

S P E E D

Enforcement

CAMERA SYSTEMS

Operational Guidelines



U. S. Department of Transportation
Federal Highway Administration



FORWARD

Speeding is one of the major causes of crashes, deaths, and injuries on the Nation's roadways. Speeding has consistently been a contributing cause in approximately 30 percent of all motor vehicle crashes over the last 10 years. The primary reason for managing traffic speeds is safety. The National Highway Traffic Safety Administration, Federal Highway Administration (FHWA), and Federal Motor Carrier Safety Administration (FMCSA) support a comprehensive approach to speed management.

Speed management involves engineering, enforcement, and education as components in a comprehensive approach to controlling excessive speeds. Speed management requires applying road design elements and engineering measures to obtain appropriate speeds; setting speed limits that are rational, safe, and reasonable; and applying highly visible and well publicized enforcement efforts that focus on crash producing violators. Reducing speeding-related crashes, injuries and deaths is the goal of speed management. Research has shown that free flow travel speeds within 5 to 10 mph of the posted speed limit has the potential to reduce serious injury and fatal crashes and produces even greater benefits when the most egregious speeders are targeted.

Automated speed enforcement (ASE) systems are an important element in speed management and can be a very effective countermeasure to prevent speeding-related crashes. **However, when used, ASE is a supplement to, not a replacement for, traditional enforcement operations.** Advantages of ASE include: the ability to increase safety for law enforcement officers by implementing ASE in areas where traditional traffic stops are dangerous or infeasible due to roadway design, the ability to continuously enforce the speed limit, and reductions in traffic congestion sometimes caused by driver distraction at traffic stops.

The ASE guidelines are intended to serve program managers, administrators, law enforcement, traffic engineers, program evaluators, and other individuals responsible for the strategic vision and daily operations of the program. The guidelines are written from a U.S. perspective and emphasize U.S. contexts and best practices. However, they are also drawn from the experiences of exemplary programs internationally. Though international differences in law, history, and culture might influence best practices for ASE, the majority of these guidelines are relevant to ASE programs worldwide.

The guidelines are intended to be accessible and inclusive, with an emphasis on presenting options and describing the advantages, particularly in increased traffic flow and reduced congestion, and disadvantages of each, so that an ASE program can be tailored to the needs of a particular jurisdiction. The technological state of the practice in ASE is developing rapidly. Some specific technologies are described, but rather than focus on the capabilities of current technologies, the emphasis is on identifying the functional requirements that technologies must meet so that the guidelines remain relevant as technologies evolve.

It is important to explain the philosophy and strategy behind the ASE program through communications and marketing programs, public meetings, and hearings. ASE should be described as a tool that can enhance the capabilities of traffic law enforcement and that ASE will supplement, rather than replace, traffic stops by law enforcement officers. The public should be made aware that ASE is used to improve safety, not to generate revenue or impose "big brother" surveillance. Saying this will not necessarily make it so in the eyes of the public, so it is important to explain how each element of the ASE program puts safety first and how controls are in place to prevent misuse of the system.

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CHAPTER 1: INTRODUCTION

Excessive speed is one of the leading factors that contribute to traffic crashes. Speeding-related crashes are responsible for an estimated \$40.4 billion in economic losses each year and were associated with the loss of 13,543¹ lives (31% of all highway fatalities) in 2006 (National Highway Traffic Safety Administration, 2007). Law enforcement agencies fulfill a crucial role in speed management through the deterrent effects of well-publicized speed enforcement programs. Highly visible, sustained speed enforcement reduces the incidence of speeding-related crashes (Povey, Frith, & Deall, 2003), and heightened levels of enforcement can further improve speed limit compliance and extend compliance for a greater period of time after heightened enforcement ends (Elliot & Broughton, 2004).

An automated speed enforcement (ASE) program can be an effective supplement to traditional speed enforcement operations as widespread knowledge of its use amplifies the enforcement program's ability to reduce speeds and speeding-related crashes. ASE programs worldwide have demonstrated the ability to reduce speeding and crashes beyond the effects observed with traditional speed enforcement alone (e.g., Pilkington & Kinra, 2005; Cunningham, Hummer, & Moon, 2005). The "Speed-Enforcement Camera Systems Operational Guidelines" have been prepared to assist program managers, administrators, law enforcement, traffic engineers, program evaluators, and others responsible for the operations of ASE programs in planning and operating ASE systems as a component of a comprehensive speed management program.

BACKGROUND

ASE is a method of traffic speed enforcement that is used to detect speeding violations and record identifying information about the vehicle and/or driver. Violation evidence is processed and reviewed in an office environment and violation notices are delivered to the registered owners of identified vehicles after the alleged violation occurs. ASE, if used, is one technology available to law enforcement as a supplement and not a replacement for traditional enforcement operations.

Evaluations² of ASE, both internationally and in the United States have identified some advantages over traditional speed enforcement methods. These include:

- *High rate of violation detection.* ASE units can detect and record multiple violations per minute. This can provide a strong deterrent effect by increasing drivers' perceived likelihood of being cited for speeding.
- *Physical safety of ASE operators and motorists.* ASE can operate at locations where roadside traffic stops are dangerous or infeasible, and where traffic conditions are unsafe for police vehicles to enter the traffic stream and stop suspected violators. With ASE there is normally no vehicle pursuit or confrontation with motorists. ASE might also reduce the occurrence of traffic congestion due to driver distraction caused by traffic stops on the roadside.
- *Fairness of operation.* Violations are recorded for all vehicles traveling in excess of the enforcement speed threshold.
- *Efficient use of resources.* ASE can act as a "force multiplier," enhancing the influence of limited traffic enforcement staff and resources.

Although ASE has some advantages, the aforementioned evaluations of ASE systems have also identified some limitations. These include:

¹ NHTSA considers a crash to be speeding-related if any driver involved in the crash is charged with a speeding-related offense or if a police officer indicates that racing, driving too fast for conditions, or exceeding the posted speed limit was a contributing factor in the crash. (*Analysis of Speeding-Related Fatal Motor Vehicle Traffic Crashes*. Technical Report, DOT HS 809 839, August 2005. Washington, DC: National Highway Traffic Safety Administration.)

² Refer to Appendix A: Further Reading

- *ASE does not immediately stop speeding drivers.* Unlike traditional enforcement, ASE does not intercept speeding drivers. This allows the driver to possibly continue at unsafe speeds.
- *Limited scope of enforcement and lack of direct contact with motorists.* ASE units typically only enforce speeding violations; other illegal activities are not enforced simultaneously. Although photo enforcement has the potential to enforce certain violations such as driving without a seatbelt as a secondary offense, the lack of direct contact between police and motorists means that police may not have the opportunity to observe suspicious activities and identify additional offenses such as impaired driving.
- *Specialization of ASE services.* In many jurisdictions where ASE is used, ASE operators and vehicles cannot perform any task other than ASE. Often the person monitoring the system is a civilian, or the vehicle used is not suitable for enforcement activities. This restricts the ability to conduct other law enforcement duties and respond to emergencies.
- *Time lag between violation and penalty.* When an ASE violation is recorded, the alleged violator might not be aware of the violation until the violation notice arrives in the mail days or weeks later, which may dissociate the violating behavior from the penalty. The immediate specific deterrence effect on the violator is therefore lost.

ASE is currently used in dozens of countries around the world and in about 30 U.S. jurisdictions, ranging in size from small towns to large cities. Appendix B lists many of the jurisdictions that conduct ASE and provides some basic information about the programs, including whether the vehicle owner or the driver is responsible for the citation (see *Chapter 2: Determine nature of violation and penalty*) and whether the jurisdiction uses mobile ASE units, fixed ASE units, or both (see *Chapter 2: Identify enforcement equipment alternatives*), their practices, evaluations of their effectiveness, and public reactions.

The effects of ASE operations on traffic speeds and crashes have been studied for more than two decades. Pilkington and Kinra (2005) conducted a systematic review of 14 major studies published between 1992 and 2003 on the effects of ASE on traffic crashes. Most of the reviewed studies were conducted in the United Kingdom and Australia, two countries with substantial and long-running ASE programs; Pilkington and Kinra did not include U.S. studies in this evaluation. All of the studies reported positive effects of ASE on crashes, injuries, and fatalities, although the magnitude of the effects varied widely between studies. The results of the review indicate that ASE, when properly used, does lead to a reduction in crashes, though the authors note that the actual magnitude of the effects are unclear due to methodological limitations in all of the reviewed studies.

In the United States, ASE was adopted later than in Europe and Australia. However, in recent years there has been a substantial increase in the number of communities that use ASE as a part of their speed management and traffic law enforcement strategy. Like their European counterparts, ASE programs in the United States have been evaluated and have been responsible for reductions in speeding and speeding-related crashes.

In Oregon, Senate Bill 382, which passed in 1995, authorized a two-year demonstration of ASE and mandated an evaluation of the program (Cities of Beaverton and Portland, 1997). Both cities collected speed data before and after the ASE program began at enforced sites and at control sites. During the four months of focused enforcement of five problematic sites, the proportion of vehicles traveling more than 10 mph above the speed limit decreased from 18 percent to 13 percent. During the same time there was a slight increase in speeding at control sites in Beaverton.

In Beaverton, the proportion of vehicles traveling more than 5 mph above the speed limit decreased from 19 percent to 13 percent at enforced sites. During the same period there was a slight increase in speeding at control sites, which reinforces the conclusion that the benefit was real.

The project team also evaluated public awareness and acceptance of ASE. Approximately eight months after ASE began, 85 percent of Beaverton residents and 88 percent of Portland residents were aware of the demonstration project and public approval of photo radar in school zones increased to 88 percent in Beaverton and to 89 percent in Portland. Approval for photo radar use in residential neighborhoods also increased during that time period.

A 2003 evaluation of the ASE program in Washington, DC, found that six months after enforcement began at seven ASE sites there was an 82-percent decrease in the proportion of vehicles exceeding the speed limit by more than 10 mph and a 14-percent decrease in mean speed during enforcement hours relative to eight control sites (Retting & Farmer, 2003). Statistics on the Metropolitan Police Department Web site (www.mpdc.dc.gov) indicate that, in 2006, about 2 percent of vehicles observed by ASE units were speeding above the enforcement threshold. A 2003 telephone survey found that about 50 percent of WashingtonDC, residents approved of the ASE program and 36 percent disapproved (Retting, 2003).

To evaluate the ASE program in Charlotte, NC, speed data were collected at 14 enforcement sites on corridors known for frequent crashes and at 11 comparison sites (Cunningham et al., 2005) before and after the start of ASE. The proportion of vehicles traveling more than 10 mph above the speed limit decreased 55 percent at enforced sites, relative to control sites, and crashes were reduced an estimated 12 percent at enforced sites compared to expectations based upon crash statistics from 2000 through 2003. In focus groups with representatives from neighborhood associations, traffic engineers, and police officers, attitudes toward ASE were generally positive, but all the participants had a preexisting interest in ASE and therefore may not have fully represented the population of Charlotte.

An independent evaluation of ASE was conducted on the Loop 101 freeway in Scottsdale, AZ (Washington, Shin, & Van Shalkwyk, 2007). A total of six fixed cameras operated on a 6.5-mile section of freeway with a 65 mph speed limit, with three cameras operating in each direction of travel. Preliminary findings indicate that the ASE units caused a mean speed reduction of more than 9 mph, from 73.5 mph to 64.2 mph during off-peak travel hours, a 50-percent reduction in crashes, and a 40-percent reduction in crash-related injuries. Although rear-end crashes actually increased, there was little or no increase in injuries associated with these crashes. The relatively small sample of crashes may limit the reliability of these preliminary findings. The study authors estimate the annual economic benefits of the freeway ASE program at \$1.4 to \$10.6 million. When enforcement was suspended at the end of the demonstration period, the rate of detected speeding violations (greater than 76 mph) increased by 836 percent.

PURPOSE AND SCOPE OF THE GUIDELINES

The *Speed-Enforcement Camera Systems Operational Guidelines* provide guidance for the deployment and operation of an ASE program. The guidelines address the crucial components of an ASE program, from planning and startup through field operations, violation processing and adjudication, and program evaluation. Although the guidelines are divided into distinct sections, it is necessary to consider all elements of an ASE program as an interrelated whole; no one aspect of an ASE program can be developed without consideration of the others. For this reason, the guidelines are designed so that readers can easily navigate between sections and find the information they need. The interrelation of the various aspects of an ASE program is emphasized by cross-references throughout the document that guides readers to additional information on a topic.

The *Speed-Enforcement Camera Systems Operational Guidelines* are intended to serve program managers, administrators, law enforcement, traffic engineers, program evaluators, and other individuals responsible for the planning and operation of the program. The guidelines are written from a United States perspective and emphasize U.S. contexts and best practices. However, they are also drawn from the experience of exemplary programs internationally. Though international differences in laws, history, cultures, and so forth might influence best practices for ASE, the majority of these guidelines are relevant to ASE programs worldwide.

The guidelines are intended to be accessible and inclusive with an emphasis on presenting options and describing the advantages and disadvantages of each so that an ASE program can be tailored to the needs of a particular jurisdiction. The technological state of the practice in ASE is developing rapidly. Some specific technologies are described, but rather than focus on the capabilities of current technologies, the emphasis is on identifying the functional requirements that technologies must meet so that the guidelines remain relevant as technologies evolve.

The *Speed-Enforcement Camera Systems Operational Guidelines* focus specifically on issues that are directly related to ASE. For more general speed enforcement guidance, refer to:

- *Speed Enforcement Program Guidelines* (NHTSA, 2008)
- *Guidelines for Developing a Municipal Speed Enforcement Program* (NHTSA, 2000)
- *Beyond the Limits: A Law Enforcement Guide to Speed Enforcement* (NHTSA, 1992)
- *Managing Speed* (Transportation Research Board, 1998)
- *Highway Safety Program Guideline No. 19: Speed Management* (NHTSA, 2006)

More general guidance is provided by the International Association of Chiefs of Police (2003), which outlined a vision for effective traffic safety operations with strategies for program management, human resource management, and use of technologies.³ A list of key documents related to ASE is presented in Appendix A.

³ Traffic Safety Strategies for Law Enforcement A Planning Guide for Law Enforcement Executives, Administrators and Managers, IACP, 2003

CHAPTER 2: GENERAL CONSIDERATIONS AND PLANNING

ENSURE LEGAL AND POLICY AUTHORITY FOR ASE

Legal authority is essential for ASE programs. The courts have consistently rejected the numerous Constitutional challenges that critics of automated enforcement have raised to this type of enforcement, by ruling that automated enforcement is consistent with U.S. and State Constitutions (Kendall, 2004). Some jurisdictions, however, have been required to correct operational inconsistencies in their programs. An overview of legal issues relevant to ASE is provided by Gilbert, Sines, and Bell (1996).⁴ A review of case law relevant to automated enforcement is presented in Appendix C. The case law is also available in Appendix A of the *Red Light Camera Systems Operational Guidelines* (FWHA & NHTSA, 2005). Kendall (2004) addresses legal challenges that have been brought against automated enforcement programs (both ASE and red light cameras) on Constitutional grounds. Some of these challenges are particular to the practices of individual jurisdictions while others are more broadly relevant:

- *Due process*. “Some critics have alleged that automated enforcement violates the right to due process for a number of reasons: not all drivers photographed receive tickets; an owner is presumed to be the driver at the time of the violation; statutes do not specifically state where a warning sign should be; it is presumed that the driver committed the offense; and the delay in receiving the ticket for the violation is too long.”
- *Equal protection*. “Other critics argued that automated enforcement violates the equal protection doctrine of the 14th amendment. They make this claim because of the different punishments between a ticket from a photographed violation and an on-the-spot officer enforced ticket...”
- *Fourth amendment*. “Two suits have alleged that issuing a citation to a registered owner of a photographed vehicle amounts to a seizure of the vehicle in violation of the search and seizure clause of the 4th amendment.”
- *“Takings clause” of 5th amendment*. “A suit in Denver, Colorado, charged that the city was violating the 5th amendment ‘takings clause’ by booting vehicles (placing a metal device on a vehicle that does not allow the vehicle to move more than a few inches forward or backward) whose owners had not paid their fines from automated enforcement.”
- *Privacy*. “Although the issue of invasion of privacy is often raised by opponents of automated enforcement no privacy challenges have been raised in court. This is probably because the issue of privacy in a vehicle has been very well defined by the Supreme Court of the United States. Driving is a regulated activity on public roads. By obtaining a license, a motorist agrees to abide by certain rules including, for example, to obey traffic signals.”

Alcee, Black, Lau, Wendzel, & Lynn (1992) address many of these same potential challenges to automated enforcement, but also address freedom of association. Critics may claim that automated enforcement violates the 1st amendment right to freedom of association by discouraging individuals from riding in the same vehicle with others with whom they would not want to be photographed. The authors claim that this criticism is unfounded because (1) ASE does not infringe upon the freedom of expressive association; (2) the protection of freedom of expressive association is specifically intended to protect “groups organized for the purpose of expressing 1st amendment rights”; and (3) “photo-radar clearly does not prevent individuals from engaging in intimate relationships with family members or any other person...”

⁴ *Photographic Traffic Law Enforcement*. May 1, 1997, TRB's National Cooperative Highway Research Program (NCHRP) Legal Research Digest 36.

In some States, specific enabling legislation is required to allow the use of ASE. In other States, ASE can be implemented under existing laws, though in some cases challenges may arise if the original intent of the law did not include ASE. Some States that permit red light camera enforcement have already passed legislation that enables ASE. A few States, including New Jersey, Wisconsin, and West Virginia, passed laws that explicitly forbid ASE. States also have different specific requirements for ASE operations. For instance, California requires the presence of an officer to issue a speeding citation. Oregon requires a speed display board on or near the ASE unit. Numerous ASE programs in the United States have been found by courts to be operating in conflict with State or local laws, so it is critical to ensure that the ASE program is established and operated in strict adherence to applicable laws. Legal experts should review current and proposed laws to ensure that they explicitly permit ASE and to ensure that there is no conflict between local and State laws. The Insurance Institute for Highway Safety maintains a limited list of current State laws that are relevant to automated enforcement on its Web site (www.iihs.org) and the National Campaign to Stop Red Light Running maintains a list of pending State legislation that would influence the use of automated enforcement on its Web site (www.stopredlightrunning.com).

Even with legislation in place that enables ASE, there may still be hurdles to overcome before ASE can be implemented. Often, local governments must specifically authorize ASE. The National Committee on Uniform Traffic Laws and Ordinances (NCUTLO) has developed a model law for automated enforcement programs. The model law, which is available on the NCUTLO Web site (www.ncutlo.org), conforms to certain assumptions that may not be applicable in all jurisdictions, but it can serve as a guide for the development of enabling legislation and enforcement procedures. Another ASE model law is provided by Alcee et al. (1992).

One of the unique aspects of ASE is the need to match vehicle license plate information to vehicle registration information. There are many challenges in identifying the proper recipient of the violation notice, and the evidentiary requirements to prove guilt vary between States and jurisdictions. These issues are addressed in *Chapter 5*.

When planning an ASE program, it is important to be aware of opposition and to confront challenges when they arise and before committing substantial effort and resources to ASE. It is also important to be aware of the mechanisms that can be used to challenge ASE. These include petitions and referenda, introduction of disabling legislative bills, local government legislative bodies, and, indirectly, public pressure on elected officials. *Chapter 2: Obtain interagency and community support* provides guidance on obtaining support from stakeholders, and *Chapter 3: Marketing and media activities (initial)* provide guidance on effective communications with the community.

It is also critical to understand all State and local laws relevant to ASE and to consider all possible interpretations of these laws. For example, in May 2006, a North Carolina Court of Appeals ruling found that automated enforcement program managers throughout the State improperly interpreted Article IX, Section 7 of the North Carolina Constitution, which states that “the clear proceeds of all penalties and forfeitures and of all fines collected in the several counties for any breach of the penal laws of the State, shall belong to and remain in the several counties, and shall be faithfully appropriated and used exclusively for maintaining free public schools” (Lowery, 2006). The city of High Point, which was the defendant in the case, argued that the city’s red light cameras imposed a civil penalty rather than a fine, but the court ruled that the nature of the offense was the same, regardless of the method of payment collection. As a result, all jurisdictions in North Carolina using automated enforcement technology were required to pay 90 percent of revenues to local school systems, plus back payments of previously collected revenues. The drastic reduction in recoupable revenues has led all automated enforcement programs in North Carolina to cease operations as a result of prohibitive costs.

An ASE program can also be rendered ineffective without being eliminated. In some States, legislative bills were introduced that would not explicitly forbid ASE, but would add infeasible operational requirements or influence revenue flow in a way that would make programs prohibitively costly. For example, Sub. H.B. 56 introduced in the Ohio legislature would require a police officer to be present during ASE operation and to issue citations at the time and location of the alleged offense. Arizona House Bill 2251 would have required all revenues from Scottsdale’s freeway ASE deployment to go to a State highway fund. The Ohio bill was passed by the State House and Senate and was awaiting a

decision by the Governor at the time of this publication. The Arizona bill failed to pass in the State House of Representatives.

From an operational standpoint, it is also important to identify and prevent loopholes or other methods for drivers to circumvent ASE. For instance, procedures should be in place to follow up with alleged violators who do not respond to notices of violation (see *Chapter 6: Options for violation notice recipient, Procedures if recipient does not respond to violation notice, and Violation notices issued to government and business vehicles* for further guidance on violation notice processing). Drivers may also attempt to circumvent ASE by using consumer radar detectors, or by altering, concealing, or falsifying license plates. In the United Kingdom, some in-vehicle global positioning systems (GPS) include a database of ASE locations. These systems warn drivers when they are approaching a location where ASE is known to be used.

IDENTIFY SPEEDING-RELATED SAFETY PROBLEMS

The first step in planning the operations of an ASE program is to identify the speeding-related safety problems and attitudes that the ASE program will be designed to address. Measures that reflect a speeding problem include speeding-related crashes, excessive speeds, speed variance, and citizen complaints.

Speeding-related crashes are the most direct indicator of a safety problem at a particular location. When assessing the crash problem, it is important to distinguish between crashes in which speeding was the primary factor, a contributing factor, or not a factor. Crashes that involve fatalities or serious injuries deserve particular attention. It is also important to identify trends and contributing factors in crash data. For example, the number and severity of speeding-related crashes might be influenced by weather conditions, time of day, traffic volume, alcohol-impaired driving, aggressive driving, the presence of enforcement, or other conditions.

Excessive speed is also an indicator of a potential safety problem because there are direct relationships between speed and crash probability (Aarts & van Schagen, 2006) and between speed and level of injury in a crash (Bowie & Walz, 1994). Like crash history, speeding may be influenced by factors such as weather conditions, traffic volume, time of day, and the presence of enforcement. Locations where excessive speeding is prevalent are normally identified through speed surveys, review of the history of speeding-related crashes, and anecdotal reports from police officers or citizens. Speeding can also have a negative impact on quality of life and perceived safety. Citizen complaints can help to identify such locations, though a speed survey should be conducted to confirm the presence of unsafe speeding before ASE is introduced.

Speed variance is a measure of the consistency of speeds among drivers on a road at a given time. The link between speed variance and crashes has not been fully resolved; numerous studies have linked speed variance to crash probability (e.g., Garber & Gadiraju, 1988; Harkey, Robertson, & Davis, 1990) but others have found that speed variance does not increase crash probability (e.g., Davis, 2002; Kockelman & Ma, 2004). It is possible that the inconsistency of results is due to methodological differences between analyses, or that speed variance might only influence crashes in particular situations. Davis (2002) suggests that very fast drivers and very slow drivers may be at elevated risk for crashes, but that speed variance itself does not cause crashes. Considering these findings, speed variance data may help to understand the nature of the speeding problem, but crash history and excessive speeding are the primary indicators of a speeding-related safety problem.

With data on crash history and excessive speeds, it is possible to determine where the speeding-related safety problem is located. Problems may be clustered at specific sites (e.g., a particular intersection or horizontal curve), general areas or road types (e.g., an arterial corridor or school zones), or problems might be broadly distributed across areas and road types. ASE site selection issues are addressed in detail in *Chapter 3: Site selection*.

DEVELOP A STRATEGIC PLAN

A strategic plan for ASE should provide the link between the ASE program's overarching objectives (e.g., to reduce the occurrence of speeding and speeding-related crashes) and the short-term and long-term benchmarks that indicate the degree of success in achieving objectives (e.g., the amount of

reduction in speeding and crashes at each deployment location). Although program objectives should be tailored to the specific speeding-related safety problem in the community, there are general objectives that all ASE programs should strive to achieve:

- Reduce the frequency and severity of speeding-related crashes.
- Reduce the frequency of excessive speeding, with an emphasis on the most extreme speeders.
- Maximize safety improvements with the most efficient use of resources.
- Maximize public awareness and approval of ASE.
- Maximize perceived likelihood that speeders will be caught.
- Use ASE as a tool to enhance the capabilities of traffic law enforcement and supplement, rather than replace, traffic stops by officers.
- Emphasize deterrence rather than punishment.
- Emphasize safety rather than revenue generation.
- Maintain program integrity by ensuring that all program employees and partners operate according to program rules and regulations.
- Maintain program transparency by educating the public about program operations and be prepared to explain and justify decisions that affect program operations.

Additional objectives might be more specific to the needs or restrictions of the jurisdiction (e.g., “Reduce speeding in school zones”). Everyone involved in the ASE program must share these objectives and work to achieve them for the program to be fully successful. The strategic plan should emphasize that it is important to avoid rushing to begin enforcement. Some jurisdictions took more than one year to plan their programs before implementation. It is also important to chart the level of success in achieving objectives. Information on program evaluation is presented in *Chapter 7*. Finally, the strategic plan should consider the long-term direction of the program, including contingencies for future expansion and improvement. Most successful ASE programs started with a minimal ASE presence and expanded their programs as the public came to accept the technology and as program participants gained experience and improved operations.

