Statement before the Pennsylvania Senate Transportation Committee

Research on Automated Speed Enforcement

Michael D. Fagin

April 21, 2014

INSURANCE INSTITUTE
FOR HIGHWAY SAFETY

1005 NORTH GLEBE ROAD ARLINGTON, VA 22201
PHONE 703/247-1500 FAX 703/247-1678
www.iihs.org

The Insurance Institute for Highway Safety is a nonprofit research and communications organization that identifies ways to reduce the deaths, injuries, and property damage on our nation's highways. We are supported by the nation's automobile insurers. I am submitting for the record information from the Institute about the use of automated enforcement technology to reduce speeding on high-risk roads.

Risks of speeding

Speeding is a major factor in motor vehicle crashes, especially those resulting in serious injuries.[1] In the United States, speeding — as defined on police crash reports as driving too fast for conditions, exceeding posted speed limits, or racing — was a contributor in about 30 percent of crash deaths in 2012, resulting in more than 10,000 fatalities.[2] Although speeding often is associated with interstates and other high-speed roads, 83 percent of speeding-related fatalities occur on roads other than interstate highways. In 2012, 26 percent of all speeding-related fatalities occurred on streets with speed limits of 35 mph or less.

New ways needed to reduce speeding on high-risk roads

The perception of the risk of getting a speeding ticket strongly influences motorists' speed choices. Traditional police patrols are the most common method of apprehending motorists who travel at excessive speeds. However, many enforcement agencies do not have sufficient personnel to mount effective speed enforcement programs. Staffing levels have not kept pace with the growth in motor vehicle travel. Between 1995 and 2012 the estimated number of vehicle miles traveled in the United States increased by 23 percent,[3] but the number of law enforcement officers grew by 14 percent.[4] Other police priorities such as apprehension of violent criminals and antiterrorism efforts can limit resources available for traffic enforcement. In addition, on multilane roads with heavy traffic moving in both directions, it is dangerous for police to make traditional traffic stops.

Speeding poses multiple risks to everyone on the road

Speeding is one of the most prevalent factors contributing to motor vehicle crashes.[5] It contributes to both crash frequency and severity.[6] Speed increases frequency because at higher speeds motorists have less time to react and stopping distances are longer. The probability of severe injury in crashes increases sharply with the impact speeds of the vehicles, reflecting the laws of physics.

The risk of death to pedestrians — the most vulnerable people on the road — climbs rapidly as speed increases. Researchers estimate that the risk of death for a pedestrian struck by a vehicle is about 5 percent for a vehicle traveling at 20 mph, about 40 percent for a vehicle traveling at 30 mph, and about 80 percent for a vehicle traveling at 40 mph.[7] Urban areas are prime candidates for speed enforcement because 73 percent of pedestrian deaths in 2012 occurred in urban areas.[8]

How to reduce speeding

The challenge is to find better methods of controlling speeds, and speed cameras can help. They photograph motor vehicles going a specified amount above the posted speed limit, and violators are ticketed by mail. Camera systems typically consist of a radar unit to measure speeds and a camera to photograph the vehicles that are violating the speed limit. The time, date, location, and speed of the vehicle are recorded. And to increase the deterrent value, prominently posted signs are used to alert motorists that cameras are being used.

Over 130 US communities use cameras to supplement conventional police enforcement of speed limits, especially on high-risk roads, as of April 2014.

In 2007 the Institute conducted an evaluation of the Montgomery County program using speed cameras to enforce limits on residential roads with speed limits of 35 mph or lower and in school zones. The study indicates that the program is helping to reduce speeding. Researchers measured traffic speeds approximately 6 months before and 6 months after camera enforcement began in May 2007. The proportion of vehicles traveling more than 10 mph above posted limits fell by 70 percent on roads where cameras were operational and by 39 percent on roads with signs warning of enforcement but where cameras were not yet in place.[9]

