



Identifying Issues Related to Deployment of Automated Speed Enforcement

Final Report

Prepared by:

Frank Douma
Lee Munnich
Thomas Garry

**Humphrey School of Public Affairs
University of Minnesota**

Joe Loveland

Loveland Communications

CTS 12-23

Technical Report Documentation Page

1. Report No. CTS 12-23	2.	3. Recipients Accession No.	
4. Title and Subtitle Identifying Issues Related to Deployment of Automated Speed Enforcement		5. Report Date July 2012	
		6.	
7. Author(s) Frank Douma, Lee Munnich, Joe Loveland, Thomas Garry		8. Performing Organization Report No.	
9. Performing Organization Name and Address State and Local Policy Program Humphrey School of Public Affairs University of Minnesota 301 19th Avenue South Minneapolis, Minnesota 55455		10. Project/Task/Work Unit No. CTS Project #2012045	
		11. Contract (C) or Grant (G) No.	
12. Sponsoring Organization Name and Address Intelligent Transportation Systems Institute Center for Transportation Studies University of Minnesota 511 Washington Avenue SE, Suite 200 Minneapolis, Minnesota 55455		13. Type of Report and Period Covered Final Report	
		14. Sponsoring Agency Code	
15. Supplementary Notes http://www.its.umn.edu/Publications/ResearchReports/			
16. Abstract (Limit: 250 words) Automated speed enforcement (ASE) has been shown to be one of the most effective strategies for reducing speeding by vehicles and improving road safety. However, the perception that ASE is unpopular and controversial has limited its use by policymakers in the United States. This report investigates whether this perception is justified in Minnesota by conducting a public opinion survey of Minnesota residents about their views of ASE. In light of the survey results, the report then examines the legal and related political obstacles for deploying ASE in Minnesota, and outlines a strategy for moving forward with ASE in Minnesota in select areas.			
17. Document Analysis/Descriptors Automated enforcement, Public opinion, Highway safety, Speeding, Speed limits, Traffic laws, Traffic law enforcement, Pilot studies, Legislation		18. Availability Statement No restrictions. Document available from: National Technical Information Services, Alexandria, Virginia 22312	
19. Security Class (this report) Unclassified	20. Security Class (this page) Unclassified	21. No. of Pages 44	22. Price

Identifying Issues Related to Deployment of Automated Speed Enforcement

Final Report

Prepared by:

Frank Douma
Lee Munnich
Thomas Garry

Humphrey School of Public Affairs
University of Minnesota

Joe Loveland

Loveland Communications

July 2012

Published by:

Intelligent Transportation Systems Institute
Center for Transportation Studies
University of Minnesota
200 Transportation and Safety Building
511 Washington Ave. S.E.
Minneapolis, MN 55455

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the information presented herein. This document is disseminated under the sponsorship of the Department of Transportation University Transportation Centers Program, in the interest of information exchange. The U.S. Government assumes no liability for the contents or use thereof. This report does not necessarily reflect the official views or policies of the University of Minnesota.

The authors, the University of Minnesota, and the U.S. Government do not endorse products or manufacturers. Any trade or manufacturers' names that may appear herein do so solely because they are considered essential to this report.

Acknowledgments

We wish to acknowledge those who made this research possible. The study was funded by the Intelligent Transportation Systems (ITS) Institute, a program of the University of Minnesota's Center for Transportation Studies, and the Minnesota Department of Transportation. Financial support was provided by the United States Department of Transportation's Research and Innovative Technologies Administration (RITA).

We would like to extend thanks to those who participated on the advisory panel for this project: Peter Buchen; Max Donath; Elliot Martin; Major John Mock; Senator Kathy Sheran; Nicole Morris; Nick Thompson; and David Thorpe. Finally, we would like to extend our gratitude to Susan Shaheen at the University of California, Berkeley, for insightful reviews and commentary.

Table of Contents

Chapter 1. Introduction	1
Chapter 2. Background and Literature Review.....	3
A. Speed Limits and Automated Enforcement.....	3
B. Safety Impacts of ASE	3
C. The Politics of ASE	4
Chapter 3. Survey of Public Opinion in Minnesota.....	7
A. Survey Findings.....	7
B. Summary of Survey Findings	10
Chapter 4. ASE and the Legal Context in Minnesota	11
A. ASE and Conflicts with Existing Law in Minnesota.....	11
B. Constitutional Restraints on ASE Authorizing Legislation.....	12
C. The Impact of the Invalidation of Minneapolis’s Red-Light Camera Program	13
D. Photograph of the Driver versus No Photograph of the Driver.....	13
E. At What Speeds are Citations Issued?	14
F. The Role of Local Authorities	15
G. Other States Provide Statutory Models	15
Chapter 5. Strategy for Moving Forward with ASE in Minnesota.....	17
A. Prepare Draft Legislation Authorizing ASE Pilot Projects in School and Work Zones	17
B. The Legislation Should Contain the Features that Further Increase Public Acceptance and Limit Legal Vulnerability	18
C. Seek Buy-In On the Draft Legislation from Key Stakeholders.....	19
Chapter 6. Conclusion	21
References	23
Appendix A. Public Opinion Survey Instrument	

List of Tables

Table 1. Impact of Location on Support for ASE (n=601)	8
Table 2. ASE Location & Public Support: Minnesota versus U.S. Public Opinion	9
Table 3. Impact of Project Variables on Likelihood to Support ASE (n=601).....	10
Table 4. Driver Photo versus No Driver Photo.....	14
Table 5. Common ASE Design Elements in State Authorizing Statutes.....	16

Executive Summary

Automated speed enforcement (ASE) has been identified as one of the most effective strategies for reducing speeding and improving road safety. ASE involves using roadside technologies that combine radar and image capturing capabilities. These technologies identify when a vehicle is speeding and capture an image of the vehicle's license plates and, if called for, an image of the vehicle's driver. Speeding citations are then mailed to the vehicle's registered owner or, alternatively, the identified driver of the vehicle.

The perception that ASE is unpopular and controversial has limited its use by policymakers in the United States. However, a public opinion survey conducted for this report shows there is major support for ASE in Minnesota, which is in line with national surveys. This support in Minnesota increases significantly when deployment is limited to school (81% net supportive) and construction zones (83% net supportive), and additional design elements are included in the program's design (e.g., ASE revenue dedicated to road safety programs).

Deploying ASE in Minnesota would require authorizing legislation and the legislature would need to address certain legal issues with ASE in such legislation. This report recommends that legislation be drafted to authorize pilot testing of ASE in school zones and MnDOT work zones, to assess not only the safety impact of ASE but also to evaluate cost-effectiveness, reliability and public acceptance. Though authorizing only pilot projects, the legislation should include the full set of ASE program design elements used in other jurisdictions to further increase the public's acceptance of ASE as well as to reduce the risk of legal challenges.

Once draft legislation is prepared, support from key legislators and stakeholders, both within and outside state government, should be sought to move the legislation forward.

Chapter 1. Introduction

Speeding continues to be a leading contributing factor in motor vehicle crashes and fatalities. In 2010 alone, over 10,000 people lost their lives in speed-related crashes in the United States. (1) About one-third of all crash-fatalities in the U.S. are speed related. (2) In Minnesota, between 2008 and 2010, illegal or unsafe speed was a contributing factor in 266 fatal crashes, resulting in 296 deaths and crash-related costs of over \$360 million. (3) In 2010, driving at an illegal or unsafe speed was the driver behavior most frequently cited by law enforcement as a contributing factor to fatal crashes in Minnesota. (4) Thus, in Minnesota as elsewhere, speed control remains a key focus for improving road safety.

Automated speed enforcement (ASE) has been identified as one of the most effective strategies for reducing speeding. (5) ASE involves using roadside technologies, either fixed or portable, that combine radar and image capturing capabilities. These technologies identify when a vehicle is speeding and capture an image of the vehicle's license plates and, if called for, an image of the vehicle's driver. Speeding citations are then mailed to the vehicle's registered owner or, alternatively, the identified driver of the vehicle.

ASE is a complement, not a replacement, for traditional speed enforcement by police officers. ASE extends the scope of speed control efforts beyond the limited number of highway miles officers can patrol at any one-time, given their staffing and resource limitations. Moreover, ASE increases safety for law enforcement by allowing more regular speed enforcement in areas, such as construction zones, where it can be hazardous for officers to pull over vehicles.