IDENTIFY COUNTERMEASURES

There are three categories of countermeasures that can mitigate a speeding-related safety problem:

- *Engineering countermeasures* can be used to improve the roadway infrastructure itself. Countermeasures can include improved signage, pavement markings, and traffic signals; improved roadway hardware and design features such as guardrails or shoulders and removal of dangerous roadside obstacles to mitigate the effects of road departure crashes; pavement resurfacing; installations of traffic-calming devices such as speed humps and rumble strips; and geometric alterations such as roundabouts and roadway realignment. Speed limits must be appropriate for the road. Engineering evaluations at problem locations can help to identify potential improvements.
- *Education countermeasures* can change public knowledge, attitudes, and behavior related to speeding. The goal of education is to promote a culture of safety-consciousness in which speeding is understood to be hazardous and socially unacceptable. Appropriate messages and information outlets are addressed in *Chapter 3: Marketing and media activities (initial)*.
- *Enforcement countermeasures* can deter speeding and penalize violators. There are many methods to conduct enforcement. Detailed guidelines for conducting a comprehensive speed enforcement program are available in *Speed Enforcement Program Guidelines* (National Highway Traffic Safety Administration, 2008). As discussed in *Chapter 1*, ASE has advantages and disadvantages relative to non-automated enforcement that should be considered before beginning an ASE program.

To operate effectively and efficiently, ASE should be deployed as part of a comprehensive plan that includes engineering, education, and enforcement countermeasures tailored to address specific speeding-related safety problems. Roles and responsibilities should be clearly delineated, and the purpose of each countermeasure should be explained to achieve buy-in from everyone who is involved in confronting the problems caused by speeding.

OBTAIN INTERAGENCY AND COMMUNITY SUPPORT

ASE is an inherently cooperative venture. A committee or advisory panel of stakeholder representatives should be formed during the planning process to guide program development and ensure that stakeholders can provide input from their unique perspectives. A successful ASE program requires the input and support of many stakeholders:

- *Law enforcement officials and officers* are at the center of ASE operations in most jurisdictions. Police resources are limited and there are competing demands for officers' time. Dedicated leadership, staff, and resources can help to ensure that ASE is fully staffed and operated consistently. Leadership must view ASE as a priority to achieve staff level buy-in. Law enforcement officers might be skeptical that ASE is as effective as traditional traffic enforcement and that ASE will supplement, rather than replace, traffic stops by officers. It is important to emphasize the benefits of ASE to officers. Emphasis should be directed at proven benefits of ASE, such as increased officer safety, crash reduction, increased traffic flow, and decreased traffic congestion. Support should also be sought from police associations such as the International Association of Chiefs of Police, the National Sheriffs' Association, and State associations of both chiefs and sheriffs.
- *Traffic engineers and department of transportation officials* are responsible for posting speed limits to maximize efficient traffic flow and alleviate congestion. Input from traffic engineers can help ensure that speed limits at proposed sites are appropriate and comply with the Manual on Uniform Traffic Control Devices, which is a national standard for all roads. Engineers are also often responsible for the collection and dissemination of data and statistics relevant to traffic safety, as well as the planning and implementation of safety countermeasures. Input from traffic engineers can guide ASE program goals and prioritization of enforcement sites. Traffic engineering data can also be used for program evaluation.
- *The legal community* must accept that the ASE program is legal, fair, and defensible in court. Stakeholders in the legal community include judges, civilian adjudicators (in jurisdictions where civilians preside over ASE hearings), and prosecuting attorneys. The most important consideration is assurance that sufficient evidence is recorded and presented to prove guilt. This means the legal community must accept that the ASE technology and evidence handling procedures are accurate, unbiased, and safeguarded against errors and tampering. The evidence must meet the standard required to uphold a speeding conviction. To that end, verification of ASE equipment accuracy through equipment testing should be conducted before each enforcement session; or if a fixed site, at appropriate and regularly established intervals. Proper configurations, focus, computer equipment, flash, and image capture processes should be checked according to established standards, local law, and manufacturers' specifications. Furthermore, the evidence presented in a hearing must be sufficient to show that the defendant is guilty of the violation. Judges must be familiar with ASE technology and informed about its accuracy and safeguards against errors and improper use. Court personnel and administrators must also commit to any increased caseload expected to be caused by ASE and the additional staff and space that this increase may require.
- *Elected officials* at the State and local levels have the power to enact legislation or regulations that affect ASE. In some cases, new legislation may be required to enable ASE. In other cases, elected officials may pass legislation that forbids or severely curtails the use of ASE. In most jurisdictions where ASE has been used, elected officials have had differences of opinion regarding ASE. The result is usually a compromise that allows ASE, but with certain restrictions and requirements.

- *Motor vehicle department personnel* are usually responsible for matching violation data with motor vehicle records and providing registration information to violation processors. Vendors may often perform this operation with the cooperation of the motor vehicle agency. ASE may impose a significant additional workload on the motor vehicle department. Program managers must work with the motor vehicle department to determine the payment structure for services, information flow, processing time, and other requirements.
- *Communications or media relations personnel* are often responsible for working with program managers to develop and disseminate marketing and media material to the public and the media.
- *Members of the public* might not have a direct role in an ASE program, but a successful ASE program must have the support of the community. Community residents do recognize the safety benefits of ASE and the majority of people support it (Freedman, Williams, & Lund, 1990; Royal, 2003). Although local residents are of primary importance, non-residents who visit or drive through the jurisdiction may also have influence. Dialogue with the community should begin during the planning stages of ASE, even before the beginning of an official public information and education campaign. People should be informed of decisions regarding the program and key aspects of operations and adjudication. They should have outlets to voice their opinions and suggestions. The public can also help to identify locations where ASE should be used. Communication with residents should always emphasize the proven benefits of ASE, including increased officer safety, crash reduction, increased traffic flow, decreased traffic congestion, and that safety is the sole motivation for the use of ASE. Representatives of citizen advocacy groups might act as intermediaries for their constituencies and have some role in program planning (see *Chapter 3: Marketing and media activities (initial)* for more information on interactions with the public).

Depending upon the structure of the ASE program, there may be other people or organizations involved in ASE planning and operations, such as experts in technology, information systems, finance, and contracting. A vendor representative may be involved after a vendor is selected. A representative from the department of public works or public safety may participate as well. Although stakeholders may have their own unique concerns about ASE, it is essential that all details of program operations are effectively communicated as early as possible to earn their trust and support. Program managers should work with all stakeholders to ensure they understand how ASE works, what safeguards are in place to ensure proper operation, and to convince them the program is designed in the interest of public safety. In-person demonstrations of the technology can help to demystify ASE and convince stakeholders it is reliable. A stakeholder committee can also provide valuable guidance for an ASE program beyond the planning and startup stages. Periodic meetings should be held throughout the duration of the program.

SEEK EXPERIENCE AND LESSONS FROM MANAGERS OF EXISTING PROGRAMS

No matter how well it is planned and managed, running an ASE program is a learning experience. All successful programs have adapted to changing situations and all successful managers have modified elements of their programs that needed improvement. A major purpose of these guidelines is to compile the wisdom and experience of successful program managers. Direct contact, however, with these managers can shed additional light on important topics and can assist in staying abreast of current events and trends relevant to ASE. A list of experienced ASE program offices is provided in Appendix F. Many informative research reports and articles are listed in the References section of these guidelines and in Appendix A.

DETERMINE NATURE OF VIOLATION AND PENALTY

Depending on State and local law, ASE violations can either be considered “point” offenses that are punishable by fines and license sanctions or non-point offenses that are only punishable by fines. In some jurisdictions, the nature of the violation and penalty might be determined by preexisting law or as a condition in enabling legislation. If possible, policies should be consistent among neighboring jurisdictions that use ASE to avoid public confusion. Many factors influence the choice of violation and penalty, and each option has its own implications, advantages, and disadvantages.

The nature of the violation and penalty can have a substantial influence on the requirements of field operations, violation notice processing, and adjudication. If violations are considered point offenses, the driver of the vehicle must be identified in the ASE violation photo. This normally requires multiple cameras and additional office labor, and increases the burden of proof upon the jurisdiction to prove that an alleged violator is guilty. A vehicle owner charged with a violation may rebut the charge by stating that he or she was not the driver at the time of the violation. If violations are considered non-point offenses, driver identification is typically not required, and the penalty for a violation is a fine issued to the vehicle's registered owner. The adjudication process for non-point offenses is typically equivalent to the process used for non-moving violations such as parking tickets. ASE programs that require driver identification do not necessarily have to issue both fines and license sanctions. In jurisdictions in Colorado that use ASE, drivers are identified, but the only penalty for a violation is a fine. Driver identification allows ASE to function more like traditional enforcement methods. Driver identification ensures that the driver of the vehicle at the time of the violation is held liable for the violation. Driver identification is necessary to impose license demerits or points. A combination of fines and license sanctions is consistent with traditional enforcement penalties and the U.S. DOT Speed Management Strategic Initiative (U.S. DOT, 2005) recommends this combination as the most effective way to deter speeding. The National Committee of Uniform Traffic Laws and Ordinances also recommends this approach in its *Automated Traffic Law Enforcement Model Law* (NCUTLO, 2001). The imposition of sanctions enables identification of drivers who have previous sanctions on their licenses and face restrictions or loss of license if they receive further sanctions.

Identifying the driver is consistent with laws regulating traditional speed enforcement. This type of program may require less substantial changes to traffic laws in allowing the use of ASE. Programs that use driver identification may also have a stronger legal basis in the case of legal challenges. For instance, Hennepin County District Court in Minnesota found that the Minneapolis red light camera program, which held registered vehicle owners responsible for violations, did not presume the defendant's innocence, in violation of the due process requirements of State law (*State of Minnesota and City of Minneapolis v. Kuhlman*, 2006). Although the automated enforcement program was permitted by a city ordinance, the court found that State law, which superseded the city ordinance, required a higher standard of due process than the automated enforcement program provided. Minneapolis's red light camera program was suspended immediately following this ruling. The Minnesota Supreme Court, in a decision rendered April 5, 2007, upheld the district court and court of appeals decisions finding that the procedures used in the automated enforcement program violated State law.

Another advantage of driver identification and license sanctions is perceived credibility. Driver identification may be viewed as fairer and more safety-oriented than vehicle identification. Driver identification ensures that the actual driver of the vehicle is held responsible. License sanctions emphasize that penalties are meant to deter speeding rather than raise revenue.

Although driver identification has many advantages, there are some limitations. First, it might be difficult to issue a citation to someone driving a vehicle not registered in that driver's name. Some jurisdictions that require driver identification cannot require registered vehicle owners to identify the driver at the time of the violation, if the driver was someone other than the registered owner (see *Chapter 5: Matching violation information to driver and vehicle records*). This can establish a system of unequal treatment where some drivers are essentially impervious to ASE. Although it might not be feasible to pursue all violators, there are procedures that can help to minimize the number of dismissed violations (see *Chapter 5: Violation notice processing and delivery* and *Chapter 6: Violation notice receipt and adjudication*).

Although traditional speed enforcement traffic stops may result in a higher rate of citation issuance per violation detected, ASE can record multiple violations in a short period of time. The high rate of ASE detection is likely to increase drivers' perceived risk of being caught, and therefore increase the deterrence of speeding behavior.

Driver identification is also likely to raise concerns about individual privacy. Although some people believe that photographing the driver's face is an invasion of privacy, the general opinion of the courts has been that driving is a regulated activity in a public space, and therefore photographing drivers is

not an invasion of privacy (Kendall, 2004). Still, negative perceptions are likely to persist so it is important to confront misperceptions early and explain the benefits of driver identification.

IDENTIFY ENFORCEMENT EQUIPMENT ALTERNATIVES

System components

All ASE systems have three basic components: a speed measuring component, a data processing and storage component, and an image capture component. Each of these components is discussed below (see *Chapter 4: Field operations* for further discussion of these components and their setup and operation in the field).

Speed-Measuring

Speed-measuring requires the ability to detect and discriminate individual vehicles on a roadway and measure their speeds in real time. This can be achieved using above-ground equipment aimed at traffic (e.g., radar or lidar) or in-ground sensors (e.g., piezo/loop detection). Speed-measuring using above-ground equipment requires a view of the target vehicle with limited obstructions such as roadside vegetation or other vehicles in the line of sight. In-ground sensors overcome many of the challenges of line of sight, but are immobile and likely require road closures for installation and maintenance. The accuracy of speed-measuring devices is crucial. Most speed-measuring devices are equally accurate measuring approaching or receding traffic speeds and are accurate to within 1 mph when used properly. Target vehicle discrimination is especially important on roads with high volumes and multiple lanes of traffic. Emerging technologies are expanding the versatility of speed-measuring devices and target vehicle discrimination. For instance, scanning lidar, which has been used in Akron, Ohio, allows lidar to be used on multiple lanes and two directions of travel simultaneously. Device stability with lidar speed-measuring devices is important to ensure accurate measurement, so care must be taken to prevent above-ground measurement equipment from movement due to wind and other factors. NHTSA provides performance specifications for across-the-road radar (2004a), down-the-road radar (2004b), and lidar (2004c). A performance specification for ASE equipment is expected to be released in 2008 (NHTSA, in press). The IACP maintains a "conforming products list" on its Web site (www.iacp.org). The use of conforming products, however, is not sufficient to ensure accuracy. Speed measurement devices must be calibrated and tested before their first use and then retested on a regular basis, preferably by an independent laboratory.

Data processing and storage

The data processing and storage component is a computer that receives data from the speed-measuring unit and compares the speed data against the threshold that was set to define violations in real time. If a vehicle's speed exceeds the threshold, the unit identifies the vehicle as a violator and triggers the camera to photograph the vehicle. Additional information such as time, date, and operator-entered information is also recorded with the speed data. Information about non-speeding vehicles may also be recorded for broader data collection purposes (e.g., to compare a violator's speed to the average or 85th percentile speed of traffic at the location). The information recorded by the ASE unit must be compatible with "back end" functions for violation processing and adjudication (see *Chapter 5*).

Image capture

The image capture component includes one or more cameras that photograph the speed violation in progress when they are triggered by the computer. The photographs must include a legible image of the license plate and, if driver identification is required, a clear image of the driver's face. A fast shutter speed and high image resolution are essential features.

ASE cameras can use either "wet" film or digital imaging. Both types of cameras are currently used in ASE programs in the U.S. Digital photographs are easy to transfer and reproduce electronically, which can save time and effort during violation processing. However, extra care is necessary to ensure the integrity of photographic evidence. Electronic encryption can prevent unauthorized individuals from tampering with or accessing photographs (see *Chapter 3: Information management: Compatibility, flow, and security* for more information on data security).

A flash might be necessary to capture images in low-light conditions. Although some people have expressed concerns about the effects of flashes on drivers, no evidence shows that frontal flashes at normal levels have caused crashes or unsafe behavior. Still, as an alternative, some ASE programs outside the United States use red-filtered flashes or infrared flashes that can flash with little or no visible light emission (Roberts & Brown-Esplain, 2005). Although these alternative flashes minimize the potential for driver distraction, image quality and effective range tend to suffer. The intensity of a flash diminishes over distance and therefore may not be as effective at long range, but some jurisdictions have used white-light flashes across four or more lanes of traffic (Roberts & Brown-Esplain, 2005).

In recent years, some jurisdictions have begun to supplement photographic evidence with a video record of speeding violations. Video resolution and frame rate are not currently at a level where video could replace photographs for driver and vehicle identification.

ASE system platforms

Mobile ASE systems

Mobile ASE systems can be transported to conduct ASE in any geometrically feasible location. Most mobile ASE units are based in vans or other vehicles that contain a full suite of system components. Figure 1 shows this type of unit operating in Portland, Oregon. This setup allows operators to easily transport all equipment and provides a safe and comfortable environment for the operator. An alternative is to use ground-based mobile ASE equipment that is transported in a vehicle, but removed and set up on the roadside to operate. Ground-based systems might be more feasible at locations where there is not enough room to safely park a vehicle or where both front and rear photographs of offending vehicles are required. An operator is typically present to monitor a mobile ASE unit while it operates and often keeps a log of information about the session and recorded violations (see *Chapter 4: Event documentation*). When deployed according to a systematic enforcement plan, mobile ASE can provide the broadest deterrent effect because it can be moved between many locations. The number of mobile units needed to achieve an optimal deterrent effect depends upon the size of the jurisdiction; the number of enforceable sites (see *Chapter 3: Site selection*); the presence of other engineering, education, and enforcement countermeasures (see *Chapter 2: Identify countermeasures* and *Chapter 3: Marketing and media activities (initial)*); and other elements of the enforcement plan).

Figure 1. Mobile ASE units in Portland, OR (top), Scottsdale, AZ (center), and San Jose, CA (bottom)



Fixed ASE systems

Fixed ASE systems are installed at locations where they can operate for up to 24 hours per day without an operator present. Fixed units are typically pole-mounted on the roadside and can use either above-ground or in-ground speed-measuring equipment. Some fixed units are installed at intersections to conduct both ASE and red light camera enforcement simultaneously. Figure 2 shows a pole-mounted ASE system at a mid-block location in Washington, DC. A fixed ASE system can provide a very substantial deterrent effect, but the effect is generally restricted to a limited area upstream and downstream of the unit. Fixed units should only be installed at locations where dangerous speeding and speeding-related crashes are especially frequent, and locations where it is unsafe or infeasible to use a mobile unit. (See Chapter 3 Program Startup, Site Selection). Fixed ASE may not be legal in jurisdictions where a human operator is required to be present with the ASE equipment.



Figure 2. Pole-mounted ASE system in Washington, DC

Public reaction to fixed ASE may be more negative than reaction to mobile ASE. First, fixed units are often derided as “speed traps” or “revenue machines” installed in locations where speed limits are perceived to be unreasonably low. In this case it is important to explain the site selection process and support site selection with safety statistics. Field operations oversight by a human operator during enforcement can lead to charges that alleged violators are unable to “face their accuser” at a hearing. Courts typically have not found this charge to be valid, given that a reliable process produced the photographic evidence. However, not all courts accept this so-called “silent witness” theory of photographic evidence (Alcee et al., 1992). To confirm the accuracy of fixed ASE speed measurements, law enforcement agencies often place hash marks on the pavement within the camera’s field of view and take two pictures of each violation, separated by a set amount of time (see Figure 2). The vehicle’s approximate speed can be determined by measuring the distance it traveled in the time between the two photos.

Summary

It is possible to use a combination of different types of ASE units, but to achieve the broadest possible effect of ASE; mobile units should be the cornerstones of an ASE program under most circumstances. Combination units that conduct both ASE and red light enforcement can be used at intersections, but the effectiveness of these units has not yet been evaluated in a controlled study. Although each type of ASE system has the potential to reduce speeds and improve safety, the actual effectiveness of these systems is dependent upon how they are used. *Chapter 4: Enforcement Plan* describes strategies to maximize the effectiveness of ASE.

IDENTIFY REQUIREMENTS AND RESOURCES NEEDED FOR ASE PROGRAM

The final step in the ASE planning phase is to identify the functional requirements, equipment requirements, and personnel requirements for the ASE program, as well as additional resources that will be needed to support the enforcement effort. A list of requirements should be developed as a precursor to program start-up and developing a request for proposal to solicit responses from potential vendors. Requirements should be defined in as much detail as possible, with prioritization according to level of need. Although some requirements might remain unknown until the final arrangements are made with the vendor, it is important to begin to identify requirements early to be able to effectively communicate needs to potential system vendors.

CHAPTER 3: PROGRAM STARTUP

Startup of an ASE program should only commence if the program has a strong legal basis and stakeholder support, and careful planning has been conducted to develop a strategic plan with identification of program requirements (see *Chapter 2*). Startup of an ASE system involves:

- site selection;
- system procurement;
- resource and personnel management;
- revenue management;
- planning for program evaluation;
- marketing and media relations; and
- program rollout.

SITE SELECTION

Selection factors

Site selection should be the first step in system startup and should be done collaboratively with the traffic engineering or transportation department. It should be done before system procurement to ensure that the vendors are not involved to avoid any appearance of conflicts of interest.

Appropriate site selection is essential to achieve the highest level of safety benefits and to ensure the public that safety is the top priority of the program. The highest priority enforcement sites should be located where there is the greatest risk for speeding-related crashes, injuries, and fatalities. Candidate sites may have been identified during the problem identification phase (see *Chapter 2: Identify speeding-related safety problems*). Crash risk can be determined from reliable data on crash history, crash patterns (e.g., seasonal or time of day) and other factors such as the percentage of vehicles that are speeding, traffic volume, and influence of other countermeasures and roadway alterations. It is generally unwise to select sites where speeding is common and crashes are rare because the public is likely to perceive these locations as “speed traps.” However, exceptions may be made in locations with many pedestrians and in neighborhoods where speeding adversely affects quality of life. The equipment vendor should not have any role in site selection, but may advise on the technical feasibility of conducting ASE at particular sites.

Citizen complaints can also help to identify locations with speeding-related safety problems. Responsiveness to citizen complaints is important because citizens may be the first to notice a developing safety problem and because the ASE program is ultimately for the benefit of the public. Site evaluations and speed surveys should be conducted to determine whether sites identified by citizens warrant speed enforcement.

Research shows that speed reductions attributed to ASE are most substantial at the location of an active ASE unit and deteriorate as distance from the unit increases (Champness, Sheehan, & Folkman, 2005; Hess, 2004; Keenan, 2004; Winnett, 2003). Although the length of this distance halo effect varies in different studies, meaningful speed reductions tend to be limited to a range of less than one mile downstream and shorter distances upstream. In a review of studies that measured halo effects, Elliott and Broughton (2004) concluded that halo effects for ASE are typically smaller than halo effects for enforcement conducted by police officers in marked patrol cars, though the authors do not distinguish between different methods of ASE.

A site should be defined either as one specific location or as a corridor with multiple enforceable locations. In general, defining a site as a corridor can be expected to result in a more widespread deterrent effect because enforcement locations are less predictable. If the speeding-related safety problem extends for more than one mile, the presence of numerous enforceable sites on the problematic corridor can have the greatest overall deterrent effect. If the problem is limited to a stretch of roadway less

than one mile long and if the safety problem is due to a roadway feature that cannot be readily resolved through engineering measures, enforcing just one specific location might be sufficient to curtail speeding in the area. *Chapter 4: Enforcement Plan* further discusses ways to maximize the deterrent effect of ASE.

Distribution of enforcement sites throughout the jurisdiction can increase the overall deterrent effect of the ASE program by increasing the perceived likelihood that drivers can be caught speeding anywhere. Sites clustered in particular neighborhoods can provoke charges of biased operations or targeting of particular groups. Site selection should also avoid the perception of prejudice toward particular groups, such as out-of-town commuters.

Road types

Distribution of enforcement between various road types can help to maximize safety benefits throughout the jurisdiction, but there are important factors to consider for each road type:

School zones

School zones are frequently selected as locations for ASE. In a national survey, Royal (2003) found that 78 percent of participants believed that it is appropriate to use ASE in school zones. This high level of support makes school zone enforcement a good way to introduce ASE in a jurisdiction. When conducting ASE in school zones, it is important to clearly display the school zone speed limit and the hours during which it applies. Focused enforcement when classes resume after summer and winter breaks combined with a child safety campaign may be an effective way to modify driver behavior in school zones. Because school zones encompass a small percentage of a jurisdiction's roadways, it is easy to sustain a reasonably high level of enforcement with a small number of ASE units.

Residential neighborhoods

Residential neighborhoods typically have low traffic volumes and low speed limits. ASE should only be conducted at locations where speeding creates a safety problem or has a negative impact on quality of life, but within this constraint, public demand for speed management can influence site selection. It is important to have support from the residents of neighborhoods where ASE is used. For example, San Jose, California, established an effective model for conducting enforcement in residential areas; where ASE is only conducted in neighborhoods if a majority of residents or a neighborhood association requests it. After ASE is requested by a neighborhood, a speed study is conducted to confirm that the speeding problem warrants enforcement. This model has generated strong public support for the ASE program.

Major roads

Major roads or arterials are often among the most dangerous roads in a jurisdiction, with high traffic volumes, high traffic speeds, and complex roadway geometries and traffic patterns. Nationally, major roads account for many more speeding-related fatalities than any other roadway functional class (Liu, Chen, Subramanian, & Utter, 2005). ASE can have a significant impact on major roads, but factors such as multiple lanes of traffic and close proximity of vehicles can make it more difficult for ASE to single out speeding vehicles.

Highway work zones

Highway work zones often feature complex and transitory traffic patterns that increase the level of risk for motorists and work crews. Voluntary compliance with reduced work zone speed limits is often low. ASE may be especially helpful in work zones because it can be used in places where traditional enforcement methods are infeasible or hazardous. Precise documentation of site features, such as location, number of lanes, presence of work crews, and speed limit are essential because of the transitory nature of work zones. Law enforcement presence in work zones has long been recognized as one of the most effective speed reduction methods available to transportation officials (Fontaine, Schrock & Ullman, 2002).

Limited-access highways

Limited-access highways provide the highest level of service at the greatest speed for the longest uninterrupted distance, with some degree of access control. Nationally, the fewest number of speeding-related crashes occur on this class of road. Special care must be taken before implementing ASE on these roadways. As an example, an ASE freeway program in Scottsdale, Arizona, led to a mean speed decrease of more than 9 mph, a 50-percent reduction in crashes, and a 40-percent reduction in crash-related injuries (Washington, Shin, & Van Shalkwyk, 2007). Limited access highways also often carry a substantial number of out-of-town motorists who are less likely to be aware of the use of ASE, and therefore harder to deter. Substantial signage might be necessary to warn all drivers on limited-access highways of the presence of ASE. A feasibility study by the Arizona Department of Transportation identified many of the implementation issues related to freeway ASE (Roberts & Brown-Esplain, 2005).

