



# EXAMINING AUTOMATED SPEED ENFORCEMENT PROGRAMS IN CANADA

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TRAFFIC INJURY RESEARCH FOUNDATION

# Traffic Injury Research Foundation

The vision of the Traffic Injury Research Foundation (TIRF) is to ensure people using roads make it home safely every day by eliminating road deaths, serious injuries, and their social costs. TIRF's mission is to be the knowledge source for safe road users and a world leader in research, program and policy development, evaluation, and knowledge transfer. TIRF is a registered charity and depends on grants, awards, and donations to provide services for the public. Visit [www.tirf.ca](http://www.tirf.ca).

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# Examining Automated Speed Enforcement Programs in Canada

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The Insurance Institute for Highway Safety (IIHS) is an independent, nonprofit scientific and educational organization dedicated to reducing deaths, injuries and property damage from motor vehicle crashes through research and evaluation and through education of consumers, policymakers and safety professionals.

# Table of contents

Acknowledgement .....	ii
Introduction .....	1
Study overview .....	4
General program information .....	6
Speed safety camera type .....	6
Area and road types with speed safety cameras .....	6
Lead agency .....	8
Issuance of citations and use of revenue .....	8
Legislative and adjudication information .....	10
General legislative components .....	10
Adjudication process .....	10
Engineering safety .....	11
Location selection .....	11
Traffic calming and other countermeasures .....	12
Program monitoring and evaluation .....	12
Public education and information .....	14
Establishment of stakeholder group .....	14
Public communication .....	14
Public surveys .....	15
Interview results .....	16
Discussion .....	19
Comparison with best practices .....	19
Speed safety camera program checklist items generally implemented in full or partially implemented .....	19
Speed safety camera program checklist items generally NOT implemented .....	21
SSCs as a component of a Safe System Approach .....	22
Alternative adjudication solutions .....	23
Public acceptance .....	24
References .....	26

# List of tables

Table 1 | Survey respondents. . . . . 5

Table 2 | Number of speed safety cameras by camera type. . . . . 6

Table 3 | Road types enforced with SSCs. . . . . 7

Table 4 | Lead agency for automated enforcement. . . . . 8

Table 5 | Agency responsible for processing and reviewing images and issuing citations . . . . . 9

Table 6 | Citation amounts in Ontario. . . . . 9

Table 7 | Permitted violator defences. . . . . 11

Table 9 | Factors used to select camera sites . . . . . 12

Table 11 | Outcome measures used to determine the safety effects of the program 13

