

Red light cameras reduce injuries but may have no effect on total crashes



Red light cameras are effective at reducing right angle crashes, right angle injury crashes, and total injury crashes. However, they also appear to increase rear end crashes.

What is the aim of this review?

This Campbell systematic review examines the effect of red light cameras on red light running and various types of traffic crashes. The review summarizes results from 38 studies covering 41 evaluations, including 37 controlled before-after studies and one study using a controlled interrupted time series design. The majority of the studies were conducted in the USA or Australia.

Red light cameras photograph violators at traffic signals. They can reduce red light running, total injury crashes, and right angle crashes. However, they may also increase the risk of rear end crashes. The impact of red light cameras on other types of crashes, including total crashes overall, is unclear.

What is this review about?

Road traffic crashes are a major cause of injury and death around the world. Many crashes occur because drivers run red lights. Red light cameras (RLCs) photograph violators, and are used to remotely enforce traffic signals as part of strategies to reduce red light running and traffic crashes. However, there are questions about their effectiveness, and there have been a number of legal challenges to their use.

This review integrates findings from 37 controlled before-after studies, and one controlled interrupted time series study, that examine the effect of RLCs on red light running and various types of traffic crashes.

What studies are included?

Included studies measure RLC effectiveness by comparing intersections with cameras to those without them. Studies that examined area-wide programs, in which RLCs operated at some but not all signalized intersections in the community were also included.

Before-after studies were only included when they had a distinct control group and collected data for treatment and control conditions both before and after RLCs were put into operation. Studies involving additional interventions, such as speed cameras or enhanced police enforcement, were excluded.

This review summarizes 38 studies that contain 41 eligible evaluations of the effects of RLCs on red light running and/or traffic crashes. The studies come from four countries, with the



How up-to-date is this review?

The authors of this review searched for studies up to 12 June 2015.

What is the Campbell Collaboration?

Campbell is an international, voluntary, non-profit research network that publishes systematic reviews. We summarise and evaluate the quality of evidence about programmes in the social and behavioural sciences. Our aim is to help people make better choices and better policy decisions.

About this summary

This summary is based on Cohn, EG, Kakar, S, Perkins, C, Steinbach, R, Edwards, P. Red light camera interventions for reducing traffic violations and traffic crashes: A systematic review. *Campbell Systematic Reviews*. 2020; 16:e1091. <https://doi.org/10.1002/cl2.1091>.



majority carried out in the USA or Australia. Five of the 38 studies were assessed as having a low risk-of-bias and eight were assessed as having a moderate risk-of-bias.

Do red light cameras reduce red light running and traffic crashes?

RLCs are effective at reducing right angle crashes, right angle injury crashes, and total injury crashes. However, they also appear to increase rear end crashes.

There is some indication that RLCs reduce total crashes due to red light running, but this effect was not significant. Additionally, there is some evidence, from three studies, that RLCs may reduce violations.

Other types of crashes did not appear to be significantly affected by the use of RLCs.

The economic implications of implementing RLC programs is not clear as few studies examined this. Overall, the costs of RLC programs tend to outweigh revenue. Studies of the effect of RLC programs on crash costs produced inconsistent results.

The potential benefits of a reduction in traffic violations and in some types of injury crashes should be weighed against the increased risk of other crash types.

What do the findings of the review mean?

Investing community and police resources in RLCs will reduce various types of traffic crashes, including total crashes involving injuries, and may reduce red light violations, but will also increase rear end crashes.

The majority of the studies examined were found to use weak methods which have a risk of bias. Policymakers and practitioners need to use evidence from better quality studies, particularly randomized controlled trials or natural experiments.

More high quality empirical studies of RLCs are needed. Future research may be informed by the information reported in this review.