Collision Analysis of Photo Enforced Intersections in Oakland CA

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Introduction

We conducted a before and after analysis of red light related collisions at eleven photo enforced intersections in Oakland, CA. All data was compiled from the CHP Statewide Integrated Traffic Records System (SWITRS) database. Red light related collisions are those where the primary collision factor is listed as a red light violation (CVC 21453). This is the proper criteria for the evaluation of the effectiveness of red light camera systems as collisions caused by red light running are the only type of collision that can reasonably be expected to be reduced through the use of red light cameras. The before and after period was designated as one year before and one year after the system went "live" issuing warning tickets.

Results

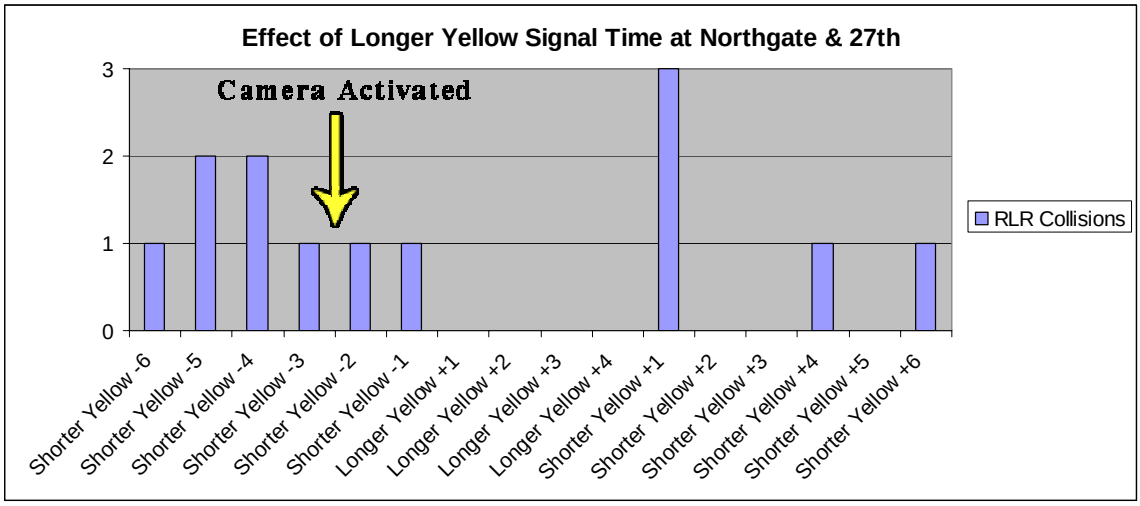
The results of the analysis appear below. The intersections are ranked from worst performing to best performing. One intersection had an increase in collisions of 1. Five intersections had no change in the number of collisions. Two intersections had a decrease in collisions of 1, from 1 to 0. Two intersections had a decrease in collisions of 2. The final intersection experienced six fewer collisions in the "after" period.

Location	Before	After	Notes
MacArthur & 82nd	1	2	**No Collisions during longer yellow period
66th & San Leandro	0	0	
Redwood & 35th	0	0	
Foothill & High	1	1	**No Collisions during longer yellow period
Market & 36th	1	1	**No Collisions during longer yellow period
Market & 35th	3	3	**No Collisions during longer yellow period
7th & Jackson	1	0	
Brookdale & High	1	0	
MacArthur & Oakland	3*	1**	*1 raining/wet road; **No Collisions during longer yellow period; Not full year data
MacArthur & Beaumont	9*	7**	*1 raining/wet road; **1 Collision during longer yellow period; Not full year data: 1 in warning period
Northgate & 27th	13	7**	**No Collisions during longer yellow period; 1 in warning period

Discussion

Although there was an overall reduction in the number of collisions, the majority of the intersections had either an increase or no change in the number of collisions. At the five intersections with reductions, four had only one or two fewer collisions. These small changes in the number of collisions cannot be considered to be statistically significant. Furthermore, at both of the intersections that had a decrease of 2 collisions, one of the collisions occurring in the "before" period occurred during rain storms with wet roadways. The inclement weather could, therefore, have been the proximate cause of these two collisions rather than intentional red light running.

It is also important to note that for a four month period from December 27, 2009 to April 27, 2010, the city increased the yellow light phase by one second at all photo enforced intersections. Of the 22 collisions that occurred in the 1 year after period, only one collision occurred during the four months when the yellow light was set to the longer time. This strongly suggests that the longer yellow signal phase provided a significant improvement in safety resulting in the lower number of collisions seen in the after period. This is especially evident at the intersection of Northgate & 27th, where there were 8 collisions in the six months before the signal timing was lengthened, no collisions during the 4 months while the light phase was longer, and 6 collisions in the six months after the signal timing was set back to the shorter time. While this intersection experienced the greatest reduction in collisions, as can be seen from the graph below, that reduction was likely due to the longer yellow light phase rather than the presence of red light cameras.



Finally, lower numbers of collisions may be seen in the after period due to the fact that the SWITRS database is incomplete for the time period after 2010 due to a backlog in entering data at the state level. Since the after period extends into the beginning of 2011 at two intersections, MacArthur & Oakland and MacArthur & Beaumont, this may have further skewed the results to incorrectly reflect fewer collisions after the cameras were installed.

Overall, photo enforcement appears not to have provided any significant improvement in safety at the intersections where they have been employed. In contrast, lengthening the yellow light phase by 1 second does appear to have made a significant positive impact on intersection safety by virtually eliminating collisions during the four month period when it was in effect. Unfortunately, the City of Oakland did not retain these longer signal phases and red light related collisions recurred once the yellow phase was shortened. It can, therefore, be concluded that safety has been compromised as a result of the City's decision to revert to the shorter yellow signal time. This could expose the City to litigation and officials should give serious thought to reconsidering this decision.