Evaluation of candidate sites

A speed survey should be conducted at each candidate site to assess speeds and the potential of various countermeasures to mitigate excessive speeds. If possible, the survey should be conducted by engineers or an independent agency. Data should be analyzed to determine the factors associated with the safety problem, and enforcement should be adapted according to these factors. For example, if speeding-related crashes occur primarily during evening rush hour, then enforcement can be focused on that particular time of day. If countermeasures other than ASE are deemed more appropriate and feasible, they should be implemented and the site should be reevaluated before implementing ASE.

It is also important to consider whether the geometry of the roadway supports the feasibility of ASE at each candidate site. There must be enough space on the roadside to place the ASE equipment without creating a safety hazard for equipment operators or motorists. Power must be available to ASE units that are not self-powered. The lines-of-sight for speed-measuring equipment and cameras must be uninterrupted. Distances and angles between the ASE unit and observed vehicles must be appropriate to ensure accurate speed measurement and clear photographs. Ideally, traffic engineers should evaluate each potential site to ensure that ASE will not have any adverse effects on safety. In some cases, fixed ASE units might be able to operate in locations where use of mobile units is infeasible. ASE equipment should be tested at each potential site to ensure that data is not compromised by electromagnetic interference, background motion, or other factors. See *Chapter 4: Field operations* for more information on ASE location and setup.

At a minimum, traffic authorities should confirm that the posted speed limit is appropriate and complies with the Manual on Uniform Traffic Control Devices and State or local guidelines. This includes the size, location, and spacing of speed limit signs and “reduced speed ahead” signs. The review should ensure that the speed limit signs are clearly visible and not obscured by vegetation. The review should ensure that the speed limit is set legally. Speed limits are usually legally implemented by means of an ordinance or resolution. Speed limits that differ from the statutory limits usually require an engineering study.

SYSTEM PROCUREMENT

Once all the requirements for the ASE program have been identified, the next step is to procure the equipment required for the program. Jurisdictions have various procurement options ranging from purchasing ASE equipment to contracting for ASE equipment and related services. System procurement requires the input of experts in technology, finance, and legal issues. Procurement and contracting experts in particular should be involved in this process. A committee of ASE stakeholders should also be involved to ensure that the ASE system and contract are acceptable to all stakeholders (see Chapter 2: Obtain interagency and community support). The system procurement process should not begin unless the legal authority of ASE is assured. Vendors are likely to be wary of providing ASE to a jurisdiction where the legal authority of ASE is uncertain.

COORDINATION WITH COURTS

The support of the judiciary and other court personnel is essential to the success and continued operation of an ASE program. Without judicial support, courts may refuse to uphold the validity of ASE citations or even rule that the ASE program itself is not valid. Depending upon legal requirements, ASE cases may be heard by a judge or a civilian adjudicator such as a magistrate or a hearing officer. Civilian adjudicators can rule on ASE cases if the infraction is considered civil, but cannot rule on criminal cases or issues of constitutionality.

ASE involves processes and technologies that are probably unfamiliar to many adjudicators, so it is important to provide adequate information to adjudicators, district attorneys, and other prosecutorial staff on how the ASE technology works and the safeguards that are in place to ensure proper operation. Adjudicators should be encouraged to develop a common consensus for ruling on ASE violations to avoid inconsistent rulings. Provide adjudicators with an informative demonstration and evidence of system reliability, but not to ask adjudicators what evidence should be presented at hearings to secure a verdict of guilt.

Support for ASE is also required from court administrators and personnel. ASE is likely to increase the courts' case management workload and may require additional staff or work space to meet this demand. Workload demands may be variable and unpredictable, particularly in the first months of ASE operation. Customer service workload may be mitigated by an effective marketing and media campaign, and by providing additional information, such as a list of common questions and answers, to citation recipients (see *Chapter 6: Supplementary materials delivered with violation notice*). Workload analyses during the early months of the ASE program may help to reevaluate staffing needs and identify potential improvements to efficiency. A report by the Scottsdale City Court administrator on the court's experience with an ASE demonstration project provides valuable insight and advice for adapting courts to handle increased workload and new challenges posed by ASE (Cornell, in press).

Program managers should coordinate closely with court administrators. A shared vision and mutual understanding of the other's roles, responsibilities, and procedures are critical to program success. Summary statistics provided by the court can provide valuable information on program outcomes and can identify inefficiencies, errors, and aspects of the program that can be improved. Program managers should keep track of the dispositions of ASE cases and review cases in which defendants were found not guilty to determine the reasons for the dispositions. Rulings of "not guilty" may reveal flaws in program operations, insufficiency of evidence presented at the hearing, or the considerations underlying adjudicators' reasoning, among other potential reasons.

INFORMATION MANAGEMENT: COMPATIBILITY, FLOW, AND SECURITY

System compatibility is essential to ensure that violation data, motor vehicle records, photographs, court records, and other information can be accessed by all authorized individuals. Compatibility can be a challenge because data may exist in a variety of forms within multiple databases that were not designed to be compatible. Incompatible systems may increase the workload and time required to process violations, and may increase the potential for processing errors to occur. Furthermore, vendor-provided processing systems may be designed for efficient violation processing, but they may not be fully compatible with existing systems within the jurisdiction. Proprietary vendor systems may also limit the jurisdiction's ability to select a different vendor. For example, violation records produced by a vendor's ASE units may be uniquely compatible with that vendor's violation processing system. The vendor contract should require a minimum level of compatibility to ensure that the jurisdiction has ownership of ASE records and that the vendor's systems do not inhibit the jurisdiction from selecting another alternative for ASE services in the future (see *Chapter 3: Contracting issues*). ASE records should also be maintained in a format that allows statistics and summary data to be generated for program analysis (see *Chapter 7*).

ASE requires efficient data flow between various systems, locations, and people. At a minimum, ASE data must flow from the enforcement unit to violation processing, violation validation, vehicle registration confirmation, and delivery to recipient. Violation status tracking, record-keeping and statistical summaries, court procedures, and other factors are likely to add further data flow requirements (see *Chapter 5*). Many tasks and data transfers can be conducted more efficiently in electronic format

rather than using paper forms. Where possible, processes may be automated to reduce staff workload, processing time, and potential for errors. Program managers should observe data flow procedures to identify inefficiencies or sources of error that can be remedied.

Information security is essential for an ASE program and should be emphasized to everyone with access to violation data and information that identifies individuals. All individuals with access to sensitive information should receive specific training on information security and confidentiality. ASE violation evidence must be managed according to standard rules for the security and preservation of legal evidence. Computer and network security experts should be involved in the implementation of security procedures and technologies. Violation data and photographs should be electronically encrypted at the time of their capture to prevent unauthorized access or tampering. Access to violation material should be restricted to individuals who require access, and should require secure passwords. Electronic signatures may be used to keep track of who has accessed particular records. Electronic data transfer should only be conducted over direct connections and secure networks and controls should be put in place to prevent information from being transferred to insecure locations.

Sensitive personal information such as Social Security numbers should not be used or linked with names unless it is necessary, and should never be printed on violation notices mailed to recipients. Once a violation notice has been settled and is no longer outstanding, the record should be processed according to jurisdiction policies. If data is retained for statistical or analysis purposes, personal identifying information should be removed from records.

PROGRAM EVALUATION PLAN

Program evaluation activities should begin long before ASE is implemented. It is important to get baseline speed and crash data that represent the time before driver behavior was influenced by ASE. It is helpful to collect data before the marketing and media campaign begins because the campaign can influence driver behavior. *Chapter 7* provides a detailed discussion of issues relevant to program evaluation.

COMMUNICATIONS AND MEDIA ACTIVITIES (INITIAL)

It is important to use a strong communications campaign including marketing and media to explain the philosophy and strategy behind the ASE program. ASE should be described as a tool that can enhance the capabilities of traffic law enforcement and that ASE will supplement rather than replace traffic stops by officers. The public should also be made aware that ASE is used to improve safety, not to generate revenue or impose “big brother” surveillance. Saying this will not necessarily make it so in the eyes of the public, so it is important to explain how each element of the ASE program puts safety first and how controls are in place to prevent misuse of the system.

A comprehensive communications campaign is essential to maintain positive public relations and to ensure that the public understands how ASE works and why it will improve safety as a supplement to traditional enforcement. The campaign should begin several months to a year in advance of ASE implementation. The two most important goals of the communications plan are to maximize public awareness and acceptance of the ASE program. Data should be evaluated to identify at-risk drivers in the community. Special attention should focus on males and young drivers. Studies conducted in the United States and abroad have consistently found that support for ASE is weakest among young drivers and males (e.g., Behavior Research Center, Inc., 2007; Blincoe, Jones, Sauerzapf, & Haynes, 2006; Corbett & Simon, 1999; Retting, 2003), so these groups may warrant particular attention.

Promote awareness of ASE program

To achieve speeding deterrence, the public must be aware of the ASE program and how it works. The public should be educated about the speeding problem and how it affects their community. Current efforts in traditional enforcement should be highlighted, including an explanation of how ASE will supplement the effort to make the community safer, decrease traffic congestion, and improve quality of life. An explanation of how the technology functions, successes in other communities, and how it is implemented should be included. The number of enforcement units in use, whether they are mobile or fixed, the types of sites that are enforceable, and the total number of enforceable sites should be ex-

plained. It is also possible to make public the specific locations of sites, though it would be unwise to reveal the schedule in advance of their deployment. Identifying all potential locations may have a positive effect on deterrence at problem locations if drivers know where enforcement is frequently located. Revealing enforcement locations also contributes to the goal of program transparency and might appease some critics of the program, though public awareness of enforceable sites may reduce the general deterrent effect of ASE.

It is also important to inform the public about the procedures for violation processing, payment, and adjudication. It is not necessary to reveal exactly what speed threshold is used to define a violation, but drivers should be made aware that the program targets dangerous speeding and they will not be ticketed by ASE for traveling 2 or 3 mph above the limit. It is not appropriate to tell drivers that the threshold is in place to allow for inaccuracy of measurement, because a threshold of 6 or 11 mph above the speed limit is substantially greater than the small potential inaccuracy of speed measurement equipment. The public should be made aware of the penalties for ASE violations and their rights and options if they receive a violation notice.

Promote acceptance of ASE program

If the purpose of promoting awareness is to explain *what* the ASE program is, then the purpose of promoting acceptance is to explain *why* the program is worthwhile. To promote acceptance of the ASE program, it is important to educate the public about the general dangers of speeding and the specific speeding-related safety problem overall and at specific locations in the jurisdiction. Despite known links between speeding, crash likelihood, and crash severity, many people believe they are capable of speeding safely. It is also difficult to dissuade people from speeding because speeding has the benefit of reducing travel time. Even though ASE can deter speeding among those who believe that speeding is safe and acceptable, a goal of the marketing and media effort should be to influence people to change their attitudes toward speeding so that speeding is seen as unsafe and socially unacceptable.

The social marketing effort should also emphasize the safety and congestion mitigation benefits of ASE. Statistics can be cited from jurisdictions in the United States and abroad that have effective ASE programs. Although U.S. data may have more relevance to the American public, substantial evaluations conducted in Europe, Australia, and other places have shown many benefits, including:

- In Victoria, Australia, within three months following the introduction of speed-enforcement cameras in late 1989, the number of offenders triggering photo radar decreased 50 percent and the percentage of vehicles significantly exceeding the speed limit decreased from about 20 percent in 1990 to less than 4 percent in 1994 (Cameron, Cavallo, & Gilbert, 1992).
- A Norwegian study found that injury crashes were reduced by 20 percent on sections of rural roads with cameras (Elvik, 1997).
- In British Columbia, Canada, there was a 7-percent decline in crashes and 20 percent fewer deaths the first year cameras were used. The proportion of speeding vehicles declined from 66 percent to less than 40 percent, and researchers attributed a 10-percent decline in daytime injuries to photo radar (Insurance Corporation of British Columbia, 1998).
- In Cambridgeshire, United Kingdom, injury crashes in the immediate vicinity of speed-enforcement camera sites were reduced 46 percent (Hess, 2004).
- One of the most ambitious efforts to control traffic speeds on a heavily traveled urban highway is on the M25, which circles London (Harbord, 1997). Speed-enforcement cameras used in conjunction with a system of variable speed limits that are adjusted based on weather and traffic conditions resulted in 28 percent fewer injury crashes during the first year of the program; preliminary data for the second year indicated that the improvements were sustained.

Although speed reductions are worth reporting, crash reductions are especially important to convince the public that ASE improves safety.

It is important to use marketing and media campaigns to explain the philosophy and strategy behind the ASE program. ASE should be described as a tool that can enhance the capabilities of traffic law enforcement and that ASE will supplement, rather than replace, traffic stops by officers. The public should also be made aware that ASE is used to improve safety, not to generate revenue or impose “big brother” surveillance. Saying this will not necessarily make it so in the eyes of the public, so it is important to explain how each element of the ASE program puts safety first and how controls are in place to prevent misuse of the system. Another key point is that ASE is intended to deter speeders, not punish them. It is important to emphasize that a low rate of violations is desirable because it means the program is successfully deterring speeders. Table 1 presents a list of common arguments used by opponents of ASE and the reasons that those arguments are not valid.

Program transparency is critical to gain the support of the public. Program spokespersons must be able to explain why every decision was made and how it benefits public safety. For instance, it is important to explain the site selection process and criteria for enforcement, the rationale behind contract arrangements with the vendor, the reasons that ASE units operate overtly or covertly, the accuracy and reliability of violation detection equipment, the quality control measures to ensure that recorded violations are valid, and so forth. If the jurisdiction is perceived as being secretive or disengaged, people are likely to become distrustful of the program’s intentions and rationales. To help the public follow the ASE startup process, program managers can distribute the minutes of relevant meetings, post information on a community Web site, or start a mailing list to send updates to interested individuals.

Table 1. Common arguments against ASE and appropriate responses

Argument	Response
ASE is primarily intended to raise money for the government.	All fines are designed to maximize the deterrent effect of ASE; the goal is to reduce the number of recorded violations, not to penalize violators.
ASE is illegal because a machine issues the ticket and that means that I am deprived of my right to face my accuser at a hearing.	The ASE system does not issue tickets; it records evidence, and a human reviewer must review each ASE citation to determine whether a violation took place. A human also serves as the accuser at a hearing.
ASE is illegal because I am presumed guilty unless I prove my innocence.	Alleged violators are presumed innocent unless they admit guilt by accepting the penalties or take their case to a court hearing and are convicted on the basis of evidence.
ASE causes more accidents than it prevents	Out of dozens of evaluations in the United States and abroad, no evaluation has ever found evidence of an increase in crashes attributed to ASE.
Speeding is not unsafe; the speed limits are set too low.	Scientific evidence shows that speeding increases both the likelihood and severity of crashes. Speed limits are not simply set according to the maximum reasonable speed of a solitary vehicle; they also accommodate the safety of pedestrians, turning and merging traffic, etc. Speed limits should be set according to current engineering policies before ASE is implemented.
Photographing me and my car is an invasion of my privacy.	Driving is a regulated activity that takes place in public, so there is no legal argument for privacy. Furthermore, ASE only takes photographs when an illegal activity is detected, and controls are in place to ensure the security of evidence.

Information outlets

For the marketing and media campaign to be effective, it is important to get the message to as many people as possible. Information outlets can vary in the type of information presented, the type and size of the audience it will reach, and cost, among other variables. A strategy to disseminate informa-

tion to the public should use a variety of information outlets to effectively reach the broadest possible range of people at a reasonable cost.

Media coverage

Media coverage is a very effective way to provide information to the public at no cost to the jurisdiction. Media interest in ASE is likely to be high during the months before and after ASE is implemented. Local television, radio, and print media outlets will want to cover the program, so it is important to facilitate their efforts. Press releases or video releases can be used to provide important information to the media and to announce program milestones or changes. Program managers or other representatives should be available for interviews, system demonstrations, and enforcement ride-alongs. Media relations should be centrally coordinated to ensure that the program's operations and strategic vision are described accurately and consistently. Responsiveness to media inquiries is critical. Reporters may want traffic safety statistics, ASE program reports, rationales for particular decisions, and other information, so it is important to make this information available. Slow or unsatisfactory responses to queries might be viewed negatively by the media. During contact with the media it is important to continually emphasize the safety-oriented philosophy and goals of the program (see *Chapter 2: Develop a strategic plan* and *Chapter 3: Promote acceptance of ASE program*). It is also important to remember that media coverage and public opinion tend to influence one another. In other words, positive media coverage can lead to positive public opinion and positive public opinion can lead to positive media coverage.

Marketing

Many marketing outlets are available to reach broad or narrow segments of the population, and costs can vary widely. The appropriate choice of media outlets depends upon the needs of the jurisdiction and the budget available for marketing. Like other elements of the social marketing campaign, marketing materials should be designed to increase awareness and acceptance of the ASE program. The marketing campaign should focus on factual information about the dangers of speeding and the ways that ASE can improve community safety, but emotional appeals that focus on the human toll of speeding-related crashes can also help to make the safety problem seem more real and relevant to the public.

The ASE program should be given a name that is memorable and favorably viewed by the public. Though many current ASE programs do not have names, some names that have been used for ASE programs (or the broader highway safety programs of which they are part) include Safe Speed (Charlotte, NC), NASCOP (Neighborhood Automated Speed Compliance Program, San Jose, CA), No Need for Speed (Davenport, IA), Focus on Safety (Scottsdale, AZ), and Eye on Safety (Washington, DC). Marketing material should have a professional appearance. Slogans, logos, and eye-catching graphics and colors can help to attract attention and improve the public's memory of the message. Some jurisdictions have held contests for schoolchildren or the broader community to name the program or develop a theme for marketing materials. Such contests can promote positive public relations and generate media attention. The program name, slogans, messages, and graphic themes should be used consistently to "brand" the ASE program. Potential marketing materials and messages can be evaluated in focus groups or surveys to ensure that they convey the intended message and are memorable.

Marketing outlets include television, radio, newspapers and newsletters, signs and billboards, posters, flyers, video presentations, and giveaway items such as bumper stickers, lapel pins, pens, and similar incentive items. Television, radio, and print ads can reach a substantial number of people, but can be relatively expensive. Television and radio ads may be most effective if aired close to traffic reports. Road signs and billboards can be an excellent way to reach drivers in the jurisdiction, but the amount of information that can be presented this way is limited. Figure 3 shows an ad placed on the rear of city buses in Washington, DC. The use of signage is covered in more detail in *Chapter 4: Signage*. Flyers and other print materials can be distributed in many ways: they can be mailed to jurisdiction residents with other items such as utility bills or by themselves; made available at government buildings such as department of motor vehicles, court houses, and libraries; distributed to organizations such as neighborhood associations, driving schools, and motorist associations; or handed out at community events such as fairs or open houses. Print materials about the ASE program should also be delivered with violation notices (see *Chapter 6: Supplementary materials delivered with violation*

notice). Video presentations about the ASE program can provide a substantial amount of information about the ASE program and its value to the community. Videos can be distributed to media outlets, driving schools, high schools, and other organizations that might be interested in showing it to their constituents. Videos could also be made available for computer download from a community Web site or by mail order.

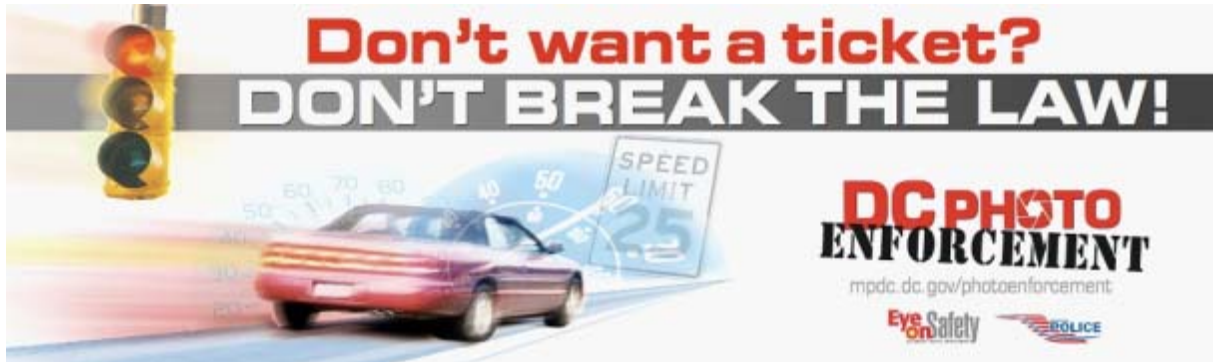


Figure 3. Advertisement on rear of city buses in Washington, DC

Jurisdiction Web site

The jurisdiction's Web site is an excellent resource that can be used to present information about the ASE program. Unlike other information outlets, a Web site can be used to present information in great detail and allows users to navigate the information at their own pace. ASE information should be easy to find on the Web site by using a search function or by locating it under a logical heading, such as public safety, police department, transportation safety, or recent news. With the space and multimedia capabilities afforded by the Internet, it is possible to include information such as the history of the ASE program, safety statistics, enforcement site locations, photographs, videos, and links to additional information, press releases, and more. A frequently-asked-questions (FAQ) section can be used to answer common questions that people have about the program and reduce the burden on live customer service representatives. Other marketing and media material should direct people to the Web site for more information. Once the ASE program has begun to issue citations, a Web site can also be used to allow users to view their own violation records and pay citations.

Public input

One of the most important aspects of a social marketing campaign is encouraging public input in the development of the ASE program. Public opinion is a major factor in the success of an ASE program, so it is important to be aware of people's concerns and to address them in its design. There are many ways to seek public input:

- People should be able to deliver their comments and concerns by telephone, e-mail, or mail.
- Public events such as an open house can be held to allow the public to interact with program managers and see the technology in person.
- "Town hall"-style meetings or appearances at public events such as neighborhood association meetings or parent teacher association meetings can be used to give program managers a chance to talk about the program and answer questions from the public.
- Guest appearances on call-in television or radio programs can allow program managers to respond to public questions and concerns. Write-in question and answer forums can also be held on the Internet.
- Focus groups can provide a structured method to delve deep into people's opinions and knowledge about many issues related to ASE, but this method is labor intensive, should only

be conducted with up to about 10 individuals per session, and is best used to develop marketing materials.

- Surveys are the best way to assess overall public opinion on a broad scale, but are not particularly effective in allowing individuals to express the sort of open-ended responses that best reflect individual concerns. Surveys are addressed in greater detail in *Chapter 7: Evaluation of public awareness and acceptance*.

Continuing public information and education after startup

An effective marketing and media campaign is critical to the success of a new ASE program, but it is important to maintain these efforts as the program matures. When the ASE program is established and public awareness and acceptance are at desirable levels, it is possible to scale down marketing and media efforts. Broad, expensive advertising such as television, radio, and print ads can be ceased, and communication efforts can be focused on inexpensive methods and specific groups. Student drivers should be a particular focus of ongoing marketing and media because they are most likely to be unfamiliar with ASE and they are also at especially high risk for speeding-related crashes. The department of motor vehicles should also be a focus of marketing and media because it serves many new drivers and people who are new to the jurisdiction. When there are important changes to program operations, program milestones are reached, or new findings regarding program effectiveness, press releases and media contacts should be used to spread the word. A community Web site is also an excellent place to maintain marketing and media materials and report current events at very little expense to the jurisdiction.

PROGRAM ROLLOUT AND WARNING PERIOD

Before the ASE program goes into operation, a demonstration should be conducted to ensure that all system components are functioning properly and all staff are following procedures. Staffing should be reevaluated to ensure that there are enough employees to handle the workload that the program will generate.

The program may begin with a warning period, during which the program is in full operation but violations do not carry fines or license sanctions. An advantage of a warning period is that managers can evaluate the program and correct problems before penalties are assessed. It also functions as an additional notice to motorists that ASE is beginning and individuals who receive warning notices can modify their behavior before actual ticketing begins. A disadvantage is that a warning period may encourage some drivers to speed intentionally because they know there will be no penalties or to get a warning notice as a "souvenir." This behavior may be especially likely to occur if ASE is conducted by fixed units that function without an operator present. To discourage such behavior, violation notices sent during the warning period should not include photographs and it should be made clear to motorists that reckless behaviors recorded by ASE units will be prosecuted. If used, a warning period should not exceed one month. A warning period may also be used at sites where the speed limit has recently decreased or increased. Whether or not a warning period is used, other methods, such as speed trailers and increased traditional enforcement, may be used prior to full implementation to mitigate speeding.

CHAPTER 4: OPERATIONS

ENFORCEMENT PLAN

The enforcement plan is the set of procedures and policies that determine how enforcement is conducted. The enforcement plan should focus on achieving the goals identified in the program's strategic plan (see *Chapter 2: Develop a strategic plan*) with efficient use of resources, public support (see *Chapter 3: Promote acceptance of ASE program*), and within the constraints of laws and policies (see *Chapter 2: Ensure legal and policy authority for ASE*). It is important to document the reasons for all decisions that affect the enforcement plan in order to defend the enforcement plan or to reevaluate its strategy. Relevant enforcement plan considerations include:

- Enforcement speed threshold;
- Overt versus covert enforcement;
- Signage;
- Days and hours of operation;
- ASE strategy and scheduling;
- Immediate feedback to drivers;
- Coordination with other traffic law enforcement efforts;
- Coordination with adjudication and judiciary communities; and
- Ongoing improvements to the enforcement plan.

