

Law & Disorder / Civilization & Discontents

Perfect enforcement: On the ground in the red light camera wars

In 2013, red light camera use declined in the US for the first time.

by [Cyrus Farivar](#) - Dec 16 2013, 6:00pm PST

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[Enlarge](#) / A red light camera at the intersection of Sylvan and Coffee in Modesto, California.
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MODESTO, CA—Speaking in his downtown office, Mayor Garrad Marsh told Ars that he has lots of questions for [Redflex](#), one of the largest red light camera (RLC) operators in the United States.

Years ago, when the Australian company's cameras first came to this Central California agricultural city of 200,000 people, Marsh was a city council member who was generally positive on the idea of using automated cameras to catch drivers dangerously zooming through intersections at high speed. "Now, I'm not sure... to almost negative," he said.

Modesto features an active downtown area replete with shops, city offices, taco trucks, and a transit center, but the city has expanded significantly to the north and east. That's where Modesto seems to be miles after miles of flat, single-family homes, strip malls, and big box retailers. Drivers regularly blow through red lights at intersections on these long, straight streets.

In June 2004, Modesto's city council [noted](#) (PDF) that the city had 313 intersection collisions (with 170 injuries) "directly attributable to red light running" in the previous year. The council unanimously approved installing cameras at "up to 10" intersections as part of a five-year contract with Redflex. The city believed at the time that "the implementation of red light photo enforcement will significantly reduce the number of red light violations in the City of Modesto" and that the city would have "another valuable traffic calming tool to improve community and pedestrian safety."

Besides safety, an added benefit of the Redflex system was its "cost neutral" basis, meaning the city would never pay Redflex anything beyond a percentage of the fines generated by the camera system. This is a [common approach to many red light camera contracts](#), designed to make the system easy for cities to approve.

Marsh voted for the resolution at the time, and he said that the goal was never for the city to make more money—a common argument against red light cameras. "It's difficult for a cop to give a red light ticket [under normal circumstances,]" Marsh told me. "The reason is that it's, 'He said, she said.' There's no proof that I entered before it turned red. It's just difficult. So [with the red light cameras] we might make a little money on it, but that was not one of the decision points for anybody. We could have greater safety and not have to utilize cops sitting on an intersection to figure out if someone ran a red light."



[Enlarge](#) / Garrad Marsh, mayor of Modesto, California, sketches intersections as he makes a point about red light cameras.

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But doubts crept in. A year after supporting the Redflex system, Marsh wanted to see the actual camera setups. He drove out near Highway 99 at Sisk Road in the northwest corner of town, close to the Vintage Faire shopping mall. What he saw surprised him. The red light camera at the intersection was "set up to only monitor the lane coming off of Highway 99 onto Sisk, going north," Marsh said. "That was the only monitored lane—the turn lane is not the T-bone situation," he said, referring to a dangerous scenario where one high-speed car plows into another at a near-right angle.

"You're not blowing through a red light the way that a truly dangerous situation would be. That looks like they've picked the one where they can make money off of it. That was what got me thinking."

Some of his doubts were allayed at a meeting with Redflex representatives, who showed off footage of a driver at another Modesto intersection who clearly made no attempt at slowing down as he blew through a red light. "It was clearly the type of ticket you would

want to give, the type that I voted for, that would cause a serious possibly fatal accident—that kind of kept me at bay for a while,” Marsh said. “It was really a dynamic and impressive piece of film.”

But he was still troubled by the focus on turn lanes and continued to look into the implementation details of the Redflex setup. Marsh found that "most of the tickets [we issue from red light cameras] are right-hand turn. It's illegal, it's dangerous, but it's not the 'fatal accident' type of turn.”