Despite its advantages, ASE is used far more widely outside of the U.S. Currently, ASE is used in only 14 states and Washington D.C. (6) ASE's use in the U.S. has been limited, in part, by a perception among policymakers that the technology is controversial and unpopular with the general public. (7) However, national public opinion surveys show there is majority support for ASE, and support increases for deployment in select locations (e.g., in school zones). (8)

ASE is not currently used in Minnesota, and there are no state laws regarding its use. This report investigates the potential for deploying ASE in Minnesota, specifically, the level of public support for ASE in Minnesota, and the legal obstacles that would need to be overcome to have ASE in Minnesota. The report then offers a strategy for moving forward with ASE in Minnesota.

The report proceeds in six chapters. Chapter 2 reviews the literature on the safety impacts of ASE. It also outlines the political objections that have arisen with respect to ASE in the U.S. Chapter 3 provides the results of a Minnesota public opinion survey about ASE undertaken for this report. The next chapter assesses the legal and related political obstacles for ASE in Minnesota. Chapter 5 then outlines a strategy for proceeding with ASE in Minnesota in select areas. The final chapter provides a brief conclusion.

Chapter 2. Background and Literature Review

A. Speed Limits and Automated Enforcement

As noted above, driving faster than the posted speed limit, or simply too fast for conditions, is not only illegal but dangerous. As speed increases, the likelihood of crashing increases. (9) Even exceeding the average speed of surrounding traffic increases the chance of a crash occurring. (10) Moreover, the severity of crash injuries increases with speed. (11)

For these basic reasons, states have acted to prevent speeding, and the resulting fatalities and injuries, by passing laws regulating vehicle speeds. Research shows, though, that many drivers do not adhere to speed limits. (12)

In Minnesota, default maximum speed limits are statutorily set by road type and location (e.g., residential or urban areas). (13) Under some circumstances local governments and the Minnesota Department of Transportation (MnDOT) can modify these limits, including temporarily in work zones. (14)

These speed laws are most commonly enforced through speeding tickets issued by a law enforcement officer directly operating a speed-measuring device, such as radar. (15) However, given the limited number of officers and hours they can be deployed enforcing speed limits, a number of states have allowed speed limits to be enforced through the use of ASE technologies. The goal of ASE is to increase both the actual and perceived chances of speeders being caught by increasing the portion of roadways subject to enforced speed controls at any one time. (16)

ASE devices use radar to determine the speed of a vehicle, typically at a single spot on the road (as opposed to over a stretch of road). If the speed detected is greater than a pre-determined threshold, cameras are automatically triggered. The cameras capture images of the speeding vehicle's license plates and, in some instances, images of the driver. The date, time, and location are recorded as well. Speeding tickets are then issued through the mail to the registered owner of the identified vehicle or, in some cases, to the driver that has been identified.

ASE technologies can be either fixed or mobile. Fixed units are typically mounted in boxes on roadside posts or other infrastructure. Mobile units can be outfitted in police vehicles or deployed on trailers or standalone tripods.

B. Safety Impacts of ASE

ASE has been more widely deployed outside of the U.S., particularly in Europe. A number of research studies have shown ASE's potential for speed reduction and/or safety improvements. For example, Pilkington and Kinra indicate that the studies they reviewed in Europe found a 5% to 69% reduction in crashes within the immediate vicinity of camera sites, a decrease in injuries of 12% to 65%, and a 17% to 71% decrease in fatalities. (17)

Similarly, a 2010 comprehensive review of 35 international before and after studies (including four from the U.S.) concluded that ASE is effective at reducing speeds and road traffic injuries and deaths. (18) The reviewed studies reported an 8% to 70% reduction in the proportion of

speeding vehicles in the vicinity of ASE sites, with most countries seeing a 10% to 35% reduction. All crash types fell a reported 8% to 49% and crashes resulting in fatalities or serious injuries similarly fell 11% to 44%. Studies of longer duration showed that these positive trends resulting from ASE deployment either improved or held steady over time.

There have been several studies focused on specific ASE deployments in the U.S. An Insurance Institute for Highway Safety study showed that six months after the implementation of mobile speed cameras within the District of Columbia the average vehicle speed was reduced by about 14%, and the number of vehicles traveling more than 10 miles per hour (mph) over the posted speed limit decreased by 82%. (19) Scottsdale, Arizona conducted a 9-month pilot study of its automated enforcement cameras along an 8-mile segment of high-speed (i.e., 65 mph posted speed limit) urban freeway. It was shown that the proportion of drivers traveling along this segment at more than 75 mph declined from 15% to about 1% or 2%. However, this percentage of excessive speeders almost returned to its original level (12%) when the system was discontinued. (20) Illinois pilot-tested ASE in two work zones, Interstate 64 in 2006 and Interstate 55 in 2007, where it found use of the technology reduced the speeds of cars and trucks by 3 to 8 mph in the work zones. (21) In Washington state, recent ASE pilot projects in high traffic urban areas in Seattle and Tacoma showed both reductions in average speed and the number of speeding infractions. (22)

Several other, more general U.S. reviews have similarly found that ASE improves highway safety. The most broad-based was NCHRP Report 622. (23) Shaheen et al. (24) and Adams and VanDrasek (25) reviewed ASE deployment studies in examining the potential for deployment in California and Minnesota, respectively.

In 2009 and 2010, researchers at the Center for Excellence in Rural Safety (CERS) at the University of Minnesota's Humphrey School of Public Affairs, conducted a review and analysis of previous research on public policies that have proven effective in reducing highway fatalities. (26) The analysis drew upon two significant reports released in 2008 that focused on the effectiveness of roadway safety improvement measures related to human behavior. (27) This review estimated that ASE would have saved 16 lives in Minnesota alone in 2008. (28) Further, the CERS studies concluded that there is strong evidence that, along with other policies, ASE would be effective in reducing fatalities on rural roads.

C. The Politics of ASE

ASE is used currently in 111 communities in the U.S., across 14 states. States with ASE typically have state laws authorizing the use of ASE. On the other hand, about eight states have enacted some form of prohibition ASE. Minnesota, like a majority of states, has no laws regarding the use of ASE and is not currently using ASE.

There is a perception among journalists and policymakers that ASE is controversial and unpopular with the general public. There are a number of voiced criticisms of ASE. They include:

- ASE is more about government revenue generation, than safety improvement.
- ASE represents an invasion of privacy and “Big Brother” style of law enforcement.
- Drivers dislike the delay between the violation and receiving the ticket.
- Drivers prefer to have in-person contact with a ticketing police officers.
- Machines should not do police work.
- ASE equipment can make ticketing mistakes that are costly and time consuming for individuals to correct. (29)

Despite these objections, national public opinion surveys have generally shown a majority of Americans support ASE. (30) Moreover, when ASE is limited to certain types of locations, opinion surveys show ASE may not be very controversial with most of the public. A national public opinion survey previously conducted by the University of Minnesota’s Humphrey School (hereafter referred to as the “National Humphrey School Survey”) found the level of support for ASE varied depending on the circumstances in which it was deployed. (31) Only when “all roads” were considered as deployment locations did support drop below 50%. When looking at deployment in select locations, support was much higher: an overwhelming 87% supported using automated speed enforcement on roads near schools and large majorities supported the use of automated speed enforcement on roads where many people have died, as well as roads where many people violate the speed limit. (32)

Chapter 3. Survey of Public Opinion in Minnesota

To better understand public opinion about ASE in Minnesota specifically, the State and Local Planning Program (SLPP), at the University of Minnesota's Humphrey School of Public Affairs, partnered with Portland, Maine-based public opinion research firm Critical Insights on a public opinion survey.

A copy of the survey is attached as Appendix A. The survey was pre-tested for administrative length and comprehension with a random cross-section of Portland, Maine-area residents. No problems were noted during this process. The survey was approximately nine minutes in duration. No incentives were offered to survey respondents.

From March 20, 2012, to April 2, 2012, a statewide sample of 601 randomly selected Minnesotans were interviewed on this subject via a Computer-Aided Telephone Interviewing (CATI) system, by trained interviewers in a controlled environment. Cell phone users were included in the sample. The sample had a theoretical margin of error of +/- 4.0%.

