

**Statement before the Ohio State Senate  
Government Oversight and Reform  
Committee**

**Red Light Camera Research**

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The Insurance Institute for Highway Safety is a nonprofit research and communications organization that identifies ways to reduce deaths, injuries, and property damage on our nation's highways. We are supported by auto insurers. Thank you for the opportunity to share research findings about the use of automated enforcement to address red light running violations.

A high likelihood of apprehension is what convinces motorists to comply with traffic laws, but many enforcement agencies have insufficient personnel to mount effective enforcement programs using traditional police patrols. Automated traffic enforcement can supplement traditional methods, especially at times of day and on roads where traditional enforcement can be difficult if not hazardous.

The most important question about the use of automated enforcement is whether it reduces crashes — and it does. A wealth of research in U.S. communities and elsewhere indicates it reduces crashes and associated deaths, injuries, and property damage by reducing illegal and dangerous driver behavior.

### **Red light running**

The running of red lights is a common — and a serious — violation. An Institute study conducted at five busy intersections in Fairfax, Virginia indicated that, on average, a motorist ran a red light every 20 minutes,<sup>1</sup> and at peak travel times the violations became more frequent. In another Institute study conducted in Arlington, Virginia, red light runners were compared with drivers who had an opportunity to run a red light but did not.<sup>2</sup> As a group, the violators were younger, less likely to use safety belts, and had poorer driving records. Red light runners were more than 3 times as likely to have multiple speeding convictions on their driver records.

Traffic signal violations may seem trivial to the violators, but the safety consequences are considerable when things go wrong. An Institute study of urban crashes found that running red lights and other traffic controls was the most common cause of all crashes (22 percent). Injuries occurred in 39 percent of crashes in which motorists ran traffic controls. This was the highest proportion found for any crash type.<sup>3</sup>

On a national basis in 2012, drivers who ran red lights were responsible for 683 deaths and an estimated 133,000 injuries.<sup>4</sup> About half of the deaths in red light running crashes are pedestrians, bicyclists and occupants in other vehicles who are hit by the red light runners.

**Cameras reduce signal violations:** Red light cameras are effective in modifying driver behavior. Violation rates in Oxnard, California, and in Fairfax, Virginia decreased about 40 percent during the first year of camera enforcement.<sup>1,5</sup> Increases in driver compliance with signals were not limited to camera-equipped sites but spilled over to intersections without cameras.

In the Institute's most recent red light camera study, significant reductions in violations at camera intersections in Arlington, Virginia were found one year after ticketing began.<sup>6</sup> These reductions were greater for violations occurring later in the red phase, when violations are more likely to result in crashes. Violations occurring at least a half second after the light turned red were 39 percent less likely than would have been expected without cameras. Violations occurring at least 1 second after were 48 percent less likely, and the odds of a violation occurring at least 1.5 seconds into the red phase fell 86 percent. Violations were lower at two nearby noncamera intersections on camera corridors but not at two other noncamera sites not on camera corridors. A larger, more widely publicized program likely is needed to achieve broad community-wide effects.

It is sometimes claimed that proper timing of yellow signals can eliminate red light running. While adequate timing is important and can reduce signal violations, longer yellow timing alone does not eliminate the benefits of red light cameras. An Institute study conducted in Philadelphia illustrated the benefits of both countermeasures by first lengthening yellow signals and then introducing red light camera enforcement.<sup>7</sup> Extending yellow lights reduced violations by 36 percent, and camera enforcement further reduced the remaining violations by 96 percent beyond the levels that had been achieved by the longer yellow intervals.

**Cameras reduce intersection crashes:** The key question is whether red light camera enforcement improves safety. Findings from Institute research indicate it does. In 2010, researchers looked at 14 cities that had cameras during 2004-08 and found that the combined per capita rate of fatal red light running crashes fell 35 percent, compared with 1992-96. The rate also fell in 48 cities without camera programs in either period, but only by 14 percent. Based on that comparison, the researchers concluded that the rate of fatal red light running crashes in cities with cameras in 2004-08 was 24 percent lower than it would have been without cameras. That adds up to 74 fewer fatal red light running crashes or, given the average number of fatalities per red light running crash, approximately 83 lives saved.<sup>8</sup> The researchers estimated that had all cities with at least 200,000 population had red light camera programs during this period, as many as 815 deaths would have been prevented in signalized intersection crashes.