It is also advisable to develop a set of operational guidelines to ensure proper and consistent operation of ASE equipment. The Department for Transport in the United Kingdom developed a handbook of rules and guidance that addresses the philosophy, strategy, and operations of ASE throughout the United Kingdom (Department for Transport, 2006). Police in Victoria, Australia, developed a policy manual for mobile ASE that addresses the philosophy of the program, roles of police and contractors, and guidelines for site selection and operations (Victoria Police Traffic Camera Office, 2006).

Enforcement speed threshold

The enforcement speed threshold is the lowest speed at which a violation will be recorded at a particular site. The enforcement speed threshold should be the same that is used for traditional speed enforcement, and should be at the point of exceeding reasonable and prudent speeds. Many jurisdictions begin enforcement at speeds 11 mph above the speed limit. This threshold is generally considered appropriate because it ensures that enforcement will only affect those who drive substantially faster than the speed limit, particularly where the speed limit was not established through a recent engineering study. Higher enforcement thresholds are not appropriate because they can lead to even greater disregard for the speed limit. Lower enforcement thresholds are more appropriate in areas with low speed limits, especially where pedestrians and children might be present, such as residential areas, schools, playgrounds, and park areas, and where the speed limit was set according to proper engineering procedures. The enforcement speed threshold set in these areas should be no less than 6 mph above the speed limit. For more information on establishing enforcement speed thresholds, refer to *Speed Enforcement Program Guidelines* (National Highway Traffic Safety Administration, 2008).

Program managers must decide whether to reveal enforcement thresholds to the public. Revealing enforcement thresholds is likely to yield a positive public reaction and might help to reduce speed variance at enforced sites. However, it might also be viewed as a tacit endorsement of a limited degree of speeding. If enforcement thresholds are not revealed, it is important to inform the public that there is some threshold, and that they will not normally be cited for driving just 2 or 3 mph above the speed limit.

Overt versus covert enforcement

Overt enforcement provides some indication to drivers that they are approaching an enforced location. Indications can include fixed or temporary signage on the approach to the enforcement unit (see *Chapter 4: Signage*), pavement markings, or markings on the enforcement unit itself, such as identifying text or logos or conspicuous colors. Enforcement units might also have features such as a speed display board or conspicuous vehicle modifications, such as a large rear window or external equipment. Covert enforcement is conducted with ASE units that are unmarked and with no specific warning to drivers that they are approaching an enforced location.

Although the differences between the effects of overt and covert enforcement are not well understood, there is reason to believe that covert enforcement does have a more substantial positive effect on driver behavior than overt enforcement (Keall, Povey, & Frith, 2001; 2002). With overt enforcement, drivers can often see an upcoming ASE unit and slow down before entering the detection zone. With covert enforcement, drivers are more likely to maintain slower speeds throughout the jurisdiction because of the possibility of unexpectedly encountering ASE. Therefore, overt enforcement is likely to result in minimal jurisdiction-wide effects, but a substantial decrease in speeding at actively enforced sites, whereas covert enforcement is likely to result in larger system-wide effects, but a less substantial decrease in speeding at actively enforced sites. This was the case in New Zealand, where the percentage of vehicles speeding through active ASE sites increased from 1 percent to 5 percent after the switch from overt to covert enforcement (Keall et al., 2001). Although no research exists on the effects of overt versus covert ASE on traffic flow, it is possible that overt enforcement will slow traffic excessively, which may impede traffic flow on high volume roads. Covert and overt enforcement can be effectively combined in a speed enforcement program and covert enforcement is especially effective in improving safety when combined with a substantial marketing and media campaign (Diamantopoulou & Cameron, 2002).

Despite the likelihood of greater jurisdiction-wide speeding reductions, covert enforcement is not often used in the United States or abroad because of negative public reactions, and numerous jurisdictions have laws that forbid covert operations. Covert ASE may increase people's concerns that the program is designed to bring in revenue and penalize speeders rather than deter them. Negative reactions also likely stem from the fact that it is substantially more difficult for drivers to spot and avoid covert ASE than overt ASE, and even drivers who generally support the concept of ASE might not support the program if they believe that drivers who rarely speed will be caught speeding too often.

Both overt and covert ASE result in positive safety effects, so either method is acceptable. In general, covert ASE should only be used where the public accepts its use or where overt enforcement has not sufficiently reduced speeding and crashes. One significant advantage of overt ASE is that its visibility can help to increase awareness of the program and increase the perceived likelihood of drivers encountering ASE. In this way, overt ASE can act as a deterrent. In contrast, covert ASE might result in drivers remaining unaware of the presence of ASE or underestimating its prevalence. If covert ASE is used, it is especially important to make the public aware that ASE units are not visible, but that they will have a substantial presence. A combination of overt and covert ASE units might be an effective way to combine the visibility of overt ASE and the broad deterrence of covert ASE.

Signage

Signage plays an important role in alerting the public to the use of ASE (Makinen & Oei, 1992). Although research has not been conducted to evaluate the effects of signage, it is likely that signage can contribute to reductions in speeding, whether or not ASE is present, because it can increase both awareness of ASE and the perceived likelihood of encountering ASE. The *Manual on Uniform Traffic Control Devices for Streets and Highways* (Federal Highway Administration, 2003), also known as the MUTCD, provides guidance on the use and appearance of photo enforcement signs as regulatory signs, in Section 2B.46. There are three basic types of signage:

- *General signage* can be placed anywhere in the jurisdiction to notify drivers that the jurisdiction uses ASE. General signage serves a public awareness function. The goal is to indicate to drivers that ASE is being used in the jurisdiction and that they should not speed. To maximize awareness, general signage should be placed on major roads and entrances to the juris-

diction. Section 2B.46 of the MUTCD specifies a “Traffic Laws Photo Enforced” sign (see sign R10-18 in Figure 4) as an option for entrances to the jurisdiction.

- *Fixed advance signage* can be placed on any road where ASE can be used. The goal of fixed advance signage is to alert drivers to the possible presence of ASE ahead and to encourage them not to speed. The MUTCD specifies a “Photo Enforced” sign (see sign R10-19 in Figure 4) as an optional plaque that can be mounted below a speed limit sign. If the “Photo Enforced” sign is used below a speed limit sign, the MUTCD requires that it “shall be a rectangle with a black legend and border on a white background.” Fixed advance signs should primarily be used to supplement speed limit signs, but stand-alone signs may also be used. Stand-alone signs do not need to follow the MUTCD requirements for a regulatory sign because they are not connected to a regulatory sign and can use different messages and formats. Some examples of fixed advance signage are shown in Figure 6.
- *Temporary advance signage* can be placed upstream of an active enforcement unit to inform drivers that they are approaching ASE in progress. Temporary advance signage is generally undesirable because drivers become aware that they will be warned and given time to slow down before they reach the ASE unit, thereby reducing the deterrent effect of ASE. However, temporary advance signage is often desired by the public and is sometimes required by law or as a compromise to satisfy opponents of ASE. If temporary advance signage is used, it should be located somewhere that it is visible and legible to approaching drivers, yet not an obstruction to drivers, pedestrians, or cyclists. The distance between the sign and the ASE unit can be selected by the jurisdiction, but the distance should be consistent between ASE sessions and sites. The sign should be wind resistant so it does not move when hit by wind gusts.

If photo enforcement is conducted by unmarked (covert) units it is a good idea to note this on general and fixed advance signs so that drivers are aware that they might not be able to see the ASE units.

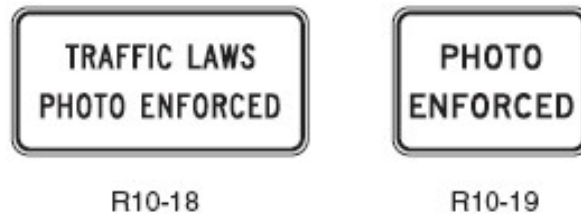


Figure 4. Optional regulatory signs specified in the MUTCD



Figure 5. General signage in Scottsdale, AZ, (left) and Washington, DC (right)



Figure 6. Fixed advance signage (clockwise from upper left): Boulder, CO; Washington, DC; San Jose, CA; San Jose, CA (again); Scottsdale, AZ; Portland, OR



Figure 7. Temporary advance signage in Charlotte, NC, (left) and Scottsdale, AZ (right)

Days and hours of operation

Days and hours of operation should be selected based on the times that speeding poses the greatest risk. This can be determined by crash data and public complaints and can also factor in traffic volumes, pedestrian presence, school hours, and so forth. ASE should be conducted every day of the week, if resources are available. However, school zones should only be enforced as such when their special speed limits are in effect and children are present or in transit. Most jurisdictions focus their mobile operations on morning, afternoon, and evening hours, while fixed units typically operate 24

hours per day. Though ASE can be conducted in darkness if a flash is used, violation notice issuance rates may be lower due to inadequate quality of some photographs, especially if driver identification is required. ASE can be conducted at any time of day, but it is important to also maintain traditional enforcement and patrols during the late evening and overnight hours when traffic volumes are lower and alcohol-impaired driving and other criminal activities are most likely to occur. See *Chapter 4: Coordination with other traffic law enforcement efforts* for additional information on integrating ASE with other traffic law enforcement activities.

ASE strategy and scheduling

The goal of ASE deployment is to use ASE where and when it will have the greatest positive effects on safety, while using resources efficiently. There are many ways to rotate enforcement between enforceable sites, and the best method for a particular jurisdiction depends upon the number of enforceable sites, the characteristics and locations of those sites, and the number of ASE units available. One potential strategy is to focus ASE in one area to create a “safety zone.” As speeding in the safety zone is reduced, the zone can be expanded by distributing enforcement across a larger area. Program managers should maintain oversight; if not direct control, of the enforcement schedule to ensure that the schedule is consistent with best practices identified in the jurisdiction, the goals of the strategic plan, and the resources available for ASE.

Fixed ASE units consist of a fixed-in-place housing and the ASE unit that can be removed for service and redeployment. The ASE unit can be permanently installed in a single, fixed location or occasionally rotated among a number of sites. One way to rotate fixed ASE units is to install a greater number of fixed ASE unit housings than there are fixed ASE units. With this strategy, some ASE housings will be “dummy housings” that have the appearance of a functioning ASE unit, but contain an ASE unit only when scheduled to have one. Dummy housings may have a deterrent effect, but they might also have the opposite effect if motorists come to believe that speeding violations are not always enforced by apparent ASE units.

One of the most important elements of a successful ASE program is to be responsive to changing safety patterns. It is essential to understand how ASE influences driver behavior at frequently enforced sites, infrequently enforced sites, and sites that are never enforced. For example, some drivers may avoid roads where ASE is used in favor of roads that are not enforced. Traffic and safety trends may also develop that are unrelated to ASE activity. *Chapter 4: Ongoing improvements to enforcement plan* provide more information on reevaluating and fine-tuning the enforcement plan.

Site-specific effects versus jurisdiction-wide effects

When deciding how to distribute enforcement to eligible sites, the agency should consider the goals of the ASE program and its desired effects on speeding and other driver behaviors. There are two ways to view the effects of ASE on speeding:

- Site-specific effects, and
- Jurisdiction-wide effects.

Site-specific effects are the effects observed at locations where ASE is used. Speeding is usually substantially reduced in the vicinity of active enforcement, but may return to baseline levels as little as one-half mile beyond the ASE unit. Site-specific speed reductions also tend to deteriorate quickly when ASE is not present. The key to maximizing site-specific speeding reductions is to use ASE to reduce speeding, and then use recurring ASE to maintain acceptable speeding levels. To reduce speeding at a site, the use of ASE at that site should be publicized and ASE should be visible and frequent during the times when speeding is most problematic. Speeds should be monitored at the site when ASE is present and when it is not present to determine the effects of recurring ASE deployments. When speeding has been reduced by an acceptable amount and positive effects persist even when the ASE unit is not present, enforcement can occur less frequently, with the goal of maintaining speeding reductions through deterrence.

Jurisdiction-wide effects are the overall effects on speeding observed throughout the jurisdiction, including on roads that are not enforced by ASE. Jurisdiction-wide effects are likely to be less dramatic

than site-specific speed reductions, but even small changes in driver behavior can have a substantial effect on safety throughout the jurisdiction. The key to maximizing jurisdiction-wide speeding reductions is to maximize the perceived likelihood of encountering an ASE unit anywhere in the jurisdiction. To achieve this, it is important to promote public awareness of ASE and to select ASE sites that distribute enforcement throughout the jurisdiction, encompassing a variety of road types. Covert enforcement units can also help to improve jurisdiction-wide effects (see *Chapter 4: Overt versus covert enforcement*).

Both site-specific and jurisdiction-wide speeding reductions are desirable, but in many cases there is a tradeoff between achieving site-specific and jurisdiction-wide speeding reductions. Some of these tradeoffs are listed in Table 2. When dealing with these tradeoffs, it is important to consider the goals identified in the strategic plan (see *Chapter 2: Develop a strategic plan*). If the program is focused on speeding reductions in a limited number of target areas or if crashes are overwhelmingly clustered on particular stretches of roadway, a more site-specific approach might be most advisable. If the goals of the program are more general and geographically distributed, a jurisdiction-wide approach might be most effective. In most cases, the solution will be somewhere in the middle, with a program designed to have a positive influence on targeted problem areas and throughout the jurisdiction.

Scheduling ASE deployments

As mentioned in *Chapter 4: Days and hours of operation*, it is important to schedule mobile ASE at a site during the times when the speeding-related safety risk is greatest. The ASE deployment plan, however, can also be scheduled to provide the most enforcement at sites with the most substantial speed-related safety problems. For instance, a major road with a substantial and persistent speeding problem might warrant more frequent enforcement than a residential road with a less substantial speeding problem.

The duration of mobile enforcement shifts should reflect the span of time when speeding is most problematic at a given site. For instance, a two- to three-hour shift might encompass an evening rush hour. Enforcement should typically be scheduled in shifts of no more than four hours to provide ASE operators with break time and variety. Although mobile ASE should be scheduled for specific times and locations, flexibility should be allowed for situations where the scheduled site is unenforceable due to sun glare, lack of safe location for ASE unit, roadway construction, traffic incidents, and so forth.

Table 2. Ways to achieve site-specific and jurisdiction-wide speeding reductions

Site-specific effects	Jurisdiction-wide effects	Reference
Overt enforcement	Covert enforcement	<i>Chapter 4: Overt versus covert enforcement</i>
Announce ASE site locations to public	Withhold ASE site locations from public	<i>Chapter 3: Promote awareness of ASE program</i>
Fixed ASE units	Mobile ASE units	<i>Chapter 2: Types of ASE systems</i>
Few road types/areas enforceable	Many road types/areas enforceable	<i>Chapter 3: Road types</i>
ASE focused on small number of sites	ASE distributed amongst large number of sites	<i>Chapter 3: Selection factors</i>
All fixed ASE sites operating full-time	Rotate fixed ASE units among many sites (dummy housings)	<i>Chapter 4: ASE strategy and scheduling</i>
Use of fixed advance signage and temporary advance signage	Use of general signage	<i>Chapter 4: Signage</i>

Immediate driver feedback

An important element of speed enforcement is the connection that drivers make between their speeding behavior and the penalty for that behavior. With ASE, a span of days or weeks may separate the violation from the receipt of the violation notice, so without immediate feedback drivers may be unable to recall the situation when the violation was recorded. Immediate feedback can help to maintain the cause-and-effect relationship between speeding and its penalties, alert drivers to the possibility they will receive a violation notice, and deter future speeding.

To the extent possible, drivers should immediately be made aware when their vehicles are recorded committing violations. Flash photography can present a passive indication that the vehicle has been photographed. A speed display board on or near the enforcement unit can also be used to indicate the speed of passing vehicles, though they may also confuse drivers who are not aware whether their vehicle is the one whose speed was displayed. If a speed display board is used, it should only display speeds of recorded violators so that non-violators do not think that they were recorded as violators. In general, they should not be used when the ASE unit is enforcing more than one traffic lane. Speed display boards are required by law in Oregon (see Figure 8). If speed display boards or other changeable message signs are used to present information to passing vehicles, messages should be designed to minimize distraction and should comply with requirements in the MUTCD (FHWA, 2003).



Figure 8. Mobile ASE unit with speed display board in Portland, OR

Coordination with other traffic law enforcement efforts

ASE should be used to supplement, but not replace, other traffic law enforcement activities. ASE can only be used to observe speeding violations, so police officers must be active on roads to observe traffic for other violations. Police presence is an important deterrent to impaired driving and other criminal activity on roadways. Police presence should be especially high during hours when impaired driving and other non-speeding violations occur most frequently. High-profile enforcement activities such as heightened police presence on holiday weekends and sobriety checkpoints can help to remind the public that ASE is only one aspect of traffic law enforcement.

ASE and traditional traffic law enforcement can also be used in combination. One option is to station a traffic law enforcement officer simultaneously on the same road as an ASE unit. This strategy may lead to a more widespread deterrent effect by indicating to drivers that once they pass an enforcement unit, there may still be additional enforcement presence on the road. Furthermore, being stopped by a police officer immediately interrupts drivers' speeding behavior, while drivers photographed by ASE may continue to drive at unsafe speeds. Another coordinated enforcement strategy is to alternate enforcement at a location between ASE and traditional traffic law enforcement. No research exists to indicate the effectiveness of strategies for combined ASE and traditional enforcement.

Another option is to use ASE in conjunction with speed display boards. Speed display boards (see Figure 9) may be placed upstream of an ASE unit to inform drivers of their speed and the speed limit on the road. The speed display board may also indicate that ASE is being conducted ahead. If the public is properly informed that speed display boards are often followed by ASE, it is possible that speed limit compliance may be improved and speed reductions may be extended over greater distances than with ASE alone. One study conducted on a road with a 50 km/h (31 mi/h) speed limit found that a speed display board located 150 meters before a fixed ASE unit on a reduced the proportion of vehicles speeding at least 10 km/h (6.2 mi/h) above the limit at the ASE site from 12.6 percent to 2.1 percent (Woo, 2007).



Figure 9. Portable speed display board

Ongoing improvements to enforcement plan

The enforcement plan should adapt and evolve to meet the needs of the jurisdiction. Speed data and crash data should be reviewed on a regular basis to determine whether resources should be shifted to respond to changing patterns. Different patterns of enforcement can be used and evaluated to determine how resources can be used most efficiently. Public opinion should be sought to determine which aspects of the program are popular and which are unpopular. Reevaluation of the enforcement plan is especially important in the first months of the program because growing public familiarity with the program is likely to influence driving patterns and because no matter how well planned the program is, it is difficult to predict the ideal distribution of ASE resources before enforcement begins.

FIELD OPERATIONS

Operator staffing and training

Unlike traditional traffic law enforcement, mobile ASE unit operators in most States do not have to be sworn police officers. While some jurisdictions do require sworn police officers to conduct ASE, others use non-sworn police employees, other local government employees, or employees of the equipment vendor. Traffic law enforcement officers have credibility with the public in terms of promoting the use of ASE as a tool for law enforcement. They are also likely to have the best sense of the relationship between ASE and other traffic law enforcement activities and are under direct police supervision. Vendor employees and other non-police operators might be perceived as unqualified and might also lead to accusations of outsourcing police responsibilities, operator conflict of interest, and an emphasis on revenue generation. Still, there are some advantages to non-police operation of ASE. First, some jurisdictions report that police officers find ASE operation undesirable or uninteresting and would pre-

fer direct contact with motorists (though supervisors should emphasize that officers conducting ASE can issue many more citations than if they were conducting traditional enforcement). Second, the use of non-police operators frees police officers to conduct activities that they alone are qualified for. Third, if the vendor supplies mobile unit operators, ASE staffing costs may be lower and the jurisdiction is relieved of the need to hire and train operators. No matter who operates ASE units, the jurisdiction's program manager must maintain control and oversight of all ASE activities and monitor the operation to ensure that operators are in full compliance with laws and policies.

Most vendors provide training for ASE operators, regardless of their affiliation. Supplementary documentation and training should be provided by the jurisdiction to familiarize operators with jurisdiction policies and procedures and to provide equipment training, if necessary. Even after training, ASE operators may require practice and experience before they achieve peak performance. Close supervision should be provided to new operators.

Unit location and setup procedures

ASE units should only be located in areas where they do not create an unsafe situation for operators or roadway users. A location might be unsafe if it protrudes into the traveled way, if there is a risk that vehicles will crash into the unit, or if the unit obstructs drivers' or pedestrians' sight. Units should not impede the way of bicyclists and pedestrians. All roadside equipment should meet the safety specifications provided in *NCHRP Report 350* (Ross, Sicking, Zimmer, & Michie, 1993). Specific setup factors such as direction of observed travel, distance from observed traffic, and angle of offset are largely determined by the functional requirements of the detection and violation recording equipment. Another consideration is sun glare, which varies by direction of observed travel and time of day.

If required, a temporary advance sign should be placed the appropriate distance upstream of the ASE unit (see *Chapter 4: Signage*). Equipment should be tested and proper operations should be verified before beginning an enforcement session. Equipment should be checked to ensure proper configuration and aim of violation detection equipment and cameras, proper focus of cameras, and proper function of flashes and computer equipment.

A checklist may be used to ensure that proper and consistent procedures are followed for mobile ASE. The checklist should address site verification, unit location, lanes and directions of travel observed, equipment startup and calibration, operations, and ending the session. A checklist may be integrated into the ASE technology to decrease the likelihood of errors and to allow the system to electronically verify and record the use of proper procedures. This record may be presented as evidence if a citation recipient challenges the citation at a hearing (see *Chapter 6: Options for violation notice recipient*). The checklist used by ASE unit operators in Beaverton, Oregon, is shown in Appendix D.

Event documentation

Mobile ASE operators should maintain a log to document specific information about the equipment setup and individual violations. The purpose of an event log is to provide a human observation to compare with the data recorded by the ASE system. Important event information to log includes time of event, vehicle descriptors (e.g., type of vehicle, color), lane location, visual confirmation of speeding, and situational factors such as the presence of pedestrians, active school hours, or the presence of emergency vehicles with flashing lights. Log data can either confirm or contradict ASE data. For instance, if the vehicle type recorded in the event log does not match the vehicle in the photograph taken by the ASE system, the violation should be voided. The same may be true if the ASE operator notes that an emergency vehicle with flashing lights was photographed by the ASE system. Event logs should be available to violation processing staff (see *Chapter 5: Violation validation*) and should be presented as evidence at a hearing to contest a violation notice, if one is requested by the alleged violator (see *Chapter 6: Contest violation*). Though not required by law in most jurisdictions, event logs should be used as a safeguard to ensure proper system operation and to assure the public that the system is constantly monitored by a trained operator.

Data transfer

ASE data includes photographs, electronic data recorded by the ASE system, and additional information and notes recorded by the ASE operator, such as an event log (see *Chapter 4: Event documentation*). Ideally, violation data from ASE sessions should be transferred for processing within 24 hours of violation occurrence to ensure that violation notices are sent to alleged violators as quickly as possible. A maximum span of time between violation detection and data transfer may be mandated to ensure timely processing (see *Chapter 5: Timeliness of processing*). Transfer methods will largely depend upon the system provided by the equipment vendor. If the system uses wet film, the film must be manually transferred to a location where the film can be developed and processed. If the system uses digital photography, photos may be transferred via electronic media or even wirelessly from the field. Though electronic transfer of digital images offers advantages in terms of ease and speed of transfer, particular care must be taken to ensure data security. ASE system data and operator event logs should preferably be maintained in electronic form to allow transfer via electronic media or a network connection. *Chapter 3: Information management: Compatibility, flow, and security* provide more information on privacy and security of ASE systems. Another critical aspect of data transfer is ensuring that the photographs, ASE data, and operator logs that comprise the violation record are linked together to maintain a complete record of the alleged violation. Many jurisdictions print violation data directly to the violation photograph to ensure record linkage. Violation records must also contain identifying information that can be used to track the status of alleged violations and query the database to find relevant information. Violation status tracking is addressed in greater detail in *Chapter 5: Status tracking*.

Equipment maintenance and calibration

In addition to field testing of equipment during session setup, ASE equipment should undergo regular maintenance to ensure that equipment continues to function properly and accurately. Speed-measuring equipment should be calibrated on a regularly scheduled basis, and after repairs are made, in a qualified testing laboratory. Proper configurations, focus, computer equipment, flash and image capture processes for the equipment should be checked according to established standards, local law and manufacturer's specifications. NHTSA (2004a; 2004b; 2004c; in press) provides standards for detection equipment testing and calibration. Further instructions may be available from the equipment manufacturer. Maintenance and calibration is sometimes conducted by the equipment vendor or equipment manufacturer. Maintenance and calibration records should be kept on file as evidence of system accuracy and integrity, and may be submitted as evidence at hearings when individuals contest ASE citations.

CHAPTER 5: VIOLATION NOTICE PROCESSING AND DELIVERY

Violation notice processing is a process in which photographs, event data, and operator event logs are reviewed to determine whether there is sufficient evidence to indicate that a speeding violation took place and whether the evidence can be linked to the individual who is responsible for the citation. During this process, the burden of proof is upon the jurisdiction to find that a violation did occur. Numerous checks must be performed to ensure that violation criteria are met and records that do not meet the criteria should be dismissed before citations are issued.

DISTRIBUTION OF RESPONSIBILITIES

Violation notice processing staff can be employees of the vendor, police employees, or other jurisdiction employees, but regardless of affiliation all processors must be trained according to jurisdiction policies and procedures and should be supervised by jurisdiction management. It is essential that the program managers maintain adequate control and supervision of the violation processing staff. In 2002, a Denver County judge found that Denver's ASE program violated Denver Revised Municipal Code §54-19 because the city wrongfully delegated police duties (summons preparation) to the ASE vendor. The judge also found that the program violated Colorado Revised Statute §42-4-110.5 because the city wrongfully paid the vendor for services beyond provision of equipment (*City and County of Denver v. Pirosko*, 2002).