In considering margin of error and in examining these results, it must be noted that results from any statewide poll may deviate from true population values because they rely on a sample, rather than a census of the full population. Indeed, all telephone surveys – whether or not they use probability sampling such as this poll – are subject to multiple sources of error. These sources of error are most often not possible to quantify or estimate with complete accuracy, including sampling error, non-response error, and any error associated with weighting and adjustments conducting following the completion of fieldwork.

When the final sample was compared to the demographic composition of Minnesota, no overt deviations were observed, so only weighting adjustments for gender and age were made to bring the study sample into alignment with the true population distribution.

A. Survey Findings

The survey asked questions about road safety in general and questions about automated speed enforcement specifically. In general, Minnesotans want to see their leaders improve road safety.

- Road Safety Seen as Important. The survey found that Minnesotans feel that improving road safety is an important focus for their leaders. Survey respondents were asked “How important is it to you that your state legislators are working to improve the safety of roads in your area?” More than nine out of every ten Minnesotans (93%) said that road safety is very important (52%) or somewhat important (41%).

1. Overall Opinion of ASE. Beyond general attitudes about road safety, the survey particularly focused on the issue of ASE.

- **A Majority Believe ASE Would be Effective.** A majority of Minnesotans believes that ASE would be an effective way “to improve road safety.” Almost two-thirds (64%) of those interviewed indicated that “enforcing speed limit laws through the use of automated camera and radar devices would be “very effective” (20%) or “somewhat effective” (44%).
- **A Majority Supports ASE.** After the question about perceived ASE effectiveness, respondents were asked whether they oppose or support the idea. A majority of Minnesotans (56%) indicated that they either are “very supportive” (20%) or “somewhat supportive” (36%) of ASE.

2. Opinions about Potential ASE Project Locations. ASE projects vary a great deal according to location and project details. Therefore, the survey also focused on the impact such design details would have on public opposition and support.

- **Overwhelming Majority Support for ASE in Limited Locations.** As Table 1 shows, Minnesotans are very willing to use ASE in specific, limited locations. Minnesotans are overwhelmingly supportive of using ASE “in construction zones where workers are endangered” (83% net support), “on roads near schools” (82% net support), “on roads where many have died” (77% net support), and “on roads where many people violate speed limits” (69% net support).
- **Majority Support Does Not Exist for ASE Use on “All Roads.”** While there is overwhelming support for using ASE in these limited locations, the level of support for using ASE “on all roads” falls just below the majority threshold, at 48% net support.

Table 1. Impact of Location on Support for ASE (n=601)

Automated camera and radar devices to monitor speeding ...	“Very supportive”	“Somewhat supportive”	NET “SUPPORTIVE”
In construction zones	57%	26%	83%
Near schools	59%	22%	81%
Where many have died	50%	27%	77%
Where many speed	39%	30%	69%
On all roads	16%	32%	48%

These results are consistent with the results seen in National Humphrey School Survey, which asked a nearly identical series of questions on the ASE location issue. Table 2 compares the results between the subject survey and the National Humphrey School Survey on this issue. (Note, the National Humphrey School Survey did not ask about the use of ASE in construction zones.)

Table 2. ASE Location & Public Support: Minnesota versus U.S. Public Opinion

Automated camera and radar devices to monitor speeding ...	Minnesota Net “Supportive” (n=601)	U.S. Net “Supportive” (n=1,205)
Near schools	81%	87%
Where many have died	77%	81%
Where many speed	69%	75%
On all roads	48%	43%

3. Impact of Various ASE Project Attributes on Support Levels. SLPP also sought to learn more about the public opinion implications of certain project attributes. Therefore, it presented five potential project variables, and asked respondents if the application of each variable would make them less or more likely to support ASE (Question 6 in the copy of the survey included as Appendix A).

- **Four Project Attributes Strengthen Likelihood of Support for ASE.** Four of the five project variables made Minnesotans more likely to support ASE. As Table 2 shows, about seven in ten Minnesotans indicated they would be more likely to support ASE “if the money raised from speeding tickets was used to improve local road safety improvements” or “if tickets were issued only to those driving at extreme speeds.” About six in ten respondents said they would be more likely to support it “if a ticket could only be issued if the automated speed equipment also took a facial photograph verifying the driver of the vehicle” or “if the locations of the speed monitoring equipment were widely publicized ahead of time.”
- **One Project Variable Weakened Likelihood of Support for ASE.** At the same time, fewer than three out of ten Minnesotans would be more likely to support ASE “if a portion of the money raised from speeding tickets went to a private company hired to operate the system.”

Table 3. Impact of Project Variables on Likelihood to Support ASE (n=601)

An automated speed enforcement system in which...	Net “more likely to support”	Net “less likely to support”	Overall Change in Likelihood of Support (Net “more likely to support” minus net “less likely to support”)
Ticket revenue is used for local safety improvements	72%	24%	+ 48%
Tickets only issued for extreme speeds	71%	27%	+44%
Facial recognition photo verification required	64%	32%	+32%
Advance notice of equipment placement locations	60%	36%	+24%
Operations are administered by a private company	27%	67%	(- 40%)

B. Summary of Survey Findings

A majority of Minnesotans supports the use of automated speed enforcement and believe it is an effective way to improve road safety.

However, the level of support is significantly impacted by project design details. For instance, a large majority of Minnesotans support monitoring speeds with automated radar and cameras in a construction zone, or near a school, while dedicating ticket revenue for local safety improvements and limiting ticketing only those driving at extreme speeds.

At the same time, a majority of Minnesotans oppose using ASE on all roads with a portion of the money raised from tickets going to a private company hired to operate the system.

In summary, project details matter a great deal. The location and project specifics of automated speed determine the extent to which Minnesotans support the use of ASE technology.

Chapter 4. ASE and the Legal Context in Minnesota

Given the public support in Minnesota for ASE under certain circumstances, a review of the legal and related political obstacles to deployment of ASE was undertaken. In short, ASE deployment in Minnesota, including any pilot projects, would need to have legislative approval through an authorizing statute.

There are relatively few legal limitations on how the legislature could set-up an ASE program through the authorizing statute. Of these limitations, the most significant is that the statute would need to incorporate some elements to lessen ASE's vulnerability to constitutional due process challenges. Generally speaking, the design elements that make ASE less susceptible to legal challenges coincide with those design elements that make ASE more acceptable to the public.

A. ASE and Conflicts with Existing Law in Minnesota

As an initial matter, ASE could not be implemented in Minnesota without changes to existing statutory law, including any pilot or demonstration projects that involve the issuance of citations that are to be enforced. ASE conflicts with current Minnesota law on two fronts: (1) the existing statute regarding the admissibility of evidence from speed-measuring devices in court does not contemplate ASE devices; and (2) the existing statutory limits on how local authorities can regulate traffic, likewise, does not include the use of ASE.

1. Evidentiary Issue. The statute that provides for what evidence from speed-measuring devices may be admissible in court to enforce a speeding ticket (Minn. Stat. 169.14 subd. 10) is limited to devices "operated" by a police officer. (33) Though the judiciary ultimately determines what evidence is admissible, courts generally respect legislative judgments as to what evidence is admissible. (34) Accordingly, because ASE devices are not operated directly by an officer, evidence from the devices would be subject to ready legal challenge that they are inadmissible, under Minn. Stat. 169.14 subd. 10, to prove in court that an ASE cited vehicle was speeding. (35)

To avoid this outcome, the legislature would need to act to do two things. First, statutorily indicate it approves the use of evidence from ASE devices in court for establishing a vehicle's speed. (36) Second, set guidelines for the courts regarding the admissibility of evidence from ASE devices, including how to establish the accuracy and reliability of a specific ASE device. The Minnesota legislature has previously done this for officer operated speed-measuring devices (e.g., officer operated radar guns), as well as for other technologies like breath tests for alcohol. (37)

2. Use of ASE by Local Authorities. In addition, if local jurisdictions were to employ ASE, the legislature would need to change state law to allow them to do so. Specifically, Minn. Stat. 169.04(a)(2) would need to be modified, as it currently only permits local authorities to use "police officers" and "traffic-control signals" to regulate traffic, and these terms as statutorily defined do not contemplate ASE. (38)

As discussed more below, depending how an ASE program was designed, further statutory components, beyond these two, would be necessary in any ASE authorizing legislation.

B. Constitutional Restraints on ASE Authorizing Legislation

Constitutional considerations about due process under the U.S. and Minnesota constitutions are relevant for ASE implementing legislation. However, under current case law, any due process constraints only impact the design of ASE. They do not, in and of themselves, prohibit ASE.

