Electronic Speed Enforcement: Coming soon to a city near you

by

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The Command College Futures Study Project is a FUTURES study of a particular emerging issue of relevance to law enforcement. Its purpose is NOT to predict the future; rather, to project a variety of possible scenarios useful for strategic planning in anticipation of the emerging landscape facing policing organizations.

This journal article was created using the futures forecasting process of Command College and its outcomes. Defining the future differs from analyzing the past, because it has not yet happened. In this article, methodologies have been used to discern useful alternatives to enhance the success of planners and leaders in their response to a range of possible future environments.

Managing the future means influencing it—creating, constraining and adapting to emerging trends and events in a way that optimizes the opportunities and minimizes the threats of relevance to the profession.

The views and conclusions expressed in the Command College Futures Project and journal article are those of the author, and are not necessarily those of the CA Commission on Peace Officer Standards and Training (POST).

Electronic Speed Enforcement: Coming soon to a city near you

Imagine you are driving on a busy freeway in the middle lane when a speeding vehicle passes you on the left. The changeable message sign ahead flashes for a moment before a cop appears on the LED screen. The text below the officer's face tells the driver of the vehicle that just blew by you to slow down; they don't. Almost immediately the text then reads, "Driver/Registered Owner electronically cited for speed. Fine $450.00." Seem too futuristic? Don't count it out.

A vehicle of the future, equipped with Collision Mitigation or Avoidance Systems, Global Positioning Systems and Radio Frequency Identification recognition systems would quite easily be a victim (automated citation recipient) of an Electronic Speed Enforcement (ESE) program on a roadway system also equipped with the Electronic Speed Enforcement technologies. Some of these systems are currently being tested for their suitability to assist in improving traffic safety. It would not be hard to imagine their use to not only passively monitor traffic flow and spot congestion, but also to actively enforce the law.

West Coast Offense

In California, the Office of Traffic Safety, Highway Patrol, Department of Transportation, National Highway Safety Traffic Administration, and the Federal Highway Administration have participated in the design, development, and implementation of a lane-specific Coupled Car Program (a program which uses some of the technology noted above). Each of these stakeholders have contributed to the program with a common goal in mind; saving lives and reducing injuries resulting from speed

related traffic collisions while managing and maintaining a smooth steady flow of traffic. The Coupled Car program is being tested by incorporating it into the daily traffic flow in the Los Angeles region in an effort to improve traffic safety by reducing speed related traffic collisions. The results of the testing have yet to be published by the Federal Highway Administration, but traffic management agencies like California's Department of Transportation and California Partners for Advanced Transit and Highways (PATH), anxiously await them and their statistical relevance to slow speeding motorists and reducing speed related traffic collisions. After all, isn't it the numbers we often use to justify the means?

The Data

According to data collected by the California Highway Patrol, the number of traffic collisions statewide decreased from 544,742 in 2002 to 532,725 in 2005.[1] In 2005, 198,708 injury collisions and 3,622 fatal collisions occurred in California. Of this total, 292,798 victims suffered injuries, and there were 4,304 fatalities.[2] Statewide, of the 161,968 collisions investigated, unsafe speed was the primary collision factor (PCF). This represents 30% of the total number of traffic collisions. This percentile is up slightly from similar data recorded by the Statewide Integrated Traffic Records System (SWITRS) in 2001, when speed was listed as the primary collision factor and responsible for 29% of all collisions.

In response to elevated statistics of traffic fatalities, Norway implemented a type of automated speed enforcement program in 1988; which will be discussed later in this

[1] California Highway Patrol, Statewide Integrated Traffic Records System, SWITRS, 2005, http://www.chp.ca.gov/switrs/switrs2005.html
[2] Ibid.

article. Even though the statistical raw data from the Norway project could not be readily obtained, the fact they are still using the program as part of their "Vision Zero" traffic safety plan after thirty years of implementation speaks volumes for the results they are attaining. If California saw similar results with the implementation of an ESE program then the implementation and use of an ESE program may be the ticket to reducing that climbing percentage of speed related collisions for the Highway Patrol in California.

CURRENT SPEED ENFORCEMENT PROGRAMS

Technologies have afforded departments like the CHP to be as aggressive in speed enforcement as possible, despite staffing shortages experienced in the profession throughout the state. Technological advances like RADAR and LIDAR (Light Detection and Ranging) units (stationary and portable) help battle the 'speed' problem throughout the nation. Both RADAR and LIDAR use has had a positive effect on detecting speeding violators while law enforcement staffing levels continue to be challenged as they diminish due to early retirement benefits, on-duty injuries/illnesses, and employer changes.

