U.S. Department of Transportation
Federal Highway Administration

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Priority, Market-Ready Technologies and Innovations

SAFETY & DESIGN

Red Light Cameras

Problem: Intersection crashes account for more than 40 percent of all crashes

Intersection safety is a serious problem in the United States, and it is one of the Federal Highway Administration's (FHWA) top priorities. The National Highway Traffic Safety Administration (NHTSA) reports that in 2004 alone, more than 9,100 people died and another 1.5 million people were injured in intersection-related crashes. According to 2004 data from NHTSA's Fatality Analysis Reporting and General Estimates Systems, crashes caused by red light running (RLR) resulted in as many as 854 fatalities and more than 168,000 injuries. In addition, approximately 40 percent of all crashes are intersection-related.

When does RLR occur?
RLR occurs when a driver enters an intersection after the traffic signal has turned red. The traditional way of enforcing this violation is to station a patrol vehicle(s) near an intersection. This method is dangerous for the officer, expensive to localities, and drains valuable police resources. Red light cameras can supplement police efforts by being where officers cannot be all of the time.

Putting It in Perspective

According to a survey conducted by U.S. Department of Transportation and the American Trauma Society, 63 percent of Americans witness a RLR incident more than once a week. One in three Americans knows someone who has been injured or killed because of a red light runner.

Solution: Red light camera technology can make intersections safer

What are red light cameras?
Red light cameras (RLC) detect a motor vehicle that passes over sensors in the pavement after a traffic signal has turned red. The sensors are connected to computers in high-speed cameras, which take two photographs of the violation. Typically, the first photo is taken of the front of the vehicle when it enters the intersection, and the second photo is taken of the rear of the vehicle when the vehicle is in the intersection. Law enforcement officials review the photograph, and a citation is mailed to the registered owner of the vehicle. The owner can challenge the citation if he or she was not the driver at the time of the violation.

Benefits

Automated enforcement systems can be effective and reliable tools to help reduce the number of RLR violations and associated crashes.

Successful Applications: Research demonstrates crash severity reductions

According to one of the most comprehensive studies to date on RLCs, FHWA's *Safety Evaluation of Red-Light Cameras* (FHWA-HRT-05-048), which included data from seven jurisdictions (Baltimore, MD; Charlotte, NC; El Cajon, CA; Howard County and Montgomery County, MD; and San Diego; and San Francisco, CA) and 132 intersections, the use of RLCs led to the following:

- 25 percent decrease in total right-angle crashes.
- 16 percent reduction in injury right-angle crashes.
- 15 percent increase in total rear-end crashes.
- 24 percent increase in injury rear-end crashes.

Economic analysis from the same study showed that RLCs save society $39,000 to $50,000 annually at each intersection where they are installed. The costs considered include hospital bills, property damage to vehicles, insurance expenses, value of lost quality of life, and other costs. The greatest economic benefits are seen at locations with a high ratio of right-angle to rear-end crashes, a higher proportion of entering annual average daily traffic on the major road, and the presence of left-turn protected phases.

In another survey, which was conducted as part of a project for the National Cooperative Highway Research Program, researchers found that a majority of jurisdictions—including those in Boulder, CO; Polk County, FL; Mesa, AZ; Sacramento, CA; and Laurel, MD—reported downward trends in RLR crashes and violations because of RLCs.

According to FHWA and NHTSA's *Red Light Camera Systems Operational Guidelines*, the following critical elements should be considered while installing RLC systems:

- Conduct an engineering study before considering camera installation.
- Evaluate effective engineering and education alternatives before considering photo enforcement.
- Make sure the RLC program is engineered and installed properly.
- Measure, document, and make safety results available.
- Ensure complete oversight and supervision by public agencies.
- Avoid compensating vendors based on the number of citations.
- Include an ongoing photo-enforcement public education program.

Deployment Statement

RLCs have the potential to reduce intersection fatalities and injuries.

Deployment Goal

State and local agencies will use RLCs where appropriate to reduce injuries and fatalities due to red light running.

Deployment Status

RLCs are permitted by law in 12 States and 37 cities.

Additional Resources

For additional information on how to prevent red light running, visit **http://safety.fhwa.dot.gov/intersections/col_redlight.htm**. For more information on RLCs, see the following documents:

- *Red Light Camera Systems Operational Guidelines*, FHWA-SA-05-002, January 2005. Available online at **http://safety.fhwa.dot.gov/intersections/rlc_guide/index.htm**.
- *Safety Evaluation of Red-Light Cameras*, FHWA-HRT-05-048, April 2005. Available online at **http://www.tfhrc.gov/safety/pubs/05048/index.htm**.
- *Making Intersections Safer: A Toolbox of Engineering Countermeasures to Reduce Red-Light Running*, a report by FHWA and the Institute of Transportation Engineers (ITE), ITE Report 115, 2003. Available online at **http://safety.fhwa.dot.gov/intersections/rlr_report/index.htm**.

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