



2021 Automated Enforcement Technology Summary-Calgary Police Service



The Calgary Police Service deploys automated enforcement in a manner consistent with the Provincial Automated Traffic Enforcement Technology Guidelines. At this time photo radar (manned speed enforcement) and intersection safety cameras that monitor both red light running and speed enforcement are utilized to monitor traffic in the City of Calgary.

One or more of these criteria must be met before automated enforcement technology is deployed at a specific site:

- Where conventional enforcement is unsafe or ineffective
- Areas or intersections with a history of collisions
- Areas or intersections with an identifiable, documented history of speeding
- Intersections with an identifiable, documented history of red light offences
- School and playground zones or areas
- Construction zones
- Areas where the public or a community has expressed concerns related to speeding; automated enforcement may be used to assess these public concerns and conduct enforcement as required.

The Calgary Police Service compiles statistical data on high collision and high volume roadways, deploying automated enforcement technologies accordingly. Photo radar speed enforcement focuses on reducing vehicle speeds and collisions within the City of Calgary. The deployment of automated enforcement is designed to create awareness and enforce the Traffic Safety Act, relative to images of vehicles that are speeding or failing to stop at a red light; this assists in creating a safe driving environment. Motorists are more likely to obey the rules of the road if there is a possibility of getting caught. The Calgary Police Service operates within this framework, targeting high speed and high collision locations.

Red light camera and Speed on Green automated enforcement focuses on intersection safety within the City of Calgary. Presently, the City of Calgary has 58 cameras that monitor 58 intersections and are equipped to capture red light violations and speed violations. All intersections that are equipped with red light cameras monitor red light offences, with speed offence enforcement being introduced at intersections in April of 2009. These intersections have photo enforcement signage, placed at all approaches to increase public awareness and safety.

In 2021, several variables were analyzed by the Calgary Police Service - Specialized Traffic Enforcement Unit to determine where automated enforcement technologies should be deployed, focusing on the following:

- Traffic volume
- Number of collisions
- Types of collisions
- Level of seriousness related to injury collisions
- High speed locations
- Community concerns
- Violation rates

For the purpose of this report, the incidence of collisions was analyzed for the top 20 photo radar deployment locations and the first 64 red light camera intersections.

Photo Radar Analysis

The impact of photo radar, as it relates to reducing the speeds of motorists is clear as the Calgary Police Service saw significant decreases in collisions. From 2001 to 2021, injury collisions were reduced by 34.9% from 106 to 69 collisions; a key factor for the Photo Radar Program. It is highly likely that this is an isolated trend that is linked directly to the pandemic, and will not reflect a long term collision trend for these locations.

Photo radar deployment is directly affected by a number of factors, such as increases in population and traffic volumes in Calgary. In 2021 there were over 1,006,510¹ motorized vehicles registered in Calgary, compared to 1,015,104 in 2020. The change in vehicle registrations in Calgary does not include additional vehicular traffic from outlying communities. Calgary's population² has increased by 51% since 2001.

Year	Calgary's Population	Collision Rate per 100,000
2001	876,519	78.6
2002	904,987	90.0
2003	922,315	81.2
2004	933,495	71.8
2005	956,078	74.8
2006	991,759	84.1
2007	1,019,942	83.2
2008	1,042,829	84.8
2009	1,065,455	72.5
2010	1,071,515	73.8
2011	1,090,936	60.9
2012	1,120,225	56.9
2013	1,149,552	55.2
2014	1,195,194	55.2
2015	1,230,915	53.5
2016	1,235,171	54.2
2017	1,246,337	46.2
2018	1,267,344	50.1
2019	1,285,711	59.0
2020	1,285,711	22.0
2021	1,323,700	35.6

¹ As per Alberta Vehicle Geographical Statistics (AB Transportation)

² Due to the COVID-19 pandemic the City of Calgary cancelled the 2020 civic census. For the purpose of reporting the 2019 population number will be used for 2020. The civic census has now been permanently cancelled and city population values moving forward will be reported from the City of Calgary Corporate Economics Data Repository.

In 2021 there were over 975 photo radar deployment locations throughout Calgary. The number of photo radar summonses issued in 2021 was 199,867³, in 2020 was 219,670, compared with 270,277 in 2019. This represents a 9.0% decrease in the number of photo radar violations issued in 2021 compared to 2020. Based on the reduction in the number and severity of injury collisions, it appears that driver speeds are decreasing at sites monitored by photo radar.

In 2021, the average violation rate (number of violations per 100 registered vehicles) for deployments in the subject locations was 15.1/100. The number of violations issued by photo radar was relatively stable from 2008 to 2014 and experienced a significant increase in 2015, with another small increase in 2016 and a more stable trend from 2015-2019. 2020 showed a steep decline in violation rates due to the COVID-19 pandemic where stay at home orders twice during the calendar year kept vehicles off the roadways. This trend continued into 2021 with waves 2, 3, and 4 of the pandemic keeping many vehicles off the roadways.