This was a pattern. The cameras in Modesto are mounted across four intersections, but they are only set up to capture six precise situations. As the [Modesto Bee](#) noted in October 2013, the cameras watch drivers who are:

- Turning left from eastbound Standiford Avenue onto northbound Sisk Road
- Turning left from eastbound Briggsmore Avenue onto northbound Prescott Road
- Traveling north on Coffee Road through Sylvan Avenue or turning east onto Sylvan from northbound Coffee
- Traveling north on Oakdale Road through Briggsmore or turning east onto Briggsmore from northbound Oakdale

In short, just two out of the six deployments are even designed to capture the most dangerous scenario worrying citizens and city officials alike: cars blasting straight through a red light at high speed.

“We're collecting \$1 million from our residents and sending most of it to Arizona,” Marsh said, referring to Redflex’s American subsidiary located in the Grand Canyon State. “I’m going: are we really making our intersections safer? If it was \$1 million and it all stayed in Modesto, I might not be so pessimistic or cynical. And if it proves to truly produce safer intersections without having to utilize personnel to be there that aren't out there catching bad guys or patrolling. I'm not guaranteeing that I'll vote against it or change, but I am quite concerned that it's not what we bought, and it doesn't do good for our local economy.”

[According to the Modesto Police Department](#), the mayor's \$1 million reference describes the total amount collected in fines across three years. Of that money, the city keeps only ten percent (in this case, \$110,000)—the rest goes to Redflex and to pay the part-time salary of one Modesto police officer who helps manage the system.

Rajiv Shah, a professor at the University of Illinois at Chicago who [studied](#) red light cameras in Chicago in 2010, said that Marsh's observations are spot-on.

“A significant portion of the red light cameras—maybe 70 or 80 percent—are for rolling right turns,” Shah told Ars. “When you think of RLC, they're for people blowing through the intersection, which don't have nearly the same kind of chance for accident or injury. A lot of people feel like it's really unfair, doing the things like the right turns.”

“There’s nothing wrong with using technology to improve traffic safety. What’s wrong with RLC is that the emphasis became on revenue instead of traffic safety early on, and that led to decisions on business models and locations and how they set up fines, warnings, education. That left a bad taste in people’s mouths,” he added.



[Enlarge](#) / Modesto Mayor Garrad Marsh points out the locations of RLCs on a map of the city.

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Cop on the digital beat

Redflex spokesperson Jody Ryan describes the company's deals with cities as "a best case scenario of a private-public partnership." She explained that Redflex's cameras go through a "rigorous" review process to make sure that the data matches the criteria for violations as defined by each city. But, she emphasized, at the end of the day, it's the local police making the determination whether to issue a citation.

Modesto Police officer Steve Silva, a 34-year police veteran who personally approves each ticket, denies about 20 percent of the cases that the Redflex system presents to him. "I have to see a good violation," he told me. "If I can't identify the driver, the picture is too bad quality... sometimes there's a big vehicle blocking the limit line, sometimes it's just real close, and I'll dismiss it because any doubt goes to the citizens, 100 percent."

Each morning when Silva arrives at work, Redflex usually has data on 40 cars that might have run the cameras. Line by line, day by day, Silva checks each entry on the Redflex website. Was the car over the line? Was the light red? Was the photo clear? Does the photo of the driver match DMV records? This task takes him a few painstaking hours each day to go through completely.

"I like my job. I think I'm good at it," Silva said. "I do see that, when you get somebody from other agencies that may come in there and may say: 'The heck with it' and may cite everybody and inconvenience them. I've worked with people that work like that. You don't want somebody like that running that type of a program."

As for revenue from the system, Silva doesn't want to know about it. "I call it the separation between church and state," he said. "I don't want to know about it. Money can't be the motivation for what I approve. That does not occur, at least with me. I've been a police officer for over 30 years and have dealt with traffic for a long time. My opinion on having a system like this is not to make money. Citations are made to change behavior."

Still, the Modesto cop called the fines that California drivers have to pay "exorbitant," but he's hardly in a position to change the amount. And he noted that some drivers are taking turns and corners far too fast, sometimes nearly "taking out" pedestrians.

"We're not trying to go out there and rape the citizens of Modesto for running red lights. You don't want to get a ticket, quit fucking running red lights!" he added.