Table 12 | Stakeholder group membership. . . . . 14

Table 13 | Public communication strategies . . . . . 14

Table 14 | Types of ongoing publicity for SSC programs . . . . . 15

Table 15 | Public support of SSC programs. . . . . 24

# List of figures

Figure 1 | Illustration of a P2P speed enforcement system. . . . . 2

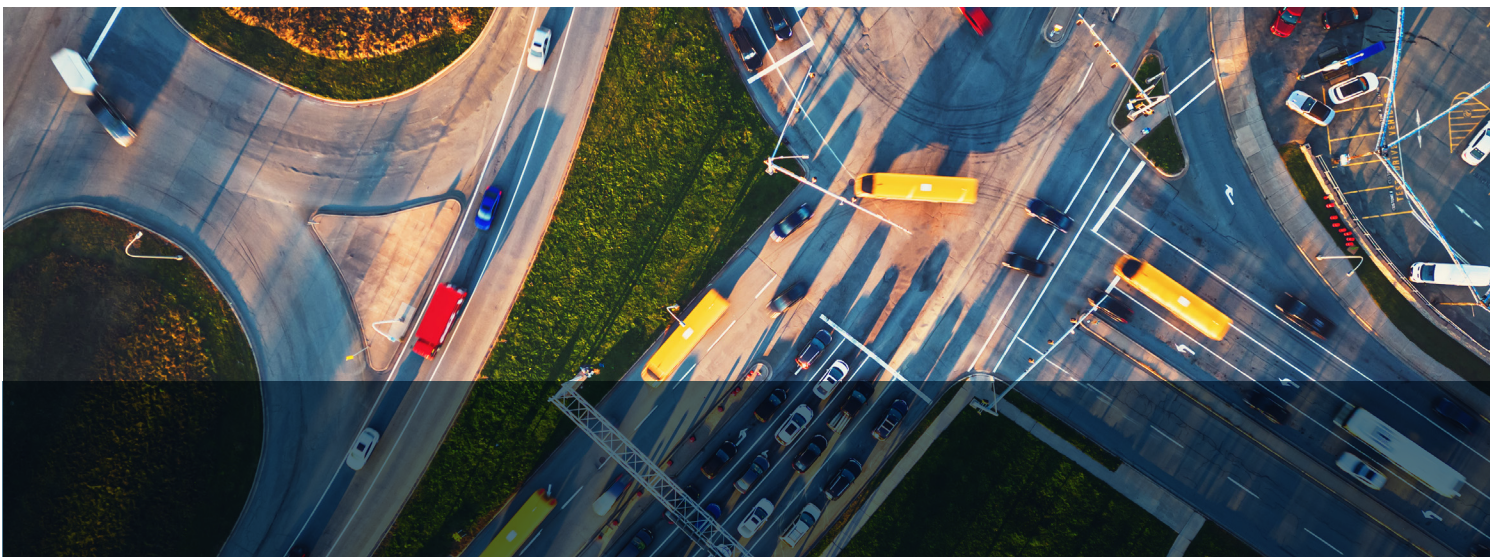
# Introduction

Speeding remains a priority road safety issue in Canada as it significantly increases the risk of a fatal crash. Data from Transport Canada (2023) revealed there were 1,630 fatal crashes in 2021, with 24.7% involving a driver speeding or driving too fast for conditions.

High vehicle speeds decrease road safety by making crashes more likely to occur, and in the event of a crash, result in more severe outcomes. Crashes are more common because higher speeds reduce the amount of time available to perceive and react to a risky situation, increase the braking distances needed to stop, may affect tire grip on the pavement, and make loss of control more likely. Additionally, at higher speeds, drivers have a narrower field of vision (Berkeley SafeTREC, n.d.).

This increased crash risk associated with higher speeds is easily observed in the data. The [Insurance Institute for Highway Safety \(IIHS\)](#) reported that an 8 km/h (5 mph) increase in the maximum speed limit was associated with an 8% increase in the fatality rate on interstates and freeways, and a 3% increase in fatalities on other classes of roads (Farmer, 2019). In another study on speeds and safety, Nilsson (2004), found that a 10% reduction in average speed resulted in 19% fewer injury crashes, 27% fewer severe crashes, and 34% fewer fatal crashes. The data also showed that outcomes were more severe due to the increased forces resulting from higher speeds. For example, on average, a person struck by a car travelling at 56 km/h (35 mph) was five times more likely to die than a person hit by a car travelling at 32 km/h (20 mph) (Tefft, 2011). More severe outcomes at higher speeds were exacerbated when victims were older pedestrians and/or struck by larger vehicles.

Most data on the speeding behaviour of drivers are gathered using questionnaires. This makes it difficult to determine how many drivers were actually speeding because all drivers have different opinions of what constitutes speeding. For example, going 5–9 km/h over the speed limit may not be considered speeding by most drivers. That being said, a survey of Canadian drivers in 2023 conducted by the [Traffic Injury Research Foundation \(TIRF\)](#) reported that roughly seven out of 10 Canadians admitted speeding by 20 to 30 km/h over the limit on highways at least occasionally, and 11% reported speeding by more than 30 km/h on highways. Furthermore, 91% of drivers reported at least occasionally seeing other drivers speeding, 13% reported having a near-crash experience due to speeding in the previous 3 months, and 2% reported having a speeding-related crash in the previous 3 months.