Year	Violation rate per 100 registered vehicles
2021	15.1
2020	21.6
2019	26.5
2018	27.3
2017	25.2
2016	29.2
2015	27.2
2014	19.1
2013	16.6
2012	21.5
2011	18.0
2010	16.5
2009	17.6
2008	17.6

The collision rate based on the number of registered vehicles in Calgary has experienced a significant decline from 2006 to 2021. This decrease in the rate of collisions relative to registered vehicles indicates that photo radar is indeed a factor in the enhancement of traffic safety on Calgary roadways.

During photo radar operations for the time period of 2001-2021 the Calgary Police Service Specialized Traffic Enforcement Unit experienced the following in the subject locations

- 34.9% decrease in injury collisions at the top 20 photo radar deployment locations
- 32.0% decrease in total collision rate at the top 20 photo radar deployment locations

³ As per ICTS Monthly Summons Download 2022.01.25

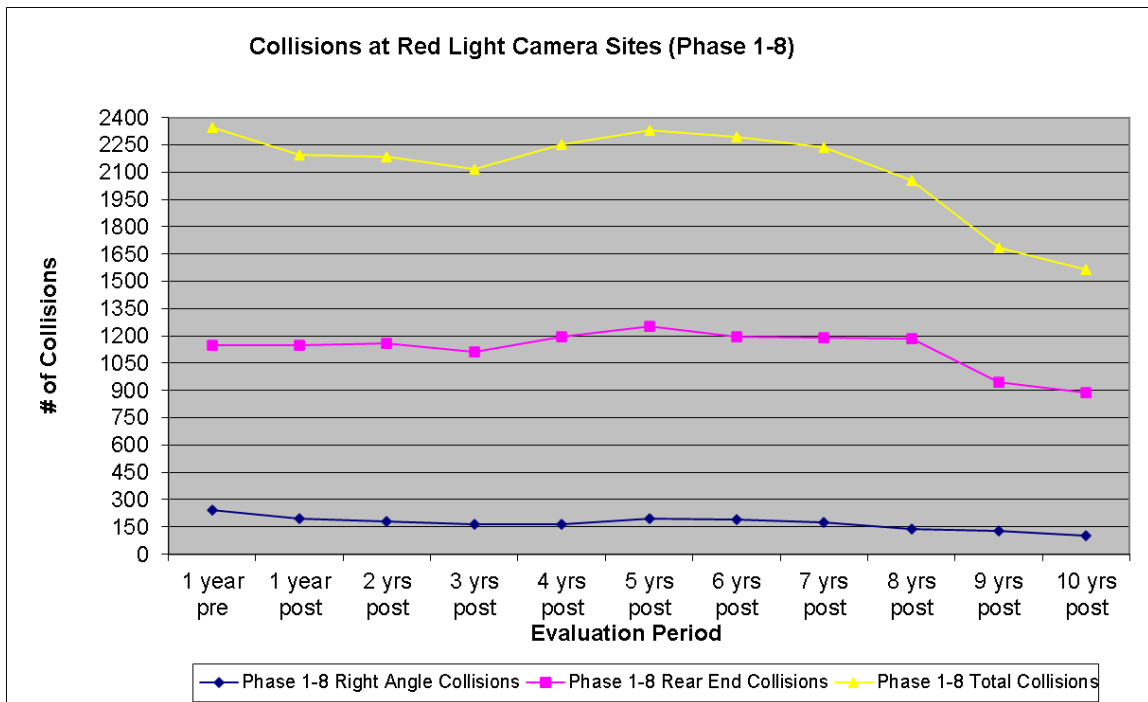
Red Light Camera Analysis

At the first 64 red light camera locations in Calgary (Phases 1-11) during the one-year pre implementation and one-year post implementation period, we see the following:

- Total collisions at the first eleven phases decreased by 7.1%
- Injury collisions have decreased by 6.2%
- Fatal collisions have decreased by 100%
- Pedestrian collisions have increased by 23.5%
- Right angle collisions have decreased by 15.6%
- Right angle injury collisions have decreased by 31.1%
- Right angle fatal collisions have decreased by 100%
- Rear end collisions have decreased by 6.7%
- Rear end injury collisions have increased by 8.7%

During the one-year pre implementation and ten-year post implementation period for phase 1-8, we see the following:

- Total collisions at the first eight phases decreased by 33.4%
- Injury collisions have decreased by 55.7%
- Fatal collisions have decreased by 75%
- Pedestrian collisions have decreased by 35.3%
- Right angle collisions have decreased by 57.9%
- Right angle injury collisions have decreased by 67.6%
- Right angle fatal collisions have decrease by 100%
- Rear end collisions have decreased by 22.3%
- Rear end injury collisions have decreased by 51.5%



Overall, the total number of collisions at red light camera intersections appears to be decreasing slightly every year, with a corresponding decrease in the number of injury and fatality collisions, as well as a decrease in right angle and right angle injury collisions. The decrease in more severe collisions that involve injuries and fatalities demonstrate that Calgarians are becoming more familiar with red light cameras and are adjusting their driving behavior to reflect this fact.

