Traffic Enforcement Strategies

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A Review of Traffic Enforcement Strategies

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1 Introduction

It has been predicted that traffic fatalities will be the sixth leading cause of death worldwide and the second leading cause of death in developing countries [1]. Traffic enforcement strategies are extremely important in any successful road safety strategy. However, there is no standard package of enforcement strategies that is suitable for all situations, environments, and cultures. Therefore, the aim of this review is to describe nine enforcement strategies. This information is needed to understand the various enforcement types and solutions and to decide the proper solution to ensure that a program is effective at improving safety.

2 Demerit Point System

A penalty point or demerit point system (DPS) is a system in which a driver's licensing authority, the police force, or another organization issues cumulative demerits, or points, to drivers who receive convictions for road traffic offenses. The aim of the DPS is to target drivers with frequent traffic violations. A driver’s license is suspended once he or she reaches a certain number of points. The DPS has been applied in the traffic law of many countries. Countries, where DPS has been reported to have positive safety effects in the form of a reduction in the traffic violations and/or traffic crashes, include Brazil [2], Ireland [3], Spain [4], and Italy [5].

3 Red-light Cameras

Red-light running (RLR) at traffic signals poses a serious problem by significantly increasing the likelihood of a crash. An RLR crash is said to occur when a driver fails to comply with the red signal and, as a direct effect of that action, collides with another vehicle or a pedestrian [6]. Red light cameras (RLCs) have been used in many countries for the purpose of yielding a demonstrable reduction in red-light violations. Figure 1 shows the concept of red light running Technology. Some studies have found that red-light violations, in addition to angle crashes and left-turn crashes, were reduced significantly with the installation of RLCs [7-9]. Retting et al. reported reductions in red-light violation rates of about 40% after the introduction of red-light cameras [10, 11]. A study in the UK reported an average 18% reduction in crashes compared to the period before camera installation [12].

4 Fixed-Speed Cameras

Speed cameras monitor traffic speeds using radar technology and photograph drivers traveling above the speed limit. This type of camera is unaccompanied by officers. Most speed cameras use radar signals to detect speeding vehicles and trigger a camera and flash unit to photograph vehicles traveling faster than the set speed. The date, time, location, and vehicle speed are recorded, along with a photograph of the offending vehicle. Fixed-speed camera enforcement is most appropriate if crashes are clearly concentrated in specific road sections and are related to excess speed. For example, if it is necessary for vehicles to slow down on a specific section of the road—e.g., an intersection or a nearby school—it is more effective to have a visible fixed-speed camera, preferably accompanied by a warning sign.