Generally speaking, due process raises special ASE design issues only if the vehicle owner is liable for the speeding violation, as opposed to the driver. (39) If the driver is responsible for the violation (driver-liability), the violations -- from a due process perspective -- can largely be handled through the existing traffic regulations for speed enforcement. In Minnesota, a speeding ticket is generally a petty misdemeanor. (40)

If, however, the vehicle owner is the party held responsible (owner-liability), this raises due process concerns about holding the owner liable without evidence that the owner was the one actually operating the vehicle at the time of the violation. From a legal standpoint, this concern with owner-liability can be mitigated through two design elements: (1) the penalties for ASE speeding violations are civil, rather than criminal; and (2) procedures for contesting violations are established.

1. Nature of Penalties. Courts in a number of jurisdictions have held that automated enforcement techniques that use owner-liability do not violate constitutionally protected due process, provided the penalties are civil in nature. (41) Generally this means the penalties are only a monetary fine and the violation is not recorded against an owner's driving record, though there may be implications for the driver's license and/or vehicle registration if the fine goes unpaid. (42) In this regard, the penalties are similar in legal nature to those for non-moving violations, such as a parking ticket. (43)

2. Adjudication Procedures. Unlike typical non-moving violations, though, the adjudication procedures for ASE in a number of jurisdictions allow the registered-owner to raise the affirmative defense that they were not the operator of the vehicle at the time of the violation. (44) In doing so, some jurisdictions require the owner to identify the party that was the driver at the time of the offense, except in certain circumstances (e.g., the vehicle was stolen). (45)

Beyond due process, claims have been brought that automated enforcement violates constitutionally guaranteed equal protection or a governmental "taking" under the Fifth Amendment. (46) These claims have failed in other jurisdictions and would likely fail in Minnesota as well. No published court cases have addressed whether automated enforcement violates a constitutionally protected right to privacy. However, under well-established U.S. Supreme Court precedents, a person travelling in a vehicle has no constitutionally protected privacy right with respect to their movements on a public street and the government may collect license plates numbers that are in plain view. (47) Thus, it is unlikely that there could be a successful challenge to ASE on constitutional privacy grounds in Minnesota.

C. The Impact of the Invalidation of Minneapolis's Red-Light Camera Program

In 2004, the City of Minneapolis enacted an ordinance providing for the automated enforcement of red-light violations with cameras. Two years later, in *State v. Kuhlman*, the Minnesota Supreme Court invalidated the ordinance. (48) A common perception is that in this case the court barred automated enforcement generally in Minnesota. However, the court's ruling was narrow and limited to the specific question of whether Minneapolis's ordinance was preempted by existing state traffic laws.

Under Minneapolis's ordinance, the red-light cameras only identified the vehicle, not the driver. Liability for the violation was imposed on the registered vehicle owner. The court overturned the ordinance because the ordinance was preempted by state law, specifically: (i) the ordinance was not authorized by state law; and (ii) it conflicted with state law by imposing owner-liability for red-light violations when the legislature had not authorized owner-liability for red-light violations. In short, the court invalidated the ordinance because it simply did something the legislature had not approved and for which Minneapolis did not have the authority to do without authorization from the legislature.

The court did not, however, reject the use of automated enforcement generally. Neither, did the court reject the use of owner-liability to enforce traffic violations. Rejecting owner-liability generally would have involved overturning other Minnesota laws that impose owner-liability for traffic offenses (e.g., passing a stopped school bus), which the court did not do. (49) Rather, *Kuhlman* generally means that if ASE were to be deployed in Minnesota with owner-liability, the legislature must expressly authorize the owner-liability.

D. Photograph of the Driver versus No Photograph of the Driver

The question of owner-liability versus driver-liability raises the issue of whether an ASE program in Minnesota must or should involve either: (i) photographs of the driver as well as of the license plates of the speeding vehicle, or (ii) just photographs of the license plates. Mechanically, if there are only photographs of the license plates, the identified plate number is matched with the vehicle's owner via the state's vehicle registration database and the citation is mailed to the owner at the address in the database. If photographs are taken of both the license plates and the driver, typically the photographs of the driver are matched with the driver's license photograph on file with the state, and the driver is mailed the ticket. (50)

Whether there should be a photo of the driver or not is a judgment for the legislature. Existing law does not require either approach, provided if no photo of the driver is taken: (i) the legislature must expressly authorize owner-liability; and (ii) civil penalties, along with appropriate adjudication procedures, should be used.

In addressing this driver-photo question, there are also practical considerations to weigh. No driver photo and owner-liability makes ASE easier to administer because matching the identified license plate with the vehicle's registered owner is a relatively straightforward process.

On the other hand, matching the ASE driver photo with the driver's license database photo involves more back-office work and thus more expense. Further, this approach creates the issue of how to handle those offenses for which the driver cannot be identified: Should they simply be

dismissed? Should a ticket be issued to the registered vehicle owner and the owner be required to pay the fine or identify the subject driver? The experience in states with ASE appears to suggest that programs with driver-liability have lower citation rates, as compared to owner-liability programs. (51) In part, because of these complications, most states with ASE do not take a picture of the driver and use owner-liability. (52) Table 4 summarizes some of the advantages and disadvantages to taking a photo of the driver versus no driver photo.

Table 4. Driver Photo versus No Driver Photo

<p>No Driver Photo (Owner-Liability)</p>	<ul style="list-style-type: none"> • Lesser, civil penalties • Easier to administer • What most states do
<p>Driver Photo (Driver-Liability)</p>	<ul style="list-style-type: none"> • Same penalties as conventional speed enforcement • Comparatively, more difficult to administer • Issue of how to handle offenses for which the driver cannot be identified

E. At What Speeds are Citations Issued?

As indicated in the public option survey in Chapter 3, support for ASE increases if the ticket is issued only for extreme speeders. This alludes to a common concern with ASE: that tickets will be automatically issued for vehicles travelling only slightly over the posted limit. In turn, this raises the issue of whether the devices could, as a legal matter, be set to issue a ticket only if the vehicle is travelling some threshold speed over the posted limit.

The answer to the question in Minnesota is “yes,” provided the legislature authorized doing so. Minnesota law already provides for differing levels of penalties depending on the extent to which a vehicle is travelling over the posted speed limit (e.g., excessive speed penalties, the Dimler amendment, administrative citations). (53) Setting ASE devices to ticket only those vehicles traveling at some speed greater than the posted limit would be an extension of this practice. Accordingly, in any ASE authorizing statute, the legislature should specifically address at what speeds, for a given zone, ASE would issue tickets.

Other states with ASE have, in their authorizing statutes, specified that the ASE trigger speed must be greater than the posted speed limit. For example, in Maryland, where ASE devices are limited to school and work zones, the trigger speed is 12 mph over the posted limit. (54) In Illinois, when ASE devices are used in school and park areas, devices are activated whenever a vehicle goes over the posted limit, but tickets are only issued for speeds 5 mph over the limit, with warnings sent for vehicles travelling less than 5 mph over the limit. (55) In Colorado, where devices are restricted to construction, school, park and residential areas, tickets are issued

for travelling 10 mph over the speed limits. (56) Warnings are issued for speeds less than 10 mph over for the first offense, but for subsequent ASE offenses of less than 10 mph over tickets are issued.

F. The Role of Local Authorities

An important legal consideration is the extent to which local jurisdictions would have control over the use of ASE. The legislature would need to decide the extent to which local authorities could determine where ASE is deployed and how it is operated. For example, would a local jurisdiction need state agency approval to deploy ASE in a given location? Alternatively, could a state agency deploy ASE in a non-work zone area without the consent of the local jurisdiction?

Some states have handled this issue by requiring, before any local deployment, the relevant jurisdiction to pass a local law approving of the use of ASE and then require the jurisdiction to submit an application to the state's department of transportation to approve the use of ASE in a given location. The state agency then provides technical guidance for deployment and operation.

G. Other States Provide Statutory Models

In most states that have ASE, there is an enabling statute that sets up the design of the program. Illinois (2012) and Maryland (2009) are two of the states that have most recently statutorily approved ASE. In Maryland, ASE is generally limited to construction and school zones. (57) Illinois has had ASE in work zones since 2004, but in 2012 the state legislature authorized Chicago to have ASE in areas around parks and schools. (58)

Most enabling statutes go well beyond simply permitting ASE in certain areas. Most include a number of design details to lessen the risk of legal challenges and reduce political opposition. The recent Illinois statute, for example, details the exact hours of time in which ASE can be operated. Table 5 lists a number of common design elements seen in ASE enabling legislation.