Speed on Green

Intersection safety cameras also have the capability to record the speed of vehicles traveling through intersections utilizing sensors embedded in the roadway in combination with a precise time distance calculation to determine speed. The Calgary Police Service implemented the program known as “Speed on Green” at intersections where red light cameras already existed in April of 2009. If a motorist is speeding through an intersection equipped with an intersection safety camera, a summons may be issued for speeding. The goal of this program is to improve the safety of Calgary’s roadways by reducing not only speed, but the number and severity of collisions at intersections.

The Speed on Green initiative in Calgary was launched in March of 2009 with an awareness campaign which included media releases, billboard advertising on Calgary Transit buses, and warning notices mailed out to offenders for speed violations over a 1 month period. On April 1st, 2009 violation tickets were issued at the first 4 Speed on Green intersections.

During the first thirteen years of the Speed on Green program, 63 existing red light camera intersections were equipped to capture speeding violations. During 2021 115,753 Speed on Green violation tickets were issued compared to 140,800 in 2020, and 142,639 in 2019. In 2021, 144,836,262 vehicles traveled through a Speed on Green site, up 12.8 million vehicles from 2020, this is still down 27 million vehicles compared to 2019. On average 12.0 million vehicles pass through the Speed on Green equipped intersections each month and approximately 0.08% of these vehicles receive a violation ticket for speeding. The average speed of the vehicles receiving violation tickets is 18 km/h above the posted limit. Violation speeds of over 100 km/h above the posted speed limit have been observed since the inception of the Speed on Green program.

Four key factors are examined to determine the effect of Calgary’s Speed on Green program, relative to reducing collisions and speed at intersections:

- Have the number of collisions decreased at intersections equipped with cameras?
- Has the severity of collisions at intersections decreased?
- Has the average speed of vehicles traveling through the intersection decreased during the program?
- Have the number of summonses issued for speeding at intersection camera locations decreased since implementation of the program?

The objective of the Speed on Green program is to improve the safety of our roads through the modification of driver behavior at intersections. Since the implementation of the program in 2009 we have seen a decrease of 16.8% in total collisions at Speed on Green sites and a decrease of 24.6% in the more serious injury and fatal collisions at

Speed on Green sites when compared to the pre-implementation year, 2008. To date while we have seen a slight reduction of 6 km/h from 2009 to 2021 in the average speed of vehicles traveling through the intersections, it has been noted that the average speed of all vehicles traveling through Speed on Green capable intersections is in fact below the posted speed limit, indicating that only a small minority of drivers are committing speed offences in Calgary.

Traffic Service Request Program

As part of the Calgary Police Service’s focus on community policing, the Traffic Section incorporated an addition to the service’s mainframe computer in late 1997 which allows Traffic Service Requests (TSR) to be entered, tracked, and reported online. Through the TSR database, citizens can request the deployment of photo radar to a roadway of concern.

In 2010, the TSR database was temporarily disabled to accommodate a system redesign that would build in greater efficiency, ease of use, and statistical capabilities into the new database. The new database went live on March 1st, 2011.

In the spring of 2013 the web link for the TSR program on the Calgary Police Service website was moved from the Traffic page directly to the front page of the CPS website resulting in a dramatic increase in TSR concerns received from communities and citizens for traffic related issues. During 2014 the TSR website was revamped to offer better data capture using the CopLogic system so that the program could respond to more traffic service requests in a timelier manner. The Residential Traffic Safety Unit completed 710 TSR’s in 2021, an increase of 149.1% from 285 TSR’s in 2020.

Type of Request	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Speed	299	206	125	0	145	86	225	602	473	503	232	300	293	175	638
Playground	126	113	83	0	61	63	165	274	194	273	103	135	103	92	51
School Zone	54	25	13	0	28	26	62	156	125	123	37	31	25	11	21
Other	0	0	0	0	0	0	0	0	0	0	0	0	12	8	0
TOTAL Requests	479	344	221	N/A	234	175	452	1,032	792	899	372	466	433	285	710

Conclusion

Since its introduction to Calgary, photo radar deployment data has varied year to year and is subject to both manpower and equipment changes. However, the effectiveness of photo radar has not varied, having contributed to a marked reduction in the number of speeding drivers and injury collisions at the deployment sites.

The use of intersection safety cameras that monitor red light running offences have contributed to a marked decrease in right angle collisions at intersections. Intersections equipped with these cameras have continued to improve the safety of Calgary's roads by decreasing the number of injury and fatal collisions at intersections. The use of the intersection safety cameras for speed enforcement has also added another layer of injury prevention through the use of enforcement and education to help decrease vehicle speeds and speed related collisions at intersections.

The presence of automated enforcement in Calgary has contributed to a decline in the number of collisions at photo radar and red light camera deployment locations. Photo radar has also contributed to a decrease in the severity of injuries. The decreases in speed, number of collisions, and the increases in the volume of vehicles on Calgary's roadways are critical factors in determining the automated enforcement program's effectiveness. The data collected by the Calgary Police Service supports the claim that automated enforcement technologies have contributed to the increase in traffic safety within the City of Calgary.