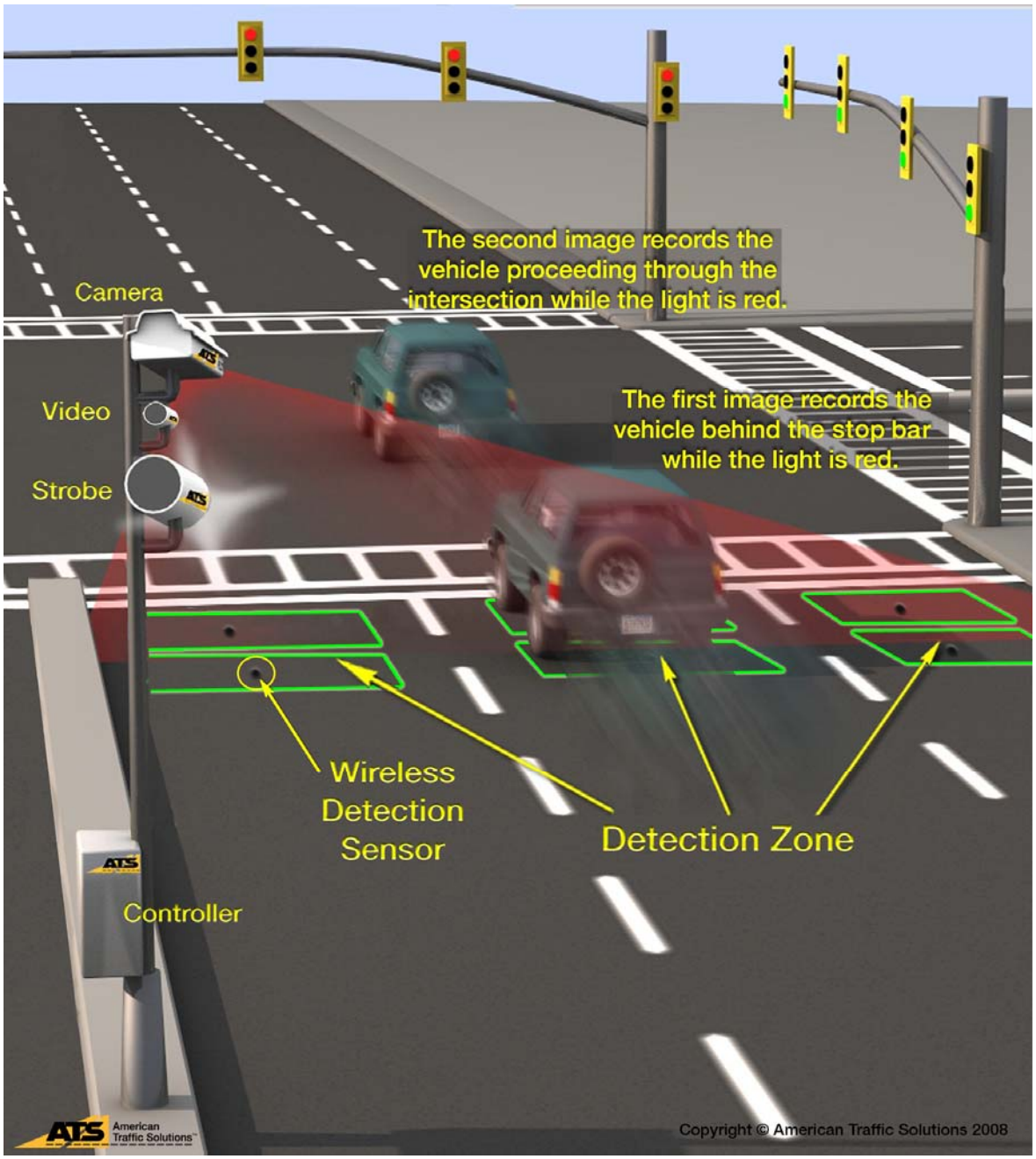

Figure 1. The Concept of Red Light Running Technology. Retrieved from https://www.deldot.gov/Programs/red_light/images/how_red_light_enforcement_works.png. Copyright 2008 by American Traffic Solutions.

The drivers' awareness of speed camera locations and warning sign boards make them drive within the speed limit in those areas. This approach increases the preventative effect; when drivers know that there is a chance of detection, they tend to maintain the speed limit. In Canada, the use of speed cameras was found to be associated with a 9% reduction in crashes [13]. A meta-analysis of 10 studies of the local effect of speed cameras in seven European countries found a decrease of 19% in injury-causing crashes [14]. Another study in the UK reported an average 28% reduction in crashes and a 2.4 mph decrease in speeds at the operating sites compared to the period before the camera installation [12].

One of the problems with these types of cameras is that drivers tend to reduce their vehicle speed when approaching speed cameras and then increase speed as soon as they pass the camera, which is known as the halo effect [15]. A study in Kuwait compared speed data measured at the deployment locations of speed cameras and those at two control locations approximately 1 km before and after the speed cameras. It was found that the difference in speed measured at and away from the speed cameras was statistically significant. The authors concluded that without live police enforcement of traffic rules and regulations to augment automatic control devices, the effectiveness of the speed cameras was insignificant [16]. Other research has shown that this method was effective in reducing vehicle speeds and violations in the vicinity of speed cameras. It was not so effective in reducing vehicle speeds on the road sections beyond the influence area of speed cameras, which was less than one km [17].

