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Photographic Red Light Cameras Role in Traffic Safety Programs

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ABSTRACT

Red light running and the associated costs in damage, injuries, and death is an issue that government agencies need to address through their law enforcement capacities. In 2007, there were almost 900 deaths and 153,000 injuries at a public cost of over 14 billion dollars (National Campaign to Stop Red Light Running, 2003-2010). Given this data, law enforcement agencies should utilize photographic red light cameras as a component of roadway safety programs. Studies on photographic red light cameras highlight their effectiveness in reducing the number of red light running incidents; reducing the number of right angle collisions resulting from red light running; and allow resource reallocation from responding to red light running relating incidents to other identified law enforcement initiatives. Research information for this paper was obtained from journals, peer reviewed articles, and the internet. The benefits resulting from the implementation of photographic red light cameras outweigh the concerns regarding their use as a component of red light enforcement programs. Some notable concerns are regarding the use of the technology as a revenue generating source for local governments and the belief intersection engineering is more effective than photographic red light cameras in reducing incidents of red light running. Another concern is the failure of red light cameras to reduce right angle collisions associated with red light running while at the same time resulting in an increase in rear end collisions. Photographic red light cameras are effective in decreasing incidents of red light running and right angle collisions associated with red light running, and they should be a component of roadway safety programs utilized by the law enforcement authority of government agencies.

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INTRODUCTION

State and local government leaders are responsible for passing laws and ordinances to protect and guide the conduct of the citizens under their sphere of control. Some of these regulations are well received, while others are controversial. Government approval for law enforcement agencies to utilize red light cameras as a component of roadway safety programs has generated much debate, especially as the use of red light cameras has become more common. In 1993, New York City was the first city in the United States to utilize a red light camera program (National Campaign to Stop Red Light Running, 2003-2010). Through May 2009, there were 25 states and 428 communities that utilized red light cameras as part of their roadway safety program (National Campaign to Stop Red Light Running, 2003-2010).

Roadway safety programs generally consist of three components: education, which is responsible for providing a framework of knowledge to safely navigate the roadway; engineering, which is responsible for ensuring roadways, intersections, traffic signs, and signals are in compliance with federal and state mandates for safety; and enforcement, which is the responsibility of law enforcement officers and includes their effort to gain compliance to established traffic laws by the motoring public in order to make the roadway as safe as possible. As new information and technology are discovered that could improve roadway safety, leaders at all levels should ensure their personnel have researched the information or technology for possible implementation in the appropriate area, whether it is education, engineering, or enforcement. Red light cameras are a technology that can supplement law enforcement's efforts in providing

continuous coverage at intersections in which red light running and right angle collisions are an issue.

To demonstrate the problem caused by red light running, in 2007, there were almost 900 fatalities and 153,000 injuries that resulted from vehicles running red lights (National Campaign to Stop Red Light Running, 2003-2010). There have been numerous studies that illustrate the effectiveness of red light cameras regarding the reduction of red light running, as well as a reduction of right angle and red light running crashes (Retting & Kyrychenko, 2002; Retting, Williams, Famer & Feldman, 1999; Walden, 2008). Given the results of the studies, resources that would be utilized to respond to crashes or address problem red light running locations can be redirected to other law enforcement identified problems. Finally, any revenue that is generated from red light cameras can be utilized to assist local governments and law enforcement agencies in funding roadway projects and programs that would allow for a safer roadway. In order for red light cameras to be an effective component of roadway safety programs, it is important that education about the problem of red light running as well as ensuring engineering standards for intersection design and signal times are followed.

State and local leaders are responsible for ensuring the safety of citizens under the sphere of their control. Ensuring the safety of the motoring public and roadway safety are primary responsibilities of these leaders. As a result of the information discovered during this research, law enforcement agencies should utilize red light cameras as a component of their roadway safety program because of their effectiveness in reducing incidents of red light running and right angle collisions associated with right light running and the subsequent reallocation of resources for

other identified law enforcement initiatives due to the decreased need for responding to issues associated with red light running.