In Sonoma County, California, for instance, the local CHP office issued 17,992 speeding citations in 2006, as compared to 19,412 in 2005. This number was lower; however, the office lost eleven uniformed field patrol officer positions ($1/5^{th}$ of their staff) in 2006. The enforcement numbers actually represent an 8% average increase of speed citations issued by each field patrol officer in 2006 in spite of the personnel loss. This increase in activity was largely due to the RADAR and the recently acquired LIDAR equipment

made available to the field patrol officers. This is just one supporting example of how technology can assist law enforcement in the battle against speeding violators. And it lends support for the need of a traffic enforcement program focused specifically on reducing speeding violators using technology to augment human resources; an ESE program. An ESE program could address the situation in Sonoma County and most likely throughout the state if implemented in the right locations.

Related technologies

Other speed enforcement related technologies that enable speed reduction on a volunteer basis is the deployment of Intelligent Traffic Systems (ITS) technologies along many different types of roadway configurations. ITS technologies is essentially incorporating speed detection devices into electronic signs mounted along roadways which serve as, and sometimes display, safety warnings to the driver(s) for the speed they are traveling. The deployment of ITS is rapidly increasing, and its use is directed towards the improvement of automobile safety.[3] The ITS uses are predominately directed to enhance awareness of individual driving habits of motorists.

Automated Speed Enforcement programs are also being explored as a tool to combat speeding motorists. Automated speed enforcement (ASE) programs are currently utilized throughout the world, and are being piloted in California. They are for the most part an administrative program, since the enforcement action and suggested monetary fines are voluntarily submitted by the offender. Cities as diverse as San Jose, CA and Boston, MA

[3] National Highway Traffic Safety Administration, http://www.its.dot.gov/, Intelligent Transportation Systems, 12/26/2006.

have experimented with ASE programs to minimize their speed related problems on their city streets. They used technologies similar to those used by Norway; ITS technologies, a speed scanning device and a camera to capture a photo of the vehicle, the driver, and the license plate. Notices of the violations are mailed to the registered owner. Any administrative fees suggested with the notices are just that; administrative only and not assessed through the judicial system. Norway's program, however, actually assesses penalties through their judicial process.[4] So how can we move from current ASE program to create an ESE of the future?

ASE's, ESE's and their uses

Typically, the components of an automated speed enforcement (ASE) system involves the use of a speed measuring device (i.e. RADAR, or LIDAR), a camera or License Plate Reader (LPR), or an electronic message board capable of displaying the speed of each car. Most of the components of an ASE program are similar to those of the Intelligent Traffic Systems (ITS) used throughout the United States. Thinking forward, an ESE program would include the enhanced technologies available today beyond those typically used for an ASE (i.e. RFID chips, virtual monitoring through Traffic Management Centers, GPS and LPS technologies) and would augment current speed enforcement tools (RADAR and LIDAR), techniques and efforts utilized by traffic safety law enforcement agencies to prevent speed related violations and collisions.

[4] 1999. Effects on Accident of Automatic Speed Enforcement in Norway, R. Elvik, Internet www.itsbenefits.its.dot.gov, 12/26/2006.

What would an ESE program look like? First you have electronic speed monitoring devices built into different portions of a roadway throughout the state. Those devices are networked to a central monitoring location/center. The person monitoring the device is able to confirm the license plate of the errant vehicle through CLETS and NCIC. Finally, an electronic traffic citation is issued for the speed violation immediately to the registered owner of the vehicle through electronic programs that link the Department of Motor Vehicles and the local judicial branch into the ESE program. Only when a person wished to contest the citation would the judicial process commence. This is simply networking technologies in such a way that it removes the personal contact by a law enforcement officer at the time of the violation and takes immediate action. The program would also have the capability to reduce the errant vehicles speed electronically if all of the technological components were in place. That is the desired effect an ESE program would have on the motoring public equipped with the newest in vehicular technologies.

It is important to note an ESE program differs from other speed enforcement programs by its ability to be self supportive and revenue generating with legislative approval. With the right legislation, an agency using an ESE program could find the program brings in revenue generated from citations for the agency as well as finances to fund the equipment. With time, an ESE program could be considered a type of ASE program; inclusive of some of the old technology with the new that would result in a more immediate enforcement action being taken than is currently done with ASE programs. Obviously the costs of such a program will be a determining factor in its use and implementation. Most likely an ESE program implementation would commence with a

state agency with the anticipation of branching out to local agencies in a collaborative effort with mutual funding sources; similar to the Driving Under the Influence Checkpoint programs of today. Funding has not been the only issue addressed by 'collaborative efforts' in a means to get a goal accomplished.