5 Mobile Speed Cameras

Mobile cameras are accompanied by enforcement officers that may move among various locations. Unlike static speed cameras, which are operated remotely from permanent camera

housings at the roadside, mobile cameras operate in this situation from parked vehicles and can be quickly moved from one site to another. The speed cameras capture the license plates of passing vehicles exceeding a speed above the legal limit and mail a fine to the driver of the vehicle. Mobile cameras tend to be rotated around a much larger number of sites than static cameras and operated at specific times, whereas static cameras typically operate around the clock all year. These differences result in fewer hours of operation at each mobile camera site than at static camera sites. Mobile cameras might be expected to be less effective than static cameras when effectiveness is measured in terms of reductions in injurious crashes per annum because of the differences in enforcement intensity. The advantage of mobile speed cameras is their unpredictability, which creates a general deterrence against speeding, leading to crash reductions across the entire network [18]. A previous study in New Zealand demonstrated reductions in crashes involving injuries of up to 32% in urban and 14% in rural areas when mobile speed cameras were integrated with more general road safety campaigns [19]. Another study in England showed that crashes decreased by 19% and fatal and serious crashes decreased by 44% at mobile speed camera sites [20].

6 Police Enforcement

The primary duty of police enforcement is the enforcement of traffic laws through stopping the vehicles on roadsides and giving tickets for different violations, such as not wearing a seat belt, using a cell phone while driving, reckless driving, etc. The recognizable image of a police vehicle stopped at the side of the road, with the officer taking enforcement actions, attracts the attention of most passing drivers. Evidence suggests that the threat of being caught is a strong motivation for most drivers to obey motor vehicle laws [21]. Stationary road policing was

consistently found to produce significant speed reduction effects in almost all of the studies conducted so far. A circulating police patrol was found to be less effective than stationary police enforcement in a comparative study, and this was also reflected in the overall results from the literature [22]. However, Axup [23] has suggested that the impact is only short term and that highly visible enforcement strategies are often compromised by drivers simply adapting their behavior at the site of enforcement activity.

7 Rewarding Safe Drivers

This strategy is based on rewarding law-abiding drivers by giving them incentives, as opposed to the other, fear-oriented strategies. The idea is to encourage drivers to apply safety standards and follow regulations rather than penalize them. The rewarding safe drivers strategy is the only one investigated strategies that looks at driving skills rather than violations. Rewarding drivers motivates them to improve their driving skills and abide by the traffic rules. However, Hurst [24] has argued that attempts to reward safe driving are not likely to produce any useful results. He mentions that insurance rebates—such as no-claims bonuses—are appropriate rewards for good behavior, but they are so hopelessly delayed that it is hard to see how they can reinforce specific safe driving behaviors.

In a similar experiment, the Police in Dubai, United Arab Emirates (UAE) launched in 2012 a rewarding strategy called “white points” for registered drivers to encourage motorists to follow traffic rules and regulations and promote safe driving. To be eligible for the system, a driver must maintain a clean record throughout the year, which also means incurring no fines on his or her license. The system allows motorists to win a maximum of 24 white points during a year. Drivers lose two points if there are any traffic law violations during any month. One thousand

prize winners were selected from among 300,000 drivers who maintained a clean record during 2013. Prizes included vouchers from retailers, mobile phones, airline tickets, and other things worth not less than $200 [25].

8 Defensive Driving Courses

Some countries developed programs that can help offenders by providing them with the information and skills necessary to develop positive attitudes towards driving and develop safer driving behaviors in the form of defensive driving course. The defensive driving courses are offered for offenders who have pleaded guilty or found guilty of specific traffic offenses. In this case, the court refers the offenders to an approved traffic course provider in order to complete a nominated course. The case is then adjourned for sentencing, allowing sufficient time for the course to be completed. For example, the Traffic Offender Intervention Program in New South Wales, Australia address offenses such as driving under the influence (DUI), speeding, driver fatigue, and occupant restraint [26, 27].

