

Collision Analysis of the Three Intersections in Beverly Hills, CA Slated for Red Light Camera Enforcement

By Jay Beeber, Executive Director, Safer Streets L.A., Member ITE

Background

Safer Streets L.A. is a grassroots organization dedicated to furthering the public interest through the adoption of scientifically sound and sensible transportation and traffic laws. We believe that accurate information and critical thinking are crucial to implementing sound public policy. Towards that end, we strive to provide the public and elected representatives with well researched and verifiable data in order to promote scientifically based solutions to motorist and pedestrian safety issues. Safer Streets L.A. provides this information on a voluntary basis and is not paid to interact with elected officials.

Our goal in forwarding the following information is to provide additional information on the use of photo enforcement in Beverly Hills, California. We hope that this information proves useful in deliberations as to whether or not to add additional locations to the city's photo enforcement program.

About the Author

Jay Beeber is the Executive Director of Safer Streets L.A. and a research fellow with the Reason Foundation concentrating on traffic safety and enforcement. He also serves on the City of Los Angeles' Pedestrian Advisory Committee and has written numerous scientific studies on traffic related safety issues. Most recently, he has served on a subcommittee of the California Traffic Control Devices Committee studying changes in the way traffic signals are timed in the state of California.

Introduction

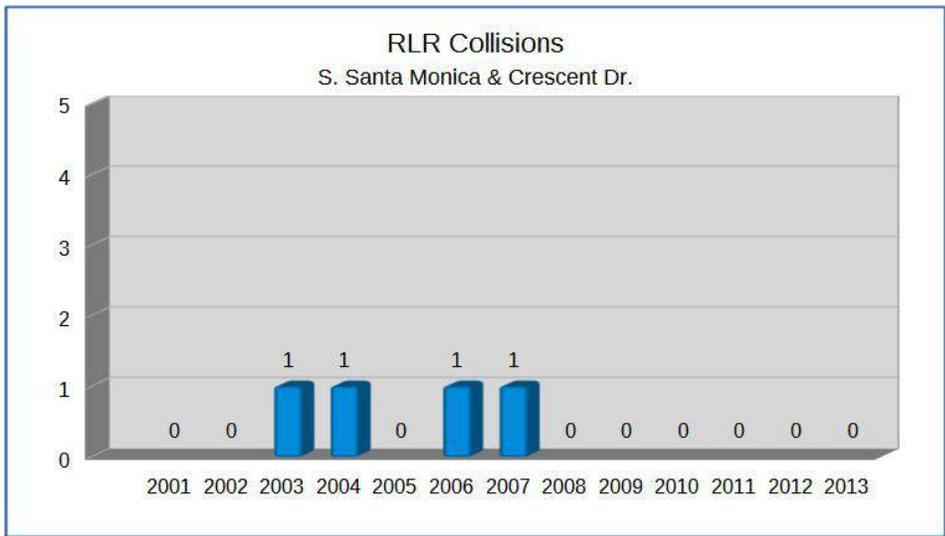
Safer Streets L.A. conducted an analysis of Red Light Related (RLR) collisions at the three additional intersections proposed for red light camera enforcement in Beverly Hills. Accident statistics were compiled beginning in 2001 from the California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS) database. The SWITRS database serves as a means to collect and process data gathered from collision scenes by multiple police agencies throughout the state. The most recent complete year for which data is available is 2013. The thirteen years of available data is sufficient to draw valid conclusions as to whether installing red light camera enforcement at the three proposed intersections could be expected to improve safety at those locations.

Supporters of photo enforcement claim that red light cameras are effective in reducing collisions caused by red light running at intersections where the cameras are in use. Therefore, any analysis of the potential need for photo enforcement must focus solely on collisions *caused by* red light running rather than on a particular *type* of collision (e.g. head on, sideswipe, broadside (T-bone), etc.) or on "collisions" in general.

Our analysis of the intersections in Beverly Hills where additional red light cameras are proposed considers only actual red light running collisions, i.e collisions where the cause of the accident was a red light running violation. In the SWITRS database, these are crashes in which the primary collision factor is listed as a violation of CVC 21453A (solid red light violation) or 21453C (right or left turn arrow violation). Collisions where the primary collision factor is listed as a violation of CVC 21453B are technically not red light running collisions as the accident investigator determined that the motorist at fault stopped prior to entering the intersection but failed to yield to oncoming traffic.