Table 5. Common ASE Design Elements in State Authorizing Statutes

- i. To address due process concerns, if the ASE device does not identify the driver, penalties are civil, not criminal, and are not recorded on a vehicle owner's driving record. Non-payment of civil fines may result in a loss of driving privileges or the inability to re-register the vehicle.
- ii. A streamlined procedure is statutorily established by which a ticketed vehicle owner or driver is permitted to raise affirmative defenses that they were not the driver or owner of the vehicle at the time of the violation (e.g., through a sworn affidavit). In some jurisdiction, raising these defenses is predicated on the owner identifying the actual driver of the vehicle, except in unusual circumstances (e.g., vehicle is stolen).
- iii. No citation is issued by the ASE system if the driver of the vehicle is ticketed by a police officer within the same area at approximately the same time.
- iv. Many states limit the eligible areas for ASE deployment (e.g., work zones, school zones, park areas) and the time of operation (e.g., only on school days, hours the park is open, or only when workers are present in work zones). If ASE is limited to static zones (e.g., park or school areas) maps with those areas must be published.
- v. In some states, ASE devices must be operated by a uniformed police officer out of a marked police vehicle.
- vi. No ticket is issued for going some small amount over the posted speed limit (e.g., 5 or 10 mph), but a written warning may be issued in these cases. Alternatively, tickets are only issued for speeds significantly over the posted limited.
- vii. The net proceeds of the ASE systems are dedicated to specific public safety initiatives.
- viii. Compensation paid to private ASE operators must be based on value of the service provided, not number of tickets issued.
- ix. Recorded images of vehicles or drivers may only be made available to the ticketing authority, the ticketed party and the prosecuting authority (but only for purposes of enforcing the ticketed violation).
- x. Signage must be posted informing drivers of the operation of ASE devices, and signage must be erected some period before devices become operational or issue tickets.
- xi. Local jurisdictions must pass a local law authorizing use of ASE in their area and receive approval from the state transportation agency before deploying ASE devices.
- xii. Regular statistical analysis of the safety impact of ASE must be undertaken with publication of the results.

Chapter 5. Strategy for Moving Forward with ASE in Minnesota

This Chapter proposes a strategy for moving forward with ASE in Minnesota, in light of the public support for ASE under certain circumstances and the legal considerations for ASE program design. In general, this Chapter outlines a process for proceeding with ASE pilot projects in Minnesota in school and works zones, given that these are the areas for which there is the most public support in Minnesota for ASE. (59) A number of other states have limited ASE to school and/or work zones. (60) Moreover, other states have first proceeded with statutorily authorized pilot testing of ASE to assess its effectiveness in certain types of areas. (61)

A. Prepare Draft Legislation Authorizing ASE Pilot Projects in School and Work Zones

The key first step is to prepare draft legislation to authorize ASE pilot projects in school zones and MnDOT work zones. Having proposed draft legislation in hand will orientate initial discussions with key lawmakers and stakeholders about ASE, and improve the quality and accuracy of those discussions.

In general, the draft legislation should permit the undertaking of pilot projects under a variety of conditions in school and MnDOT road work areas to assess the impact and effectiveness of ASE. MnDOT will select the project locations and manage them in coordination with the State Patrol, as well as local authorities in the case of school zones. Specifically, the projects will involve the following basic elements:

1. Mobile or portable ASE units (e.g., trailer units) would be deployed in areas around selected schools and in selected MnDOT work zones. The units would not be operated directly by an officer; that is, they would be unmanned units.
2. Projects would be of sufficient duration to determine the effectiveness of ASE in school and work zones. Data would be collected from the deployment areas during: the pre-ASE period; a deployment warning period; the full-implementation period; and the post-implementation period.
3. Factors to be evaluated at each pilot site and across pilot sites, include: speed reductions as a result of ASE, both average speeds and the number of extreme speeders; effect on traffic flows; increases in student, pedestrian, officer, and work crew safety; cost effectiveness, including administrative and enforcement costs; reliability of technology and administrative systems (including the vehicle ownership database for issuing citations); public awareness and acceptance of ASE in deployment areas; and the relative impact of warning tickets versus tickets with penalties.
4. At the end of the pilot projects, MnDOT and the State Patrol would report to the legislature and governor on the results and recommendations for ASE.

With respect to MnDOT work zones, the draft legislation need not address the involvement of local authorities. It does, however, need to do so with respect to school zones. With regard to school zones, either volunteer local jurisdictions could be engaged in advance and identified in the proposed legislation to host school zone pilot projects. Or, alternatively, a mechanism could be established in the legislation by which local jurisdictions may choose, in coordination with

MnDOT, to host school zone pilot projects. In either case, the local jurisdiction should pass an ordinance/resolution evidencing local support for the project prior to deployment.

B. The Legislation Should Contain the Features that Further Increase Public Acceptance and Limit Legal Vulnerability

The draft legislation should contain the full set of design elements thought to (a) further increase public acceptance of ASE and (b) limit the legal vulnerability of ASE, including the following:

1. Deployment of ASE units would be supported by a public information campaign about work and school zone safety and the use of ASE to improve work and school zone safety. In deployment locations, advance signage would alert drivers to the presence of ASE devices and dynamic “your speed” signs would give drivers warnings about their speed before they reach the ASE devices.
2. Citations would be issued for vehicles travelling some threshold speed over the posted speed limit (e.g., 10 mph over the posted limit). Optional design elements include: (i) the issuance of warnings for lesser speeds over the posted limit; and (ii) citations are only issued if workers are present at the time of the violation, or if the violation occurs during school hours on school days.
3. ASE devices would either: (i) only capture images of a vehicle’s license plates and citations would be issued to the registered owner of the vehicle (owner-liability); or (ii) capture images of license plates and the driver, with the aim of ticketing the actual driver (driver-liability). If option (i) is chosen, citations would be civil, not criminal penalties, and would not be recorded in the driver’s license database. If option (ii) is chosen, the same penalties as for other traffic violations could be imposed (i.e., petty misdemeanors).
4. If the legislation employs owner-liability, it should cite the affirmative defenses that owners could raise, including the defenses that: the vehicle was leased (e.g., a rental car); and/or the license plates or vehicle itself had been stolen. The legislation should address how (e.g., written affidavit) and where (e.g., an administrative forum) these defenses can be raised. The legislation should also address whether it is a permissible defense for the owner to claim someone else was the driver and, if so, whether this defense is conditioned on the owner identifying the actual driver of the vehicle at the time of the violation.
5. The legislation should address how evidence from ASE can be established as reliable and accurate in the adjudication process, with consideration of the costs associated in doing so (e.g., does an officer have to appear at the hearing).
6. Contractors needed to provide technical support for operation of the ASE devices would be compensated based on the value of services provided, not the number of citations issued.
7. Revenue from ASE citations would go towards funding the pilot projects. Proceeds of the projects, net of costs, are directed to work and school zone safety initiatives.

C. Seek Buy-In On the Draft Legislation from Key Stakeholders

Initial support and input from key lawmakers, state agency commissioners and other stakeholders will be critical in moving ASE legislation forward in Minnesota. Other key stakeholders to engage early in the process include: law enforcement associations, federations and unions; motorist associations; insurance companies; and local community and school district leaders whose areas may be candidates for school zone pilot projects. Input should also be sought from the judiciary, who may have insights in how to efficiently structure the adjudication procedures related to ASE and minimize any adverse impact on the courts from ASE.

Chapter 6. Conclusion

ASE has been shown to improve road safety in those areas where it has been deployed. The perception that ASE is unpopular and controversial has limited its use by policymakers. However, the public opinion survey conducted for this report shows there is major support for ASE in Minnesota, which is in line with national surveys. This support in Minnesota increases significantly when deployment is limited to school (81% net supportive) and construction zones (83% net supportive), and additional design elements are included in the program's design (e.g., ASE revenue dedicated to road safety programs).

