

Automated Enforcement and Detection of Driver Risk

Executive Summary

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Executive Summary

Can we use automated enforcement data to improve road safety?

Municipalities and law enforcement agencies across Alberta are sitting on a rich store of traffic safety information. Every day, cameras in our communities record the licence plates of drivers who exceed posted speed limits, run red lights and speed through intersections and school zones. These cameras, called automated photo enforcement technologies, include Intersection Safety Devices and Photo Radar Cameras. The information they collect is stored and used to ticket the registered owners of the vehicles involved in these dangerous behaviours.

Could this data be put to work in other ways? Could this information be used to identify those drivers who repeatedly break traffic safety laws and put all of us at risk? That's the question the Capital Region Safety Partnership (CRISP) asked in 2010. The same year, an Australian study showed that automated enforcement (AE) data could be used as an indicator of driver behaviour – but more study was needed to understand how this data could be applied to improve road safety.

In 2012, CRISP partners supported a proof-of-concept study by a researcher from the University of Alberta Criminology program to explore the untapped potential of automated enforcement data.

The Study

The purpose of this study was to determine how data collected through automated enforcement technologies could be used to improve road safety in the Capital Region.

Four types of data were used:

- *Automated enforcement data* from the City of Edmonton and Strathcona County for 2010-2011 – a total of 669,186 violations associated with 378,138 vehicles.
- *Collision data* from the City of Edmonton and Strathcona County for 2010-2011, including the total number of collisions and total injury collisions associated with each given vehicle.
- *Driver records* of the registered owners of all vehicles in the study, showing all driving-related charges, most of which have a numerical demerit rating.
- *Criminal records** of the registered owners of all vehicles in the study, including all listed charges and convictions.

The AE data was used to create 12 groups of drivers, based on the number of AE violations associated with a single vehicle – from 1 violation to 12 or more. The researcher then looked for relationships between the number of AE violations and collision involvement, other traffic violations and criminal history.

* Driver records and criminal records were stripped of all personal information before being provided to the researcher. Individuals were identified solely by an associated license plate to protect anonymity.

Key Findings

- **Is there a relationship between AE violations and collision involvement?**

The study found a strong, positive relationship between the number of AE violations and collision involvement. On average, drivers with more AE violations had more collisions than other drivers. Moreover, those drivers with 12 or more AE violations were involved in the highest proportion of *injury* collisions: 21% compared to 12-17% among drivers with fewer AE violations.

- **Is there a relationship between AE violations and other traffic violations?**

On average, those drivers with higher numbers of AE violations committed higher numbers of demerit-earning violations than did other drivers. For example, in this study the registered owners of vehicles with the most AE violations received, on average, three demerits per year of driving, compared to a random population average of less than one demerit per year of driving.

- **Is there a relationship between traffic violations and criminal history?**

Drivers with criminal records were more likely than drivers without criminal records to have higher numbers of AE violations. These drivers were also more likely to commit demerit-earning violations than drivers with the same number of AE violations who do not have criminal records.

- **What proportion of drivers commit AE violations across jurisdictions?**

Of the 378,138 vehicles with at least one AE violation, 20,915 or 5.3% committed AE violations in both the City of Edmonton and Strathcona County. Roughly 10% of drivers with only 2 AE infractions had committed violations in both jurisdictions. In comparison, over 30% of the most prolific offenders had violations in both the City of Edmonton and Strathcona County. Generally speaking, drivers with more AE violations were more likely to offend in both jurisdictions.

Conclusions

This study found positive relationships between AE violations and other traffic-related behaviours. The study also found that drivers with high numbers of AE violations were more likely than other drivers to be involved in criminal activities.

Unfortunately, the data do not allow us to say that AE violations caused (or were caused by) collisions, criminal activity, or other traffic violations. Despite this, the findings certainly indicate that AE data can add to our general understanding of driver behaviour, and can be used to identify at least some of the high-risk driving population.

Further research is needed to refine our methods of identifying high risk drivers. There is no doubt that AE data can play an important role in the development of more effective intervention strategies that will make our roadways and communities safer for everyone.