South Santa Monica Blvd & Crescent Drive

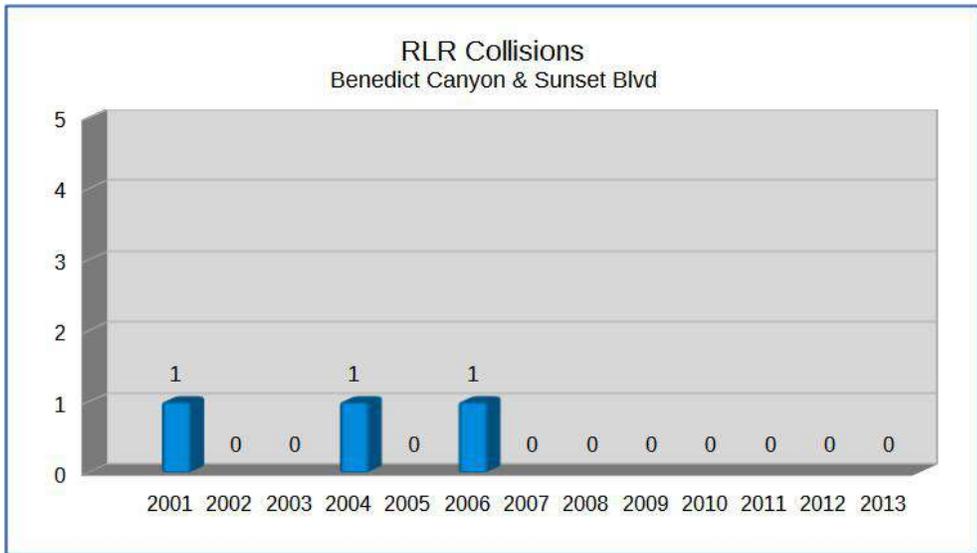
At this intersection there have been a total of 4 minor red light running collisions over a thirteen year period. Of the four collisions, only two occurred in the direction of proposed enforcement (Eastbound/Westbound). The last red light running collision at this intersection occurred in March 2007, over 7 ½ years ago. The graph below shows the red light running collision history for this intersection.



There is currently no red light running collision problem at this intersection and the installation of red light cameras cannot be expected to improve safety.

Benedict Canyon & Sunset Blvd.

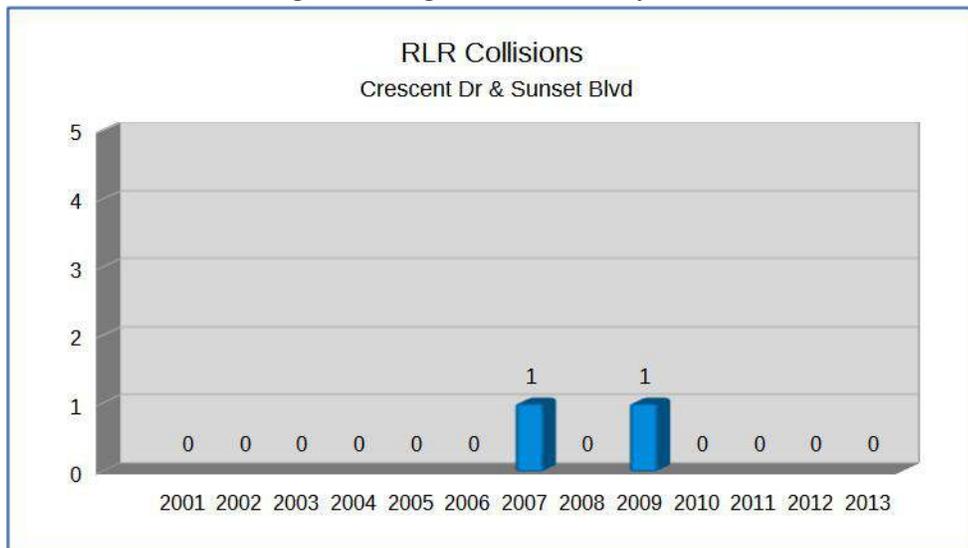
At this intersection there have been a total of 3 minor red light running collisions over a thirteen year period. Of the three collisions, none occurred in the direction of proposed enforcement (Northbound/Southbound). The last red light running collision at this intersection occurred in May 2006, almost 8 ½ years ago. The graph below shows the red light running collision history for this intersection.



There is currently no red light running collision problem at this intersection and the installation of red light cameras cannot be expected to improve safety.

