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SAFE CROSSINGS

By Pete Goldin

Making intersections safer for everyone is a priority for transportation agencies around the world, but are some solutions just adding to the problem?

Intersections, almost by definition, breed conflict among their many varied users, says John Bowman, communications director for the National Motorists Association (NMA). Intersection crashes are a significant problem in cities, and they often result from drivers running red lights, adds Anne McCartt, senior vice president for research at the Insurance Institute for Highway Safety (IIHS); an Institute study found that almost one-quarter of urban crashes involve drivers running red lights or other traffic controls.

In 2008, there were more than 2.3 million intersection-related crashes, resulting in more than 7,770 fatalities and approximately 733,000 injury crashes, according to the National Highway Traffic Safety Administration (NHTSA). To address this problem, transportation authorities across the US have made intersection safety a priority in the last decade, leveraging a range of technologies and engineering techniques — from improved signal placement and cycle length optimization to yellow signal backplates, rumble strips and red light cameras — to reduce red light running.

But the question remains: What is the most effective way to secure safety in the intersection? For some transportation organizations, the answer is red light cameras that take photos of vehicles running red lights. In recent years, red light camera enforcement has grown in popularity — a total of 24 states have red light cameras currently operating — sparking a debate about the effectiveness and ethics of this approach.

Preventing Crashes

"In terms of behavioral safety, the main challenge is getting drivers to obey traffic signals and come to a complete stop at red lights and stop signs," says Kara Macek, communications manager for the Governors Highway Safety Association (GHSA).

Both the Federal Highway Administration (FHWA) and NHTSA state that red light camera systems can be an effective countermeasure to prevent red light running.

"In order to hold those drivers who disregard the law and recklessly disregard the traffic control devices at an intersection, automated enforcement such as red light running enforcement is the best tool available to hold reckless drivers accountable for breaking the law," says Jack Nata, manager of the Division of Traffic and Signals at City of Newark. "The presence of photo

enforcement causes drivers to think twice before initiating any risky maneuvers."

Nata says that photo enforcement programs help prevent crashes, thereby reducing traffic delays and resource allocation by police, fire and EMT resources. "More importantly," he continues, "automated enforcement cameras save lives."

McCartt agrees. "It's a proven, effective tool to reduce red light running. Deterrence is the key. Well-publicized camera enforcement creates an atmosphere where drivers know that if they run a red light, they will get a ticket," she says.

Last month, the City of Newark released data showing a 64 percent reduction in total crashes; 69 percent reduction in right-angle crashes; and a 61 percent reduction in same direction (rear-end) crashes at seven of the city's most problematic intersections that have had red light running photo enforcement in operation for three full years.

San Francisco Municipal Transportation Agency (SFMTA) has also seen positive results with its red light camera (RLC) program. Since the program was instituted, the number of red light related right-angle crashes has been reduced by about 50 percent citywide.

"Not all of the reduction can be attributed to the RLC Program, but it plays a role," says Bond Yee, director of the Sustainable Streets Division of SFMTA.

Causing Crashes

While many see great benefits from red light enforcement cameras, others see significant challenges.

"When it comes to the dynamics of intersection safety, trying to alter driver behavior is simply ineffective," says Bowman of NMA. "Those drivers who cause the most serious angle-type crashes are entering the intersection three or more seconds after the light has turned red. These folks simply aren't paying attention or they may be impaired or responding to an emergency. No red light camera can change their behavior and prevent that accident. It simply mails them a ticket after the fact."

Bowman adds that there is no legitimate traffic safety reason to justify the use of red light cameras. "Cameras don't live up to their promise of increasing intersection safety," he says. "Many studies have confirmed that rear-end collisions routinely increase when cameras are installed."

Bowman cites a 2008 report from the University of South Florida, which found that "… cameras actually increase crashes and injuries, providing a safety argument not to install them."

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>
> — *JOHN BOWMAN, NMA COMMUNICATIONS DIRECTOR*

Likewise, FHWA research from 2005, covering seven cities across the US, found that while red light cameras resulted in a 25 percent decrease in right-angle crashes, they also resulted in a 15 percent increase in rear-end crashes.

According to Yee, however, this was not the case with SFMTA. "We took care to ensure that the length of yellow lights meet published standards," he says. "Our analysis showed that after the implementation of the RLC program, the number of rear-end collisions in the city has not increased."

"There have been several studies of RLR automated enforcement," explains Hugh McGee, Ph.D., a traffic safety engineer who has conducted research on red light running automated enforcement. McGee concurs that red light cameras can actually cause as well as prevent crashes. "While there have been

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varying results — some attributed to alternative evaluation methods — they tend to show that red light running is reduced, rear-end crashes increase and angle crashes decrease. Angle crashes tend to be more severe than rear-end and therefore, there is an overall improvement."

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>
> — HUGH MCGEE, PH.D.

Public Backlash

The factor that may cause the greatest problems for red light cameras is the question: Who profits?

"Red light camera programs depend on short yellow light times for their profitability," says Bowman. "Shortened yellows inflate violation rates, and without them, the cameras wouldn't generate enough citation income to be viable. Short yellow lights and red light cameras go together like peanut butter and jelly."

Bowman believes that red light camera programs distort what should be common sense traffic safety policies into money-making schemes due to their for-profit nature. "They prey on responsible motorists and degrade public safety," he says. "Having a private, for-profit company managing intersection safety represents a huge conflict of interest since the more tickets they issue, the better their bottom line looks."

The potential for conflict of interest in a government program can even lead to a public backlash against red light cameras.