The correlation of vehicle-to-roadway engineering for the purpose of electronic speed monitoring has been a collaborative effort for the past ten years throughout the world. It is this genre of collaboration which feeds the vision of an ESE program. The National Highway Traffic Safety Administration has long studied the concept of vehicle-to-roadway engineering for the purpose of improving traffic safety. In Europe, Norway, Germany, and Britain have all used it in one form or another. As noted earlier in this article, Norway uses an automated speed enforcement program (ASE) and has been very successful in reducing traffic collisions since 1988.[5] The Norway ASE program, which utilized license plate readers, speed monitoring devices, and cameras) has been successful enough to warrant incorporating it into the country's traffic plan under the title of "Vision Zero" (no fatalities from traffic collisions). Programs such as Coupled Car[6] (vehicles electronically sensing each other and hitching up electronically for controlled movements), SMART Car, and SMART Roads have all been subject to recent experiments in southern California with the intentions of reducing collisions; particularly speed related collisions.

[5] 1999. Effects on Accident of Automatic Speed Enforcement in Norway, R. Elvik, Internet www.itsbenefits.its.dot.gov, 12/26/2006.

[6] Automated Highway System, first prototype mandated in 1991. Smart Road, Smart Car: The Automated Highway System, PUBLIC ROADS On-line, Nita Congress, Autumn 1996, http://www.itsdocs.fhwa.dot.gov/JPODOCS/PERIODIC/3731.htm

The Coupled Car program includes technologies that could be utilized in an Electronic Speed Enforcement (ESE) program; a vehicle recognition device (RFID or GPS) and a means to transmit information electronically. Unlike the Coupled Car program, however, the ESE program would not be dependent upon a particular traffic lane configuration for its implementation. An added bonus is its flexibility for deployment and cost effectiveness.

Whether the components of an ESE program are placed in a stationary or portable mode, just imagine the multi-faceted impact an ESE program could have. There could be deterrence of speeding violations, reduction of speed related collisions, reduction in speed related traffic fatalities, safer environment for the motorists, pedestrians, and bicyclists, reduction in insurance premium costs for vehicle owners, and revenue to the agency from citations issued. If an agency desired to pounce on this future concept of traffic offense enforcement, they would need to branch out in thinking and start planning today how best to implement an ESE program to augment their current traffic management program.

Potential Outcomes

Naturally, the planning phase of implementing an ESE program begs questions like, how many lives presumably will an ESE program save, given it is implemented in a desirable location? How long before we see the results and will those results be embraced by the communities it is designed to protect? These are all questions any agency representative will have to be prepared to answer before their governing/funding board.

An Expert Group Weighs In

These are the same questions pondered by an expert panel convened to study this emerging issue.[7] The panel members consisted of professionals directly involved or impacted by speed related collisions. The panel examined the current status of the behavior of the community, the efforts of law enforcement towards saving lives, the tools currently used, those issues facing society today, prospective issues to contemplate in the years to come, and the exponential evolution time and technology will have on the world's population.

Forecasting ten to fifteen years from the present, the panel concluded an ESE program is both feasible and doable, but not all necessary elements and components of the program were attainable within the ten year framework. Furthermore, many of the panel members believed other trends and events would impact the implementation of an ESE program to as much as twenty years out from today's date; like the carbon tax and resistance of the auto industry to comply with installing necessary components at the time of manufacture. As a prospective agency considering implementing an ESE program in the future to augment your current efforts in speed enforcement and collision reduction, you must stay abreast of the elements and movements that could impact the foundation of the program. Preparation and readiness would be paramount to your agency's success in incorporating the program into your existing traffic safety regiment.

[7] Nominal Group Technique panel comprised of experts in fields impacted by an ESE program took place in Santa Rosa, CA in April 2007.

Pros and Cons

Without a doubt, there will be supporters and opponents to the program. Nothing would bolster the chests of the supporters or silence the opposition faster than to demonstrate the successes of an ESE program. Based on work as described in this article, proponents would most likely be insurance companies, Departments of Transportation (DOT), local and federal traffic safety agencies, and perhaps even the law enforcement communities. Why? Because each of these stakeholders have at least one shared goal; saving lives and providing for a safer environment for the motoring public. Insurance providers will pay out less in claims, DOT's will lessen their litigation costs, traffic safety agencies would see a reduction in traffic injuries/fatalities, and law enforcement agencies would be more available to respond to crime prevention efforts rather than traffic related matters.

