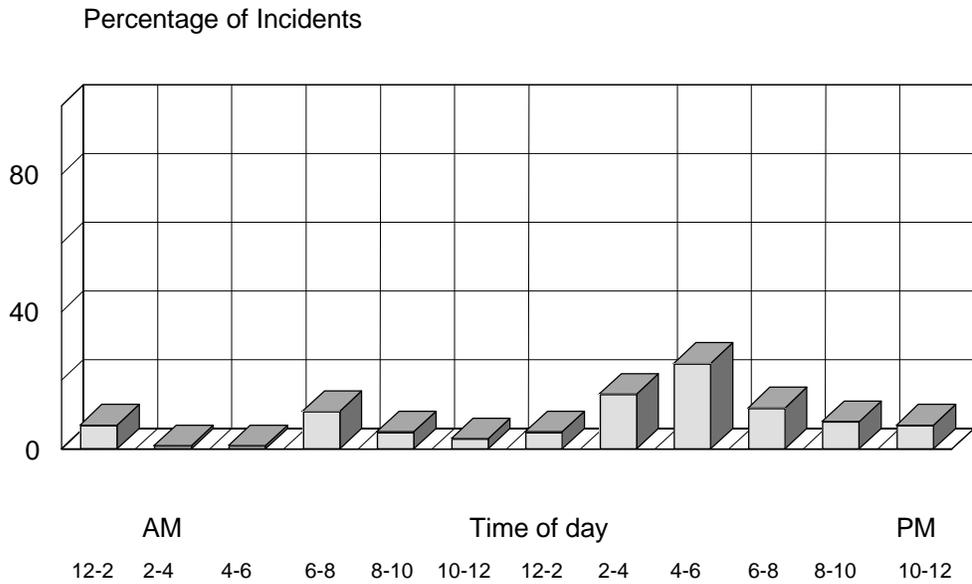
**Table 7. Time of Day**

Respondents: 40  
 Total Number of Incidents: 80

Time	Total	Detailed Survey	Characteristics	Percent of Total
12AM-2AM	5	1	4	6.5
2AM-4AM	1	0	1	1.3
4AM-6AM	1	1	0	1.3
6AM-8AM	8	5	3	10.5
8AM-10AM	4	1	3	5.3
10AM-12PM	2	0	2	2.6
12PM-2PM	4	1	3	5.3
2PM-4PM	12	4	8	15.8
4PM-6PM	19	6	13	25.0
6PM-8PM	9	2	7	11.8
8PM-10PM	6	0	6	7.9
10PM-12AM	5	1	4	6.6
Totals	76	22	54	99.9

There were three non-responses and one respondent answered that he had witnessed no incidents at any time. These four answers were not included in the computations. Percent total does not equal 100 due to rounding.

**Figure 7. Time of day**



*Weather*

The majority of road rage incidents reported in these surveys, 68.3 percent, occurred during sunny weather. Another 20.1 percent of incidents occurred on overcast days. Inclement weather does not appear to contribute to road rage; it may actually decrease it by keeping motorists more preoccupied with roadway conditions and lowering driver expectations. Of the 63 incidents (17 were either unknown or did not report the conditions), none were reported to have occurred during rainy or snowy weather, and only one was reported to have occurred under icy conditions. Incidents reported at night constituted 9.5 percent.

**Table 8. Weather Conditions**

Total Number of Respondents: 40  
 Total Number of Incidents: 80

Weather	Total	Detailed Survey	Characteristics	Percent of Total
Sunny	43	16	27	68.3
Overcast	13	3	10	20.1
Rainy	0	0	0	0.0
Icy	1	0	1	1.6
Snowy	0	0	0	0.0
Dark/Night	6	1	5	9.5
N/A	8	6	2	--
Unknown	9	0	9	--
Total	80	26	54	99.5

One respondent answered that he had not witnessed an incident under any conditions. This answer was included in the N/A category, which was excluded from tabulations. Although Dark/Night was not included as an answer option, these were volunteered by respondents and have been categorized separately. Percent total does not equal 100 percent due to rounding.

