

Automated Speed Enforcement - Background

- Each year, road injuries kill 1.25 million people throughout the world, equivalent, on average, to over 3,000 people a day
- Speed contributed around 50% of road crashes in low-income countries and 30% of deaths in high-income countries
- Road traffic crashes are estimated to cost countries approximately 3% of their GDP, with the economic losses in low- and middle-income countries equivalent to 5% of GDP



Global cost of speed

Since the early days of the motorcar, drivers always had one major risk to contend with: Speed. As automotive technology improved, cars not only became faster and more powerful, mass production also created wide-spread affordability around the globe. Unfortunately, this marvel of human transportation also comes at a price, as approximately 1.25 million people die every year on the road world-wide as a result of traffic crashes.

The basic law of physics explains the situation: the transfer of energy absorbed by the body on impact is the sole cause of injuries – as such, the amount of energy transferred increases as the square speed, meaning that a crash at 141 km/h is twice as damaging than one at 100 km/h. Unsurprisingly, speeding is one of the major contributing factors of road crashes and fatalities around the world, as higher speeds increase both the probability of a crash as well as its severity.

In Mexico, for example, this effect is experienced firsthand. For accident fatality rates, the National Institute of Public Health of Mexico (INSPM) ranked Mexico seventh in the world and third in Latin America, with 22 deaths per day pertaining to people aged between 15 and 29, with an average of 24,000 deaths annually. Furthermore, road accidents in Mexico are the leading cause of death of youth aged between five and 29 and remains as fifth cause of death among the general population.

In other parts of the world, such as Canada, speeding remains a major issue on roads. In the Province of Québec,

Institut National De Santé Publique du Québec (INSPQ) reports the burden on victims of road collisions accounts on average for roughly 700 deaths and 6,000 hospitalizations a year, and speeding is directly linked to cause between 30 per cent and 50 percent of fatal collisions and 25 percent of collisions causing serious injury.

Despite the advancement of automotive safety technology such as airbags, seatbelts and crumple zones, speeding remains a leading concern for government transportation agencies around the world.

Pumping the brakes on speed

The World Health Organization (WHO) states that a reduction in speed of just 1 km/h could cut fatalities and injuries by 5 per cent and 3 per cent, respectively, world-wide. This is a goal that nations around the world today are actively pursuing.

Oldest and most common method of speed enforcement is using police officers equipped with radar and laser devices, however the overall high cost and safety risk far outweighs any significant reduction in speed infractions.

This is where automatic intelligent traffic enforcement cameras step in. These devices automatically capture speed measurement identification of offending vehicles, then sends offending drivers speeding tickets by mail once the system has validated the information. The key advantage of this method is its capacity to detect greater numbers of offenders, especially since it can be activated at any time of the day or night, intermittently or continuously, on

permanent or temporary sites, on busy roads and, more importantly, without police staffing.

The first major initiative using automated traffic cameras was carried out on a problematic segment of the highway between Frankfurt and Cologne, Germany, which was studied between 1971 and 1982. While the introduction of a 100-km/h speed limit immediately reduced the average speed by 30 km/h, the introduction of cameras one year later led to a further 20-km/h reduction in average speed.

Another study in 1994 estimated a 91 percent drop in collisions on this road segment compared with 56 per cent on other German highways, a decrease in the number of collisions with victims from 80 to five, and a drop in annual fatalities from seven to zero.



Environmental Impact of Speed

Not all negative impacts caused by speed can be immediately translated into loss of human life; our environment around us suffers too as a result.

Recent research has shown transportation-related pollutants have a significant impact on public health, particularly when higher speed is factored in. For example, gasoline consumption is expected to increase by 25 per cent when the speed limit on expressways rises from 88 km/h to 112 km/h. NOx emissions start to increase at 77 km/h and carbon monoxide emissions start to increase at 88 km/h.

Speeding aggravates the adverse effects of pollutants in the environment generated by transportation, and in the United States, airborne emissions of main contaminants increased when driving speeds rose.

Reduce costs with the help of Automated Speed Enforcement

In other parts of the world, where government transport agencies have limited funding for speed enforcement, automated traffic cameras have made a significant impact on speed reduction and penalization.