Silva has no doubt that the cameras have improved safety in Modesto, and he said he has not observed an increase in rear-end collisions as some of the academic studies suggest. In fact, if it were up to him, he would expand the program.

As for camera placement at particular intersections, Redflex appears to have final say (but would be willing to make adjustments as per the city's request, for a fee), and the company doesn't apologize for not covering all lanes of traffic or for focusing on turn lanes. Full coverage simply costs too much. Instead, each intersection features signs warning drivers from all directions about the presence of the cameras, and it's impossible for casual drivers to know which direction of travel or which lanes are actually being watched.

"If you have four approaches at a location and you install the equipment for all approaches, it's going to be very expensive and you're not going to be able to be cost-effective and spread the wealth around," explained Tony Parrino, director of Redflex's

system support. "By putting a single camera system at a single intersection, people don't know if it's the northbound or southbound approach. We call it the halo effect. We're making sure that we're being the most effective given the resources that we have."



[Enlarge](#) / A few hundred feet before the actual RLC intersection, Modesto drivers are warned.

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Peak camera?

2013 may be a turning point for red-light cameras across the United States. According to the [Insurance Institute for Highway Safety](#) (IIHS), a non-profit largely funded by auto insurance companies, this year is the first time in nearly two decades that the number of American cities with red-light cameras has fallen—the systems were installed in 509 communities as of November 2013.

While a single-year drop may not ultimately mean much, legislators across the country are increasingly agitated about the cameras. Bills are also pending in [Florida](#) and [Ohio](#) that would ban the devices entirely. A state representative in Iowa has also twice

introduced legislation to ban RLCs (he was not successful). Part of this backlash has to do with the (sometimes accurate) perception that RLCs are a moneymaking scheme, pure and simple.

The Ohio bill is largely a reaction against [Elmwood Place](#), a tiny village surrounded by Cincinnati, which collected \$1.5 million in fines from 20,000 people on a single block during two weeks in 2012. In June 2013, a local judge ordered that village's camera program to be shut down and had all the cameras [confiscated](#). By October 2013, the mayor of Elmwood Place [resigned](#) as a result of the controversial program. In 2012, Ohio cities collectively took in [\\$16 million](#) from red light camera systems.

Earlier this year, Chicago, which alone comprised 13.6 percent of Redflex's revenue, kicked the company to the curb in the wake of a [corruption scandal](#). Chicago Mayor Rahm Emanuel [dropped](#) Redflex and its 384 cameras in February 2013 after then-city transportation official John Bills was shown to have accepted a hotel room paid for by Redflex. City officials believe that the corruption goes much further.

"Redflex attempted to minimize its relationship with Mr. Bills and characterized the wrongful behavior as an isolated payment for one hotel stay," Emanuel's chief procurement officer, Jamie Rhee, wrote in a letter to Redflex lawyers in February 2013. "It now appears that many of the statements made by Redflex to the city about this issue were not accurate," Rhee added, citing the *Chicago Tribune's* disclosure of new revelations by investigators. (In October 2013, Chicago [selected Xerox ACS](#) to replace Redflex as its red-light camera operator.)

Redflex's US operations took a hit in 2013 as the company installed 54 new systems—but removed 101. Redflex's recent [fiscal report](#) (PDF) shows that its after-tax net profits in a six-month period have dropped by half: plummeting from \$7.1 million in the first half of 2012 to \$3.6 million in the first six months of 2013.

Some 26 states have already [banned the cameras outright or do not have them at all](#), including Maine, Kentucky, Arkansas, Massachusetts, and many Midwestern states.

After having rapidly risen to cities large and small across America, citizens and members of local government are starting to ask themselves the same questions that Mayor Marsh is asking: are these cameras actually making our communities safer? And is it a good idea to use speeders' fines to pay for a system designed to catch them? Plus, are all laws even meant to be perfectly enforced?

Only weaker studies show a benefit

These questions—especially the ones on safety—are difficult questions to answer. A handful of studies have been done on the use of red-light cameras, including some scientific meta-analyses, though, and they generally agree that red light cameras *increase* front-to-back crashes (as people brake suddenly during yellow lights) but also *decrease* the more dangerous T-bone crashes. All said, there's notable disagreement as to how

much T-bone crashes decline and whether the increase of forward collisions offsets the benefits from T-bone crash reduction.