### Season

The highest percentage of road rage incidents, 37.8 percent, was reported to have occurred during the summer. The lowest percentage was reported for the winter months at 10.8 percent. Spring and fall occurrences were observed to be 23.0 percent and 28.4 percent, respectively.

**Table 9. Season**

Total Number of Respondents: 40  
 Total Number of Incidents: 80

Season	Total	Detailed Survey	Characteristics	Percent of Total
Spring	17	9	8	23.0
Summer	28	6	22	37.8
Fall	21	4	17	28.4
Winter	8	1	7	10.8
N/A	6	6	0	--
Total	80	26	54	100.0

The six N/A values were not included in the "Percent of Total" column.

### Holidays

The occurrence of a holiday does not appear to influence the frequency of road rage incidents. Only 12.5 percent of reported incidents occurred within four days of a holiday.

**Table 10. Proximity to Holidays**

Respondents: 40  
 Incidents: 80

Within Four Days of a Holiday?	Total	Detailed Survey	Characteristics	Percent of Total
Yes	8	3	5	12.5
No	56	16	40	87.5
N/A	16	7	9	---
Total	80	26	54	100.0

The sixteen N/A values were not included in the "Percent of Total" column.

### Day of the Week

The highest percentage of reported incidents, 26.1 percent, occurred on Friday. The next highest percentage, 17.4 percent, occurred on Wednesday, followed by Tuesday and Thursday, both 15.9 percent. The weekend had the lowest percentage of reported incidents, with 10.1 percent occurring on Saturday and 7.3 percent on Sunday.

**Table 11. Day of the Week**

Total Number of Respondents: 40  
 Total Number of Incidents: 80

Day	Total	Detailed Survey	Characteristics	Percent of Total
Monday	5	1	4	7.3
Tuesday	11	3	8	15.9
Wednesday	12	7	5	17.4
Thursday	11	3	8	15.9
Friday	18	4	14	26.1
Saturday	7	1	6	10.1
Sunday	5	0	5	7.3
N/A	9	7	2	--
Unknown	2	0	2	--
Total	80	26	54	100.0

Not available and unknown responses were omitted from the "Percent of Total" column.

### Traffic Conditions

The highest percentage of road rage incidents reported on the surveys, 33.3 percent, occurred under moderately congested conditions. This figure was followed by 26.4 percent of incidents that occurred under free-flowing conditions, and 22.2 percent occurring under conditions of heavy congestion. The fewest incidents, 18.1 percent, occurred under lightly congested conditions.

**Table 12. Traffic Conditions**

Total Number of Respondents: 40  
 Total Number of Incidents: 80

Traffic Conditions	Total	Detailed Survey	Characteristics	Percent of Total
Free-flowing	19	1	18	26.4
Lightly Congested	13	3	10	18.1
Moderately Congested	24	6	18	33.3
Heavily Congested	16	11	5	22.2
N/A	7	4	3	--
Unknown	1	1	0	--
Total	80	26	54	100.0

Not available and unknown responses were omitted from the "Percent of Total" column.

### Alcohol and Drugs

In one quarter of the incidents (25.5%), where the information was known, either alcohol or drugs was reported to be a factor.

**Table 13. Involvement of Alcohol and/or Drugs**

Total Number of Respondents: 40  
 Total Number of Incidents: 80

Was Alcohol or Drugs a Factor?	Total	Detailed Survey	Characteristics	Percent of Total
Yes	12	4	8	25.5
No	35	11	24	74.5
N/A	17	6	11	--
Unknown	16	5	11	--
Total	80	26	54	100.0

Not available and unknown responses were omitted from the “Percent of Total” column.

### Location and Roadway Type

Road rage incidents were most commonly reported to have occurred on urban freeways (23.7 percent). Urban area non-freeways followed closely with 21.1 percent of reported incidents. The smallest percentage, 7.9 percent, occurred on rural non-freeways.