According to a Canadian traffic safety study, Safety & Economic Impacts of Photo Radar Program, Traffic Injury Prevention, “the cost-effectiveness of an automated speed enforcement program is especially relevant at the present time when governments are cutting back traffic safety funding.” It further adds, “the trend in government fiscal austerity can only be expected to get worse in the foreseeable future, when all governments struggle to balance their budgets, confronted by looming escalating medical and social security expenses.”

Such is the case in Mexico, where the impact of Viion’s intelligent automated speed enforcement technology has been significant. A year after intelligent traffic cameras were installed in Mexico City, deaths related to traffic accidents dropped by 16 per cent (133 fewer deaths that year), and more than 64 million pesos (around \$27 million USD) were collected from photo infractions, according to Alejandro Araujo, Director of IntelTrafico, whose company has been using Viion products and services since 2016.

“Viion’s intelligent TrafficCam 3D cameras have rendered an extraordinary service,” Araujo said. “We are using (Viion) cameras as electronic tools to detect and gather pieces of evidence of infraction of vehicles driving over the established speed limit to support the issuance of fines. In the past three years, we have processed over 3 million infraction evidence packages.”

During the last three years, the number of deaths due to traffic accidents in Mexico have continued to decrease in speed enforcement areas. In Mexico City, where the use of the photo infractions went into effect at the end of 2015, there was a downward trend in the number of fatalities. In 2015, there were 739 road-related deaths, yet for 2016 the figure was reduced to 626 cases. By end of December 2015, there were just 550 cases.

Photo infractions also helped reduce the impact of road accidents and injuries; 4,122 registered in 2015, 4,041 in 2016 and 3,684 in November 2017.

In Malaysia, around 500 radar devices were added each year and by 2010 more than 2,756 speed cameras – 1,823 fixed devices and 933 mobile devices – were in operation. Fixed devices were generally installed close to “black spots” or areas experiencing high levels of excessive or inappropriate speed, whereas mobile devices were used in various contexts based on the local knowledge of police officers. An evaluation of the programme demonstrated that between November 2003 and December 2010, about 15,000 road traffic deaths and 62,000 road traffic injuries were averted. Additionally, ASE cameras reduced fatal and serious casualty crashes by 15.52 percent and medically-treated injury crashes by 7.76 percent in enforcement zones.

Today, intelligent traffic camera systems are widely deployed in North America, Oceania and Europe, though have seen an emergence in Latin America and Asia.

Benefits of Automated Speed Enforcement

- Following the implementation of automated intelligent traffic cameras, some U.S. states reported a 63 per cent reduction in single-vehicle crashes, a 48 per cent reduction in sideswipe (same direction) crashes, a 26% reduction in rear-end crashes, and an overall 54% reduction in crashes
- Estimated the annual economic benefits of the freeway Automated Speed Enforcement (ASE) program at \$1.4 to \$10.6 million. When enforcement was suspended at the end of the demonstration period, the rate of detected speeding violations (greater than 76 mph) increased by a staggering 836%
- In September 1989, police in Victoria, Australia, introduced its photo radar program with expanded use of 60 speed cameras. As of 1994, the program deployed more than 4,000 hours of the devices per month. The program is associated with an 85% reduction in the proportion of speeding vehicles
- In the Canadian province of British Columbia, an automated speed enforcement program was successful in reducing fatal and injury collisions, with an estimated net economic benefit of approximately \$114 million/year



A TrafficCam 3D monitors speed near a busy roadway in Mexico City

Viion’s Intelligent cameras in Latin America

We have seen direct results emerge from our clients in Latin America, who have implemented our TrafficCam 3D solution in their speed enforcement and traffic monitor planning. In Ecuador, we have more than 600 intelligent cameras deployed, actively monitoring and catching offending drivers every hour, around the clock.

Among the traffic solutions selected by IntelTrafico in Mexico City and the State of Mexico, more than 200 Viion TrafficCam 3D intelligent cameras have been deployed with successful results.

“Viion’s team has been a responsive and support partner, quickly implementing adjustments and improvements needed to satisfy our customers,” Arajuo said.

In Ecuador, where Viion has cameras deployed throughout the country, the Ecuador Transit Commission (ETC) reported a significant drop of 74 percent in speed-related deaths and accidents in the Province of Manabí.

As the need for monitoring speed is needed more around the world, Viion continues to develop speed enforcement solutions that are smart, accessible and flexible.

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