If a driver receives a ticket, he or she has the chance to attend a basic driver improvement course and pay a reduced fine, or pay the fine and have points added to their license. This strategy is currently available in many countries in different forms. For example, in some states in the United States, drivers can voluntarily complete a DDS course for an automatic point reduction, fee reduction, or auto insurance discount [28]. In other states, taking a DDS course is mandatory in cases of extreme violations, such as extreme cases of DUI or after crashes that involve death or serious injury [29]. One study showed that these types of courses could lead to a decrease in the frequency of traffic violations by about 10% [30]. In another study, an evaluation of road crash records for the 12 month periods before and after course attendance indicated that

the DDC was not effective in reducing crashes for 17–19-year-old drivers or for female drivers aged over 20 years; however, significant crash reductions were found for male drivers aged 20–39 years [31].

9 Community Service for Traffic Tickets

Community service for traffic tickets is a system that helps drivers to improve after violating one of the rules by requiring them to work as volunteers instead of making them pay a fine. It is human nature to prefer a positive way to pay for the consequences of mistakes [32]. In Baton Rouge, Louisiana, a program requires alcohol-related traffic offenders to do community service at different organizations approved by the city court. The community service varies from general tasks to professional services for skilled offenders [32]. In Marion County, California, a program deducts $10 off the fine for each hour of community service at a nonprofit organization. The court has a list of approved community service organizations. In Shasta County, California, a traffic ticket fine can be reduced by $50 for every eight hours of community service put in. In Pasco County, Florida, a program offers a similar alternative, allowing residents who can demonstrate financial hardship to pay off fines through public works or community service projects [33].

10 Driver Behavior Cameras

New cameras that can be used to detect and fine drivers and passengers who do not wear seat belts, drivers that use their cell phone while driving, and drivers who display aggressive behavior, such as tailgating. The operators of these types of cameras can zoom in and snap offending drivers from a distance long before motorists spot the camera. Similar cameras have

been investigated in Australia [34]. The Dubai Traffic Police have already tested similar technologies to enforce tailgating. According to officials, the new technology proved six times more efficient than conventional technologies [35].

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Traffic Enforcement Strategies - Quiz

Updated: 2/21/2019

1) A penalty point or demerit point system (DPS) is a system in which a driver's licensing authority, the police force, or another organization issues cumulative demerits, or points, to drivers _____.

a. who receive convictions for road traffic offenses.
b. as a warning.
c. for good behavior.
d. All of the above.

2) DPS has been reported to have_____ safety effects in the form of a reduction in the traffic violations and/or traffic crashes.

a. negative
b. no
c. positive
d. mixed

3) Red light cameras (RLCs) have been used in many countries for the purpose of _____

a. providing a warning for the drivers.
b. yielding a demonstrable reduction in red-light violations.
c. reducing the speed at the intersections.
d. All of the above.

4) Some studies have found that red-light violations, in addition to _____ crashes, were reduced significantly with the installation of RLCs.

a. rear end
b. sideswipe
c. pedestrian related
d. angle crashes and left-turn

5) Speed cameras monitor traffic speeds using _____and photograph drivers traveling above the speed limit.

a. radar technology
b. GPS technology
c. Remote sensing technology
d. RFID technology

6) One of the problems with these types of cameras is that drivers tend to reduce their vehicle speed when approaching speed cameras and then increase speed as soon as they pass the camera, which is known as the _____effect.

a. Reverse
b. Halo
c. Passing
d. Active

7) Mobile cameras might be expected to be _____effective than static cameras when effectiveness is measured in terms of reductions in injurious crashes per annum because of the differences in enforcement intensity.

a. more
b. equally
c. less
d. less or more

8) The advantage of mobile speed cameras is their_____.

a. cost
b. energy saving
c. effort less.
d. unpredictability

9) Circulating police patrol was found to be _____than stationary police enforcement.

a. less effective
b. more effective
c. less expensive
d. more expensive

10) The rewarding same drivers strategy is the only one investigated strategies that looks at _____rather than violations.

a. driving skills
b. safety of the vehicle
c. penalty value
d. driving history

11) Community service for traffic tickets is a system that helps drivers to improve after violating one of the rules by

a. requiring them to work as volunteers instead of making them pay a fine.
b. apologizing to the community.
c. paying a fine to the community
d. All of the above