Camera proponents often point to an academic paper ([Retting et al., 2010](#)) examining data from Israel, Australia, Europe, and the United States. (The study was funded by IIHS, the American auto insurance lobby, and many have criticized its methodology.) The paper concludes:

It is clear that red light camera enforcement is highly effective in reducing red light violations and right-angle injury crashes associated with red light running. Although results vary considerably due in part to the methodological weaknesses of the studies, the results all indicate that red light camera enforcement reduces injury crashes; the best estimate is about 25–30 percent.

An earlier [Retting and Kyrychenko \(2002\)](#) study indicates red light cameras reduce injury crashes by 29 percent. Rear-end crashes increased in many studies, but rear-end injury crashes increased less and were more than offset by the reductions in right-angle injury crashes.

But one of the best meta-analyses of the research comes to some pretty damning conclusions for the pro-red light camera crowd. In 2008, the Norwegian Public Roads Administration and the Ministry of Transport of Communications partly funded a massive analysis of 22 papers containing data from Norway, Australia, Singapore, the United Kingdom, and the United States.

Like most science, different methodologies will yield different results even when examining the same phenomenon. The paper resulting from the Norwegian funding, "[Red light for red-light cameras? A meta-analysis of the effects of red-light cameras on crashes](#)," examines the methodologies of the papers it surveys and concludes that the best ones take into account "regression to the mean" (RTM) and "spillover effects." Studies that don't take into account these phenomena have weaker methodologies and are thus less reliable.

The concept of RTM says that a phenomenon that is higher than usual, will, over time, converge on the mean. Here, if a given intersection has an abnormally high level of crashes one year, it will almost certainly decrease the following year. If city planners and camera vendors identify locations with a high number of recent crashes, there would have almost certainly been a decrease in crashes even without the addition of a camera. In a thoughtful study examining the before and after effects with a control group, RTM can be controlled for by randomly assigning study and control groups—but rarely are cameras installed in a real-world setting randomly. Statisticians can correct for the RTM effect, however, by using a technique called empirical Bayes methodology.

Spillover effects, by contrast, deal with the opposite problem of underestimating camera effects on a given intersection. As the meta-analysis notes, "The installation of RLCs may affect red-light running and crashes not only at those intersections at which RLCs are

installed but also at nearby intersections without RLCs. Drivers may for example become generally more inclined to stop when lights are changing to red.”

The meta-analysis concluded that, when only the best studies were considered, "The results of the meta-analysis are rather unfavorable for RLCs... According to the results from these studies, right-angle collisions are reduced by about 10 percent, rear-end collisions increase significantly by about 40 percent, and the overall effect on all types of crashes is an increase by about 15 percent. Only studies with weaker study designs yield results that are more favorable for RLCs."

The best study examined by the meta-analysis was a 2007 study examining seven years' worth of data across six jurisdictions in the US state of Virginia: Alexandria, Arlington, Fairfax City, Fairfax County, Falls Church, and Vienna. This study, "[The Impact of Red Light Cameras \(Photo-Red Enforcement\) on Crashes in Virginia \(Garber et al., 2007\)](#)" found that, generally, rear-end crashes increased and red-light running crashes decreased.

However, the same study also found:

The cameras were associated with a net negative impact when results for all six jurisdictions and all crashes (injury and non-injury) were combined; i.e., the increase in costs from the increase in rear-end crashes more than offset the reduction in costs from the decrease in red light running crashes.

“These results cannot be used to justify the widespread installation of cameras because they are not universally effective,” the authors wrote. “These results also cannot be used to justify the abolition of cameras, as they have had a positive impact at some intersections and in some jurisdictions. The report recommends, therefore, that the decision to install a red light camera be made on an intersection-by-intersection basis.”