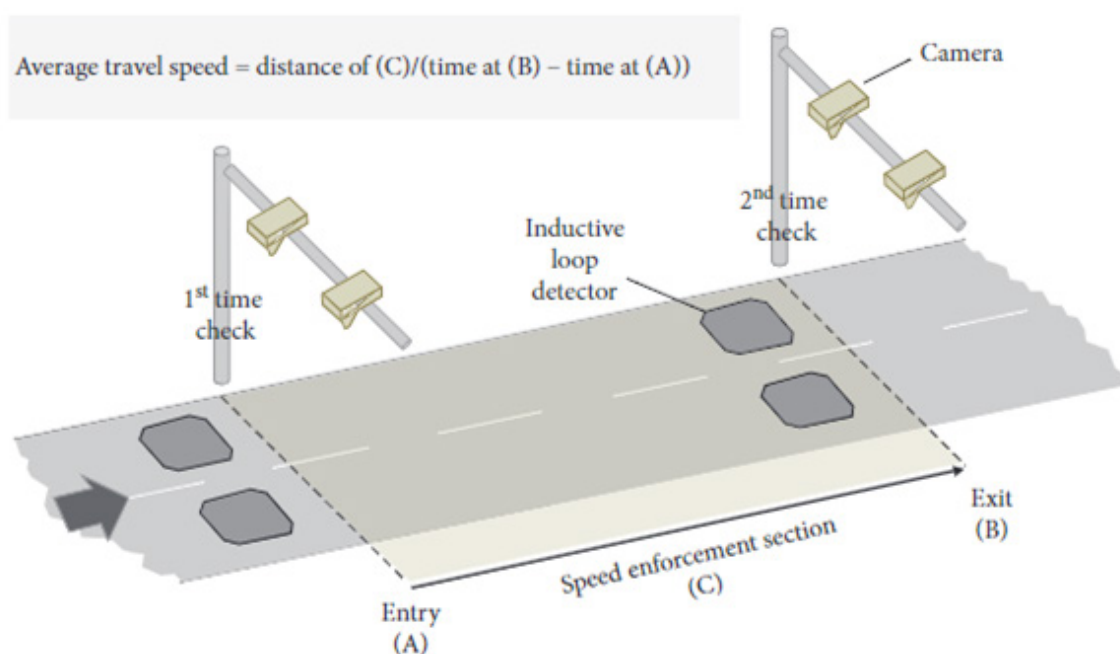
While traditional speed enforcement by law enforcement officers is effective, such enforcement is often limited due to the myriad of other demands placed on law enforcement, police department budgets, and other practical constraints.

As such, a speed safety camera (SSC) program can provide continuous monitoring of roadways, allowing police officers to focus on more complex and competing priority issues in the communities they serve.

Many communities have adopted SSCs to reduce the prevalence of excessive speeding in targeted areas and make roads safer. SSCs can be used to detect speeding vehicles and capture an image of the licence plate, which documents the date, time, and speed of the vehicle. Once images are reviewed and confirmed by a trained professional, citations are issued by mail.

To date in North America, SSCs have been implemented using single-point cameras, whereby vehicle speed is measured at a single point in time, similar to a police officer with a radar gun or lidar-based device. Cameras may be mounted at fixed locations, rotated across multiple fixed locations, or attached to police vehicles for mobile enforcement with or without police officers present. In some other countries, an alternative to using single-point cameras is to deploy Point-to-Point (P2P), also known as section-speed, speed-over-distance, or average speed enforcement camera systems. These latter systems use cameras mounted in pairs along a control section that capture a time-stamped photo of each vehicle, use licence plate readers to measure the elapsed travel time between the two locations, and issue tickets based on the average speed of the vehicle. This approach encourages driver speed compliance over longer distances than policies based on the use of a single location or spot enforcement. Figure 1 illustrates a P2P system.

Figure 1 | Illustration of a P2P speed enforcement system



Source: Evaluation of Section Speed Enforcement System Using Empirical Bayes Approach and Turning Point Analysis, by J. Shim, O. H. Kwon, S. H. Park, S. Chung, and K. Jang, 2020, Journal of Advanced Transportation, 2020, 9461483 (<https://doi.org/10.1155/2020/9461483>). CC BY 4.0.



Previous evaluation studies have shown that SSC programs decrease crashes when employed. The Transportation Research Board's 2012 report *Automated Enforcement for Speeding and Red Light Running* cited a previous review by Thomas et al. (2008), which included evaluations of both fixed and mobile speed safety camera programs. A range of crash reductions were reported, from approximately 9% to 18% for all crash types and 21% to 51% for injury crashes. Included in that review was a study using data from Canada (Chen et al., 2002), which showed a 16% corridor-wide reduction (i.e., a general deterrence effect) in all crashes along a single 22-km (13.75-mi) corridor in a rural environment with 12 specific camera-enforced sites. The study also reported speed reductions at the treated sites and non-treated locations along the corridor 2 years post-implementation. This report further cited several additional studies, including:

- > Hitchens (1994), who estimated a crash reduction of 16%, a reduction of injuries of 21%, and a 30% reduction in fatalities;
- > Mara et al. (1996), who reported a significant reduction of 13% in fatal and serious crashes in urban areas during low-alcohol-exposure times and a reduction of 23% in non-alcohol-exposure times;
- > Cunningham et al. (2005), who cited a Norwegian study showing reductions of 20% in injury crashes, an Australian study showing reductions of 21% for all severity levels, and a United Kingdom study showing an 18% reduction for all crashes and a 31% reduction for injury crashes; and
- > Shin et al. (2009), who analyzed fixed photo speed enforcement on a 10.5 km (6.5-mi) stretch of limited-access freeway with a 105 km/h (65 mph) speed limit in Scottsdale, Arizona.