**Table 14. Location and Roadway Type**

Total Number of Respondents: 40  
 Total Number of Incidents: 80

Location	Total	Detailed Survey	Characteristics	Percent of Total
Urban area (non-freeway)	16	3	13	21.1
Urban area (freeway)	18	8	10	23.7
Suburban area (non-freeway)	14	3	11	18.4
Suburban area (freeway)	13	7	6	17.1
Rural area (non-freeway)	6	0	6	7.9
Rural area (freeway)	9	0	9	11.8
N/A	5	5	0	--
Total	81	55	26	100.0

The total number of incidents shown is higher than reported because one was reported to have involved two types of roadway. Responses in the N/A category were not included in the percentages.

#### IV. Synthesis of Results

State legislatures are only beginning to make the distinction between road rage and other forms of aggressive driving. Many lawmakers perceive, often correctly, that aggressive driving offenses are already covered under existing statutes (64). One of the primary difficulties in drafting such legislation lies in defining offenses in a way that is unmistakable to the officer on the scene, who must decide quickly whether an act qualifies as violent or merely aggressive. Motorists, on the other hand, must feel they are being treated fairly and that fines and penalties are appropriate to the offense. State legislative efforts are underway to examine these issues.

Other legislative approaches include mandated educational efforts oriented towards both inexperienced and aggressive drivers. The bills introduced to date make the distinction between these two very different groups. Driver education programs for novice drivers, such as Virginia's, include aggressive driving as a program component, while others, such as Connecticut's (which died in committee), require repeat offenders to undergo specific re-education on aggressive driving. The Massachusetts study (cited earlier) showed a 70 percent reduction in crashes and violations in the year following offenders participation in the course "Attitudinal Dynamics of Driving" given by the National Safety Council.

A related approach, graduated licensing, is already in wide use and may prove to be another means of providing early awareness and prevention of violent or aggressive driving. Several states have undertaken research to determine the best strategies for addressing the problem.

At the implementation level, many regional, state and local efforts are already underway, operating under existing statutes. Regional efforts tend to be cooperative, capitalizing on the resources made available by all participants. Efforts such as the Washington metropolitan area's "Smooth Operator" program have the added advantage of creating invisible boundaries between jurisdictions, which is especially beneficial on interstate roadways.

Most of these large-scale efforts include law enforcement and public awareness components. According to the national survey respondents, enhanced enforcement and media and public information campaigns are the most commonly implemented and planned components of their programs. This is possibly in recognition of the fact that enforcement efforts alone are unlikely to deter potential offenders. However, it also makes the independent evaluation of each effort difficult. Less comprehensive efforts, however, are more likely to rely on law enforcement alone. Although enforcement is an important element of these programs, potential offenders may not improve their behavior unless they believe the chances of getting caught and punished for aggressive driving have increased. In addition, many drivers are genuinely interested in improving their driving ability. In either case, well-publicized programs of enforcement and education, such as Maryland's, are more likely to reproduce this state's impressive 22 percent reduction in fatalities since 1995 or New Jersey's 18 percent reduction in fatalities in a nine-month period.

Local efforts are less likely to feature extensive public information and education components in their programs. This is probably due to both the high cost of publicizing efforts and unfamiliarity with the public information arena. Coordinating resources between smaller jurisdictions may offer a public information economy of scale that also focuses attention on changing driver behavior.

For people truly interested in improving their driving behavior, educational and self-help methods are becoming increasingly available. Many of these materials focus on the self-defense aspect of roadway violence and provide valuable information on how to avoid such encounters. Other materials educate drivers on how their own behavior may contribute to confrontations. Hotlines may provide an alternative avenue for venting driver frustration, even where complaints from citizens cannot form the basis for issuing citations. It is difficult to evaluate the effectiveness of these efforts in isolation because the motorists most likely to access them are probably also the most motivated to improve their driving. Empirical data on effectiveness of these approaches is still lacking.

Changes in the roadway environment are also being considered to combat road rage. The most promising appears to be the use of intelligent transportation systems and photo enforcement. Their success lies in their ability to detect offenders without the physical presence of an enforcement officer and the perception by motorists that officers need not be present or visible to enforce roadway laws. They are likely to be effective in discouraging violent aggressive driving, as well, because offenders may feel that their chances of being detected are increased and the use of this technology allows for a higher level of monitoring without substantially increasing the number of officers required.