"The law is not meant to be perfectly enforced"

Those who object to the cameras don't do so solely on the grounds of an unproven safety record. [Woodrow Hartzog](#), a law professor at the Cumberland School of Law at Samford University, has [written extensively on robotics and the law](#). He told Ars that one of the reasons people don't like red light cameras is because the system “makes the entire process less transparent.”

Prosecutorial and police discretion are important, Hartzog adds. While lots of laws are on the books, every citizen knows that they are not always enforced equally—or at all. Local law enforcement has the discretion to enforce the law based on severity, timeliness, and resource priority. Cops generally prioritize more serious crimes (violent crimes) over petty ones (jaywalking), though both remain illegal.

“There's this explicit or implicit sorting that goes on, and RLC removes that by automating it all,” Hartzog said. “The officer only ditches cases if the evidence isn't sufficient to establish a violation. Ostensibly RLC perfectly enforces the law—but we

argue that the law is not meant to be perfectly enforced. At a more basic level I feel that society has a general agreement that not all traffic laws need to be followed 100 percent of the time—I don't think that laws are created with that in mind."

He cites the example of making a turn at 3:00am on a road with no one around. "When you have these RLCs, this removes any possibility that you can negotiate these laws a little," Hartzog said. "Resource limitations have limited that until this point."

In addition, the state is incentivized to use such technical systems to approach perfect enforcement. "There's a perverse incentive" to the red light camera system, Hartzog said, "which is that when you have the capacity to enforce the law, it takes very few resources to generate [money] for the state."

In California, where red light tickets are notably higher than in the rest of the country ([\\$500](#) versus an average of \$100 elsewhere), irritation with the systems can run hot. Not surprisingly, California contains some of the most vocal online opponents of the cameras. HighwayRobbery.net's editor, who goes by "Jim," lives in Southern California and has followed the issue for several years. His site prominently features a long list of [quotes from city officials](#) who have decided to pull down their cameras.

"I'm just deferring to the dozen or so California cities where the city officials finally figured it out for themselves," he told Ars, referring to the [locales across the Golden State](#) that have declined to renew their RLC cameras. "These were cities that were immersed in it up to their elbows [and found] that it really didn't make a difference. They couldn't find a difference. I'm more inclined to believe the cities that come clean."

As a recent example, Jim cites the city of Poway, in San Diego County, which [decided](#) in October 2013 to end its contract with Redflex.

Not brain surgery

In the absence of red light cameras, alternatives for reducing traffic accidents do exist. Much of the academic literature suggests [expanding the length of a yellow light](#) or even adding an "all-clear" red light in an intersection.

"There's too much of a conflict of interest in running this stuff," [John Large](#), a professor of public health at the University of South Florida, told Ars. He was one of the authors of the 2008 and 2011 papers largely arguing against the camera systems.

"If you actually do the correct studies, one of the easiest is to set the correct yellow light time and provide an all-clear red, some studies show that red light running drops by 80 percent," Large said. "If you drop by that much and then put up a camera, it would come down because it couldn't make enough to pay for itself. The politicians themselves even point out the problem, but to fix it, they say that we need a camera. I would argue that cameras don't help drivers drive, engineering improvements do."

Ohio State Representative Dale Mallory (D), who is leading the charge to ban the cameras in the Buckeye State, has an even lower-tech idea.

“If you put a police car there and turn on the lights, you don’t even have to have an officer, just a good battery,” he said, explaining that each time he hears from red light camera proponents, they are city officials and police chiefs—not traffic engineers. “They’re laying off police officers as they generate money.”

Despite the criticism, camera defenders aren't ready to give up the fight. Modesto's officer Silva, who again oversees the cameras there, says that the city does have properly timed yellow lights. Yet, in his experience, people still try to run intersections. Instead of critiquing the cameras, he just wants drivers to stop breaking the law.

“I personally time the yellow lights monthly—all of them are longer than by state law,” he added. “For a protected left turn, [California Department of Transportation] says three seconds minimum; we have it at four-and-a-half seconds. If you don’t want to pay \$500, don’t run red lights. It’s not brain surgery here.”