This program included six speed detection locations, with three cameras in each direction, and used a threshold speed of 122 km/h (76 mph) for issuing a ticket. For all severities combined, the estimated reductions by crash type were 63% for single-vehicle, 48% for side-swipe same-direction, 26% for rear-end, and 88% for other.

In addition, a 2023 Federal Highway Administration (FHWA) publication cited several more recent studies, including:

- > Li et al. (2020), who found a decrease in fatal and injury crashes from 1.8% to 21.4% for all crash types;
- > Li et al. (2015), who found mobile units can reduce crashes on urban principal arterials by up to 20% for fatal and injury crashes;
- > Montella et al. (2015), who found reductions in fatal and injury crashes on urban expressways, freeways, and principal arterials up to 37%; and
- > Hu and McCartt (2016), who found that speed cameras were associated with a 19% reduction in the likelihood that a crash resulted in an incapacitating or fatal injury, with the implementation of a corridor approach in which cameras were periodically moved along the length of a roadway segment, providing an additional 30% reduction over and above the cameras.

More recent studies included Shim et al. (2020), who evaluated a P2P system on a Korean expressway and found a 43% reduction in crashes, and Tilahun (2022), who estimated reductions of 12% in fatal and injury crashes in the City of Chicago.

The use of SSCs can support a Safe System Approach to reaching Vision Zero, which aims to eliminate traffic-related deaths and serious injuries. SSC programs would contribute to the pillars of safe road users and safe speeds by encouraging drivers to adhere to speed limits. SSCs can help complement traditional enforcement efforts, not replace them, and be considered in the context of other countermeasures and programs being applied in a community.

# Study overview

With funding from IIHS, TIRF conducted a review of the use of speed safety cameras in Canada. This review examined related laws and policies, technologies used, location types, private partnerships, and ways that data are used to support and evaluate programs. It also included a jurisdictional scan by an electronic survey submitted to agencies across Canada with active SSC programs at the time of the review. We followed up with interviews of willing survey respondents to acquire additional details.

The objective was to document how SSC programs are implemented and managed in Canada and to identify challenges and lessons learned. The intended audience for this research includes, but is not limited to, public agencies and other stakeholders primarily responsible for the safety of the road network such as enforcement agencies, highway engineers, legislators, and elected officials.



# Jurisdictional scan results

A scan of Canadian jurisdictions with active SSC programs was undertaken to collect relevant information about the implementation and management of such programs. Potential jurisdictions were identified by contacting industry groups, including the Transportation Association of Canada's road safety committee, the Road Safety Committee of Ontario, and the Canadian Association of Road Safety Professionals, and through the extensive network of TIRF staff.

To conduct the scan, an electronic survey was developed and distributed. The information collected focused on program features including relevant legislation, program structure, site selection, program monitoring and evaluation, and resource requirements. Survey responses were collected during July and August of 2023.

Of the 10 provinces and three territories in Canada at the time of the survey, six provinces had at least one jurisdiction with an active SSC program. Of these six provinces, three programs were run at the provincial level (British Columbia, Saskatchewan, and Quebec). In the province of Manitoba, there was only one city (Winnipeg) with an SSC program, while in Alberta and Ontario, there were multiple cities with SSC programs.

Survey responses were obtained for the three provincially run SSC programs as well as Winnipeg. In Alberta, responses were received from the two largest cities in the province (Calgary and Edmonton). In Ontario, responses were received from seven jurisdictions (Peel Region, Durham Region, York Region, Region of Waterloo, Guelph, Ottawa, and Toronto).

Table 1 contains a list of the jurisdictions that responded to the survey. Information about the number of speed safety cameras and initiation dates for issuing citations and warnings (where applicable) is also provided.

**Table 1 | Survey respondents**

Jurisdiction	Province	Speed safety camera program		
		# of speed safety cameras	Initiation date for warnings	Initiation date for warnings
Province of British Columbia	BC	35	n/a	01/01/2019
Province of Saskatchewan	SK	9	12/08/2014	06/01/2015
Province of Quebec	QC	54	05/01/2009	08/01/2009
City of Winnipeg	MB	44	11/01/2002	01/07/2003
City of Calgary	AB	68	n/a	06/01/1990
City of Edmonton	AB	143	01/01/1995	02/01/1995
Region of Peel	ON	1	n/a	12/01/2020
Region of Durham	ON	22	n/a	09/09/2020
Region of York	ON	3	n/a	11/12/2020
Region of Waterloo	ON	16	n/a	09/01/2021
City of Guelph	ON	4	n/a	08/01/2023
City of Ottawa	ON	20	n/a	07/13/2020
City of Toronto	ON	75	02/06/2020	07/06/2020
Note: n/a = not applicable. Data are current as of August 2023.				