The Institute also evaluated the effect of a pilot speed-camera enforcement program begun in 2006 in Scottsdale, Arizona. Cameras photographed vehicles going more than 10 mph above the 65 mph speed limit on Loop 101, a six-lane freeway encircling the Phoenix metro area. Speeding in the city's camera enforcement zone decreased among both passenger vehicles and large trucks, with the combined proportion of vehicles exceeding 75 mph dropping from 15 percent before camera enforcement to 1-2 percent while cameras were in use. By comparing Loop 101 speeds with those observed on nearby freeways that did not have cameras, researchers concluded that the Scottsdale program was associated with as much as a 95 percent decrease in the odds that drivers would surpass 75 mph.[10]

In 2002 the Institute evaluated the effect of a city-wide speed camera program begun in 2001 by the District of Columbia. The program involved five vehicles equipped with cameras rotated among 60 enforcement zones throughout the city. Institute researchers measured travel speeds on seven neighborhood streets before cameras were deployed and again at the same sites about six months after deployment. At all of the sites the proportion of motorists going fast enough to warrant a ticket (more than 10 mph above the speed limit) went down dramatically. Reductions at the seven sites ranged from 38 to 89 percent. Institute researchers also measured travel speeds in Baltimore, Maryland, a nearby city that does not use speed cameras. At the same time DC was experiencing a decrease in travel speeds because of the camera enforcement program, the proportion of motorists going more than 10 mph above the speed limit at sites in Baltimore stayed about the same or increased slightly.[11]

Similar results were found in a pilot speed camera program in Beaverton and Portland, Oregon.[12] Engineers compared vehicle speeds before and after implementation of speed cameras. In Beaverton the percentage of vehicles exceeding the posted limit by more than 5 mph decreased 28 percent on streets with speed cameras. Likewise, in Portland the percentage of vehicles exceeding the posted limit by more than 10 mph decreased by 27 percent on streets with speed cameras.

Studies have evaluated crash effects of automated speed enforcement. Evaluating a program in British Columbia that involved 30 cameras, researchers found a 7 percent decline in crashes, a 10 percent decline in daytime crash injuries, and up to 20 percent fewer deaths during the first year cameras were used.[13]

The Transportation Research Board and others have reported the following examples of the successful use of speed cameras:

- Victoria, Australia, launched a speed camera program in 1989. A little more than a year later, the frequency of crashes involving injuries or deaths had decreased by about 30 percent.[6]
- On a stretch of Autobahn A3 between Cologne and Frankfurt, Germany, where speed cameras were deployed, total crashes dropped from about 300 per year to fewer than 30. Injury crashes decreased by a factor of 20.[6]
- Speed cameras were deployed on 64 roads in Norway, producing a 20 percent reduction in injury crashes.[6]

- An evaluation of fixed speed cameras on 30 mph roads in the United Kingdom found the average effect was a 25 percent reduction in injury crashes.[14]

The effects of automated speed enforcement on crashes also have been summarized in two systematic reviews of the international literature. A 2005 review analyzed data from 14 studies and found crash reductions in the immediate vicinities of camera sites, ranging from 5 to 69 percent for all crashes, 12 to 65 percent for injury crashes, and 17 to 71 percent for fatal crashes.[15] A 2010 review published by the Cochrane Collaboration (an international organization that conducts systematic reviews of the scientific literature on public health issues) analyzed data from 28 studies and found reductions ranging from 8 to 49 percent for all crashes, 8 to 50 percent for injury crashes, and 11 to 44 percent for crashes involving fatalities and serious injuries.[16]

Public support for speed enforcement

One reason cameras are not used more extensively in this country is that many elected officials believe there is an absence of public support. Concerns also have been expressed about privacy issues. However, a national survey conducted in 2006 by the Insurance Research Council found that 60 percent of US residents favor using cameras to enforce speed limit laws.[17] A 2012 Institute survey of residents of the District of Columbia found strong support for speed cameras.[18] Seventy-one percent of residents who had driven a car in the past month and 90 percent of residents who had not driven supported speed cameras. The Institute surveyed Montgomery County residents about the speed camera program, and 62 percent supported it. Likewise, the Institute's survey of Scottsdale, Arizona, drivers found that a majority thought speeding was a problem on Loop 101, and about 70 percent supported the speed camera program. The use of speed cameras throughout Maryland can help police enforce speed limits more effectively.