Crescent Drive & Sunset Blvd

At this intersection there have been a total of 2 minor red light running collisions over a thirteen year period. Of the two collisions, none occurred in the direction of proposed enforcement (Northbound/Southbound). The last red light running collision at this intersection occurred in June 2009, almost 5 ½ years ago. In addition, one of the two collisions involved alcohol impairment (red light cameras cannot be expected to prevent impaired driving collisions). In the other collision, no party was deemed at fault so although a driver ran a red light, it was not deemed a willful act. The graph below shows the red light running collision history for this intersection.



There is currently no red light running collision problem at this intersection and the installation of red light cameras cannot be expected to improve safety.

Summary

None of the intersections proposed for red light camera enforcement would be considered good candidates for photo enforcement. Red light running collisions are sporadic at these intersections and are likely caused by momentary lapses in attention or other external factors, not drivers trying to beat the yellow light. When drivers are unaware of the red signal, no amount of additional enforcement can possibly prevent them from running the red light. Further, none of the collisions resulted in severe injuries or fatalities. Since none of these three intersections currently has an ongoing red light running collision problem, no safety benefit can be gained by installing photo enforcement at these locations. It is unclear why they might have been chosen for the installation of red light camera systems.

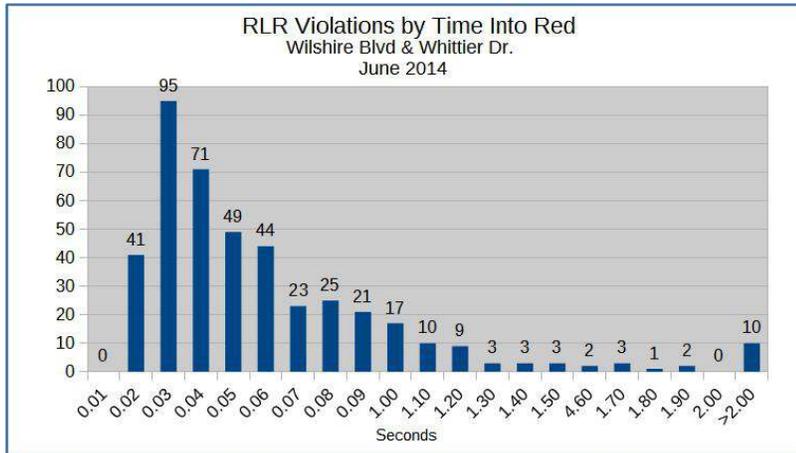
A Discussion of Red Light Running Violations

Those advocating for the need for automated enforcement based on measurements of red light running violations fail to acknowledge that there are different kinds of red light running violations and that not all red light violations have an equal tendency to cause crashes. Red light violations tend to fall into three categories, straight through, right turns, and left turns. Each has unique characteristics and varies in its potential to cause serious collisions.

Straight Through Violations

Straight through red light violations can be separated into Early Into Red (EIR) violations, those that occur immediately after the light turns red when the intersection is relatively clear, and Late Into Red (LIR) violations, those that occur long after the light has turned red and cross traffic is potentially present within the intersection.

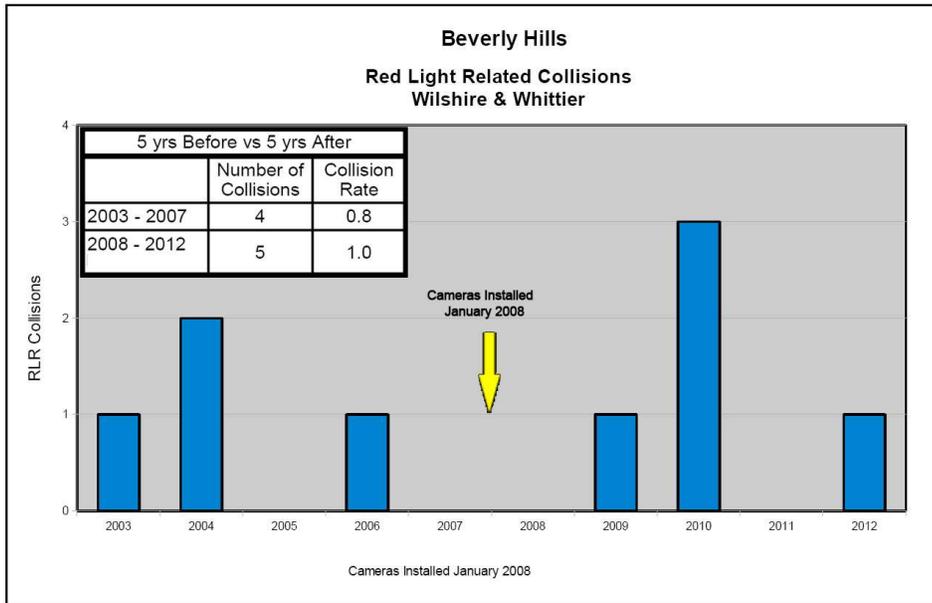
Violation data directly captured by red light camera systems in Beverly Hills (see graph below) confirms the results from nationwide studies that show that the vast majority of straight through red light violations (up to 90%) occur within the first second of the red interval; 8% occur during the 2nd second of the red interval. Only 2% or less of all straight through red light violations occur late into the red interval.