Violations typically should not be processed by the same individuals who operated the ASE units because operational errors may be more likely to go undetected. Jurisdiction managers should also be responsible for reviewing violation notices to ensure that they are valid before they are delivered to recipients. Quality control and violation review procedures are described in further detail in *Chapter 5: Review and quality control procedures*.

VIOLATION VALIDATION

The first step in violation notice processing is to review the evidence and determine whether there is sufficient evidence to indicate that a violation did occur. Processors should ensure that the session information recorded by the ASE operator (e.g., location, lane(s) observed, date, time) is correct and that ASE was authorized at that time and location. Each photograph should be reviewed to ensure that only one vehicle was within the detection zone at the time that speed was recorded, that the vehicle has a legible license plate, and, if necessary, that the photograph includes the driver's face. If the system captured more than one photograph (e.g., one of the rear for license plate identification and one of the front for driver identification), the photos should be compared to ensure that they represent the same vehicle. Event data recorded by the speed-measuring component should be reviewed to ensure that the vehicle's speed was in excess of the enforcement threshold and that other values such as vehicle distance from the enforcement unit are within reasonable bounds and consistent with the photographic evidence. Processors should review event logs to ensure that the ASE operator's documentation supports the evidence provided by the photograph and other violation data. If consecutive photographs or a video record of the violation are recorded, they should be reviewed for visual confirmation of excessive speed.

MATCHING VIOLATION INFORMATION TO DRIVER AND VEHICLE RECORDS

If it is determined that a violation did occur and the evidence is sufficient to identify the vehicle license plate (and driver, if necessary), the next step is to retrieve information about the registered owner of the vehicle. These records are maintained by motor vehicle administrations and an arrangement must be made with the agency to obtain access to these records. If the vendor is responsible for violation processing, the vendor will often arrange to receive records directly from the motor vehicle administration. Regardless of which organization is given access to motor vehicle records, care must be taken to protect sensitive information and to limit record access to the information needed to process ASE violations. Violation processors should not have access to the entire database of registration information, but should only have access to the relevant information about vehicles that were recorded allegedly committing a violation. One method is to acquire vehicle information in batches. With this method,

violation processors can gather a list of license plate numbers of violators and then send this list to the motor vehicle administration. The motor vehicle administration can then deliver the relevant registration information to data processors.

Once registration information has been received, violation processors should perform a second check to ensure that the make and model of the vehicle reported in the registration information matches the vehicle in the violation photo. If the jurisdiction requires positive identification of the driver, then additional steps may be required to determine who was driving the vehicle at the time of the violation. Most jurisdictions that require driver identification first determine whether the driver in the violation photo is of the same gender as a registered owner of the vehicle. If there is a gender mismatch, the only practical way to identify the driver is to ask the registered owner of the vehicle to identify him or her. Some jurisdictions have found this procedure to be excessively burdensome and unpopular with the public and have therefore opted to dismiss violations in which there is a gender mismatch. In jurisdictions that perform an initial gender match, about one in five recorded violations is dismissed because of a gender mismatch. If there is a gender match between the photograph and the registration information, a violation notice can be sent to the registered owner indicating that the vehicle was observed committing a violation and that the registered owner must either admit guilt by paying the fine, attest that he or she was not the driver at the time of the violation, or contest the citation in court. These alternatives are addressed in further detail in *Chapter 6: Options for violation notice recipient*.

DELIVERY TO RECIPIENTS

If sufficient evidence exists to determine that a violation has occurred, a violation notice should be delivered to the registered owner of the vehicle. The most practical and cost-effective delivery method is postal mail. Envelopes should be clearly marked with the name of the enforcing agency. More information on violation notices is provided in *Chapter 6: Information on violation notice* and *Chapter 6: Supplementary materials delivered with violation notice*.

REVIEW AND QUALITY CONTROL PROCEDURES

Quality control procedures are essential to ensure that violation processing staff is following all procedures correctly and to discover errors and flaws early in the process. At a minimum, violations deemed valid by processors should be spot checked by law enforcement supervisors. Ideally, all violations should be reviewed and certified by at least two individuals. If two reviewers disagree on whether a violation is valid, it should be sent to a supervisor for review. Traffic law enforcement officers are appropriate reviewers because they are knowledgeable about traffic laws and enforcement technologies, because police officer certification of citations more closely matches traditional enforcement methods, and because the public is likely to perceive police review of citations as more credible than non-police review. However, non-police employees can also review violations if they are appropriately trained and supervised.

It is important to document the reasons that violations are invalidated to confront problems as soon as they are discovered. If invalidations are caused by ASE operator error, the operator should receive feedback to this effect and remedial training, if necessary. If invalidations are due to equipment failure, the problematic equipment should be replaced or repaired and recalibrated. If invalidations are due to normal limitations of the technology or setup procedures, then ASE operator procedures should be altered or equipment should be upgraded to meet requirements.

STATUS TRACKING

From the time that a violation is recorded until the record is purged from the system, it is essential to track violation information. Most vendors will provide a proprietary computer system to track violations, but the jurisdiction must confirm that the vendor's system meets the needs of the program and is consistent with laws, regulations, and information security policies. Each violation event should be assigned a unique identifying number so that photographs, event data, and event log information can remain linked and accessible. The current status of violation records (e.g., violation confirmed, violation notice issued, fine paid) should be noted within each record. If violation information is retained for statistical purposes, personally identifying information should be removed from records.

TIMELINESS OF PROCESSING

Violation notices must be delivered in a timely manner for the recipient to maintain a mental association between the violation and the penalty. Long delays between the violation and the receipt of the violation notice can result in public disapproval. The jurisdiction should establish a maximum time for the violation to be sent. An appropriate target is two weeks or 10 business days from the date of the violation, but faster processing times are better. The jurisdiction should establish policies that minimize processing time. For instance, there could be a policy that requires violation photos and data to be delivered for processing within 24 hours of the end of the ASE session. The arrangement to receive vehicle registration information from the motor vehicle administration should require motor vehicle administration staff to deliver the information to processors in a timely manner. Adequate processing staff should be in place to keep pace with violation data. Processing speed should never be achieved at the expense of quality control and review procedures (see *Chapter 5: Review and quality control procedures*).

CHAPTER 6: VIOLATION NOTICE RECEIPT AND ADJUDICATION

INFORMATION ON VIOLATION NOTICE

All information necessary for recipients to understand the violation notice and their response options should be provided on the notice itself. The violation notice should clearly identify the issuing agency and any coded information on the notice should be explained. The violation notice must include the date, time, and location associated with the violation. The measured speed of the vehicle and the speed limit at the location must be stated. The notice should also state the traffic law that was violated and the fine and other penalties associated with that violation. The notice should include a violation identification number to aid in customer service and status tracking and should make clear that the violation notice was delivered to the registered owner of the vehicle. The notice should explain the recipient's due process or appeal rights. The method of requesting a hearing or trial and its date, time and location should be explained. The notice should include at least one photograph that shows the vehicle and the surrounding roadway, a legible image of the license plate, and, if necessary, the driver's face. Sections of photos may be blown up to present greater detail (e.g., license plate), but other image enhancements that alter the appearance of photos should not be used. Color photographs are preferable. A sample citation from Charlotte, North Carolina, is presented in Appendix E. If a video record of the violation was also captured, notice recipients may be given instructions on how to access the video, such as on the Internet or at a government site. After viewing the violation video, notice recipients may be less likely to contest the violation.

The violation notice should describe the response options for the recipient, payment methods, the due date for response, and the results of a failure to respond by the due date. The burden for response should be minimal and should not require in-person appearances at government facilities. Multiple payment methods should be available and people should be able to pay by mail or in-person. If there is an online payment option, the payment system must be secured from unauthorized access or tampering (see *Chapter 3: Information management: Compatibility, flow, and security*). The notice should also direct recipients to other sources of information about the program including customer service contacts. A pre-addressed envelope should be provided for recipients to mail in their payment or other response to the notice. Additional information can also be provided as supplementary material delivered with the violation notice.

SUPPLEMENTARY MATERIAL DELIVERED WITH VIOLATION NOTICE

Supplementary information can be delivered with violation notices to help recipients understand how ASE works, why it is used, and what their options are to respond to the notice. Effective use of supplementary material can improve notice recipients' understanding and acceptance of the program, reduce the difficulty and stress of responding to the notice, and reduce the burden on customer service representatives. Supplementary material should include:

- Description of ASE technology;
- Support for the legality of ASE;
- Description of the violation review process;
- Description of the goal to reduce speeding-related crashes;
- Summary of positive effects of the ASE program;
- Options for recipient to respond to the notice;
- List of frequently asked questions (FAQ) and their answers;
- If available, the community ASE Web site; and
- References to sources of additional information or support.

The purposes of the program should be described with an emphasis on reducing speeding-related crashes and speeding. The harmful effects of speeding within the jurisdiction should be described,

along with the positive effects of ASE observed in the jurisdiction, if data is available. Positive effects observed in other jurisdictions may be cited as well. The description should emphasize the degree of precision and accuracy and the training received by the ASE operator. The legality of ASE should be asserted and common arguments made against ASE should be debunked (see Table 1 above for examples). The review process should be described with an emphasis on the presence of a trained reviewer and the quality control procedures in place. Violation notice recipients' options should be noted on the citation itself, but additional details may be presented within supplementary materials. For instance, a list of common questions and their answers can be provided. Recipients should also be directed to other sources of information, such as a Web site or customer service contact. Customer service and support is discussed in *Chapter 6: Additional help and support*.

OPTIONS FOR VIOLATION NOTICE RECIPIENT

Jurisdiction policies should allow violation notice recipients to respond to the violation notice in one of three ways: accept responsibility for the violation, deny responsibility for the violation, or contest the citation at a hearing. The specific procedures involved for each of these options must be defined by the jurisdiction. For all options, the jurisdiction should make all reasonable efforts to minimize the burden placed upon violation notice recipients.

Accept responsibility

The most common way for violation notice recipients to accept responsibility for the violation is to pay the fine. One possible alternative is to allow violators to take a driving safety class in return for a reduction or dismissal of penalties. Jurisdictions may consider providing a payment extension or installment payment option for individuals without the means to pay citations by their due date. In some jurisdictions, a failure to respond to the notice by the due date also constitutes acceptance of responsibility and a waiver of the ability to contest the notice. Non-response is addressed in greater detail in *Chapter 6: Procedures if recipient does not respond to violation notice*.

Deny responsibility

If violation notice recipients deny that they were the driver of the vehicle at the time that the violation occurred, they should be granted the opportunity to respond to the violation notice with a certification of innocence. If drivers are not photographed in the jurisdiction, a certification of innocence should require either the identification of the actual driver at the time of the violation or evidence that the vehicle was not in the legal possession of the registered owner at the time of the violation. Requirements for driver identification should discourage driver identification fraud: violation notice recipients may be required to provide an address, phone number, and driver's license number of the actual driver, and penalties for intentionally false identifications should be emphasized. A person who chooses to file a certificate of innocence may be required to have the document notarized for legal certification. Specific procedures related to violation notices issued to business vehicles and government vehicles are addressed in *Chapter 6: Violation notices issued to government and business vehicles*. If driver identification is required by the jurisdiction, violation notice recipients may be required to send a copy of their driver's licenses as evidence of innocence. If the driver's license photo does not match the photo of the driver of the vehicle, the violation may either be dismissed or the violation notice recipient may be required to identify the driver of the vehicle at the time of the violation. Most jurisdictions have opted to dismiss violations if the recipient provides evidence that he or she was not the driver because of the burden created by the driver identification requirement.

Contest violation

Violation notice recipients must be provided the opportunity to contest violations at a hearing. If ASE violations carry license sanctions as penalties, hearing procedures should be the same as those for non-automated speeding violations. If ASE violations do not carry license sanctions, then procedures may be more like those for non-moving violations such as parking tickets and registration violations. Specific requirements and procedures may be required by State or local law.

An individual must be present at the hearing to represent the ASE program. If the violation was recorded by a manned mobile ASE unit, the operator whose unit recorded the violation may represent the ASE program. If the violation was recorded by an unmanned unit, an ASE expert from either the jurisdiction or the vendor should represent the ASE program. However, vendor experts may be perceived as less credible if they have a financial stake, so jurisdiction experts are generally preferable. In prosecuting ASE violations, one of the most important responsibilities of the expert is to explain the technology and assert its validity and reliability. This is especially important during the ASE program's first weeks and months, and when the individual presiding over the hearing is inexperienced in hearing ASE cases (see *Chapter 2: Obtain interagency and community support* for guidance on securing support from the judiciary). Testimony by ASE program representatives should follow a script to ensure that they present thorough and accurate descriptions of the ASE technology, violation processing procedures, and the violation in question. If available, the unit operator's event log should be used as evidence to support the prosecution and to refute erroneous claims by the defendant. Additional material such as a video of the violation, site photographs, crash history statistics, and site speed distribution charts can provide additional support.

PROCEDURES IF RECIPIENT DOES NOT RESPOND TO VIOLATION NOTICE

Procedures and penalties for overdue violation notices should be made clear to recipients to encourage a response to the initial notice. Recipients of violation notices may fail to respond to the violation notice by the due date for a variety of reasons: the notice may be misplaced or unintentionally discarded, it may be sent to an outdated address, the recipient may forget about the notice or procrastinate until the due date passes, or it may be willfully disregarded. When the due date has passed, a reminder notice should be sent to the registered owner. The notice should specify a new due date and any penalties associated with the failure to respond to the initial notice or the second notice. Additional penalties for a failure to respond to the first notice or subsequent notices may include the inability to contest the citation or proclaim innocence, late fees, inability to reregister the vehicle or drivers license, license suspension, or vehicle immobilization (e.g., with a Denver boot) or impounding. Overdue violations may also be referred to a collection agency for service by mail or in person. It may also be possible for the jurisdiction to collect debts from violators' tax returns. State and local laws and procedures for overdue non-automated speeding violations should be considered when developing procedures for overdue ASE violation notices.

VIOLATION NOTICES ISSUED TO GOVERNMENT AND BUSINESS VEHICLES

Vehicles registered to government agencies and businesses (including vehicle rental or leasing businesses) pose a special challenge because these vehicles are unlikely to be driven by their registered owners. It is important to take all reasonable measures to identify the drivers of these vehicles. When registration records indicate that a speeding vehicle is owned by a government agency or a business, a form should be sent to the registered owner or fleet manager requesting the identification of the driver of the vehicle at the time of the violation. To do this, vehicle fleet managers may need to consult vehicle use log books to determine who was driving the vehicle at the time of the violation. This level of compliance may be required by policy in government agencies, but may be more difficult to achieve with business vehicles. If no response to the notice is received, or the responsible individual is not identified, State and local laws may determine whether the organization is responsible for the violation notice or it should be dismissed. In Victoria, Australia, businesses that do not identify the driver of a violating vehicle are subject to a fine greater than the maximum fine for an ASE violation, but license sanctions are not assessed (Victorian Road Safety [General] Regulations 1999, 2005).

Special considerations must also be made for emergency vehicles such as ambulances and police cruisers. In addition to determining the identity of the driver, it is important to determine whether an emergency vehicle was responding to an emergency at the time of the recorded violation. Dispatch information should be used to make this determination. If available, ASE operator event logs should also be consulted to determine whether the vehicle had active emergency lights or sirens.

Every ASE violation committed by a government vehicle (including emergency vehicles while not on an emergency call) should be reviewed by the driver's supervisor or a fleet manager. Penalties and

procedures to contest the violation should be the same as for the general public, though government vehicle drivers may face additional disciplinary action in accordance with department policies.

ACCESSIBILITY OF VIOLATION NOTICE

Violation notices should be designed to maximize accessibility to all potential recipients. All important information should be presented in plain language and small “fine print” should not be used. If there is a large non-English-speaking population in the jurisdiction, the violation notice may be fully or partially multilingual. The violation notice may also include a reference to a Web site, phone number, or other source where support is available in other languages.

ADDITIONAL HELP AND SUPPORT

Additional help and support should be available to people who have questions or comments about the ASE program or a particular violation. People should be encouraged to seek information on the program Web site or in supplementary information provided with violation notices before contacting ASE program representatives (see *Chapter 6: Supplementary materials delivered with violation notice* for guidance on providing supplementary materials). Support should be available over the phone and, optionally, in person at a government building or customer service location. Representatives should be thoroughly knowledgeable about program policies and procedures, especially those related to the rights, responsibilities, and options of violation notice recipients. The purposes and outcomes of support calls should be recorded and regularly reviewed by program managers to determine what confusions and misunderstandings people have about the program and to improve informational materials to address these issues.

CHAPTER 7: PROGRAM EVALUATION

ASE program evaluation is critical to understand how the program is affecting safety and how it is perceived by the public. An evaluation plan should be developed during the program planning phase (see *Chapter 2*). Minimal evaluation methods can include tracking speeds at enforced sites, crashes, and citation issuance. If resources are available, more sophisticated analyses should be conducted to investigate crash effects, speed effects, and public awareness and acceptance. This chapter provides guidelines on:

- Program monitoring
- Statistical analysis of speeds and crash effects
- Evaluation of public awareness and acceptance

BASIC PROGRAM MONITORING

At a minimum, basic data about program operations should be recorded and analyzed. Speed data should be recorded by ASE units during enforcement sessions, then transferred and maintained in a community-wide database. This data can be used to determine the range of speeds of passing vehicles and the frequency of speeding violations. Speed data can give a general idea of the effectiveness that ASE units have in lowering vehicle speeds when they are present. Violation frequency data can help to estimate the number of violations that will need to be processed and give an early indication if trends in violation frequencies are changing. If possible, speed data should also be collected covertly when ASE units are not present to determine the lingering effects of ASE, which are sometimes called halo effects. Key variables include the percentage of vehicles speeding above the speed limit, the enforcement threshold, and 85th, 90th, and 95th percentile speeds. The percentage of drivers speeding above the mean speed and measures of dispersion such as speed variance may also be of interest, but are of less direct relevance to safety. Crash statistics should also be monitored at ASE sites and throughout the jurisdiction to identify the highest priority sites for ASE. Particular attention should be given to crashes where speeding was a factor and where crashes were severe. Evaluation of crash and speed data is addressed in greater detail in *Chapter 7: Statistical evaluation of crash effects and speed effects*.

STATISTICAL EVALUATION OF CRASH EFFECTS AND SPEED EFFECTS

The most important measures of ASE effectiveness are its effects on crashes and vehicle speeds. Issues related specifically to crash effects are addressed in *Chapter 7: Crash effects* and issues related specifically to speed effects are addressed in *Chapter 7: Speed effects*. Issues common to both types of data are addressed in this section. Statistical evaluations should be conducted by an independent organization with experience in evaluation design and statistical analyses. Evaluations conducted by an agency with a stake in the ASE program may be perceived as biased and less credible by the public.

Crash and speed effects can be evaluated at individual ASE sites, at the entire set of ASE sites, or throughout the jurisdiction. Data from individual sites is useful to determine where ASE is having the greatest positive effects and where improvements should be made to the enforcement plan (see *Chapter 4: Ongoing improvements to enforcement plan*). It can also help to identify where confounds (other factors that affect driver behavior) may be present. Data from the entire set of ASE sites can be used to determine the direct effects of ASE where it is used. Jurisdiction-wide data can be used to determine whether ASE is influencing behavior beyond enforced sites.

Program evaluators are cautioned to avoid oversimplifying the effects of ASE. The evaluation should encompass more than just a simple comparison of data before ASE was implemented versus data during ASE activity. There are many phases of an ASE program, which can be loosely defined as follows:

- *Pre-ASE.* This is the stage before the marketing and media campaign begins, before widespread public awareness of the program, and before site locations are announced. This is the true “before” data in a before-and-after evaluation of ASE effects.
- *Approach.* This is the stage that includes the marketing and media campaign and other efforts to raise public awareness. Driver behavior may begin to change during this phase in anticipation of enforcement or as a result of a heightened awareness of the dangers of speeding instilled by marketing and media efforts.
- *Warning period.* This is an optional phase during which the ASE program is operational, but only warning notices are being delivered (see *Chapter 3: Program rollout and warning period*).
- *Full implementation.* This phase begins when the ASE program is in operation and citations are being delivered. Even within this full implementation, driver behavior is likely to continue to change for many months as people adapt to and become familiar with the program. Changes in program operations and confounding variables may continue to influence behavior years into the program.
- *Post-implementation.* ASE operations may be ceased at a site or throughout the jurisdiction for a variety of reasons. Data collection at former ASE sites can provide valuable data on driver behavior. For example, it may be of interest to determine whether speeding and crashes occur more frequently once ASE is removed, and how long it takes for these measures to reach or exceed their pre-ASE levels. A study conducted on a freeway in Scottsdale, Arizona, found that the rate of speeding violation detection increased by 836 percent after the fixed ASE units were deactivated (Washington, Shin, & Van Shalkwyk, 2007).

The first and fourth phases are the most important to assess the effects of the ASE program, but the other phases can also shed light on the ways in which behavior is changing and to help identify the reasons for this.

One of the major challenges to an ASE evaluation is identifying confounds and controlling for them. There are numerous factors that can influence driver behavior. These include time of day, day of week, seasonal patterns, weather patterns, daylight patterns, traffic volumes, changes in the vehicle fleet, changes to roadways, or their safety features, changes in laws, driver demographics, police presence, public information and education campaigns, changes to the ASE program plan, and so forth. Although it is impossible to eliminate all possible confounds, it is possible to control for their effects by also collecting data at comparison sites.

Comparison sites can show whether there were any changes in crash patterns or speed patterns at locations where ASE was not an influence. Comparison sites may be located within the ASE-enforced jurisdiction or in a nearby jurisdiction without ASE but otherwise with comparable characteristics. Comparison sites within the jurisdiction can control for many potential confounds, but it may be impossible to distinguish between effects that are independent of ASE and those that are related to ASE. Comparison sites outside the jurisdiction may eliminate the influence of ASE, but may be subject to different confounds than those in the enforced jurisdiction (e.g., the effectiveness of its conventional speed enforcement program). Although comparison sites are not likely to perfectly control for all confounds, they are important to account for and understand the trends that are influencing crashes and speeds.

One additional confound that can influence the effects of an ASE evaluation is regression to the mean. This refers to the natural tendency for a site that has recently experienced a high number of crashes to return to its baseline crash level without any intervention. In many cases, sites are selected for ASE because they have recently experienced a substantial number of crashes. The problem with this is that it is unclear whether this high number of crashes represents a continuing trend of high crash frequency or simply an anomaly that will pass, with the site crash frequency ultimately returning to its baseline level. Therefore, if ASE is used at such a site, it may be unclear whether ASE caused the reduction in crashes or whether it was due to regression to the mean. It is possible to partially control for regression to the mean by selecting comparison sites that have experienced similar increases in

crashes or by selecting sites with long-established histories of frequent crashes rather than those that have experienced a recent upsurge.

Crash effects

Crash effects are the most direct measure of an ASE program's effectiveness. Crashes can be broken down by whether or not they had speed as a causal or contributing factor, and by level of severity, with common crash categories including property damage only, injury, and fatality. It is important to focus on speed-related crashes and to establish clear definitions for categories of severity. Crashes that are not reported to the police are unlikely to be available for analysis, though unreported crashes are likely to be minor. Crash documentation should be reviewed to ensure that all variables necessary for analysis are present. Data such as specific crash location, date, time, severity, and causal factors (primary and secondary) is essential. Other factors such as weather conditions, vehicle type, driver demographics, and specific mechanisms of injury may also be useful in analysis. All crashes that result in fatalities are summarized in a standard national format, provided to NHTSA, and included in the FARS database, so additional details may be available about fatal crashes. If insufficient crash documentation is currently being collected, efforts should be made to work with police and emergency responders to collect additional information of use for ASE program analysis.

One of the challenges of crash effect analysis is collecting enough data to make statistically meaningful comparisons. Crashes are relatively rare events, and injury and fatal crashes account for small fractions of total crashes. Years of data before and after the start of ASE may be required to make statistical comparisons, especially for crashes involving speed as a factor and injuries or fatalities. Preliminary, non-statistical comparisons can be made in the shorter term, but care must be taken to consider the possible effects of confounds and other external factors.

Speed effects

Numerous studies have found a positive relationship between speeding and the likelihood and severity of a crash. Therefore, speeding can be used as an indicator of risk. To analyze overall program effects, speed data should be collected at mobile ASE sites when ASE is not present. This is because for any given site, ASE will not be present far more often than it is present. Speeding is likely to occur much less frequently when ASE is present than when it is not, so the reliance on speed data recorded during ASE sessions is likely to substantially overestimate the program's broader effects on vehicle speeds. The enforcement agency should determine whether it has the in-house capability to operate a comprehensive speed measurement program. If not, it would be more appropriate to use the jurisdiction's traffic engineering function or a consultant for speed measurement.

EVALUATION OF PUBLIC AWARENESS AND ACCEPTANCE

Public awareness and acceptance of the ASE program are essential to the program's success (see *Chapter 3: Promote awareness of ASE program* and *Chapter 3: Promote acceptance of ASE program*). Program managers can benefit by gaining knowledge of current levels of awareness and acceptance and by identifying areas that need improvement. The public can also benefit from the opportunity to voice their opinions and concerns about the program. There are many ways to assess public awareness and attitudes, both formally and informally. These methods are described in *Chapter 3: Public input* with regard to program startup, but they are also relevant to the evaluation of an active ASE program. Of all evaluation methods, formal surveys are typically the most appropriate way to assess public awareness, understanding, and acceptance. As such, surveys are singled out here for further discussion.

Surveys can be conducted using a variety of methods, including telephone, mail, Internet, handout, or in-person interviews. Surveys administrators should typically attempt to survey a representative sample of the relevant population (e.g., residents of the jurisdiction who have driver's licenses). Sometimes a convenience (unrepresentative) sample may be more practical for budgetary or other reasons. Although convenience samples can be useful as a compromise, the limitations and potential biases of an unrepresentative sample may influence the findings of the survey.