Significant citywide crash reductions followed the introduction of cameras in Oxnard, California.<sup>9</sup> Injury crashes at intersections with traffic signals were reduced 29 percent. Front-into-side collisions — the crash type most closely associated with red light running — were reduced 32 percent, and front-into-side crashes involving injuries were reduced 68 percent. Crashes declined throughout Oxnard, even though cameras were installed at only 11 of the city's 125 intersections with traffic signals.

A review of the international literature concluded that red light camera enforcement reduces violations an estimated 40-50 percent. It reduces injury crashes 25-30 percent.<sup>10</sup>

Some studies have reported that, even as red light cameras reduce front-into-side collisions and overall injury crashes, they can increase rear-end crashes in the initial period following camera installation. A 2005 study sponsored by the Federal Highway Administration evaluated red light camera programs in 7 communities, finding a 25 percent reduction in right-angle crashes while rear-end collisions increased 15 percent.<sup>11</sup> But because the types of crashes that are prevented by red light cameras tend to be more severe and more costly than the additional rear-end crashes that can occur, the study estimated a positive societal benefit of more than \$18.5 million in the 7 communities.

Not all studies have reported increases in rear-end crashes. In 2005 the Cochrane Collaboration, an international nonprofit organization that conducts systematic reviews of the scientific literature on public health issues, reviewed 10 controlled before-and-after studies of red light camera effectiveness in Australia, Singapore, and the United States.<sup>12</sup> These studies showed a 16 percent reduction in all types of injury crashes and a 24 percent reduction in right-angle crashes. The review did not find a statistically significant change in rear-end crashes.

Some studies have purported to find overall crash increases following camera enforcement,<sup>13,14</sup> but careful review indicates the researchers failed to incorporate appropriate comparison sites. The result is that the expected number of crashes at intersections where cameras were installed could not be properly estimated,<sup>15,16</sup> so the effects of the enforcement on crashes could not be determined.

**Another option:** A good way to reduce crashes is to convert traditional intersections to roundabouts, which eliminate the need for traffic signals, as well as cameras. Where roundabouts have been installed, crashes have declined about 40 percent. Crashes involving injuries have declined about 80 percent.<sup>17</sup> Still, many intersections will continue to be controlled by traffic lights, so red light cameras will continue to be useful.

### **Public support**

Like other government policies and programs, camera enforcement requires acceptance and support among the public as well as elected leaders. Some opponents of automated enforcement raise the “big brother” issue to stir up disapproval, but acceptance of cameras always has been strong. An IIHS survey conducted in 2013 of people who live in the District of Columbia, which has an extensive camera program, found that 87 percent of residents support red light cameras.<sup>18</sup> A 2011 Institute survey found that two thirds of drivers in 14 big cities with long-standing camera programs support their use.<sup>19</sup> An earlier Institute survey conducted in 10 U.S. cities,

five with red light cameras and five without, found more than 75 percent of drivers supported the cameras.<sup>20</sup> A nationwide survey sponsored by the National Highway Traffic Safety Administration also found favor among 75 percent of drivers.<sup>21</sup> In a survey by the Virginia Transportation Research Council at five locations in the state, almost 2 of 3 respondents supported red light cameras.<sup>22</sup>

## Summary and conclusions

Automated traffic enforcement is not a panacea, but it is a proven way to reduce traffic violations and prevent crashes, especially serious crashes that result in injury and death. Opponents often criticize the revenue-generating aspects of camera programs, but a plus is that such programs can be financially self-sufficient. Once cameras have been in place long enough that residents know they will be ticketed for flouting the law, violations and revenues decline.

Cameras are sometimes said to violate privacy, but driving is a regulated activity on public roads. By obtaining a license, a motorist agrees to abide by certain rules, such as to obey traffic signals. Neither the law nor common sense suggests that drivers shouldn't be observed on the road or have their violations documented.

In tallying the costs and benefits of camera enforcement, communities should factor in the considerable social and economic benefits of successfully reducing crashes. Besides foregone medical costs, car repair bills, and lost income, citizens in communities with cameras experience direct savings in terms of reduced police time to investigate and report crashes, lessened need for emergency response service, and lower roadway cleanup costs.

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