The survey responses were summarized according to the following four categories:

- > General program information
- > Legislative and adjudication Information
- > Engineering and safety
- > Public education and information.

Note that for some questions, the number of responses was less than the total number of survey respondents because information was not reported by one or more respondents.

## General program information

### Speed safety camera type

Both mobile and fixed SSCs are in use in Canada. Four jurisdictions used only fixed SSCs, and four used only mobile SSCs. Another five jurisdictions reported using both fixed and mobile cameras. No jurisdictions reported the use of P2P systems.

Table 2 contains the number of SSCs in each jurisdiction by camera type. The number of SSCs in operation varies widely, from a single mobile camera in the Region of Peel, Ontario, to a total of 143 cameras in the City of Edmonton.

Table 2 | Number of speed safety cameras by camera type

Jurisdiction	Province	Camera system type	
		Fixed	Mobile
Province of British Columbia	BC	35	
Province of Saskatchewan	SK	9	
Province of Quebec	QC	30	24
City of Winnipeg	MB	49	10
City of Calgary	AB	54	15
City of Edmonton	AB	105	38
Region of Peel	ON		1
Region of Durham	ON	10	12
Region of York	ON		3
Region of Waterloo	ON	16	
City of Guelph	ON		4
City of Ottawa	ON	20	
City of Toronto	ON		75

All jurisdictions reported using highly visible SSC operations, i.e., overt enforcement. Ten jurisdictions reported having warning signs installed wherever SSCs will be placed to alert drivers of their upcoming installation or reinstallation. Two jurisdictions reported no warning signs were used.

### Area and road types with speed safety cameras

Table 3 provides the number of jurisdictions using SSCs in a variety of locations with different road classifications. Note that the classification can result in overlapping categories (e.g., school zones located in suburban areas). More jurisdictions used SSCs in urban (12) and suburban (11) locations than in rural (5) locations. School zones were most often enforced (13), followed by residential (8),



commercial zones (5), and work zones (3). By road classification, arterials were most often enforced (9), followed by local streets (8), expressways (3), and collectors (1). Three respondents also noted in the *other* category that they were using SSCs in community safety zones, which were most often located in residential areas. In jurisdictions that reported expressways, SSCs were not limited to work zones.

Table 3 | Road types enforced with SSCs

Location type	Number of jurisdictions
Rural	5
Urban	12
Suburban	11
Residential	8
Commercial zones	5
School zones	13
Work zones	3
By road classification	
Local streets	8
Collectors	1
Arterials	9
Expressways	3
Other	3



A review of the laws and regulations related to SSCs revealed some restrictions regarding locations where SSCs can be implemented. In the province of Alberta, cameras were prohibited on residential roads with speed limits under 50 km/h, excluding roads with a school, playground, or construction zone. In the province of Manitoba, SSCs were limited to construction zones, schools, and playgrounds, and Intersection Safety Cameras that detected and ticketed both speeding and red-light running were permitted at intersections controlled by traffic signals. In the province of Ontario, use was limited to community safety zones with speed limits under 80 km/h or school zones.

Lead agency

SSC programs were managed by a variety of agencies, as presented in Table 4. Most programs were operated by local city or regional governments (8). Regional governments were defined as geographically larger levels of government responsible for delivering certain area-wide municipal functions to several municipalities.

Two jurisdictions reported police services were the lead agency. In provincially run programs, two jurisdictions reported the provincial government and one reported a public auto insurer as the lead agency. In the latter case, the public insurer contracted with a vendor to manage the program, and its role in the ticketing process was limited to providing registered owner information for specific licence plates.

Among government-run programs, the lead agency was typically a transportation or public works department.

Table 4 | Lead agency for automated enforcement

Lead Agency	Number of jurisdictions
Police department	
(including designated traffic unit)	2
Provincial government	2
City or regional government	8
Public insurer	1

Issuance of citations and use of revenue

All 13 jurisdictions indicated that images of the rear of offending vehicles were captured, with just one jurisdiction also capturing frontal images. Five jurisdictions captured an image of the entire vehicle, and no jurisdictions reported capturing driver images.

Six jurisdictions reported that the processing and reviewing of images as well as the issuing of citations was the responsibility of the agency managing the program. Two jurisdictions reported that image processing and issuing citations was performed by the vendor providing the cameras, after the associated police service first validated the ticket. Five jurisdictions in Ontario reported outsourcing these functions to the Joint Processing Centre (JPC).