Surveys can be used to assess public knowledge and opinions on a variety of relevant issues. They can also include questions on issues other than ASE. Some key issues to assess using surveys include:

- awareness of the ASE program's existence;
- awareness of the ASE marketing and media campaign and attitudes toward the campaign;
- sources of information about ASE program;
- awareness of various features and operational aspects of the program;
- presence of incorrect beliefs about program features and operations;
- perceived purposes of ASE;
- perceived appropriateness of site selection and amount of enforcement;
- general attitudes toward highway safety, speeding, and enforcement;
- perceived likelihood of self or others being ticketed by ASE;
- perceived changes in own driving behavior as a result of ASE;
- perceived changes in behaviors of other drivers in the jurisdiction;
- level of support/acceptance of ASE program;
- perceived attitudes of other people toward the ASE program;
- effects of ASE on roadway safety; and
- desired changes to ASE program.

If possible, an expert in survey methodology should design the surveys. Questions must be worded carefully to make sure that their meanings are clear and to avoid common pitfalls such as biased language, vague questions, inappropriate response choices, and so forth. Surveys typically should not include any descriptions of the program or its effects that could bias respondents. For example, a summary of positive safety effects should only be given to respondents if the specific focus of the survey is to assess the influence of this knowledge upon attitudes and opinions. The survey must also be designed so that the responses will provide a meaningful basis for analysis. If budget allows, ASE program managers can hire an organization that specializes in survey research to design and conduct surveys. In addition to the advantages in expertise that such an organization can provide, the public may regard an independent organization as less biased than the jurisdiction. This strategy can assist in alleviating public opposition to the program.

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APPENDIX B: SUMMARY OF ASE PRACTICES IN THE UNITED STATES

INTRODUCTION

The first substantial demonstrations of automated speed enforcement technologies occurred in the 1980s. Since then, the technologies have become more advanced and programs have been implemented in dozens of countries around the world. In the United States, about 20 jurisdictions are currently using ASE and some other jurisdictions are planning to implement programs of their own. Table B-1 shows the U.S. jurisdictions where ASE is currently being used. The table shows that ASE has been used in locations ranging in size from small towns to large cities.

Table B-1. Selected U.S. jurisdictions with active ASE programs (as of February 2007)

Jurisdiction	Population (year 2000)*	Land area (mi ²)	Program start	ID type	Fixed or mobile
Mesa, AZ	448,000	125	1996	Driver	Both
Paradise Valley, AZ	14,000	16	1987	Driver	Both
Pinal County, AZ	271,059	5,3704	2007	Driver	Both
Phoenix, AZ	1,321,000	475	2001	Driver	Mobile
Prescott Valley, AZ	33,068	32	??	Driver	??
Scottsdale, AZ	203,000	184	1996	Driver	Both
Tempe, AZ	159,000	40	1997	Driver	Mobile
San Jose, CA	895,000	175	1997	Driver	Mobile
Boulder, CO	95,000	24	1998	Driver	Mobile
Denver, CO	555,000	153	1998	Driver	Mobile
Fort Collins, CO	119,000	47	1996	Driver	Mobile
Washington, DC	572,000	61	2001	Vehicle	Both
Chicago State Police District, IL**	5,377,000	946	2006	Driver	Mobile
Davenport, IA	98,000	63	2006	Vehicle	Both
Montgomery County, MD	922,000	496	2007	Vehicle	Both
Charlotte-Mecklenburg, NC***	827,445	526.28	2003	Vehicle	Both
Albuquerque, NM	471,856	181	2004	Driver	Both
Akron, OH	217,000	62	2005	Vehicle	Mobile
Cleveland, OH	478,000	78	2006	Vehicle	Both
Northwood, OH	5,000	8	2005	Vehicle	Both
Toledo, OH	314,000	81	2004	Vehicle	Both
Trotwood, OH	27,000	31	2005	Vehicle	Fixed
Beaverton, OR	76,000	16	1996	Driver	Mobile
Medford, OR	63,000	22	2002	Driver	Mobile
Jackson, TN	62,099	49	?		
Portland, OR	529,000	134	1996	Driver	Mobile

**Census estimate to nearest 1,000 population*

***District encompasses Cook County, IL; ASE is conducted only on interstate highways*

**** The population and land area is for Mecklenburg County – The program is currently suspended due to a legal challenge*

ASE was first implemented in the United States in the late 1980s with mixed success. The program established in Paradise Valley, Arizona, in 1987 is still running today with strong public support. However, a number of other programs established in the late 1980s and early 1990s did not last. ASE programs have been discontinued for a variety of reasons, including negative public opinion, inability to demonstrate positive safety effects, incompatibility with existing laws or regulations, lack of support from judges or elected officials, dissatisfaction with the equipment vendor, excessive administrative burden, and unanticipated program expenses.

In the late 1990s and early 2000s a number of new ASE programs were established in the United States and most of them are still active. Although State laws regulate many aspects of ASE operations, most jurisdictions by and large have the freedom to decide how their program will be run. This has led to great diversity in the way that ASE programs are run in the United States.

SUMMARY OF PROGRAM OPERATIONS

Many of the jurisdictions that have implemented ASE in the United States are small- to medium-size cities that have experienced rapid increases in traffic volumes and crashes. This was the case in the Phoenix metropolitan area where surrounding cities including Scottsdale and Paradise Valley were seeing their police forces overwhelmed by traffic duties to the detriment of other responsibilities. When traditional enforcement failed to bring the problem under control, they sought other solutions and saw potential in ASE. Other jurisdictions have not had such specific challenges, but nonetheless saw ASE as a tool that could improve safety and free police resources without excessive costs.

All ASE programs require the cooperation of multiple agencies and groups. Local and State government bodies often must provide initial approval for ASE to be conducted. Police departments are typically responsible for the daily enforcement operations and the strategic planning of operations, though daily operations in some jurisdictions, including San Jose and Boulder, are managed by department of transportation or public works staff. The vendor provides equipment and services vital to the ASE program. A supportive judiciary is critical to ensure that ASE citations will be upheld as legal and valid.

ASE programs must start with a sound legal basis if they are to be stable and successful. Not all programs require the passage of specific enabling legislation. Many States and jurisdictions were able to initiate ASE programs in accordance with preexisting laws enacted to permit the use of red light cameras. Some States initially passed legislation to allow a temporary ASE demonstration project. Legislators could then decide whether or not to support the continuation of ASE based on demonstrated results. Oregon, North Carolina, Boulder, and Akron introduced ASE with demonstration projects and the use of freeway ASE in Scottsdale also was approved as a demonstration project.

CONTRACT ISSUES

There are three basic options for a jurisdiction to acquire ASE equipment and services from a vendor: (1) purchase equipment, (2) lease equipment, and (3) use equipment at no cost in exchange for a share of revenues. There are countless possible variations on these basic options and each jurisdiction has a unique arrangement worked out between program managers and vendor representatives to meet the needs of the jurisdiction. Most jurisdictions pay a contractually obligated recurring fee in addition to some compensation based on the number of citations processed by the vendor. Scottsdale pays its vendor a monthly rental fee for ASE equipment plus a fee for each successfully disposed citation. Successful dispositions include paid citations, completion of an accredited defensive driving class, or defendant failure to pay or appear in court and being found in default by a hearing examiner. Washington, DC, pays its vendor a set monthly fee for equipment and services. A previous contract with the same vendor entitled the vendor to a set monthly fee plus additional fees if monthly citation volume exceeded a predetermined threshold. Program managers negotiated to eliminate citation vol-

ume fees in the most recent contract because citation volume had become more stable and predictable. Charlotte pays its vendor on a per-citation basis, with the majority of citation revenue going to the vendor and the remainder used to cover program expenses. Akron, during its demonstration phase, pays a portion of each citation to the vendor, and does not pay any recurring lease fees. San Jose and Paradise Valley purchased their equipment from the vendor.

FIELD OPERATIONS

Site Selection

Most jurisdictions restrict ASE to particular types of roads. ASE is used in Akron and Phoenix only to enforce school zones. San Jose only enforces residential neighborhoods. Colorado law limits enforcement to residential neighborhoods, school zones, park areas, and construction zones with average daily traffic between 10,000 and 15,000 vehicles and speed limits of 35 mph or less. Beaverton distributes 45 percent of its enforcement time to major arterials, 35 percent to school zones, and 20 percent to residential neighborhoods, in compliance with a city law designed to distribute enforcement in proportion to the locations where speeding problems are deemed most serious. Charlotte focuses enforcement on high speed corridors with histories of high crash rates. Scottsdale and Washington, DC, can enforce any location where speeding is considered problematic. These are the only two jurisdictions in the United States that currently conduct ASE on freeways. Oregon law specifically prohibits use of ASE on freeways.

The criteria for ASE site selection also vary between jurisdictions. In San Jose, the City Department of Transportation only conducts ASE at locations where (1) a majority of local residents approve of ASE at that location and (2) a speed survey conducted by the DOT finds that speeds are excessive. Resident approval is determined by petition signatures or approval by a neighborhood association. In Scottsdale, sites are selected by reviewing volume and crash data, speed surveys, and feedback from citizens and police officers. All potential ASE sites first undergo an engineering study to determine if speeds are excessive and if countermeasures other than ASE are appropriate and feasible. Scottsdale's contract specifies that the equipment vendor must not have input in site selection. Portland selects sites where vehicle speeds are substantially above the speed limit and where citizens have expressed concerns about speeding. All potential sites undergo an engineering study before approval. More than 300 sites in Portland have been approved for ASE, but many sites are not used because speeding is no longer a substantial problem at those locations. Beaverton selects sites based on presence of a speeding problem (at least 6% of vehicles exceeding the speed limit by more than 10 mph), assessed crash risk, mixed use of roadway, and the presence of construction. Paradise Valley site selection is primarily based upon crash history and citizen complaints. The police traffic officers have a monthly meeting to review statistics and identify locations that could benefit from ASE. Site selection in Tempe is based upon crash data provided by the city traffic engineer, citizen complaints, and traffic officer input. Special consideration is given to school zones. In Charlotte, ASE is conducted at locations on 14 corridors where speed-related crashes were known to be a serious problem before ASE began. Washington, DC, police choose sites that are known to have speeding problems and high crash rates. They also consider citizen complaints and proximity to school zones. In Boulder, ASE is used where speed violations occur too frequently for a police officer to cite most of them while conducting traditional enforcement. An engineering study is conducted for each site before it is approved for ASE.

Mobile Units

The primary method of enforcement in most jurisdictions is a mobile ASE configuration that can be transported to numerous locations. All of the jurisdictions that use mobile ASE have between one and five units, with the exception of Washington, DC, which has 12 mobile units. The majority of jurisdictions use a van or other vehicle equipped with the suite of speed monitoring and photographic equipment. This setup allows all equipment to be easily transported and provides a safe and comfortable environment for the equipment operator. In Akron, the mobile ASE equipment is transported in a vehicle, but is operated from tripods located on the roadside. ASE equipment can also be operated from

tripods in Washington, DC. In Steubenville, the mobile ASE equipment is contained in a weatherproof housing that can be secured to a pole and left to operate without human oversight.

Most mobile units operate overtly, with clearly marked vehicles, advance signage, or both. Operators in North Carolina, Oregon, Paradise Valley, Boulder, and Akron are required to place temporary signs upstream of the enforcement unit that state the speed limit and warn of speed enforcement ahead. In North Carolina, the sign must be placed within 1,000 feet of the unit. In Oregon, the sign must be placed between 300 and 1,200 feet of the enforcement unit. In Arizona, ARS 28-654 defines signage requirements for fixed and mobile ASE systems. Permanent signage is also used in many jurisdictions. In San Jose, signage is located at entrances to neighborhoods and on enforced streets. Washington, DC, does not require signage immediately upstream of an enforced site, but does have signs throughout the city that state that traffic laws are photo enforced. Oregon State law requires ASE notification signs on all major highway entrances to jurisdictions where ASE is used. In Charlotte, supplementary plaques that state “Photo Enforced” were placed below every speed limit sign on ASE-enforced corridors. Figure B-1 shows the temporary advance signage and supplementary plaque used in Charlotte and Figure B-2 shows a fixed advance sign in Boulder.



Figure B-1. Temporary ASE warning sign (left) and supplementary speed limit plaque (right) used in Charlotte, NC



Figure B-2. Fixed advance sign in Boulder, CO

Most mobile ASE vehicles are marked to indicate that they are enforcement vehicles. The van in Northwood, Ohio, has a speed limit sign on the back with an additional plaque that states “SPEED ENFORCED.” In Oregon, enforcement vehicles are required by law to have a speed display board on or near the enforcement unit that displays violators’ speeds as they approach the vehicle. One of Portland’s ASE vans is shown in Figure B-3. Mobile units in Charlotte and San Jose are marked on the sides, but not on the rear. Paradise Valley’s mobile units are inconspicuously marked. In Boulder and Washington, DC, unmarked police vehicles are used to conduct enforcement.



Figure B-3. Mobile ASE van in Portland, OR

In most jurisdictions, trained operators are required to monitor the mobile ASE system while it is in use. In addition to ensuring proper setup and operation of the equipment, operators are required to maintain event logs in most jurisdictions. Event logs are typically used to record information about the session (e.g., specific location, direction of traffic observed, start time, weather conditions, etc.) and information about specific violations (e.g., visual confirmation of violation, vehicle description, presence of emergency vehicles). Log information can be used as supplementary evidence during citation processing and adjudication.

The affiliation of van operators also differs between jurisdictions. Oregon requires that police officers operate mobile units. Portland uses sworn officers and Beaverton uses special reserve officers. Washington, DC, and Charlotte also use sworn police officers. Operators in San Jose are City Department of Transportation employees. Operators in Tempe and Boulder are police employee's equivalent to parking enforcement staff. Operators in Scottsdale and Paradise Valley are employees of the equipment vendor, Redflex.

Mobile unit operators follow a variety of procedures in different jurisdictions. Most jurisdictions operate ASE either Monday through Saturday or seven days per week. Jurisdictions that only enforce school zones during school hours operate only on days when schools are in session. The first shift of the day starts in most jurisdictions between 5:30 a.m. and 7 a.m. Most programs end mobile enforcement in the evening, between 6 p.m. and 11 p.m., though Scottsdale can conduct mobile enforcement 24 hours per day. Oregon law states that enforcement cannot be conducted at one location for more than 4 hours per day. Tempe also conducts enforcement in 4-hour shifts. In Washington, DC, shifts can be as long as 8 hours.

Fixed Units

Fixed ASE units that can conduct speed enforcement up to 24 hours per day without human supervision have been used for many years in Europe and Australia, but now are becoming increasingly common in the United States. Pole-mounted fixed units are used in Scottsdale; Paradise Valley; Washington, DC; Trotwood; Northwood; Cleveland; and Toledo. Washington, DC, has 10 fixed units located at mid-block locations on city streets. Scottsdale has a pair of midblock units to enforce both directions of an arterial road as well as 9 intersection cameras that conduct ASE and red light camera enforcement simultaneously. These combination units, sometimes called 'speed-on-green' red light cameras, are becoming popular among jurisdictions using ASE. Paradise Valley has 3 combination units, Toledo has 6, and Cleveland and Trotwood have 2 each. If a driver is photographed speeding through an intersection while the light is red, the driver will be cited for both violations in Paradise Valley, Scottsdale, Trotwood, and Northwood, but only for one of the violations in Toledo and Cleveland. Program managers in Washington, DC, and Mesa are considering adding ASE capability to some of their red light camera intersections.

Enforcement Speed Threshold

Nearly all jurisdictions use a speed threshold of 10 or 11 mph or more above the speed limit to record a violation. However, many of the jurisdictions that enforce school zones have a speed threshold of about 6 mph or more above the speed limit. Trotwood has a 16 mph threshold for its fixed camera monitoring an intersection on a State highway with a 50 mph speed limit. This threshold was selected because a substantial number of vehicles were traveling at least 16 mph above the speed limit before enforcement began.

Violation Types and Penalties

Some jurisdictions require that the *driver* of a speeding vehicle be identified while other jurisdictions only require that the *vehicle* be identified. Often this decision is driven by State legislation. For instance, Colorado, Oregon, and Arizona laws require driver identification, while Ohio, North Carolina, and Washington, DC, laws do not. In most jurisdictions where drivers are identified, penalties are consistent with the penalties assessed through traditional speed enforcement and include a fine and license sanctions. Colorado is an exception, where driver identification is required, but only civil penalties are assessed. In jurisdictions where only the vehicle is identified, violations are considered civil violations and penalties are limited to fines. Fines for ASE violations are the same as those for moving violations in Washington, DC, but Colorado, Charlotte, and all jurisdictions in Ohio with the exception of Cleveland and Northwood assess flat fines for all ASE violations, though fines may be higher in school zones. In Northwood, all speeding fines assessed by fixed units are \$90, but fines assessed by the mobile unit range from \$80 for up to 10 mph above the speed limit to \$145 for up to 35 mph above the limit. The fines assessed by the mobile unit are consistent with those issued by a police officer during a traffic stop. No jurisdiction raises fines for repeat offenses.

Detection Technologies

The majority of jurisdictions use radar in their mobile units to detect vehicle speeds, but Charlotte uses lidar and Akron use scanning lidar. Scanning lidar rapidly scans a beam horizontally across the roadway, allowing the system to monitor speeds in multiple lanes and in both directions of travel. The majority of fixed ASE units measure vehicle speed as a function of the time required for vehicles to pass over two piezo sensors embedded in the pavement. In Washington, DC, fixed units measure speed using pole-mounted radar.

Image Capture

ASE units in all jurisdictions take at least one still photo of the rear of a vehicle and jurisdictions that require driver identification also take at least one photo of the front of a vehicle. The rear photograph must show the vehicle on the road and include a legible depiction of the vehicle's rear license plate. Most mobile units take one rear photograph, but many fixed ASE units, including those in Washington, DC, take two photographs when a violation is detected; the photos show the distance that the alleged violator traveled over a short period of time, which can be used as an additional verification of the recorded speed. In jurisdictions where driver identification is required, ASE units also photograph the front of the vehicle. The front photograph must include the driver's face and might also include the front license plate.

Separate cameras are required to photograph the front and the rear of a vehicle. For mobile units, the most common arrangement is to have both cameras located in the same location, typically inside the mobile vehicle, with one camera aimed at approaching traffic and one camera aimed at receding traffic. When a violation is detected, the camera aimed at approaching traffic records a photograph of the front of the vehicle. When the vehicle passes the ASE unit, a second detection device (e.g., radar) triggers the second camera to take the photo of the rear of the vehicle. A less common approach has the two cameras separated by a distance and the cameras' fields of view converge to allow the front and rear photographs to be taken simultaneously. Although this approach does not require a second detection device to trigger the second camera, it does require at least one camera to be located remotely away from the mobile ASE unit and more effort might be required to ensure that the remote camera is properly aimed. With fixed ASE units, however, front and rear photographs are taken simul-

taneously, or almost simultaneously, by cameras separated by some distance, because the difficulty of setting up remote cameras is minimal in a fixed unit.

Currently, about half of jurisdictions are using digital photography for some or all of their ASE units, and some of the jurisdictions currently using wet film are considering switching to digital cameras. Digital photography is advantageous because of the ease of transmission and reproduction, but not all program managers are convinced that the current digital technology yields images of sufficient quality for driver identification.

Most jurisdictions report a success rate of 60 to 80 percent in capturing photographs of sufficient quality to issue a notice of violation. Precipitation and dark conditions decrease the likelihood that photos will be adequate. Operator error has also resulted in insufficient photographic evidence in many jurisdictions. During the first weeks of Scottsdale's freeway ASE demonstration, the challenges of capturing photos across up to three lanes of dense traffic contributed to inadequate photographs for about half of recorded violations.

In addition to still images, some jurisdictions capture digital video of violations. Fixed units capture video clips of red light and speed violations in Toledo and Northwood. Scottsdale has this capability on all of its fixed units and is testing the use of digital video capture in mobile enforcement units. Video clips supplement, rather than replace, still photos. In Scottsdale, an alleged violator can view a 12-second video of the violation online.

VIOLATION REVIEW

Review Process

The basic steps of the review process are similar across jurisdictions:

1. Review violation record to determine if a violation took place.
2. If the violation is valid, use the vehicle's license plate to retrieve the registration and driver's license information from motor vehicle records.
3. If registration information matches violation information (including driver appearance, if driver identification is required), send a violation notice or citation to the registered owner of the vehicle.

Additional processes may be required if the vehicle photographed is registered to a business or government agency, or if the driver of the vehicle does not match the description of the registered owner. In such cases, many jurisdictions send a violation notice to the registered owner requesting that the owner identify the driver. Some jurisdictions hold the registered owner responsible for the violation if he/she does not identify the driver or provides invalid information.

In almost all jurisdictions, the violation review process is conducted by vendor staff with the guidance and oversight of police staff. Vendor staff is usually the first to view violation data. If they determine that a violation is valid, they send the vehicle's license plate information to the State department of motor vehicles, which provides the name and address of the vehicle's registered owner along with vehicle descriptors. At this point, a second check is usually made to ensure that the vehicle records match the information seen in the violation photograph and ASE operator log. This second check might be conducted by the vendor or the police agency. It is typically the role of the police to maintain the quality of the review process and to ensure that the vendor staff follows all jurisdiction regulations. In most jurisdictions, police staff must review and approve all citations before they can be mailed to recipients. However, in some jurisdictions, including Scottsdale and Charlotte, only a fraction of recorded violations are spot-checked by police, though Scottsdale began using a full police review and approval process in July 2007.

Driver Identification versus Vehicle Identification

All United States jurisdictions follow the basic process described above, but there are some differences in the details of how the process is performed. For instance, there are additional requirements if driver identification is required. Most jurisdictions that require driver identification perform a gender

match, in which reviewers determine whether the gender of the vehicle's registered owner matches the gender of the observed driver in the violation photo. If there is a gender mismatch, the violation is dismissed or a violation notice is sent requesting that the recipient identify the driver at the time of the violation, though no jurisdiction that performs a gender match penalizes registered owners for failing to implicate another driver. Most jurisdictions that perform a gender match report that about 20 percent of photographed drivers do not match the gender of a registered owner of the vehicle.

In jurisdictions where driver identification is not required, the registered owner of the vehicle is held responsible unless he/she successfully challenges the citation in a hearing or submits a form to certify that someone else was driving the vehicle at the time. In Washington, DC, citation recipients must provide the name, address, and driver's license number of the actual driver of the vehicle along with the certification of innocence.

CITATION AND ADJUDICATION PROCESSES

In most jurisdictions, the first notice mailed to the alleged violator is a citation. The citation includes information about the violation, including date, time, location, speed limit, vehicle's recorded speed, and so forth. Most jurisdictions provide at least one still photo of the vehicle at the time of the violation. In jurisdictions where facial identification is required, there are often separate photos to show the vehicle and the driver's face. Most jurisdictions include at least one photo with the citation, but Paradise Valley and San Jose require recipients to come to a court building if they choose to view the photos. Portland sends reduced-quality black and white reproductions of violation photos to recipients. Recipients can view the original photos at a court building.

Not all jurisdictions mail a citation as the first notice to the alleged violator. San Jose and all programs in Colorado first send a courtesy letter that informs the recipient that his/her vehicle was observed speeding. The letter recipient has the option to take responsibility or identify the actual driver. The citation is sent to the driver that the recipient identified as the driver of the vehicle at the time of the violation.

The amount of time from when the violation occurs to when the notice is mailed to the recipient varies between jurisdictions. Oregon law specifies that notices must be mailed out within six days of the violation. Scottsdale originally required that notices be sent out within 30 days of the violation, but because of improved procedures currently requires that notices be mailed out within 14 days of the violation. In Tempe, citations are often sent about four weeks after the violation due to procedural inefficiencies. Scottsdale and Washington, DC, also allow citation recipients secure online access to their citations, and other jurisdictions are considering options for online citation access.

Options for Recipient of Violation Notice

In all jurisdictions, notice recipients have at least three options: (1) pay the fine, (2) certify that someone else was driving the vehicle at the time of the violation, or (3) request a hearing to challenge the citation. Fines can usually be paid by mail or in person at a government building. Some jurisdictions, including Scottsdale, Beaverton, and Washington, DC, provide an online payment method. All jurisdictions provide a form that citation recipients can fill out to certify innocence. In jurisdictions that require driver identification, recipients typically must mail a photocopy of their driver's license to prove that they were not the driver of the vehicle at the time of the violation. Some jurisdictions request that the recipient identify the actual driver of the vehicle, while others simply dismiss the citation if the driver's license photo does not match the photo of the driver at the time of the violation. In jurisdictions that do not require driver identification, recipients may be required to identify someone else as the driver at the time of the violation. A driving safety class is another option in some jurisdictions. Successful completion of a driving class allows a citation recipient to avoid having license points assessed in Medford and Scottsdale.

In all U.S. jurisdictions that use ASE, citation recipients have a right to a hearing to contest their citations. The person who presides over the hearing may be a judge, magistrate, or civilian adjudicator, depending upon State law and type of violation (civil or criminal). Typically, there are three individuals at the hearing: the adjudicator, the defendant, and a witness for the prosecution. In most jurisdictions, the witness for the prosecution of a citation issued by a mobile unit is the person who was operating

the unit at the time of the violation. If the violation was recorded by an unmanned unit, an expert witness is generally provided by the vendor or the agency that manages the program (e.g., police or department of transportation). The prosecution witness is present to attest to the validity of the citation and the integrity of the ASE process. If available, the information logged by the mobile unit at the time of the violation may also be used to support the prosecution. In Scottsdale, an ASE expert is provided by the vendor for all ASE hearings. The expert also submits as evidence photographs of the location where the violation occurred and a histogram of recorded speeds at the site to show that the defendant was traveling in excess of a reasonable and prudent speed.