POSITION

Photographic red light cameras are a continuous technology that helps reduce the incidents of red light running, reduces the number of right angle collisions associated with running red lights, and provides the ability to reallocate resources to the law enforcement agency's deployment model in responding to crime and order maintenance issues as a result of the reduction of red light running and right angle collisions. The first listed benefit resulting from the utilization of photographic red light cameras involves the reduction of red light running incidents at locations in which photographic red light cameras are installed. In an evaluation of photographic red light cameras impact on red light running one year after installation in Fairfax, VA, Retting, Williams, Farmer, and Feldman (1999) found a 44% decrease in red light violations. This study indicated that although red light running was not eliminated, the photographic red light camera had a significant deterrent affect, resulting in a reduction of the number of red light violations by nearly half.

In addition to reducing the number of red light running incidents, the installation and use of photographic red light cameras reduces the number of right angle collisions, which are associated with collisions caused by red light running. In a study of collisions at red light camera intersections in Oxnard, California, Retting and Kyrychenko (2001) found a 32% reduction in right angle collisions as well as a 68% reduction in injury from right angle collisions. Similar results were also found in an analysis of the effectiveness of photographic red light signal enforcement in Texas. In a statewide review of

photographic red light cameras operating at intersections across the state of Texas, Walden (2008) found an overall statewide decrease of 43% in right angle collisions. Although right angle collisions associated with red light running were not eliminated, an overall decrease of almost half, again points to the effectiveness of photographic red light cameras as a deterrent to red light running.

Law enforcement agencies must utilize their resources in the most effective and efficient way possible, especially given the economic conditions and budgetary constraints that have been impacting government agencies for the last several years. Patrol resources are an integral part of the department's deployment strategy, as well as their roadway safety responsibilities. Departmental deployment strategies are utilized to determine how the agency addresses crime and community order maintenance issues, such as problem oriented policing and community policing. Roadway safety responsibilities center on maintaining a safe and smooth flow of traffic through the jurisdiction and utilizes such mechanisms as keeping traffic lanes clear of obstructions, completing collision investigations in a timely manner, and the issuing of citations, to accomplish this task.

With the identified decreases in red light running and right angle collisions associated with red light running, resulting from the utilization of photographic red light cameras, there will be fewer demands on the law enforcement agency's resources addressing roadway safety responsibilities. With fewer demands on roadway safety responsibilities, resources can be reallocated to the law enforcement agency's deployment strategy in addressing crime and order maintenance issues. With the reallocation of these additional resources to address crime and order maintenance

issues, there is a secondary benefit of having more resources available to maintain their response times at an acceptable level, especially during periods of high call demand. Unfortunately, as of the writing of this paper, there has not been any research or studies conducted related to the recapturing of resource capability as a result of the decrease of red light running incidents or right angle collisions that are the result of red light running.

COUNTER POSITION

As with any issue, there are proponents of government agencies using photographic red light technology as a resource to provide safer roadways for the motoring public. Opponents of photographic red light enforcement believe the technology is being implemented simply as a government revenue generator, and the timing cycles of the yellow light are manipulated to 'entrap' motorists in committing red light running violations. In addition, it is argued that implementing proper timing cycles for yellow lights will reduce red light running and red light running collisions. The final argument to be discussed is that using photographic red light technology does not make the roadway safer, but more dangerous, due to an increase in rear-end collisions at intersections where photographic red light cameras are installed.

The first oppositional concern of photographic red light cameras is the belief that government agencies are only using the technology as a revenue generator through the manipulation of the yellow light timing cycle, which results in the 'entrapment' of motorists to commit red light running violations. In a review of the City of San Diego's photographic red light program in 2001, it was discovered that the city's red light vendor, Lockheed Martin, who received money for each convicted violation, had shortened the timing cycle for the yellow light in order to produce additional violations (Page, 2002).

Although in this incident there was an identified instance in which the government agency allowed the vendor to have unmonitored access to the intersection lights timing cycle and the timing cycle was manipulated with increased government agencies utilizing photographic red light technology, 'best practices' have evolved regarding the implementation of photographic red light programs. The National Committee on Uniform Traffic Laws and Ordinances (NCUTLO) has created a model policy that not only addresses the issue of compensating vendors based on the equipment and services provided and not on the revenue generated, but the entire process, which is based on lessons learned from issues identified from programs implemented earlier (National Committee on Uniformed Traffic Laws and Ordinances, 1997).