The literature search on the characteristics of road rage incidents yielded little in the way of documented studies. This may be due to the relative low incidence of road rage or to the fact that road rage is a relatively new phenomenon. Still, the potentially disastrous consequences of aggressive driving and road rage would seem to require greater expenditures of public funds on research, education, and enforcement. This is especially true given the number of respondents to the national survey who indicated that road rage is perceived to be a problem in their areas.

Survey results indicate that road rage is most likely to occur Friday afternoon, in peak travel times, and in fair weather. The surprisingly low number of incidents recorded during rainy, snowy and icy weather may reflect increased attention to roadway conditions and lowered expectations by the driver. It is, however, during the afternoon peak that drivers are most apt to be both fatigued and rushed, with resulting shorter tempers. Incidents occur most frequently during the summer months and do not appear to be related to holiday stress. They are most frequently encountered under conditions of moderate congestion, and alcohol or drugs may be contributing factors. While urban areas were the most frequently reported location for such incidents, survey respondents represented large metropolitan areas and this finding should be verified through further research. The finding of moderately congested conditions is contrary to the anecdotal evidence that congestion *per se* is the cause of increasing numbers of these incidents. It is almost certainly a factor, but heavily congested conditions both

lower driver expectations and prevent escape for the truly violent. Heavy congestion may also lessen the sense of anonymity that contributes to aggression on roadways.

The literature search and detailed survey illustrate not only a preference by respondents for programs focused on enforcement and public information, but also provide a clear indication that such efforts are rarely evaluated for their effectiveness. Of those programs that are being monitored, most track the number of citations recorded -- a measure of effectiveness that may be more closely related to patrol activity than to improved driver behavior.

Still, several reporting jurisdictions are rating their programs as very effective using measures of effectiveness that reflect goals of improving roadway safety. One of the most comprehensive of these efforts, conducted by the State of New Jersey, includes the continuing collection of data on collisions and evaluates its program based on an impressive reduction in fatalities since program inception. The effort is cooperative, sharing resources between jurisdictions, and features both strong enforcement and public information components in addition to the use of technology. The program may provide a model for jurisdictions that want to improve roadway safety through the reduction of aggressive driving and road rage.

## V. Conclusions and Recommendations

Legislation should clearly distinguish between aggressive driving and road rage. Clear, unambiguous laws and penalties are needed and the public needs to be educated about these legal consequences. Driver education courses, including those mandated for the re-education of less-motivated offenders, may be a worthwhile avenue for preventing road rage. Much additional research is needed to determine which program elements and methods are most likely to be successful.

Law enforcement organizations that are implementing programs to combat road rage should consider partnering with other organizations to pool resources and create invisible boundaries. While the cost of public information may appear prohibitive to smaller jurisdictions, heightened awareness is a necessary component in preventing aggressive driving and road rage. Cooperative efforts may lessen these costs. The use of intelligent transportation systems and photo radar, though relatively untested for this purpose, may be effective in deterring aggressive drivers and even road rage offenders.

The key to strong evaluations of road rage interventions is to collect solid “before” and “after” data. Organizations that develop such programs should make program evaluation an integral component right from the start. Outcome measures should reflect a change in either driver behavior or a reduction of incidents, rather than simply the number of citations issued.

More research is needed to recognize the conditions under which road rage incidents are likely to occur. The incidence of road rage appears to be higher during Friday afternoon peak hours, under moderately congested traffic conditions, and during fair weather, particularly in urban areas. Targeting limited law enforcement resources during these times may be most effective. Similarly, motorists who wish to avoid confrontations should be especially cautious under these conditions.

Definitional problems and overlap with existing laws make it difficult to identify factors associated with aggressive driving incidents. The identification of these factors is made difficult by the relative infrequency of these incidents. The small number of actual road rage cases suggest that much additional research is needed to corroborate or refute the role of these factors.

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