The JPC is managed by the City of Toronto and staffed by provincial offence officers, who must first be designated by the province with authority to issue charges captured by SSCs, and additional support staff for contract management and record management. The JPC reviews all photos, obtains licence plate ownership information, assists with warning letters, processes evidence, issues tickets, and prepares evidence for use in court proceedings, as needed. All municipalities using the JPC share the program costs.



Table 5 | Agency responsible for processing and reviewing images and issuing citations

Agency	Number of jurisdictions
Camera vendor	2
Agency responsible for the program	6
Joint Processing Centre	5

For vendor payment, eight jurisdictions reported paying a flat fee for vendor services. Two jurisdictions paid vendors based on the number of citations issued, and two jurisdictions reported the equipment was purchased from vendors with no further vendor costs.

Five jurisdictions reported using a warning period before citations were issued, while eight indicated warning periods were not used. The length of this period ranged from approximately 30 to 180 days.

For the threshold used to determine when citations are issued, three jurisdictions ranged from 10 to 20 km/h over the posted speed limit. One of these three jurisdictions reported the threshold varied based on the location the driver was speeding in; it was 10 km/h in a school zone and 15 km/h in other locations. Ten jurisdictions indicated this information was confidential or did not respond.

The citation amounts varied by jurisdiction, varying from \$35 to \$990 (Canadian dollars), depending on the number of kilometres per hour over the speed limit, and may depend on whether the violation occurred in a community safety zone or school zone. Among the nine jurisdictions that reported increasing fines for exceeding the posted speed limit in a community safety zone or school zone, eight doubled the total fine and one doubled the portion of the fine related to the amount by which the vehicle was exceeding the posted limit. Seven jurisdictions increased fines for exceeding the posted speed limit in a construction zone, and of these, five doubled the fine amount.

Income was not a factor in determining the fine amount in any of the jurisdictions.

As an example of how citation amounts can vary, Table 6 documents the fines across all jurisdictions in Ontario. Note that the range of speeding across jurisdictions does not reflect the use of any tolerance limit. No jurisdictions in Ontario chose to indicate whether a tolerance limit was used in the determination to issue a citation.

Table 6 | Citation amounts in Ontario

Amount over the speed limit (km/h)	Area type			
	General	Community safety zone	Construction zone	Construction zone worker present
1-19	\$2.50/km	\$5.00/km	\$2.50/km	\$5.00/km
20-29	\$3.75/km	\$7.50/km	\$3.75/km	\$7.50/km
30-49	\$6.00/km	\$12/km	\$6.00/km	\$12.00/km
50 or more	No out-of-court settlement	No out-of-court settlement	No out-of-court settlement	No out-of-court settlement
Note: All fine amounts are listed in Canadian dollars.				

In all jurisdictions, the vehicle owner is held responsible for the speeding violation and no demerit points are assigned to a driver’s licence. At least one jurisdiction’s sanction also includes a victim fine surcharge and court costs.

Three jurisdictions reported the amount of revenue generated in 2022, and amounts ranged from \$300,000 in a region of roughly a half million people to almost \$62 million in a province-wide program.

Five jurisdictions reported that surplus revenue generated by SSC programs was directed into a general fund. The surplus funds were put specifically into a highway safety fund in four jurisdictions. The other jurisdictions reported surplus funds going to the police agency or the court system.

## Legislative and adjudication information

### General legislative components

In all jurisdictions, the enabling legislation for SSC programs was provincial.

Ten jurisdictions reported a maximum amount of time to issue a violation notice after the violation occurred. Reported periods varied from 14 days to 6 months. One jurisdiction reported having no time limit.

Four jurisdictions reported the program was audited, while seven reported it was not.

The length of time the violator images were retained also varied across jurisdictions. Four jurisdictions reported retaining the violator images indefinitely, whereas the remaining five jurisdictions responding to the question indicated a range of three to 120 months.

### Adjudication process

In seven jurisdictions, the violations were reported as civil, whereas they were reported as criminal in six jurisdictions. Note that although some jurisdictions considered violations to be criminal, the laws in several provinces specifically stated that vehicle owners were not subject to imprisonment. Unless it is an administrative penalty system, citations can be considered quasi-criminal. Five jurisdictions reported that violation data was shared with insurance companies.

Eleven jurisdictions reported having a process in place for dispute resolution, whereas one reported having no resolution process. Of those with a process, all but two required dispute resolution to occur in court. One jurisdiction required that disputes be conducted as part of an early resolution meeting with the prosecutor, and the second allowed for citations to be disputed by mail at the driver-licensing office, or at court. The jurisdictions reporting no dispute resolution process handled citations at the administrative level and did allow for court appeals.