Deploying ASE in Minnesota would require authorizing legislation and the legislature would need to address certain legal issues with ASE in such legislation. This report recommends that legislation be drafted to authorize pilot testing of ASE in school zones and MnDOT work zones, to assess not only the safety impact but also to evaluate cost-effectiveness, reliability and public acceptance. Though authorizing only pilot projects, the legislation should have the full set of ASE program design elements used in other jurisdictions to further increase the public's acceptance of ASE as well as to reduce the risk of legal challenges.

Once draft legislation is prepared, support from key legislators and stakeholders, both within and outside state government, should be sought to move the legislation forward.

References

1. Governors Highway Safety Association (GHSA), *Speeding and Aggressive Driving: Survey of the States* (2012), GHSA: Washington D.C., available at <http://www.ghsa.org/html/publications/survey/speed2012.html> (last accessed May 14, 2012), citing National Highway Traffic Safety Administration (NHTSA) data.
2. GHSA, *Speeding and Aggressive Driving: Survey of the States*, Reference 1.
3. Minnesota Department of Public Safety Office of Traffic Safety, “Minnesota Speeding Facts” (2011), available at <https://dps.mn.gov/divisions/ots/educational-materials/Documents/speed-fs-overview.pdf> (last accessed May 17, 2012).
4. Minnesota Department of Public Safety Office of Traffic Safety, “Minnesota Motor Vehicle Crash Facts - 2010” (2011), available at <https://dps.mn.gov/divisions/ots/educational-materials/Documents/CRASH-FACTS-2010.pdf> (last accessed May 17, 2012).
5. See e.g., K. Knapp, and B. Utecht, *Application of a Rural Safety Policy Improvement Index (RSPII) Framework*, (2010), University of Minnesota Center for Transportation Studies, available at <http://www.cts.umn.edu/Publications/ResearchReports/reportdetail.html?id=1926> (last accessed May 16, 2012).
6. GHSA, *Speeding and Aggressive Driving: Survey of the States*, Reference 1.
7. For example, some states have passed statutes prohibiting the use of ASE. See Insurance Institute For Highway Safety, “Automatic Enforcement Laws,” available at http://www.iihs.org/laws/automated_enforcement.aspx (last accessed May 14, 2012).
8. For a discussion of the national surveys, see S. A. Shaheen, C. J. Rodier, and E. Cavanagh, (2007) *Automated Speed Enforcement in the U.S.: A Review of the Literature on Benefits and Barriers to Implementation*, Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-07-17. For a discussion of how national support increases for ASE when deployed in certain locations, see Lee Munnich, Jr., and Joseph D. Loveland, “Do Americans Oppose Controversial Evidence-Based Road Safety Policies?” (2011) *Transportation Research Record: Journal of the Transportation Research Board*, No. 2213, Transportation Research Board of the National Academies, Washington, D.C., pp. 9-12.
9. L. Evans, “Driver Behavior” in *Traffic Safety*, Science Servicing Society: Bloomfield Hills, MI, 2004, 206-236; and B. Harsha and J. Hedlund, *Improving America’s Culture of Speed on the Roads*. American Automobile Association Foundation for Traffic Safety: Washington, D.C., 2007.
10. Committee for Guidance on Setting and Enforcing Speed Limits. *Managing Speed Review of Current Practice for Setting and Enforcing Speed Limits*. Special Report 254. Transportation Research Board: Washington, D.C., 1998.

11. L.S. Friedman, D. Hedeker, and E.D. Richter, "Long-term effects of repealing the national maximum speed limit in the United States," *American Journal of Public Health* 99(9), 1626-31.
12. L.J. Thomas, R. Srinivasan, L.E. Decina, and L. Staplin "Safety Effects of Automated Speed Enforcement Programs: Critical Review of International Literature," *Transportation Research Record: Journal of the Transportation Research Board*, No. 2078, 2008, pp. 117-126.
13. Minn. Stat. 169.14 (2011).
14. Minn. Stat. 169.14 (2011).
15. See e.g., Minn. Stat. 169.14, subd. 10 (2011).
16. Thomas, et al., "Safety Effects of Automated Speed Enforcement Programs," Reference 12.
17. P. Pilkington and S. Kinra, "Effectiveness of Speed Cameras in Preventing Road Traffic Collisions and Related Casualties: Systematic Review," *British Medical Journal*, Vol. 330, 2005, pp. 331-334.
18. C. Wilson, C. Willis, J.K. Henrikz, R. Le Brocque, and N. Bellamy, "Speed cameras for the prevention of road traffic injuries and deaths," *Cochrane Database of Systemic Reviews*, 2010, Issue 10. The countries represented in these studies were: Australia; Canada; Germany; Denmark; Finland; Great Britain; Netherlands; Hong Kong; Norway; New Zealand; Spain; and the United States.
19. R. A. Retting and C. M. Farmer, "Evaluation of Speed Camera Enforcement in the District of Columbia," *In Transportation Research Record: Journal of the Transportation Research Board*, Number 1830, 2003, pp. 13-20.
20. R.A. Retting, S. Y. Kyrychenko, and A. T. McCartt, "Evaluation of Automated Enforcement on Loop 101 Freeway in Scottsdale, Arizona," *Accident Analysis and Prevention*, Volume 40, 2008, pp. 1506-1512
21. M. V. Chitturi, R. F. Benekohal, A. Hajbabaie, M.-H. Wang, and J. C. Medina, "Effectiveness of Automated Speed Enforcement in Work Zones," *ITE Journal*, Vol. 80, No. 6, June 2010, pp. 28–35.
22. Washington Traffic Safety Commission, *Automated Speed Enforcement Pilot Project Evaluation* (2011), available at <http://www.wtsc.wa.gov/statistics-reports/research-studies/> (last accessed May 17, 2012).
23. D. F. Preusser, A. F. Williams, J. L. Nichols, J. Tison, and N. K. Chaudhary, *Effectiveness of Behavioral Highway Safety Countermeasures*, National Cooperative Highway Research Program Report 622. Transportation Research Board, Washington, D.C., 2008.
24. Shaheen, et al. (2007) *Automated Speed Enforcement in the U.S.* Reference 8.
25. J. Adams and VanDrasek, B (2009), *Automated Enforcement of Red-Light Running & Speeding Laws in Minnesota: Bridging Technology and Public Policy*, University of Minnesota Center for Transportation Studies, CTS 09-26, available at

<http://www.cts.umn.edu/Publications/ResearchReports/reportdetail.html?id=1832> (last accessed May 17, 2012).

26. K. Knapp, Kelcie Young, and Brad Utecht, *Feasibility of a Quantitative Rural Safety Policy Improvement Index (RSPII): Phase I*, University of Minnesota Center for Transportation Studies (2009), available at <http://www.cts.umn.edu/Publications/ResearchReports/reportdetail.html?id=1766> (last accessed May 17, 2012); and Knapp and Utecht, “Application of a Rural Safety Policy Improvement Index (RSPII) Framework” (2010), Reference 5.

27. A. H. Goodwin, W. L. Hall, J.C. Raborn, L. J. Thomas, S. V. Masten, and M.E. Tucker, *Countermeasures that Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, Third Edition*. Publication DOT HS 810 891. National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, D.C., 2008; and D. F. Preusser, A. F. Williams, J. L. Nichols, J. Tison, and N. K. Chaudhary, *Effectiveness of Behavioral Highway Safety Countermeasures*, National Cooperative Highway Research Program Report 622, Transportation Research Board, Washington, D.C., 2008.

28. Knapp and Utecht, *Application of a Rural Safety Policy Improvement Index (RSPII) Framework* (2010), Reference 5.

29. For a discussion see, Shaheen, et al. (2007) *Automated Speed Enforcement in the U.S.*, Reference 8; and J. Adams and B. VanDrasek (2009), “Automated Enforcement of Red-Light Running & Speeding Laws in Minnesota,” Reference 25.

30. For a discussion of the national surveys, see Shaheen, et al. (2007) *Automated Speed Enforcement in the U.S.*, Reference 8

31. Munnich and Loveland, “Do Americans Oppose Controversial Evidence-Based Road Safety Policies?” Reference 8.

32. Munnich and Loveland, “Do Americans Oppose Controversial Evidence-Based Road Safety Policies?” Reference 8.

33. Minn. Stat. 169.14, subd. 10 (a)(1) (2011).

34. See e.g., *State v. Willis*, 332 N.W.2d 180, 184 (Minn. 1983).

35. Some states employed manned ASE units. These are radar units operated directly by an officer, with the units also taking a photograph of the speeding vehicle so that a citation may be issued via the mail. Arguably, evidence from these units would be admissible under Minn. Stat. 169.14, subd. 10 (a)(1). However, even if that was the case and manned ASE units were used in Minnesota, there are other elements of any ASE program that need legislative authorization. Moreover, such manned units do not offer the same savings in terms of officer time and resources that unmanned ASE units do, and thus are not discussed by this report.