"The challenge of red light cameras is the pushback by a good portion of the public," McGee points out. "It is seen as an intrusion into their privacy and just being used to get money for the agency. Some have accused the agencies of modifying the yellow time interval — making it shorter than it should be — to induce more red-light running. However, this claim is not substantiated. I doubt any traffic engineer would do that."

> Loma Linda mayor Rhodes Rigsby confirmed that a month after the city lengthened the yellow light by one second, the number of violations dropped by 90 percent.

"The privacy issue is difficult to address, but one can argue that there is some level of implied consent regarding recorded traffic enforcement for drivers who are using public rights-of-way," answers GHSA's Macek.

To address the "revenue generator" argument, GHSA recommends that compensation paid for an automated traffic enforcement system should be based on its value and not on the amount of revenue it generates nor the number of tickets issued. FHWA, GHSA and most industry experts agree that red light cameras should not be used as a revenue generator; GHSA also suggests that revenues derived from automated enforcement should be used solely to fund highway safety functions.

McGee advises that the public should be informed about the program and advised of the safety benefits accrued. Macek agrees. "Use of cameras should be preceded by a public information campaign, and the campaign should continue throughout the life of the automated enforcement program," she says.

"Cities need to bring the public along by clearly laying out the safety problem the cameras are intended to solve, and by being transparent about implementation," adds McCartt. "Cities that do that will have public support."

Yellow Light Timing

Most transportation experts agree that yellow light timing is also a critical intersection safety approach, and some believe it is a valid alternative to red light cameras.

"Properly engineered intersections are the key to reducing red-light running accidents," says Bowman. "The yellow light change interval must be of the proper duration to allow motorists time to stop or clear the intersection before pedestrians or cross traffic have the right of way."

Bowman cites studies from the Texas Transportation Institute that show the safety value of slightly longer yellow light durations. A 2003 report shows that an increase of 0.5 to 1.5 seconds in yellow duration — such that it does not exceed 5.5 seconds — will decrease the frequency of red light running by at least 50 percent. A follow-up study in 2004 demonstrates that a one second increase in the yellow light time corresponds to a 40 percent reduction in intersection crashes.

Loma Linda, California serves as an example. According to an ABC News report, red light cameras "were installed with the promise of increasing safety and decreasing accidents, but city officials say the cameras don't deliver. To help improve safety at busy intersections Loma Linda increased the timing on yellow traffic lights" by an extra second.

Loma Linda mayor Rhodes Rigsby confirmed that a month after the city lengthened the yellow light by one second, the number of violations dropped by 90 percent.

"Yellow light timing is an important aspect of intersection safety," McCartt agrees, who supports a combination of yellow light timing and red light cameras. "Studies have shown that lengthening yellow timing in accordance with traffic engineering guidelines can significantly reduce red light running violations. An Institute study in Philadelphia examined separately the effects of first lengthening yellow timing, and then introducing red light

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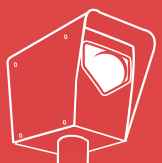

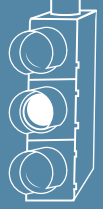

"Yellow light timing is an important aspect of intersection safety."

— ANNE McCARTT, V.P. OF RESEARCH FOR IIHS

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— JOHN BOWMAN, COMMUNICATIONS DIRECTOR FOR NMA

cameras. While the longer yellow reduced red light violations by 36 percent, adding camera enforcement cut red light running by another 96 percent."

Weighing the Alternatives

In addition to yellow light timing, other basic engineering countermeasures can have a significant safety impact, says Bowman. "A study from AAA Michigan demonstrates how simple engineering improvements such as enlarging traffic light lenses by 50 percent, re-striping left turn lanes with pavement markings, re-timing the traffic signals, and adding all-red clearance intervals can reduce accidents by nearly 50 percent," he says.

"I think that intersection safety will be improved with more development and implementation of vehicle technology," McGee adds.

Supporting this prediction, Connected Vehicle Insights, a new report from ITS America, states, "It is very likely that nearly all new cars on the road will have automotive radar (or some other sensing capability) in the next decades to support some form of automated crash avoidance … There are relatively few vehicles on the road today with crash prevention systems, but early data and insurance claims are beginning to show that these systems, particularly Forward Crash Prevention, are reducing crashes and improving traffic safety."

Meanwhile, IIHS suggests one solution that addresses red light camera concerns is to do away with intersections altogether, and use roundabouts instead.

In the end, Bowman challenges: "Given all of the safety and legal problems associated with red light cameras, and the fact that better and fairer alternatives exist, why would anyone want to perpetuate the use of cameras for any reason? Except for those parties who benefit from the revenue stream?"

On the other hand, the documented results from cities like Newark and San Francisco provide strong arguments in favor of expanding the use of red light cameras.

"Transportation agencies should be utilizing red light cameras to the extent allowed by their state laws," Macek counters.

"More communities should be implementing photo enforcement programs," McCartt agrees. "Camera enforcement of traffic laws is still relatively rare in the US compared with what has been accomplished in other countries that have been more aggressive in trying to improve public safety on the road."

With such strong opinions on both sides of the red light camera issue, it is difficult to draw a definitive conclusion one way or the other. Time will tell, as the success or failure of current programs becomes more apparent, but ultimately this comes down to a decision that each community and its leaders will have to make on their own. ■

Pete Goldin is a freelance journalist specializing in transportation and technology. He has written for magazines such as ITS International, World Highways, Parking World and the ITS Daily News at the ITS World Congress. Mr. Goldin can be reached at petegoldin@gmail.com.