Straight through violations that occur early in the red phase will rarely result in the catastrophic right angle (aka broadside or T-bone) crashes one generally envisions when discussing the dangers of red light running. This is because cross traffic has not yet entered the intersection due to start-up delay or, where utilized, the presence of an all-red signal phase (where the light momentarily displays red for all approaches).

The traditional assumption about red light violations is that they are the result of the aggressive driving behavior of motorists who choose to “push the yellow”. Unquestionably, some aggressive drivers, when faced with a yellow light warning them of an impending signal change, will try to beat the light rather than stop appropriately. A portion of these drivers will fail in this attempt and will violate the light by a few fractions of a second. These types of violations, while unlawful, rarely result in collisions since they occur early in the red interval when the intersection is devoid of cross traffic. Therefore, if massive enforcement efforts targeting these drivers could be successful, the number of red light related crashes is rarely reduced.

Additionally, research has shown that many drivers are forced to inadvertently violate traffic signals early in the red interval due to yellow signal times which are too short for the prevailing traffic conditions on the roadway. This creates a “dilemma zone”, where a driver in this section of roadway when the signal changes from green to yellow can neither stop safely, nor enter the intersection before the onset of the red phase. Where this condition exists, such as at the intersection of Wilshire Blvd. and Whittier Drive, the use of red light ticketing cameras results in vast numbers of citations being issued to unsuspecting drivers who unintentionally violate the red by mere fractions of a second. Here too, massive enforcement has had no effect on crash rates since the violations being targeted are not willful and occur early in the red interval when no cross traffic is present. See the graph below for a five year before and after evaluation of red light running collisions at this intersection.



Although thousands of violations occur annually at this location, few collisions actually result from those violations. Additionally there has been no change in the collision rate, even after five years of red light camera enforcement.

Late Into Red violations generally represent about 2% or less of all straight through red light running violations. Because cross traffic is more likely to be present within the intersection when the traffic signal has been red for a duration of greater than two seconds, it is these violations that are most likely to result in the severe right-angle collisions depicted in most red light running crash videos and which should be of greatest concern to safety proponents. Indeed, when a catastrophic red light running collision occurs, it is almost exclusively the result of a driver entering the intersection at full speed on a stale red light.

The causes of Late Into Red violations vary, but are generally the result of the driver being unable to stop or being unaware of the presence of the red signal. Most often this is due to impairment, distraction, fatigue, sun glare, inclement weather, or other adverse roadway conditions, rather than an aggressive driver willfully ignoring the red light. These somewhat unintentional LIR violations are therefore resistant to the effects of increased intersection specific enforcement, especially in the form of red light cameras.

Rolling Right Turn Violations

Where the law permits, drivers may make a right turn on red after stopping behind a limit line (aka stop bar). However, it is fairly common for drivers intending to turn right to stop slightly past the limit line in order to obtain a clear view of traffic approaching from the left. Also, drivers will frequently slow and yield to oncoming traffic and pedestrians, rather than come to a complete stop before executing the turn. Both these maneuvers violate the letter of the law, and although they tend to occur throughout the red phase, rarely result in collisions because these drivers are generally traveling at low speeds and are capable of yielding where appropriate to avoid a collision. In addition, a large portion of rolling right turns occur during the overlapping left-turn phase for traffic on the cross street. During this phase, a driver making a rolling right turn has no chance of colliding with cross traffic or pedestrians as conflicts are prevented by the movement of the left turning vehicles. As with the early into red violations, slow rolling right turns are relatively safe and rarely endanger other roadway users.