It is also argued that if government agencies want to reduce red light running and red light running collisions, they should focus on implementing better engineering standards, specifically lengthening the duration of the yellow light cycle to ensure it is in compliance with the guidelines established by the Institute of Traffic Engineers (ITE). A study by Retting, Ferguson, and Farmer (2007) conducted in Philadelphia, Pennsylvania found that by extending the duration of the yellow light cycle so it was consistent with ITE guidelines, red light running decreased by 21% to 63% at intersections where photographic red light cameras were going to be installed. While this study does seem to support the idea that engineering efforts are more effective in reducing incidents of red light running than photographic red light cameras, and photographic red light cameras are indeed being used as a revenue generator, the study had additional findings. In addition to the reduction of red light running attributed to yellow light timing cycles meeting ITE guideline, Retting et al. (2007) also found that

when the photographic red light cameras were installed, there was an additional 87% to 100% reduction of red light running. The overall findings of this study support the holistic approach to roadway safety.

The final concern to be addressed regarding photographic red light cameras involves the increase in rear-end collisions at intersections in which these cameras have been installed. If photographic red light cameras are designed to reduce collisions, the resulting increase in rear-end collisions points to the ineffectiveness of the technology in making the roadways safer, which is why the technology should be abandoned. Burkey and Obeng (2004) conducted a review of crashes in small urban areas and found no decrease in angle crashes, which are the collisions that are consistent with those involving a red light running violation, and an increase in rear-end collisions. When reviewing additional studies on crash data at intersections in which photographic red light cameras have been installed, each study found there was a slight increase in rear-end collisions, in addition to the reduction of right angle collisions (Retting & Kyrochenko, 2001; Walden, 2008). With multiple studies indicating that photographic red light camera intersections experience an increase in rear end collisions, there is a belief that the technology is only being utilized because of the revenue generated. However, in an executive summary on red light cameras prepared by Council, Persaud, Eccles, Lyons, and Griffith (2005) for the Federal Highway Administration, in which the benefits of the reduction of right angle collisions was compared to the increase in rear end collisions, the “increase in rear end crash frequency does not negate the decrease in the right-angle crashes targeted by red-light camera systems” (p. 5). There is a positive aggregate benefit obtained from the decrease of right angle collisions

compared to the increase in rear-end collisions of approximately $39,000 per site year (Council et al., 2005). These findings indicate that photographic red light cameras are an effective component of roadway safety programs

CONCLUSION

Photographic red light cameras are an invaluable component in roadway safety programs. They are an automated resource that is continuously available to combat the issue of red light running, which, in 2007, resulted in almost 900 deaths and 153,000 injuries at a public cost exceeding 14 billion dollars (National Campaign to Stop Red Light Running, 2003-2010). In reviewing the literature of photographic red light cameras, there is evidence that the utilization and implementation of this technology reduces incidents of red light running and right angle collisions resulting from red light running. There were not any studies that showed the impact of photographic red light cameras on law enforcement resources, specifically resource reallocation as a result of the reduced need to address red light running and associated right angle collisions. It is recommended that this type of study take place in an attempt to quantify the percentage impact that photographic red light cameras have on resource reallocation. In addition, it is recommended that government agencies currently utilizing photographic red light cameras or looking to implement photographic red light cameras in the future utilize the recommendations of the sample policy created by NCUTLO.

With a properly constructed policy and yellow light timing cycles that are consistent with ITE guidelines, photographic red light cameras are an additional resource to enhance roadway safety for motorists. The studies by Retting and Kyryochnko (2001), Retting et al. (2007), and Walden (2008) revealed the dramatic

decrease in both red light running and the associated right angle collisions with the installation of photographic red light cameras. In addition, Council et al. (2005) quantified the aggregate benefit of the reduction of right angle collisions compared to the increase in rear end collisions.

The evidence from the reviewed literature clearly demonstrates that photographic red light cameras should be a component in roadway safety programs. Their impact on reducing incidents of red light running, reducing the associated right angle collisions, and allowing for the reallocation of resources to other identified law enforcement initiatives because of the reduction of red light running incidents and collisions, speaks to the effectiveness of this technology. Any new government initiated program will have issues that need to be addressed and refined based on feedback from the public, and the implementation of photographic red light cameras is no different. The implementation of a universal best practices policy and ensuring yellow light cycles are consistent with ITE guidelines is the first step government agencies can take in order to be responsive to the feedback provided by citizens who have been exposed to photographic red light programs. With the current economic climate resulting in reduced government budgets, law enforcement agencies continue to explore creative ways to do more with less as it relates to providing service to their community. With a combined educational, engineering, and traffic safety enforcement program, roadway safety will be enhanced by the reduction of damage, injuries, and deaths associated with red light running.

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