If a recipient fails to respond to a notice by the due date, typically between two and four weeks after citation issuance, reminder notices are sent in most jurisdictions. Washington, DC, and Charlotte also assess late fees if fines are not paid by the due date. If there is no response after multiple notices are delivered, many jurisdictions turn the case over to a collection agency or a peace officer who conducts personal service at the expense of the citation recipient. In some jurisdictions, failure to respond to a citation can result in a default guilty judgment, inability to reregister the vehicle, or loss of driver's license. However, in Mesa and in all jurisdictions in Colorado (by State law), the citation must be dismissed if the debt collector cannot complete personal service.

Procedures for Government and Business Vehicles

Government vehicles (e.g., emergency vehicles, buses, agency vehicles) and business vehicles (e.g., commercial trucks, rental cars) pose a special challenge for an ASE program. Emergency vehicles such as police cruisers, ambulances, or fire trucks may be permitted to speed if responding to an emergency. Other official and business vehicles are rarely driven by their registered owners. Many jurisdictions have special procedures in place to ensure that the drivers of these vehicles are held responsible for unauthorized speeding. For example, in Oregon and Colorado, registered owners of business vehicles are provided with a form to identify the person who was driving at the time of the violation. In Colorado, emergency vehicle drivers are held responsible for citations unless dispatch logs indicate that the driver was responding to an emergency. Drivers of government vehicles also face agency discipline for speeding violations while using an official vehicle.

EVALUATIONS OF ASE

There have been few formal, comprehensive evaluations of the safety effects of ASE programs in the United States. Those that have been conducted are often limited in their validity due to incomplete or misrepresentative reporting of methods and data, confounding variables, lack of statistical rigor, and a lack of suitable comparison (control) data. Formal evaluations are often conducted within six months to a year of the beginning of the ASE program, but follow-up evaluations are rarely conducted to investigate longer-term effects and the effects of changes in enforcement operations. Furthermore, substantial differences between jurisdictions, their practices, and their evaluation methods preclude the ability to make meaningful comparisons between the observed effects of ASE in different jurisdictions. Despite the limitations of the evaluation methods and the need for caution when interpreting results, ASE has generally been associated with positive safety effects in the communities that have evaluated their programs. Some of the most substantial evaluations of ASE in the United States are reviewed below.

PORTLAND, OR AND BEAVERTON, OR

Oregon Senate Bill 382, which passed in 1995, authorized a two-year demonstration of ASE and mandated an evaluation of the program (Cities of Beaverton and Portland, 1997). Both cities collected speed data before and after the ASE program began at enforced sites and at control sites. In Portland, one photo radar van enforced 11 sites on residential streets and school zones. The first five months of data showed that there was no speed reduction due to ASE, so enforcement was focused on just five of the 11 streets for the remainder of the evaluation. During the four months of focused enforcement, the proportion of vehicles traveling more than 10 mph above the speed limit decreased from 18 percent to 13 percent. A slight increase in speeding was observed during the same time period at control sites.

Beaverton recorded vehicle speeds on 8 residential streets and 8 school zone streets before and after ASE began. Half of the sites were enforced sites and half were control sites. Vehicle speeds were recorded three months prior to ASE and again in the second month of enforcement. The proportion of vehicles traveling more than 5 mph above the speed limit decreased from 19 percent to 13 percent at enforced sites. A slight increase in speeding was observed during the same time period at control sites.

The project team also evaluated public awareness and acceptance of ASE. Approximately eight months after ASE began, 85 percent of Beaverton residents and 88 percent of Portland residents were aware of the demonstration project. Public approval was more widespread eight months after the program began than it was four months before it began. Over this time span, the percentage of residents who approved of photo radar in school zones increased from 81 percent to 88 percent in Beaverton, and 82 percent to 89 percent in Portland. Approval for photo radar use in residential neighborhoods increased from 68 percent to 78 percent in Beaverton, and 69 percent to 74 percent in Portland.

WASHINGTON, DC

An evaluation of the program in Washington, DC, compared vehicle speeds at seven ASE sites with speeds at eight loosely matched control sites in Baltimore, Maryland, where ASE was not conducted (Retting & Farmer, 2003). Speed data were collected in both cities one year before enforcement began and six months after enforcement began. Relative to the control sites, enforced sites experienced an 82-percent decrease in the proportion of vehicles exceeding the speed limit by more than 10 mph and a 14-percent decrease in mean speeds. However, the speed effects were recorded by ASE units during enforcement hours, so it is likely that speed reductions would have been less substantial if speeds were recorded without the presence of enforcement. This study does not address the effects of ASE on crash rates, but data from the Fatality Analysis Reporting System (FARS) do not suggest a reduction in traffic fatalities attributed to speeding since the beginning of ASE in Washington, DC, (see Table B-2). A 2003 telephone survey found that about 50 percent of Washington, DC, residents approved of the ASE program and 36 percent disapproved (Retting, 2003).

Table B-2. Traffic fatalities in Washington, DC, 2000 through 2004

	Number of traffic fatalities involved in speed-related crashes	Total number of traffic fatalities	Percent of fatal crashes that were speed-related	Traffic fatalities per 100 million vehicle miles traveled
2005	17	48	35%	-
2004	20	43	44%	1.15
2003	22	67	30%	1.87
2002	17	47	36%	1.33
2001*	19	68	28%	1.81
2000	21	48	42%	1.37

*Enforcement began in September, 2001

CHARLOTTE, NC

The North Carolina Governor's Highway Safety Program mandated an evaluation of Charlotte's ASE demonstration project, which began operating in August 2004 (Cunningham, Hummer, & Moon, 2005). Speed data was collected at 14 enforcement sites on corridors known for frequent crashes and at 11 comparison sites. Data was collected about 10 months before ASE and about three months after the start of ASE. The proportion of vehicles traveling more than 10 mph above the speed limit decreased 55 percent at enforced sites, relative to control sites. Mean speeds and 85th percentile speeds decreased by less than 1 mph at enforced sites, relative to control sites. The authors report an estimated crash reduction of about 12 percent at enforced sites compared to expectations based upon crash statistics from 2000 through 2003. Although this study is among the most statistically rigorous

evaluations of ASE to date, there are some limitations. The authors note that the short duration of the data collection during the enforcement period and the intense media focus on ASE might have influenced results. The authors also failed to account for the downward trend in crashes per million vehicle miles traveled in Charlotte, which may have led to an overestimation of the crash reduction attributed to ASE. The enforced sites and the control sites were also inadequately matched; on average, enforced sites experienced substantially higher crash rates than the control sites during the five years preceding ASE. This difference indicates that the enforced sites might have been more susceptible than the control sites to the effects of regression to the mean. The researchers also conducted focus groups with representatives from neighborhood associations, traffic engineers, and police officers. Attitudes toward ASE were generally positive, but all participants had a preexisting interest in ASE and therefore did not represent the population of Charlotte.

SCOTTSDALE, AZ

An independent evaluation of ASE was conducted on the Loop 101 freeway in Scottsdale, Arizona (Washington, Shin, & Van Shalkwyk, 2007). A total of six fixed cameras operated on a 6.5-mile section of freeway with a 65 mph speed limit, with three cameras operating in each direction of travel. Preliminary findings indicate that the ASE units led to a mean speed reduction of more than 9 mph, from 73.5 mph to 64.2 mph during off-peak travel hours, a 50-percent reduction in crashes, and a 40-percent reduction in crash-related injuries. Although rear-end crashes actually increased, there was little or no increase in injuries associated with these crashes. The relatively small sample of crashes may limit the reliability of these preliminary findings. The study authors estimate the annual economic benefits of the freeway ASE program at \$1.4 to \$10.6 million. When enforcement was suspended at the end of the demonstration period, the rate of speeding violation detection (greater than 76 mph) increased by 836 percent.

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APPENDIX C. PHOTO RED LIGHT ENFORCEMENT LEGAL CONSIDERATIONS NOTICE:

The National Highway Traffic Safety Administration and the Federal Highway Administration have compiled and distributed this information as a legal guide only. This material is not intended to be a complete treatment of every jurisdiction's laws and court decisions related to photo red light enforcement. Instead, this material includes highlights and examples of court decisions, and discusses issues that users engaged in photo red light enforcement should consider.

*Due to the dynamic nature of law enforcement and the evolution of technology, it is important that each department review this information to verify that it is consistent with applicable, current State and local law and regulations, and with department policy and procedure. **This information is NOT intended to substitute for the advice of legal counsel.** You should speak with your legal advisor, and/or local prosecutor, about the sufficiency of your department's manual, policy, curriculum, and training program on this subject. This material should not be used as the sole basis for compliance with any law or regulation, and **departments should NOT rely on this material as a legal defense** in any civil or criminal action. Remember that new court decisions and amendments to the law could change the material in this appendix.*

Photo red light enforcement is a relatively new law enforcement tool. Thus, case law is not well established. Although the few cases involving photo red light raised constitutional issues, the decisions were based upon procedural grounds, never answering the ultimate question – is it constitutional? The ruling on the motion to dismiss citations issued under San Diego, California's photo red light program (under appeal as of the preparation of this report), found the program constitutional. However, this ruling is not binding and only provides insight into the court's reasoning.

Automated speed enforcement, a relatively new enforcement tool as well, shares common legal issues with photo red light enforcement – such as the registered owner presumption, notice, procedural, constitutional issues, etc. Most automated speed cases have also tended to avoid constitutional questions. Some issues (e.g., chain of custody, service of process issues, registered owner presumption) have been addressed, but these decisions tend to be highly fact-dependent or are based on State statutes.

Many questions remain. The answer to these questions may be gleaned from cases not specific to automated enforcement. Existing case precedent dealing with evidentiary issues of older enforcement techniques will shape the use of automated enforcement evidence in the future. Law enforcement will use the same criminal procedures as are applicable to the collection (search and seizure), preservation (chain-of-custody), and discovery of other types of evidence.

It is most important to note that although the courts will borrow from established case law to determine case law regarding automated enforcement, the path will most likely be contorted. The law is known for nuances. Thus, subtle distinctions between photo red light programs may affect a court's decision and produce seeming inconsistencies. Most importantly, the classification of the photo red light violation, as either a civil or criminal violation, will dramatically effect decisions. Similarly, as in the San Diego photo red light program, the enabling statute may impact the admissibility of the evidence (see below for enabling statutes). A State's surrounding body of law and the manner in which the program is conducted will also impact the viability of the photo red light program and the success or failure of challenges to the program. Without assessing merit, the following are some of the procedural and substantive issues that may be generated by photo red light enforcement.

Procedural Issues:

- Authentication of photographs
- Chain of evidence of photographs
- Compliance with enabling statutes
- Foundation: Device reliability (maintenance, checks for accuracy, training of personnel involved in the process)

- Misuse or dissemination of photographs
- Municipal drafting
- Notice – compliance with applicable State rules for service
- Proper notice of use of photo red light enforcement (signs)
- Standing – who can bring an action, when, and where

Substantive Issues:

- Administration of the program violates Fourteenth Amendment Due Process rights
- Confrontation rights (6th Amendment right)
- Equal protection (disparate treatment for public, police, rental, corporate, out-of-State vehicles, motorists cited by police)
- Fifth amendment right to remain silent (for statutes requiring affidavit as to who was driving)
- Mailing a citation that requires appearance is a seizure subject to the 4th amendment
- Photographing a motorist is a search subject to the 4th amendment
- Pre-charging delay (delay between the violation’s occurrence and receipt of notice) – 14th amendment due process
- Presumption that the registered owner is the driver impermissibly shifts the burden of proof
- Privacy – violation of State privacy laws
- Revenue generation: selection criteria for photo red light enforcement, light phase timing
- Substantive due process - Privacy

The above are all issues that are likely to continue to be the subject of legal review and refinement. Monitoring their long-term clarification through legal proceedings is to be advised for all jurisdictions adopting red light camera enforcement systems. The remainder of Appendix C reviews current relevant case law examples and in doing so illuminates the types of issues that have been raised.

PHOTO RED LIGHT CASE LAW SYNOPSIS

***Dajani v. Governor of Md.*, No. CCB-00-713, 2001 U.S. Dist. LEXIS 982 (D. Md. Jan. 24, 2001) (unreported).**

Facts: The defendant was charged with a photo red light violation and convicted. In this jurisdiction, photo red light violations are civil and not considered moving violations. Insurance companies may not consider the convictions.

Issue: The defendant appealed to the Federal district court, requesting the court declare the statute unconstitutional. The defendant alleged the photo red light statute violated the 6th amendment’s Confrontation Clause and the 14th amendment’s Due Process Clause.

The court upheld the conviction on procedural matters (lack of Federal jurisdiction and lack of standing) without comment on the constitutional issues. The Fourth Circuit Court of Appeals affirmed the District Court’s decision. (*Dajani v. Governor of Md.*, No. 01-1179, 2001 U.S. App. LEXIS 17303 (4th Cir. 2001).

***Kovach v. District of Columbia*, 805 A.2d 957 (D.C. 2002).**

Facts: The defendant paid, without contesting, a photo red light citation. Subsequently, the police department “decided to remove the camera because it was observing an inordinate number of people running the light, which was confusing to motorists.” *Id.* at 959. Outstanding fines were dismissed, but those motorists who had paid were not reimbursed.

Issue: The defendant appealed, alleging the District’s decision to forgive some, but not all, violations violated the 5th and 14th amendments.

The court upheld the conviction because “in failing to contest the infraction, appellant effectively acknowledged liability for running the red light.” The court also rejected the defendant’s argument that the confusing placement of the stoplight created “manifest injustice.” The defendant “has no standing to challenge the decision unless . . . he was confused . . .” *Id.* at 962-63.

Structural Components Int., Inc. v. City of Charlotte, No. C0A102-200 (N.C. Ct. App., Nov. 19, 2002) (unreported – not final until expiration of rehearing period).

Facts: The president of Structural Components received a photo red light citation for one of its vehicles. In this jurisdiction, violations are civil. Structural Components contested the violation at a “review hearing.”

Issue: Upon conviction, Structural Components (plaintiff) filed suit in the superior court alleging negligence (by failing to establish reasonable guideline, failure to govern the program in a reasonable manner, and failure to provide a reasonable appeals process) and civil rights violations (State/Federal due process and equal protection).

Upon defendant’s (the City and Lockheed Martin) motion to dismiss, the court determined it lacked jurisdiction and dismissed the action. Structural Components appealed. The appellate court affirmed the trial court’s dismissal on procedural grounds (waiver of the negligence action for failure to properly State issue in appeals brief and, because one cannot recover monetary damage for a procedural due process violation involving a civil penalty, failure to state a claim). The court noted the proper avenue to challenge the constitutionality of the statute was by certiorari to the superior court (which Structural Components had not used) and the present statutory scheme provided an adequate method for challenging the legality of the program.

City of Commerce City v. Colorado, 40 P.3d 1273 (Colo. 2002).

Issue: Commerce City challenged whether the Colorado statute (COLO. REV. STAT. § 42-4-110.5 (2002)), which authorized the photo red light program, infringed upon the city’s “home-rule” powers. Noting that the program involved a “mix” of State and local concerns and, where conflicts arose, State concerns prevail, the court affirmed the validity of the program.

People v. John Allen (In re Red Light Camera Cases), No. 57927SD (Cal. Super. Ct. Aug. 2001) (order denying motion to dismiss) (available at <http://freedom.gov/auto/cases/sdmotion.asp>). This case remains under appeal. This order is presented to illustrate issues that may arise with photo red light enforcement.

Facts: Defendants in a photo red light case filed a motion to dismiss alleging failure to comply with the authorizing statute (section 21455.5 of the California Vehicle Code). In this jurisdiction, the violation is criminal and a conviction is entered onto the driver’s license record.

Issue #1: The defendants contended the photo red light program was not operated by a government agency in cooperation with a law enforcement agency as required by the authorizing statute.

The court noted “once the construction process was begun, there was very little City involvement.” The City did not inspect the project when complete and the “entire process of installation and calibration of the camera equipment, putting film into the cameras, unloading the cameras, developing the film, maintaining the camera equipment, and reviewing the photographs to make the initial determination as to whether or not there was a violation and whether the alleged violator can be identified, is done by Lockheed Martin. Further, once Lockheed determines that a citation will not [be] issue[d], that decision is not reviewed by the City.

If Lockheed decides a citation should [be] issue[d], it reviews Department of Motor Vehicles’ information . . . prints the citation, including printing the signature of the sergeant in charge of the program on the citation. The first time the City becomes involved is when the police department receives the citation which has already been printed.” The police review copies of the photographs and the digital information to determine whether the citation should be issued. If a citation is issued, Lockheed mails it . . .” The court found the City had “no involvement with, nor supervision over, with the ongoing operation of the system” and “[t]he Legislature did not contemplate such a lack of participation by the City”

when it authorized a government agency to “operate an automated enforcement system.” Thus, the program violated the statute.

Issue #2: The defendants contended the signs were inadequate.

The statute required signs “clearly indicating the system’s presence, visible to traffic approaching from all directions.” The posted signs were 24 inches by 30 inches. Based upon testimony of police officers as to the signs visibility and the lack of evidence drivers were not able to see the signs, the court found the signs adequate.

Issue #3: A related statute (section 40520 of the California Vehicle Code) required photo red light violations to be accompanied by an affidavit of non-liability, information as to what constitutes non-liability, information as to the effect of executing the affidavit, and instructions for return. The defendants alleged this procedure was “unconstitutional because it requires innocent people to testify against each other.”

The court noted the section was a legislative attempt to prevent blanket immunity for corporate and rental agencies vehicles and provides a method for the registered owner who is not driving to avoid liability. Without elaboration, the court determined the statute compliant with due process and “a legitimate exercise of the police power in an attempt to issue citations to the actual driver who violated the red light.”

Issue #4: The California Penal Code (section 959.1) requires pleadings (citations) be sworn before an officer entitled to administer oaths. The defendants alleged that “no officer swears to the facts because the signature is affixed electronically before it is sent to the police and the officer who reviews the citation is not the sergeant whose signature appears on the citation.” The reviewing officer merely stamps his ID number below the signature.

The court noted that pleading defects (i.e., minor errors in the pleading document) that do not prejudice a substantial right do not justify dismissal.

Issue #5: The defendants argued that because the City did not comply with statutory provisions regarding the “operation” of the program, all citations must be dismissed. In making its determination the court looked at the following issues.

Issue #5A: Was the delegation of authority constitutional?

Although, the City had delegated the tasks of evidence collection and determining who will not be cited to Lockheed Martin, the police retained the “ultimate authority to determine who will be prosecuted.” Thus, the delegation was not unconstitutional.

Issue #5B: Is the fee paid to Lockheed Martin a contingency fee and if so, what is the legal effect?

Because Lockheed’s payment was contingent upon a conviction, the fee was deemed a contingency fee.

The court indicated that Lockheed was “supposed to be a neutral evaluator of the evidence” and “should not have a financial interest in the outcome.” The court reasoned that because the statute mandated a government agency “operate” the program, the purpose was to guarantee, “information obtained from the red light cameras would be trustworthy. The potential conflict created by a contingent method of compensation further undermines the trustworthiness of the evidence which is used to prosecute the red light violations.”

Issue #5C: Does the delegation, without statutory authority, which operates on a contingent fee basis violate due process such that it requires a dismissal of pending actions? The court noted that the threshold question in a due process challenge to executive action is whether the behavior is “so egregious, so outrageous, that it may fairly be said to shock the contemporary conscience.” In this case, the court held the conduct did not rise to that level.

Issue #5D: Is the photo red light evidence admissible?

The court indicated that “where evidence is obtained from sources subject to legislative standards, there should be substantial compliance.” The court noted that “there is no authority in the Vehicle Code for unsupervised private operation of a red light camera system. Therefore, there is not substan-

tial compliance with the safeguards required by the statute. Such a lack of authority, combined with the collection based compensation, result in evidence lacking foundation. Without foundation, the evidence is not relevant and is not admissible.”

Accordingly, the court did not grant the motion to dismiss, but rather granted a motion to exclude the evidence.

Office of the Attorney General of the State of Texas, Opinion No. JC-0460, 2002 Tex. Op. Atty. Gen. 20 (2002).

Issue: Could a city pass an ordinance authorizing a photo red light program and could violations be civil, rather than criminal?

Based on Texas law (which deemed red light violations criminal), the Attorney General opined a city could authorize a photo red light program to identify violators, but could not make violations civil.

Office of the Attorney General of the State of Tennessee, Opinion No. 01-004, 2001 Tenn. AG LEXIS 6 (2001) (available at <http://www.attorneygeneral.state.tn.us/op/>

2001/OP/OP4.pdf).

Issue: The Attorney General’s Office was tasked with determining whether, pursuant to inherent police power, a city had authority to enact ordinances allowing photo-enforcement.

Without addressing specific constitutional issues, the Attorney General’s opinion concluded that the use of photo-enforcement did not conflict with any State statute. In a footnote, the opinion noted photo-enforcement has “generally been viewed as a permissible exercise of State and local government police power which is not violative of Federal or State constitutional provisions.”

Office of the Attorney General of the State of Nebraska, Opinion No. 00001, 2000 Neb. AG LEXIS 1 (2000) (Available at <http://www.ago.state.ne.us/opinion/index.html>).

The Attorney General’s office was tasked with assessing the constitutionality of proposed legislation involving photo red light enforcement. The Attorney General offered the following opinions:

Issue #1: Procedural Due Process

The proposed legislation permitted a defendant to contest the violation in a county court and assumed that proper notice would be provided. Thus, the Attorney General opined the proposed legislation would comply with the procedural due process requirements of reasonable notice and an opportunity to be heard.

Issue #2: Substantive Due Process

Substantive due process guarantees individuals protection from arbitrary government action. The Attorney General noted that due process is satisfied if the government has the power to act on the subject matter, if they did not act capriciously or in a discriminatory manner, and if there was a reasonable relationship to a proper governmental purpose.

The Attorney General opined that the proposed legislation complied with substantive due process because protecting public safety is a proper subject matter and the legislation was rationally related to that interest.

As to the registered owner presumption, the Attorney General opined this was also a “proper exercise of the State’s police power” similar to holding the registered owner of a parked vehicle liable.

Issue #3: Equal Protection

The Attorney General noted the similarities of the Nebraska and U.S. Constitution in that equal protection challenges not involving a suspect class or fundamental right are tested only for rationality. A Nebraska Supreme Court decision (*State v. Michalski*, 221 Neb. 380, 377 N.W.2d 510 (1985)) had held that driving is not a fundamental right, and that drivers were not a suspect class.

The Attorney General opined that the classification would be between two types of drivers: (1) those individuals cited directly by an officer who receive a criminal penalty, and have the conviction recorded

on their driver's license; and (2) those individuals cited by the photo red light program who are subjected only to civil penalties and no recordation on their driver's license.

The Attorney General noted that, although the purpose of the legislation was not set forth, the apparent purpose was to reduce the hazards of running red lights. Thus, the Attorney General concluded that, given the "wide latitude" and deference to the legislative process, the legislation met the rational basis standard and the proposed law would comply with Equal Protection rights. 45 *Red Light Camera Systems*

RELATED AUTOMATED ENFORCEMENT CASE LAW SYNOPSIS

***Oregon v. Dahl*, 57 P.3d 965 (Or. Ct. App. 2002).**

Facts: An officer operating a photo radar unit photographed the defendant's vehicle exceeding the posted speed limit. The defendant was the only registered owner. The officer observed the violation, but did not effect an enforcement stop and could not identify the driver. At trial, a witness commented that the defendant failed to provide a sworn certificate of innocence as permitted by statute.

Issue #1: The defendant contended the Oregon statute which establishes a presumption that the registered owner of a vehicle is the driver impermissibly shifts the burden of persuasion.

An Oregon statute (OR. REV. STAT § 153.030.1) provides that unless excepted, criminal procedure laws apply to traffic violations. However, a different statute (OR. REV. STAT § 153.076.2) provides that traffic violations must be proved by a preponderance of the evidence (a civil standard). Because this statute authorized a civil standard of proof, the court reasoned a civil standard also applied to the presumption. Therefore, the burden shift was permissible.

Issue #2: The defendant contended that, even if the violation is civil, the Oregon presumption statute violated due process standards.

The court noted that both U.S. Supreme Court (*Bandini Petroleum Co. v. Superior Ct.*, 284 U.S. 8 (1931)) and Oregon State court decisions required a "rational connection" between the fact proved and the ultimate fact presumed. The defendant argued that "vehicles usually have more than one key, licensed drivers outnumber registered vehicles, and vehicles commonly are borrowed or stolen, all of which indicate that vehicle are often driven by someone other than their owner." The court, although acknowledging that vehicles are often driven by non-owners, found that "it is not irrational for the legislature to presume that vehicles are often driven by owners" and "we need not decide what facts are more likely to be true; the rational connection test does not require adoption of the best or most persuasive explanation." Thus, the Oregon statute did not violate due process. *Id.* at 968-969.

Issue #3: The defendant contended a witness reference to her failure to submit a sworn certificate of innocence violated her statutory and constitutional right to remain silent.

The Fifth Amendment provides that no person "shall be compelled *in any criminal case* to be a witness against himself." The court indicated that the defendant had failed to identify how she could have been exposed to any criminal responsibility. Thus, "her constitutional right was not implicated." *Id.* at 969.