36. The Minnesota legislature has attempted to do this previously. In 1996, a bill was introduced at the legislature to provide that photographic evidence from officer-operated ASE devices was admissible to prosecute speeding tickets. This bill, however, did not make it out of committee.

Minnesota Senate Bill 2139 (1996), full-text available at https://www.revisor.mn.gov/revisor/pages/search_status/status_detail.php?b=Senate&f=SF2139&ssn=0&y=1995 (last accessed May 14, 2012).

37. Minn. Stat. 169.14, subd. 10, and Minn. Stat. 169A (2011).

38. Minn. Stat. 169.04(a)(2) and Minn. Stat. 169.011 (2011).

39. Due process claims have been raised with respect to the fact that ASE speeding tickets are served on offenders through the mail. This type of challenge would apply to both driver-liability and owner-liability ASE programs. However, such claims have failed so far in other jurisdictions. See e.g., *Agomo v. Fenty*, 916 A.2d 181 (D.C. App. 2007); and *State v. King*, 111 P.3d 1146 (Or. 2005).

40. For a summary of Minnesota's speed limits and penalties for violating them, see M. Burress and R. Pirius, "Traffic Citations," *Research Department of the Minnesota House of Representatives* (December, 2010), available at <http://www.house.leg.state.mn.us/hrd/pubs/trafcit.pdf> (last accessed May 14, 2012).

41. See e.g., *State v. Dahl*, 336 Ore. 481 (Or. 2004); *Shavitz v. City of High Point*, 270 F.Supp 2d 702 (M.D.N.C. 2003), *vacated on other grounds*, *Shavitz v. Guilford County Board of Education*, 100 Fed. Appx 146 (4th Cir. 2004) (with respect to red-light cameras); *Idris v. City of Chicago*, 552 F.3d 564 (7th Cir. 2009) (with respect to red-light cameras).

42. For example, under Illinois's most recent ASE statute, the failure to pay 5 or more ASE citations can result in the suspension of the offender's driver's license, similar to the penalty for unpaid parking tickets. See 625 Illinois Compiled Statutes 5/6.306.5 (2012).

43. In Minnesota, there is legal precedent for holding a vehicle owner liable for a traffic violation with the conventional set of penalties for a traffic violation (i.e., not civil penalties). In *State v. Eakins*, 720 N.W.2d 597, 603 (Minn. App. 2006), against a due process challenge, the Minnesota Court of Appeals, upheld the Minnesota statute that creates owner-liability for a vehicle that passes a school with its stop-signal arm extended. However, the Court of Appeals, in part, relied on an analysis that petty misdemeanors are not "crimes" for purposes of due process analysis. This analysis was called in to some question by the Minnesota Supreme Court in *State v. Kuhlman*, 729 N.W.2d 577 (Minnesota 2007). Hence, *State v. Eakins* may not necessarily create a foundation for using owner-liability for ASE in Minnesota with the conventional set of penalties for traffic violations.

44. See e.g., Maryland Annotated Code § 21-809 (2011).

45. See e.g., Washington D.C. Code § 50-2209.02 (2011).

46. See e.g., *Shavitz v. City of High Point*, 270 F.Supp 2d 702 (M.D.N.C. 2003), *vacated on other grounds*, *Shavitz v. Guilford County Board of Education*, 100 Fed. Appx 146 (4th Cir. 2004), *remanded to* 630 S.E.2d 4 (N.C. 2006) (addressing the equal protection claim with respect to red-light cameras); *McCarthy v. City of Cleveland*, 2010 WL 4453614 (6th Cir. 2010) (addressing the "taking" claim).

47. *United States v. Knotts*, 460 U.S. 276 (1983); *New York v. Class*, 475 U.S. 106 (1986); and *Arizona v. Hicks*, 480 U.S. 321 (1987).
48. *State v. Kuhlman*, 729 N.W.2d 577 (Minnesota 2007).
49. Minn. Stat. § 169.444, subds. 1, 6 (2011) (owner-liability for passing a stopped school bus with its stop-arm extended).
50. For an over view of the administration of ASE programs, see NHTSA, *Speed Enforcement Camera Systems Operational Guidelines*, Washington, D.C.: Federal Highway Administration, NHTSA (2008).
51. Shaheen, et al. (2007) *Automated Speed Enforcement in the U.S*, Reference 8.
52. Insurance Institute For Highway Safety, “Automatic Enforcement Laws,” available at http://www.iihs.org/laws/automated_enforcement.aspx (last accessed May 14, 2012).
53. Minn. Stat. 169.14, subd. 1a and subd. 2(d) (2011) (increased penalties for driving at extreme speeds); Minn. Stat. 171.12, subd. 6 (2011) (the “Dimler Amendment” under which certain speeding offenses are not recorded on a motorist’s driving record); Minn. Stat. 169.999 (administrative citations are issued as a lesser, alternative penalty for certain speeding offenses).
54. Maryland Annotated Code § 21–810 (2011)
55. 625 Illinois Compile Statutes 5/11-208.8 (2012)
56. Colorado Revised Statutes 42-4-110.5 (2011)
57. Maryland Annotated Code § 21–809 and § 21–810 (2011)
58. 625 Illinois Compile Statutes 5/11-208.8 (2012)
59. The term “work zone” is used here in the discussion of the legal aspects of ASE, as opposed to the term “construction zone”, to parallel the statutorily defined term “highway work zone” used in Minnesota statutory law. Minn. Stat. 169.14, subd. 5d(e) (2011).
60. The Insurance Institute For Highway Safety lists two states in which ASE is specifically authorized to be used statewide in construction zones and four states in which ASE is specifically authorized to be used statewide in school zones. Insurance Institute For Highway Safety “Q&A: Speed — law enforcement,” (2011), available at http://www.iihs.org/research/qanda/speed_lawenf.aspx (last accessed May 14, 2012), Reference 7.
61. See e.g., Revised Code of Washington 46.63.170 (2011).

Appendix A

Public Opinion Survey Instrument

Roadway Survey Items

Hello, my name is _____ and I'm calling from Critical Insights, a national public opinion polling firm.

We are conducting an interesting poll in your area regarding people's opinions about driving and your state's roadways. This poll is being sponsored by the University of Minnesota.

Your views are important and the poll will last no more than 10 minutes; would you have 10 minutes to spend with me to complete this poll?

- 1 YES -----> CONTINUE
- 2 NO -----> ARRANGE CALL-BACK AT SAME OR DIFFERENT #

Your participation in the survey is voluntary and your answers to the questions are completely anonymous. You may skip any questions with which you are not comfortable. Should you have any questions about the poll, I can provide you with information for contacting the researchers.

C1. To begin, have I reached you (today/this evening) on a cell phone or on a traditional landline phone?

- 1 Cell phone -----> CONTINUE
- 2 Traditional landline -----> GO TO S1a
- 8 DON'T KNOW -----> THANK AND END
- 9 REF. -----> THANK AND END

C2a. I apologize for calling on your cell phone, but your participation in the poll is important to us.

If you are in a safe place to speak, may I continue with the poll?

- 1 YES -----> CONTINUE
- 2 NO -----> ARRANGE CALL-BACK AT SAME OR DIFFERENT #
- 8 DON'T KNOW -----> THANK AND END
- 9 REF. -----> THANK AND END

C2b. Is this cell phone your only telephone, or do you also have a traditional landline phone in your home?

- 1 Only have cell phone
- 2 Have both cell and landline phone
- 8 DON'T KNOW
- 9 REF.

[GO TO S2a]

S1a. While I'm speaking to you (today/this evening) on a landline phone, do you also have a cell phone?

- 1 Yes, also have cell phone -----> CONTINUE
- 2 No, only have landline -----> CONTINUE
- 8 DON'T KNOW -----> THANK AND END
- 9 REF. -----> THANK AND END

S1b. In total, how many people age 18 or older live in your household?