Nine jurisdictions reported permitting violator defences, as summarized in Table 7.

Table 7 | Permitted violator defences

Defence	Number of jurisdictions
Vehicle was stolen	5
Registered owner did not own the vehicle during the time of the offence	5
Device calibration and/or testing issues	3
Registered owner provides proof they were not operating the vehicle at the time of the violation	1
Other	4

Among the jurisdictions allowing for other defences, four allowed any defence to be presented.

Twelve jurisdictions reported sanctions imposed if individuals receiving a violation notice failed to pay the fine or contest the violation within a certain period, as shown in Table 8. Most commonly, a licence plate renewal was denied.

Table 8 | Sanctions for nonpayment

Sanction	Number of jurisdictions
Unpaid fine was sent to collections	1
Found "Guilty in Absence" by the court	2
Unknown	1
Unpaid fine was sent to small claims court	2
Licence plate renewal denied	7

Eight jurisdictions reported sending citations to vehicles registered outside the jurisdiction, while three reported this was not their practice.

### Engineering safety

Respondents were asked if a safety needs assessment of the community as a whole was conducted to identify if speeding and speeding-related crashes were prevalent (not at specific locations) prior to the decision to initiate an SSC program. All respondents indicated that no such study was specifically undertaken.

### Location selection

Nine jurisdictions reported that a formal engineering study was undertaken when selecting enforcement locations. Three jurisdictions reported no such study was undertaken, although all three reported that engineering personnel were responsible for selecting locations.

Ten jurisdictions reported that engineering personnel were involved in site selection. While four of these 10 indicated that enforcement personnel were involved, two indicated that camera personnel were involved.

Respondents reported using a variety of factors to select camera sites, and these are summarized in Table 9. In many cases, jurisdictions applied a combination of factors. The most common factors included evidence of speeding, frequency of crashes, and traffic volumes.

Table 9 | Factors used to select camera sites

Factor	Number of jurisdictions
Speed data	12
Traffic volume	12
Crash frequency	11
Crash type	11
Selected by engineering personnel	11
Violation data	6
Selected by enforcement personnel	6
Public input	4
School zones	3
Other	3
Selected by camera vendor personnel	2
Underserved communities	1

### Traffic calming and other countermeasures

Twelve of 13 jurisdictions reported also implementing traffic calming or other roadway or enforcement countermeasures to reduce speeding. Reported countermeasures included:

- > Road geometry improvements such as narrowing lanes, adding active transportation facilities, and building roundabouts
- > Speed bumps, planter boxes, bulb-outs, and raised crosswalks
- > Signs at the roadside displaying a vehicle's speed and indicating if they are over the speed limit
- > Speed limit pavement markings
- > Centreline flex stakes
- > Reduced speed limits in residential areas
- > Stronger legislation and penalties for speeding, stunt driving, and race driving
- > Public communication campaigns
- > High-visibility police enforcement

### Program monitoring and evaluation

Jurisdictions were asked how often they monitored the operation of the program to ensure the system was functioning as intended. Five reported daily, five reported weekly, one reported monthly, and two reported that monitoring was according to vendor discretion.

Ten jurisdictions reported maintaining logs of ongoing operations, while two reported not doing so. The documentation of these logs was extensive, and a summary is provided in Table 10. Other documentation included system maintenance records, system upgrades, operating costs, controllable and uncontrollable rejects, and vendor maintenance.

Table 10 | Documentation included in operation logs

Documentation	Number of jurisdictions
Deployment site locations	10
Deployment site hours of operation	9
Responsible staff	9
Enforcement speed threshold	8
Observed behaviours	3
Citations issued	9
Maintenance log	10
Calibration dates	10
Other	3

Eleven jurisdictions reported evaluating the safety effects of the SSC program and one reported not doing so. Table 11 summarizes which outcome measures were used to gauge the safety effects of the program. The most commonly reported measures were the percentage of speeding vehicles, the number of speeding violations issued, and the number of crashes involving speeding.

Table 11 | Outcome measures used to determine the safety effects of the program

Outcome measure	Number of jurisdictions
Crashes involving speeding	10
Crashes overall	9
Injury and fatal crashes	9
Traffic conflicts (near misses)	1
Speeding violations	11
Speed differentials of cited vehicles	3
Average speed of travel	8
Traffic volume	4
Percentage of speeding vehicles	11

Ten jurisdictions reported their program had shown safety benefits, while one reported it did not. Cited benefits include speed reductions and reduced crashes.