Section 810.439 provides a defendant in a traffic violation case an opportunity to avoid trial by submitting a certificate of innocence. The defendant may disregard that opportunity. The court "assumed without deciding" that the witness's comment impermissibly infringed on the defendant's statutory right, however, the court also stated "there was no indication that the trial court relied on that testimony in making its decision." Thus, the court found the defendant was not prejudiced by the comment. *Id.*

McNeil v. Town of Paradise Valley, No. 01-17003, 2002 U.S. App. LEXIS 17306 (9th Cir. Aug. 12, 2002). Not Published – Check with Court Rules. The case is presented to illustrate issues that may arise with photo red light enforcement.

Issues: McNeil appealed the district court's dismissal of alleged civil rights and Racketeer Influenced and Corrupt Organizations Act (RICO) violations premised on the issuance of an automated speed citation. The facts and basis for these contentions was not clearly set forth. However, it appears that McNeil contended the mailing of a traffic citation to the registered owner was a seizure and the process was in violation of due process.

Without elaboration, the court found municipalities cannot constitute a RICO enterprise. Further the court indicated that, because a seizure requires intentional physical control, the mailing of a citation is not a seizure. As for the due process claim, the court indicated that the challenge to the citation in municipal court was sufficient.

***Oregon v. Clay*, 29 P.3d 1101 (Or. 2001).**

Facts: An officer operating a photo radar unit photographed the defendant's vehicle speeding. The officer did not effect an enforcement stop and did not know the identity of the driver in the radar photo. Subsequently, a citation was issued and mailed to the defendant. The defendant did not appear at trial, but rather was represented by counsel. No evidence was presented on behalf of the defendant. The State presented no direct evidence that the defendant was the registered owner, but rather relied on witness testimony and an "official duty" presumption to establish the defendant as the registered owner. Upon being found guilty, the defendant appealed, contending the State had failed to prove that she was the registered owner of the vehicle. The Oregon Court of Appeals upheld the conviction and the defendant appealed to the State supreme court.

In this jurisdiction, the registered owner is presumed to be the driver – see Oregon Law 1995, Chapter 579, sections 1-3 later codified to Oregon Revised Statutes §§ 810.438-810.439. Oregon statute section 811.123 requires proof that a particular person was speeding.

Issue: The defendant contended there was insufficient evidence to permit the trier of fact to find that she was the registered owner of the vehicle.

The court indicated that it did not "perceive any evidentiary basis . . . that would permit a trier of fact to find that the defendant was the registered owner of the speeding car." *Id.* at 1103. The percipient witness could not identify the driver and there was no evidence to conclude the defendant was the registered owner (which would have invoked the presumption that the registered owner was the driver).

The court indicated that because an officer had the authority, not a duty, to send the citation, the presumption that an "official duty had been performed" was not applicable. Because they could not prove the notice had been mailed to the registered owner, they could not prove the defendant was the registered owner. Because they could not prove that the defendant was the registered owner, the presumption that the registered owner was the driver was not applicable. 47 *Red Light Camera Systems*

***Oregon v. Weber*, 19 P.3d 378 (Or. Ct. App. 2001).**

Facts: An officer operating a photo radar unit observed the defendant's vehicle speed. The unit photographed the vehicle. Subsequently, the defendant was mailed a citation.

Issue #1: The defendant contended the inscription (indicating vehicle speed) on the photograph was impermissible hearsay.

The court indicated that, by statutory definition (Oregon Evidence Code 801), hearsay is a statement by a declarant and a declarant is a person who makes a statement. A machine, not a person, made the inscription on the photograph. Thus, the hearsay rule is inapplicable.

Issue #2: The defendant contended the court should have excluded the photograph on chain-of-custody grounds because the State offered no evidence as to "who picked up the film from the station, what happened to the film, how it was handled, or what was done to it prior to the citation and photograph being returned to the police station six days later."

The court indicated that, "given the totality of circumstances, the trial court was well within its discretion in determining that there was no appreciable likelihood of alteration or tampering and that no further foundation was required." *Id.* at 381-82.

Issue #3: The defendant contended the automated speed enforcement unconstitutionally shifts the burden of proof of the offender identity.

The court ruled the defendant had failed to use the proper judicial procedure to preserve this issue.

Issue #4: The defendant contended the time delay (between the occurrence of the violation and the mailing of the notice) violated her Fourteenth Amendment due process rights.

The court indicated that “for a precharging delay to give rise to a due process violation, a defendant must show both substantial prejudice to his right to a fair trial and that the delay was done intentionally to gain a tactical advantage.” The court found the defendant failed to establish the State intentionally delayed the notice to gain a tactical advantage. *Id.* at 385.

***Bentley v. West Valley City*, 21 P.3d 210 (Utah 2001).**

Issue: Plaintiffs, who received automated speed enforcement citations, sought reimbursement of fines alleging the automated enforcement program violated Utah Code section 41-6-52.5. None of the plaintiffs had challenged the program during the criminal proceedings.

The court ruled on procedural grounds finding the plaintiffs failed to assert an “actionable civil theory under which criminal fines are recoverable.

***Anchorage v. Baxley*, 946 P.2d 894 (Alaska Ct. App. 1997).**

Facts: The defendants received automated speed enforcement citations. At trial, numerous witnesses testified to the reliability of the speed enforcement device. However, the trial court found the witnesses’ financial interest in the acceptance of speed enforcement units tainted their credibility. The magistrates found that, absent independent corroboration as to the reliability of the device, results were not admissible.

Issue: The city appealed seeking a ruling that automated speed enforcement evidence was admissible without corroboration.

The court indicated the case was moot because “we would only review the magistrates’ decision to determine whether the evidence presented would allow a reasonable fact finder to conclude that the municipality had failed to prove its case.” And, given the magistrates’ dim view of the witnesses’ credibility, no reversible error occurred. *Id.* at 598-99.

***West Valley City v. McDonald*, 948 P.2d 371 (Utah Ct. App. 1997).**

Facts: The defendant received an automated speed enforcement citation and requested a jury trial. The State amended the complaint to a lesser charge (which did not warrant a jury trial). Subsequently, the defendant was convicted.

Issue: The defendant appealed claiming that reducing the charge deprived her of her statutory right to a jury trial.

The court upheld the conviction.

***Tonner v. Paradise Valley Magistrate’s Court*, 831 P.2d 448 (Ariz. Ct. App. 1992).**

Facts: An automated speed enforcement citation was mailed to General Motors Acceptance Corporation (GMAC), the registered owner. GMAC forwarded the notice to Tonner and mailed a copy of its transmittal letter to the court. The court reissued the notice to Tonner. Tonner failed to reply or appear. The court entered an order for a civil sanction (fine).

Issue: Tonner filed an action to vacate the sanction arguing lack of personal jurisdiction based upon improper service of notice.

The court indicated that under Arizona civil procedure rules (ARIZ. R. CIV. P. 4.1c), service is not complete unless acknowledged. As Tonner failed to reply, service was not complete. Without service, the court lacked jurisdiction by which to sanction Tonner.

Office of the Attorney General of the State of South Carolina, (No Opinion No.) 2002 S.C. AG LEXIS 209 (2002).

The Attorney General re-evaluated¹ the use of automated traffic enforcement and concluded that “general case law and other authority reviewed herein support the conclusion that a properly drafted statute authorizing use of photo-radar or similar forms of automated traffic enforcement would pass constitutional muster. These authorities have reviewed automated traffic enforcement from a variety of constitutional perspective include the Due Process and Equal Protection Clauses, the 4th amendment’s protection against unreasonable searches and seizures, the 6th amendment’s right to present

an adequate defense, as well as the federal and State constitution's right to privacy. The general consensus is that automated traffic enforcement is constitutional."

"Of course, the constitutionality of any statute authorizing automated traffic enforcement would depend, in part, upon a well drafted statute."

See also:

1. Office of the Attorney General of the State of Mississippi, Opinion No 2000-0068, 2000 Miss. AG LEXIS 113 (2000) indicated that, prior to implementing a photo red light program, a municipality would need statutory authority allowing citation of the registered owner of a violator's vehicle.
 2. Office of the Attorney General of the State of South Carolina, 1996 S.C. AG LEXIS 54 (1996) regarding municipalities use of photo-radar in South Carolina. Though the opinion notes that no State statute prohibited photo-radar enforcement, the Attorney General nevertheless expressed concerns about the registered owner presumption, concluding that the Legislature was the appropriate authority to authorize use of the presumption.
 3. Office of the Attorney General of the State of Montana, 45 Op. Atty Gen. Mont. 7 (1993) regarding a municipality enacting a photo-radar ordinance. The Attorney General's opinion noted "a presumption exists that legislative acts are constitutional" and "the constitutionality of a proposed legislative act is not an appropriate subject for an Attorney General's Opinion."
 4. Office of the Attorney General of the State of Alabama, 239 Op. Atty Gen. Ala. 52 (1995) regarding the use of photo radar devices. The Attorney General indicated that, "while the use of such devices is legal, the use of such devices to mail speeding citation to motorists would not comply with substantive or procedural requirement of Alabama law."
 5. Office of the Attorney General of the State of Georgia, No. 82000-7, 2000 Ga. AG LEXIS 13 (2000) concluding the "Home Rule Act" allowed municipalities to enact photo enforcement programs.
 6. Office of the Attorney General of the State of Georgia, No. U2000-12, 2000 Ga. AG LEXIS 23 (2000) concluding counties may enact ordinances permitting photo enforcement and whether such devices may be used within the State highway system.
- ¹ See Office of the Attorney General of the State of South Carolina, 1996 S.C. AG LEXIS 54 (1996).
7. Tarr, Andrew N. J., *Picture It: Red Light Cameras Abide by the Law of the Land*, 80 N.C. L. REV., 1879 (2002).
 8. Lehman, Mark. *Are Red Light Cameras Snapping Privacy Rights?*, 33 U. TOL. L. REV., 815 (2002).
 9. Naumchi, Steven Tafoya, *Review of Selected 1998 California Legislation, Transportation and Motor Vehicles: Stop Photographic Enforcement of Red Lights*, 30 MCGEORGE L. REV., 833 (1999).
 10. Stanek, Thomas M., Comment, *Photo Radar in Arizona: Is it Constitutional?*, 30 ARIZ ST. L.J., 1209 (1998).

AUTOMATED ENFORCEMENT RELATED STATUTES AND ORDINANCES

Model Statute:

National Committee of Uniform Traffic Laws and Ordinances, *Automated Traffic Law Enforcement Model Law* – www.ncutlo.org/autoenforce622.htm.

State Statutes:

1. California Vehicle Code– CAL. VEH. CODE §§ 210, 21455.5, 21455.6, 40518, 40520 (2003).
2. Colorado Revised Statutes – COLO. REV. STAT. § 42-4-110.5 (2002).
3. Delaware Code Annotated - DEL. CODE. ANN. TITL 21 § 4101(d) (2002).
4. Official Code of Georgia Annotated – GA. CODE. ANN. § 40-6-20 (2002).
5. Illinois Compiled Statutes Annotated - 625 ILL. COMP. STAT. ANN. 5/1-105.5, 5/11-306 (2002).
6. Annotated Code of Maryland – MD. CODE ANN. TRANSP. § 21-202.1 (2002).
7. Nevada Revised Statutes Annotated – NEV. REV. STAT. ANN. § 484.910 (2002).
8. New Jersey Annotated Statutes – *N.J. STAT. ANN. § 39:4-103.1* (2002).
9. New York Consolidated Laws Service – N.Y. VEH. & TRAF. LAW § 1111-a (2002).
10. General Statutes of North Carolina – N.C. GEN. STAT. § 160A-300.1 (2002).
11. Oregon Revised Statutes – OR. REV. STAT. §§ 810.434 - 36, 438 - 439 (2001).
12. Pennsylvania Consolidated Statutes - 75 PA.C.S. §§ 102, 3116 (2002).
13. Utah Code Annotated –UTAH CODE ANN. § 41-6-52.5 (2002).
14. Code of Virginia – VA. CODE. ANN. §§ 46.2-819.1, 833.01 (2002).
15. Wisconsin Statutes - WIS. STAT. § 349.02 (2002).

Ordinances:

1. TOLEDO, OHIO, MUN. CODE § 313.12 (1999) and ORDINANCE NO. 451-00 (2000).
2. DAYTON, OHIO, REV. CODE OF GEN. ORDINANCES NO. 70.121 (2002).
3. DISTRICT OF COLUMBIA CODE ANN. §§ 50-2209.01, 03 (2002).
4. CHARLOTTE, N. C., ORDINANCE NO. 966 (1998) – see

www.charmeck.org/Departments/transportation/special+programs/city+ordinance.asp

APPENDIX D: ASE UNIT SETUP CHECKLIST FOR BEAVERTON, OREGON



City of Beaverton Photo Radar Deployment Form

DATE: _____ VEHICLE: _____

OPERATOR NAME: _____ DPSST #: _____

LOCATION CODE: _____ LOCATION DESCRIPTION: _____

OF LANES ENFORCED: _____ SPEED LIMIT: _____ TRIGGER SPEED: _____

CHECKLIST (Check In Sequence)

Surveying the Site

- Confirm location of the van and offense is with the City limits of Beaverton
- Verify that no large, metallic objects in radar's field of view
- Set out warning sign between 100 – 400 yards before Photo Radar Van
- Verify that sunlight is not shining directly into camera lens

Positioning the Vehicle

- Park the vehicle facing the direction of travel
- Ensure vehicle is parallel with the road

Radar Alignment

- Verify that the radar is locked in place.
- Level the radar unit by checking the position of the level bubble and using the key and level provided.

Starting the Deployments

- Turn main power switch ON"
- Enter your operator's details (user name and password)
- Enter the deployment details (Settings)
- Take a Manual Shot to test the cameras.
- Take next vehicle shots to test image alignment
- Verify the correct camera settings
- Verify that both the flashes fire properly
- Press the Start button to begin the deployment

Ending the Deployment

- Record statistical data as displayed
- Press the Shut Down button to shut down system
- Turn the power switch to "OFF" position
- Collect warning signs

Approach Sign _____ **feet** **Exit Sign** _____ **feet**

<p>DEPLOYMENT TIMES: [From Operating Screen]</p> <p>Deployment Start Time: _____ (Hour: Mm)</p> <p>Deployment End Time: _____ (Hour: Mm)</p> <p>TRAFFIC: LIGHT___ MODERATE___ HEAVY___</p> <p>WEATHER: _____</p> <p>COMMENTS:</p> <p>_____</p> <p>_____</p>	<p>STATISTICAL INFORMATION</p> <p>TRAFFIC COUNT: _____</p> <p>IMAGE COUNT: _____</p>
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I, BEING FIRST DULY SWORN, DEPOSE & SAY: I HAVE BEEN PROPELY TRAINED & QUALIFIED TO OPERATE THE RTS SPEED CAMERA SYSTEM. ON THE DATE & TIME RECORDED ABOVE I PARKED THE SPEED CAMERA SYSTEM AT THE ABOVE LOCATION & USING THE CORRECT PROCEDURE, OPERATED THE TRAFFIC CAMERA TO MONITOR TRAFFIC. I CERTIFY THAT UPON REASONABLE GROUNDS I BELIEVE THAT EACH OF THE DEFENDANTS COMPLAINED AGAINST ON THIS DATE UPON THE BASIS OF THE TRAFFIC CAMERA COMMITTED THE ACT DESCRIBED CONTRARY TO LAW & I HAVE CAUSED A NOTICE WITH A COPY OF THE COMPLAINT TO BE MAILED TO EACH DEFENDANT.

APPENDIX E: SAMPLE CITATION FOR CHARLOTTE, NORTH CAROLINA (FRONT)



City of Charlotte
Safe Speed Camera Enforcement Program
 229 South Brevard Street, Suite 102, Charlotte, NC 28202
 (704) 375-3177



NOTICE OF CITATION AVISO DE CITACION

Payment Due Date: 09/07/2004
 Fecha de vencimiento de pago

Citation Number 3710927
 Numero de citacion

Internet Password: 7C9VSI
 Contraseña del Internet

Amount ~ Cantidad: \$50.00



Charlotte, NC 28227

Amount Paid ~ Cantidad pagada

Contact us on the Internet for
 citation information and payments at:

<https://onlineviolation.com/charlottenc/speeding>

Pongase en contacto con nosotros por Internet para
 obtener informacion sobre citaciones y pagos en:

<https://onlineviolation.com/charlottenc/speeding>

Detach here and return the above portion with your payment
 Separe aqui la hora y devuelva la parte superior con su pago

Speed limit limite de velocidad	Speed Velocidad	Vehicle Tag Number Numero de calcomania del vehiculo	Date / Time Fecha / Hora	Location of Violation Ubicacion del vehiculo
45.00	59.00	[REDACTED]	08/03/2004 11:54 AM	3500-3700 Independence Blvd west

On August 03, 2004 at 11:54 AM your vehicle was photographed (see below) while exceeding the posted speed limit in violation of Charlotte City Code Section 14-203. The civil fine for this violation is \$50.00. No points will be assessed against your driving record or insurance as a result of this violation. Please see the reverse side for payment and the process to appeal this citation.

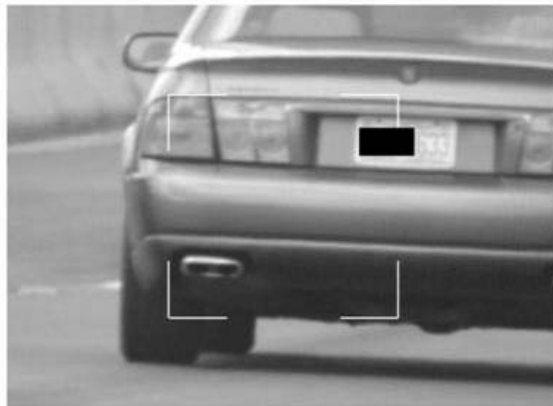
This program has been initiated to increase roadway safety and reduce accidents, injuries and fatalities.

Important Notice: Failure to pay this civil fine by the due date shown above will result in an additional late penalty of \$50.00. Request for appeal, transfer of responsibility, or payment must be received prior to the due date to be considered. On-line payments and appeal is available at the internet address noted above.

El August 03, 2004 a las 11:54 AM su vehiculo fue fotografiado (vease abajo) mientras excedia el limited anunciado de velocidad en violacion a la Seccion delCodigo de la Ciudad de Charlotte 14-203. La multa civil por esta violacion es de \$50.00. No se agregaran puntos a su historial de infracciones de transito o a su seguro como resultado de esta violacion. Favor de ver el lado reverso para saber sobre el pago y el proceso de apelacion de esta citacion.

Este programa se ha iniciado para aumentar la seguridad de transito y para reducir accidentes, lesiones y muertes.

Aviso importante: No pagar esta multa civil antes de la fecha de vencimiento arriba tendra como resultado una multa por retraso de \$50.00. Se deben recibir las peticiones por apelacion, las transferencias de responsabilidad, o los pagos, antes de la fecha de vencimiento para que se tomen en consideracion. Los pagos y las apelaciones en linea estan disponibles en la direccion del Internet escrita arriba.



Safe Speed Saves Lives in Charlotte ~ Las velocidades seguras salvan vidas en Charlotte

APPENDIX E: SAMPLE CITATION FOR CHARLOTTE, NORTH CAROLINA (BACK)

PAYMENT OPTIONS	APPEAL REQUEST	AFFIDAVIT TRANSFERRING RESPONSIBILITY*
<p>Checks or money orders should be made payable to the City of Charlotte. Do not send cash. If you fail to remit payment or contest the citation within 30 days of the date of the citation, a \$50.00 penalty will be added to the total amount due. Make sure your name, address, license number and citation number are on your check or money order.</p> <p>Pay online with VISA or Mastercard at: https://onlineviolation.com/charlottenc</p> <p>Mail check or money order to: City of Charlotte 229 South Brevard Street Suite 102 Charlotte, NC 28202</p> <p>Walk-in payments may be made at: 229 South Brevard Street, Suite 102 Charlotte, NC 28202</p> <p>(Cash, Check, MasterCard and Visa accepted)</p>	<p>An appeal request must be accompanied by a deposit of \$50, which shall constitute a bond. You will be contacted to schedule a hearing before a hearing officer. If the hearing officer upholds the citation, your bond will be used to satisfy your civil penalty obligation. If the citation is dismissed, your bond will be returned.</p> <p>Basis for contesting citation: Only those reasons stated in this appeal request may be argued at the hearing. (You may attach a separate document if the space provided is not sufficient.)</p> <p>_____ Your Signature</p> <p>_____ Telephone (_____) _____</p> <p style="text-align: center;">-----</p> <p style="text-align: center;">SOLICITUD DE APELACIÓN</p> <p>Una solicitud de apelación debe estar acompañada por un depósito de \$50.00, lo cual constituirá una garantía. Se pondrán en contacto con usted para programar una audiencia ante un funcionario de audiencias. Si el funcionario de audiencias apoya la citación, su garantía se usará para cumplir con su obligación de la multa civil. Si se rechaza la citación, su garantía se devolverá.</p> <p>La impugnación de la citación se basa en: Sólo las razones declaradas en esta solicitud de apelación se pueden argumentar en la audiencia. (Puede agregar un documento separado si el espacio proporcionado no es suficiente.)</p> <p>_____ Su firma</p> <p>_____ Teléfono (_____) _____</p> <p>_____ _____ _____ _____</p>	<p>I, _____ (print or type name), being duly sworn, state that I was not driving the vehicle identified in this Notice of Citation at the time of the violation. The name and address of the person or company who had the care, custody and control of the vehicle at the time of the violation is:</p> <p>Name _____ Address _____</p> <p>* I understand that a new Notice of Citation will be issued to the person I identified.</p> <p>Your Signature _____ Sworn to and subscribed before me this _____ day of _____, 200____, _____ Notary Public</p> <p>My Commission Expires: _____</p> <p style="text-align: center;">-----</p> <p style="text-align: center;">DECLARACIÓN JURADA DE TRANSFERENCIA DE RESPONSABILIDAD*</p> <p>Yo _____ (escriba su nombre en letra de molde o en máquina de escribir), estando bajo juramento, afirmo que no estaba manejando el vehículo identificado en este Aviso de Citación en el momento de la violación. El nombre y dirección de la persona o compañía que tenía el cargo, la custodia y el control del vehículo en el momento de la violación es:</p> <p>Nombre _____ Dirección _____</p> <p>* Entiendo que un nuevo Aviso de Citación se emitirá a la persona que identifiqué.</p> <p>Su firma _____ Jurada y suscrita ante mí el _____ del _____ 200____, _____ Notario Público</p> <p>Se vence mi mandato: _____</p>
<p>OPCIONES DE PAGO</p> <p>Los cheques y los giros bancarios deben ser pagaderos a la Ciudad de Charlotte. No envíe dinero en efectivo. Si no remite su pago o impugna la citación dentro de 30 días desde la fecha de la citación, se agregará una multa de \$50.00 a la cantidad total a pagar. Asegúrese que su nombre, dirección, número de licencia y número de citación estén en su cheque o giro bancario.</p> <p>Pague en línea con VISA o Mastercard en: https://onlineviolation.com/charlottenc</p> <p>Envíe el cheque o giro bancario a: City of Charlotte 229 South Brevard Street Suite 102 Charlotte, NC 28202</p> <p>Se puede pagar en persona en: 229 South Brevard Street, Suite 102 Charlotte, NC 28202</p> <p>(Se aceptan cheques, dinero en efectivo, MasterCard y Visa)</p>	<p>OPCIÓN DE APELACIÓN</p> <p>Una solicitud de apelación debe estar acompañada por un depósito de \$50.00, lo cual constituirá una garantía. Se pondrán en contacto con usted para programar una audiencia ante un funcionario de audiencias. Si el funcionario de audiencias apoya la citación, su garantía se usará para cumplir con su obligación de la multa civil. Si se rechaza la citación, su garantía se devolverá.</p> <p>La impugnación de la citación se basa en: Sólo las razones declaradas en esta solicitud de apelación se pueden argumentar en la audiencia. (Puede agregar un documento separado si el espacio proporcionado no es suficiente.)</p> <p>_____ Su firma</p> <p>_____ Teléfono (_____) _____</p> <p>_____ _____ _____ _____</p>	<p>DECLARACIÓN JURADA DE TRANSFERENCIA DE RESPONSABILIDAD*</p> <p>Yo _____ (escriba su nombre en letra de molde o en máquina de escribir), estando bajo juramento, afirmo que no estaba manejando el vehículo identificado en este Aviso de Citación en el momento de la violación. El nombre y dirección de la persona o compañía que tenía el cargo, la custodia y el control del vehículo en el momento de la violación es:</p> <p>Nombre _____ Dirección _____</p> <p>* Entiendo que un nuevo Aviso de Citación se emitirá a la persona que identifiqué.</p> <p>Su firma _____ Jurada y suscrita ante mí el _____ del _____ 200____, _____ Notario Público</p> <p>Se vence mi mandato: _____</p>

APPENDIX F: LIST OF JURISDICTIONS USING ASE PROGRAMS

Organization	Location	Phone
San Jose Department of Transportation	San Jose, CA	408-975-3725
Charlotte-Mecklenburg Police Department	Charlotte, NC	704-336-4197
Portland Police Bureau	Portland, OR	503-823-2151
California Highway Patrol	Sacramento, CA	916-657-9090 ext 4022
Tempe Police Department	Tempe, AZ	480-350-8065
City of Boulder – Transportation Division	Boulder, CO	303-441-4054
Scottsdale Police Department	Scottsdale, AZ	480-312-7014
Metropolitan Police Department	Washington, DC	202-576-9260
Chevy Chase Village Police Department	Chevy Chase, MD	301-654-7300
Montgomery County Police Department	Montgomery County, MD	301-840-2881

This list is comprised of jurisdictions that participated in an expert panel convened to assist in the development of the Speed-Enforcement Camera Systems Operational Guidelines. They are available to assist with concerns pertaining to ASE matters.

DOT HS 810 916
March 2008



U. S. Department of Transportation
**National Highway Traffic Safety
Administration**
Federal Highway Administration