_____ [RECORD NUMBER]

- 1 One -----> CONFIRM SPEAKING TO THAT PERSON; GO TO S2a
- 2 Two or more -----> CONTINUE
- 8 DON'T KNOW -----> THANK AND END
- 9 REF. -----> THANK AND END

S1c. How many of these people drive a motor vehicle, even if it is only occasionally?

_____ [RECORD NUMBER]

- 1 One -----> CONFIRM SPEAKING TO THAT PERSON; GO TO S2a
- 2 Two or more -----> CONTINUE
- 8 DON'T KNOW -----> THANK AND END
- 9 REF. -----> THANK AND END

S1d. Since there are multiple drivers in the household, we need to pick one at random for interviewing. Could I please speak to the youngest male in your household, age 18 and older? [IF NOT AVAILABLE, ASK FOR (SEQUENTIALLY) youngest female, next youngest male, next youngest female]

- 1 Person is on phone -----> CONTINUE
- 2 Phone passed to other person -----> CONTINUE
- 3 Resp. not available -----> ARRANGE SPECIFIC CALLBACK
- 8 DON'T KNOW -----> THANK AND END
- 9 REF. -----> THANK AND END

S2a. Are you a registered voter?

- 1 YES -----> CONTINUE
- 2 NO -----> THANK AND END
- 8 DON'T KNOW -----> THANK AND END
- 9 REF. -----> THANK AND END

S2b. And, to confirm, do you drive a motor vehicle, even if it is only occasionally?

- 1 YES -----> CONTINUE
- 2 NO -----> THANK AND END
- 8 DON'T KNOW -----> THANK AND END
- 9 REF. -----> THANK AND END

S3. And to confirm, am I calling _____ [INSERT COUNTY FROM SAMPLE] in the state of Minnesota?

- 1 YES -----> CONTINUE
- 2 NO (INCORRECT COUNTY) -----> CONTINUE;
NOTE CORRECT COUNTY
CODE WHERE RESPONDENT
VOTES
- 2 NOT IN MINNESOTA -----> THANK AND END
- 8 DON'T KNOW -----> THANK AND END
- 9 REF. -----> THANK AND END

POLICY

1. To begin, I'd like you to think about efforts on the part of your state legislators to improve road safety.

First, how important is it to you that your state legislators are working to improve the safety of roads in your area? Would you say "not at all important," "not very important," "somewhat important," or "very important"?

- 1 Not at all important
- 2 Not very important
- 3 Somewhat important
- 4 Very important
- 8 DON'T KNOW DO NOT READ
- 9 REF. DO NOT READ

2. Thinking about efforts of your state legislators to improve road safety, which one of the following three statements best matches your opinion? Do you believe...[READ OPTIONS]

- 1 They should be doing less to improve road safety,
- 2 They are doing *about the right amount* to improve roads safety, or
- 3 They should be doing more to improve road safety
- 8 DON'T KNOW DO NOT READ
- 9 REF. DO NOT READ

3. Next, I'm going to read you a brief list of ideas being discussed as possible ways to make roads safer.

After I read each, please tell me how effective you believe that idea would be as a way to improve road safety.

I'll ask you if you believe that idea is "very ineffective," "somewhat ineffective," "somewhat effective," or "every effective."

Let's begin... [ROTATE]

Very ineffective	Somewhat ineffective	Somewhat effective	Very effective	DK
1	2	3	4	9

A.	Allowing law enforcement officials to stop and ticket drivers for failure to obey seatbelt laws	1	2	3	4	9
B.	Enforcing speed limit laws through the use of automated camera and radar devices	1	2	3	4	9
C.	Requiring people convicted of drunk driving to install a device on their car that locks the ignition if the driver fails an automated in-vehicle breathalyzer test	1	2	3	4	9

4. Now, I'm going to read you the same list of ideas being discussed in order to improve road safety in your area.

After I read each, please tell me whether you oppose or support that idea.

For each idea, I'll ask if you are "very opposed," "somewhat opposed," "somewhat supportive," or "very supportive" of the idea.

Let's begin... [ROTATE]

Very opposed	Somewhat opposed	Somewhat supportive	Very supportive	DK
1	2	3	4	9

A.	Allowing law enforcement officials to stop and ticket drivers for failure to obey seatbelt laws	1	2	3	4	9
B.	Enforcing speed limit laws through the use of automated camera and radar devices	1	2	3	4	9
C.	Requiring people convicted of drunk driving to install a device on their car that locks the ignition if the driver fails an automated in-vehicle breathalyzer test	1	2	3	4	9

5. Next, I'm going to read you a list of special locations in which automated camera and radar devices could be deployed to improve road safety in your area.

Each idea refers to using automated camera and radar devices to monitor speeding in the areas we'll be discussing.

After I read each area being considered for these systems, I'll ask if you are "very opposed," "somewhat opposed," "somewhat supportive," or "very supportive" of using automated cameras and radar to monitor speeding in that area.

Let's begin... [ROTATE]

		Very opposed	Somewhat opposed	Somewhat supportive	Very supportive	DK
		1	2	3	4	9
A.	On roads near schools	1	2	3	4	9
B.	On roads where many people violate speed limits	1	2	3	4	9
C.	On roads where many people have died	1	2	3	4	9
D.	In construction zones where workers are endangered	1	2	3	4	9
E.	On all roads					

6. Changing things up a bit, I'm now going to read you a few ways automated camera and radar devices could potentially be used to enforce speeding laws.

After I read each idea, I'll ask if the use of that approach would make you "much more likely to support using automated speed enforcement," "somewhat more likely to support it" "somewhat less likely to support it," or "much less likely to support it."

Let's begin... [ROTATE]

Much more likely to support	Somewhat more likely to support	Somewhat less likely to support	Much less likely to support	DK
1	2	3	4	9

If the locations of the speed monitoring equipment were widely publicized ahead of time, would that make you...	1	2	3	4	9
If tickets were issued only to those driving at extreme speeds, would that make you...	1	2	3	4	9
If the money raised from speeding tickets were used to improve local road safety improvements, would that make you, would that make you...	1	2	3	4	9
If a portion of the money raised from speeding tickets went to a private company hired to operate the system, would that make you, would that make you...	1	2	3	4	9
If a ticket could only be issued if the automated equipment also took a facial photograph verifying the driver of the vehicle, would that make you, would that make you...	1	2	3	4	9

DEMOGRAPHICS & CLASSIFICATION

To finish up, I just have a few questions so we can compare your answers to those of other people in your area and across the country. [IF HESITANT ADD] This information is only for our use in making sure we've spoken to a range of people across the country.

D1. [OBSERVE] Gender [ASK ONLY IF NEC.]

- 1 MALE
- 2 FEMALE

D2. Which of the following best describes the area where you live? [READ OPTIONS]

- 1 Large city or urban area
- 2 Small city
- 3 Suburban area
- 4 Small town
- 5 Rural area
- 9 DON'T KNOW/REFUSED

DO NOT READ

D3. What is the 5-digit Zip Code where you live?

— — — — —

D4. For classification purposes only, could you tell me your age? [IF HESITANT, ASK:] Which of the following ranges includes your age? I am asking only so we can be sure we're talking to the correct mix of people across the state. [IF NEC., READ OPTIONS]

- 1 18-24
- 2 25-34
- 3 35-44
- 4 45-54
- 5 55-64
- 6 64-74
- 7 75+
- 9 DON'T KNOW/REFUSED

DO NOT READ

D5. Which of the following best describes your political views? [READ OPTIONS]

- 1 Very conservative
- 2 Somewhat conservative
- 3 Neither conservative nor liberal
- 4 Somewhat liberal
- 5 Very liberal
- 9 DON'T KNOW/REFUSED

DO NOT READ

D6. Finally, which of the following categories I'm going to read best represents the combined income for all family members in your household for the past 12 months (before taxes)?

Again, this item is only for classification purposes so I can be sure I'm speaking to a range of people across the country.

- 1 Less than \$25,000
- 2 \$25,000 to just under \$50,000
- 3 \$50,000 to just under \$75,000
- 4 \$75,000 to just under \$100,000
- 5 \$100,000 to just under \$200,000
- 6 \$200,000 or more
- 9 DON'T KNOW/REFUSED

DO NOT READ

Those are all the questions I have for you (today/this evening); thank you very much for your time.

[ONLY IF RESPONDENT HAS QUESTIONS READ:] If you have any questions or concerns regarding the study and would like to speak with the study's sponsor, the University of Minnesota, you may contact (651) 626-9946.