References

1. Elvik, R. 2005. Speed and road safety: synthesis of evidence from evaluation studies. *Transportation Research Record* 1908:59-69. Washington, DC: Transportation Research Board.
2. Insurance Institute for Highway Safety. 2014. [Unpublished analysis of data from the Fatality Analysis Reporting System]. Arlington, VA.
3. Federal Highway Administration. 2013. Highway statistics. Washington, DC: US Department of Transportation. Available: http://www.fhwa.dot.gov/policy/ohpi/hss/hsspubs.htm.
4. Federal Bureau of Investigation. 2013. Crime in the United States. Washington, DC: US Department of Justice. Available: http://www.fbi.gov/ucr/ucr.htm.
5. Bowie, N.N. and Waltz, M. 1994. Data analysis of the speed-related crash issue. *Auto and Traffic Safety* 1:31-38.
6. Transportation Research Board. 1998. Special report 254; Managing speed: review of current practice for setting and enforcing speed limits. Washington, DC: National Academy of Sciences.

7. Pasanen, E. 1992. Driving speeds and pedestrian safety – a mathematical model. Technical Report No. REPT-77. Espoo, Finland: Helsinki University of Technology

8. Insurance Institute for Highway Safety. 2014. Fatality facts 2012: pedestrians. Arlington, VA. Available: http://www.iihs.org/iihs/topics/t/pedestrians-and-bicyclists/fatalityfacts/pedestrians/2012.

9. Retting, R.A.; Farmer, C.M.; and McCartt, A.T. 2008. Evaluation of automated speed enforcement in Montgomery County, Maryland. *Traffic Injury Prevention* 9:440-45.

10. Retting, R.A.; Kyrychenko, S.Y.; and McCartt, A.T. 2008. Evaluation of automated speed enforcement on Loop 101 freeway in Scottsdale, Arizona. *Accident Analysis and Prevention* 40:1506-12.

11. Retting, R.A. and Farmer, C.M. 2003. Evaluation of speed camera enforcement in the District of Columbia. *Transportation Research Record* 1830:34-37. Washington, DC: Transportation Research Board.

12. Portland Office of Transportation, City of Beaverton. 1997. Photo radar demonstration project evaluation: cities of Beaverton and Portland. Portland, OR: Oregon Department of Transportation. Available: http://www.portlandonline.com/police/index.cfm?c=cjiha&a=dcdii.

13. Chen, G.; Wilson, J.; Wu, J.; Mehle, W.; and Cooper, P. 1998. Interim evaluation report: photo radar program one year after introduction of the violation ticket phase. Victoria, British Columbia: Insurance Corporation of British Columbia.

14. Mountain, L.J.; Hirst, W.M.; and Maher, M.J. 2004. Costing lives or saving lives? A detailed evaluation of the impact of speed cameras on safety. *Traffic Engineering and Control* 45:280-87.

15. Pilkington, P. and Kinra, S. 2005. Effectiveness of speed cameras in preventing road traffic collisions and related casualties: systematic review. *British Medical Journal* 330:331-34.

16. Wilson, C.; Willis, C.: Hendrikz, J.K.; Le Brocque, R.; and Bellamy, N. 2010. Speed cameras for the prevention of road traffic injuries and deaths. The Cochrane Library 2010, Issue 10. Oxfordshire, England: The Cochrane Collaboration.

17. Insurance Research Council. 2007. Public attitude monitor 2007; Public support for laws and devices that promote highway safety. Malvern, PA.

18. Cicchino, J.B.; Wells, J.K.; and McCartt, A.T. 2014. Survey about pedestrian safety and attitudes toward automated traffic enforcement in Washington, D.C. Traffic Injury Prevention 15(4):414-23.