Those opposed to an ESE could be civil liberty groups, vehicle manufacturers and law enforcement labor unions. The civil liberty groups would certainly have concerns of intrusions into the privacy of individuals, and also of the lack of adequate recourse for drivers subject to fines and sanctions in an automated system. Vehicle manufacturers could absorb significant costs reconfiguring their assembly lines and designs of vehicle to incorporate the RFID and GPS technologies necessary to be recognized by ESE programs. Finally, law enforcement labor unions could be opposed based on the possible elimination of peace officer positions through the application on ESE technology.

Even though each of these stakeholders would have a desire to save lives; however, elements of ESE programs that affect the concerns of each group must be addressed for any contemplated ESE effort to be successful.

Some options to address concerns might be to include those with concerns in the planning and implementation process; assess ways to come to consensus on issues of contention. For example, the vehicle manufacturers could receive additional federal funding to transition their equipment and design to meet the technological demands. The civil liberty and labor groups could work collaboratively with legislative lobbyists and public safety employers to educate the motoring public on speed related traffic safety concerns and consequences. Insurance companies could assist in the educational and legislative arenas to garner support for ESE program. These are just a few ways some of the opponents and supporters of an ESE program could be persuaded to embrace it; no one wants to lose a loved one if there was a way to help prevent it available.

Starting Points

Putting an ESE program into place is going to take some doing. A good starting point would be to identify your stakeholders (including civil liberty groups, Departments of Transportations, Motor Vehicles, and the judiciary) and obtain their support. You may find yourself having to enlighten your audience with the technological advances and capabilities of the components of an ESE program. Providing specific information from your jurisdiction that would demonstrate how this type of speed enforcement program would positively impact the traffic collision picture and pay for itself. Certainly, solid

statistical data exists with local, regional, state and federal traffic safety agencies to support the belief that ESE can reduce collisions and save lives.

Obtaining the funding and approval for implementation would take some legwork as well. Depending upon your level of governing body, some form of legislative approval for the program would be necessary. Drafting the proposal for implementation for your governing body is going to have to include statistical data, potential locations for deployment, anticipated outcomes, costs, and naturally pros and cons associated with an ESE program. To help your proposal along, seek out some of your funding sources in advance; locally, regionally, and at the state and federal levels. There is money out there waiting to be part of 'cutting edge' traffic safety programs. Local and regional Office of Traffic Safety Grants, federal funds from National Highway Traffic Safety Administration and the Federal Highway Administration may also be available.[8] Private corporations like WalMart offer grants in the interest of public safety as well.

There is plenty of work to be done in the next five to ten years. Experts consulted believed it would take before some of the trends and events necessary for an ESE program would come to fruition. Put that time to good use in answering some of the most obvious questions a governing board may have; how many lives presumably will an ESE program save, given it is implemented in a desirable location? How long before we see the results and will those results be embraced by the communities it is designed to

[8] Office of Traffic Safety, California. Apply for a Grant. Internet. www.ots.ca.gov. 02/29/2008; National Highway Traffic Safety Administration. Programs. Internet. www.nhtsa.dot.gov. 02/29/2008

protect? Start collecting your own data while some of the trends and events you have no control over play out.

A prompt reduction in traffic collisions within a short amount of time would likely come to fruition based upon ESE being another tool to augment speed enforcement by traffic safety law enforcement personnel. If Norway can continue to utilize their ASE program year in–year out for the past 30 years based upon positive results, the likelihood of similar results in any jurisdiction using an ESE program is high. Likewise, an effective self-supporting speed enforcement program which augments current efforts by law enforcement would permit valuable human resources to be deployed in more demanding areas of crime prevention and should increase the levels of service provided to the communities served.

Conclusion

Currently, law enforcement and traffic safety agencies use components of an ITS program as a ***preventative measure*** to warn the motoring public of their speed or recent roadway changes with the intent of making vehicular travel a safer adventure. Using an expanded system as a ***punitive tool*** will take a little more work, as would be the case in an ESE program, but may be well worth the efforts in light of our growing traffic collision problem, projected increases in congestion, increasing population, and the inability to recruit and retain sworn personnel in the profession of law enforcement and traffic management. So why not utilize technologies available today to assist your agency in policing traffic offenses of the future? That policing for the future starts with

the open mindset ready to embark on new ventures and programs never thought possible in the past; an Electronic Speed Enforcement program.

An effectively implemented ESE program would create a safer driving environment, a reduction in the number of speed related traffic collisions, a reduction in traffic related law enforcement officer injury/death and an increase in retention levels of law enforcement personnel. The most crucial variable in an ESE program implementation is you and your agency. Are you going to wait for it to come to you, or are going to go out there, get informed, and go get it?