Data from the National Highway Traffic Safety Administration and a 2011 study in Los Angeles confirm that the number of collisions which result from rolling right turn violations is infinitesimally small. The NTHSA study found that all types of right-turn-on-red crashes “represent a very small proportion of the total number of traffic crashes (0.05 percent)”. Rolling right turns on red, being a subset of all right turns on red, therefore represented an even smaller portion of the total number of traffic crashes than the percentage reported in the NTHSA study.

The Los Angeles study determined that although approximately 15,540,500 rolling-right-turns occur annually in the City, the chance that a rolling right turn would result in a collision was less than 1 in 345,000. Further, rolling right turns represented just 0.079% of all accidents per year in Los Angeles. By way of comparison, about three times as many collisions are caused by drivers opening their car door into passing traffic. Additionally, the majority of rolling right turn collisions that did occur were classified as resulting in minimal or no injuries, even when pedestrians or bicyclists were involved. These results suggest that, contrary to the claims of red light camera advocates, the rolling-right-turn does not present a significant hazard to other motorists, pedestrians or bicyclists. Certainly, some aggressive drivers will fail to slow sufficiently or yield appropriately when executing a rolling right turn. But the best evidence suggests that the behavior of these drivers represents a very small minority of the rolling right turns that occur on our roadways with regular frequency and without incident.

Follow-Through Left Turn Violations

The follow-through type violation occurs when drivers cued up in the left turn lane follow the vehicle directly in front through the turn. Since the length of the yellow signal can vary greatly, especially in dedicated turning lanes, drivers do not have a good sense of when the yellow time will run out. As a result, the last car through may cross the limit line just after the light has turned red. Since the vehicle that has violated the red is closely following the car ahead, there is little chance that a collision with cross traffic will occur. Conflicting traffic is unlikely to start up and enter the intersection until the full line of turning vehicles has cleared. While a minor annoyance to other roadway users, follow-through left turn violations generally do not result in collisions and targeting them with enforcement cameras can therefore provide no improvement in safety, even if they are successfully eliminated.

Left Turn Violations Due to Short Yellows

Yellow intervals that do not account for a motorist's need to slow down to a lower speed to negotiate a turn frequently also create dilemma zones in left turn lanes. This issue is especially acute where drivers may initially be traveling at or near the prevailing speed of the through traffic in a long left turn pocket prior to slowing for the turn. The problem for left turning drivers is made worse when the traffic engineer sets a yellow time shorter than for the through movement. Not only is the driver cheated of requisite yellow time, his expectations are violated by a yellow interval shorter than what he has come to expect in through lanes. Left turn violations of this type have the potential to result in right angle collisions if the opposing traffic is given a green signal immediately after the left turn signal turns red. Again, no amount of enforcement can eliminate these types of left turn violations as they are due to an engineering defect, not poor driver behavior.

Once the true nature of the varying types of red light running violations and their causes are understood, the fallacy of safety improvements through the use of red light cameras becomes clear. Catastrophic red light running collisions which cause serious injury or death are almost exclusively the result of a driver entering an intersection at high speed long after the traffic signal light has turned red. These types of crashes are most often due to impairment, distraction, fatigue, weather and environmental elements, or other adverse roadway conditions, rather than an aggressive driver attempting to beat the red light. Red light cameras can have no effect on these causal factors and therefore cannot reduce these types of accidents. Likewise, red light cameras cannot prevent violations that are caused by engineering deficiencies, such as yellow intervals too short for prevailing conditions,

as these transgressions are not intentional. In contrast, willful infractions such as those caused by drivers trying to beat the light, rolling right turns, and follow-through left turn violations may be somewhat reduced by photo enforcement. However, even if massive ticketing were to be successful in reducing these offenses, little or no safety improvement is realized since these violations rarely, if ever, result in collisions.

Conclusions

The implementation of additional red light camera enforcement at the intersections of South Santa Monica Blvd & Crescent Drive, Benedict Canyon & Sunset Blvd, and Crescent Drive & Sunset Blvd cannot improve safety since few red light running collisions occur at these locations. If the elected officials of Beverly Hills wish to improve roadway safety within the city, they should look towards engineering countermeasures which have been proven to reduce the most common types of collisions. In 2012, red light running collisions accounted for about 3% of all collisions in Beverly Hills. More collisions were caused by unsafe lane changes (4%), failure to yield (8%), unsafe turns (14%), unsafe speed (12%), and DUI (5%) than were caused by red light running. Rather than spending additional police, city, and court resources on targeting minor red light violations that do not cause significant numbers of accidents, officials should instead use those resources to target violations which most frequently result in collisions on the city's roadways.