## Public education and information

### Establishment of stakeholder group

Six jurisdictions reported establishing a stakeholder group to plan the SSC program and six reported not doing so. Table 12 shows the number of jurisdictions that reported including various groups as stakeholders.

Table 12 | Stakeholder group membership

Stakeholder	Number of jurisdictions
Law enforcement	6
Transportation departments	5
Public information offices	1
Courts	5
Finance offices	2
Facility departments	1
City council	2
Mayor	2
Researchers	1
Residents	0
Other	1

Notably, several cities in Ontario were members of a municipal steering committee that met regularly and aimed to harmonize approaches to SSC programs.

### Public communication

When the public was informed about the program by the agency responsible for the program, the means through which this was communicated are shown in Table 13. Most jurisdictions disseminated messaging through TV or radio and social media. Public meetings were only used in a third of responding jurisdictions.

Table 13 | Public communication strategies

Strategy	Number of jurisdictions
Public service announcement on TV or radio	9
Social media	8
Print ads	6
Public meetings	4
Mailings to residents	1
Other	0
No effort was made	0

Jurisdictions were asked how continuing publicity of the SSC program was achieved. Table 14 provides a summary of the types of continuing publicity implemented in the 12 jurisdictions that responded to this question. The most common methods were through a website (12), signage on the approach to an enforcement area (10), and social media (8). For the other category, one jurisdiction reported sending an email to the ward councillor where the SSCs were implemented.



Table 14 | Types of ongoing publicity for SSC programs

Type of publicity	Number of jurisdictions
Public service announcement on TV or radio	4
Print ads	3
Signs on approach to the enforcement area	10
Signs at the entrance to the jurisdiction	2
Social media	8
Website	12
Other	1

## Public surveys

Three jurisdictions reported that public support for SSCs was assessed prior to the start of the program, while nine jurisdictions indicated this was not done.

Respondents were also asked if they conducted periodic surveys to determine whether drivers supported SSCs and whether they reduced their speed because of the cameras. Five jurisdictions reported conducting surveys to determine whether drivers supported SSCs, and six jurisdictions reported surveying drivers to find out whether they reduced their speed. Two jurisdictions shared this data.

The City of Ottawa surveyed residents and determined the level of support for SSCs was high and varied by location type, including:

- > Near schools: 87%
- > Near parks: 76%
- > Near playgrounds: 85%
- > Near seniors' residences: 76%
- > Near hospitals: 77%
- > On any road where there is speeding: 65%

Among those who reported receiving a ticket from an SSC (14% of respondents), 79% said it modified their behaviour, including 65% who said they reduced speed in most driving situations.



Saskatchewan Government Insurance indicated 52% of respondents supported continuing the SSC program, including 44% who supported expanding the program. Forty-five percent of respondents agreed SSCs improved road safety and 34% agreed they generally speed less.

## Interview results

Follow-up interviews were requested from all survey respondents to collect additional insights into program features that made the SSC programs successful. While interviews were requested for all responding agencies, only a subset agreed. Interviews were successfully scheduled with eight jurisdictions, including the Region of Durham, City of Guelph, City of Ottawa, Region of Peel, City of Toronto, and Region of York in the province of Ontario; Saskatchewan Government Insurance; and, the City of Winnipeg.

The interviews focused on seven key questions:

1. What key elements contributed to the success of the SSC program?
  2. Were there any aspects of SSC program planning or implementation you would do differently?
  3. Are there any future planned changes to the SSC program? If so, how do you expect to improve it?
  4. What issues arose with vendors and how were they resolved?
  5. What information about the SSC program was shared with the public?
  6. What was your assessment of community support for SSCs and has it changed over time? What influenced community support either positively or negatively?
  7. If the SSC program included mobile enforcement, how was the intensity and pattern of camera rotation determined?
1. What key elements contributed to the success of the SSC program?

Interviewees provided consistent responses with respect to what made an SSC program successful. In terms of obtaining community support, transparency was emphasized. It was critical that communities not perceive the SSC programs as a cash grab. Public education about the importance and objectives of the SSC program and how it worked was vital. This was achieved through agency websites, traditional media, and social media (e.g., sharing anonymized high-speed driving videos).

Another way to promote community support was to focus, at least initially, on areas around school zones or designated community safety zones.

Another consistent message was that decisions around SSC program implementation should be evidence-based, minimizing political influence. In particular, interviewees cited using data for decisions on the enforcement locations and the total number of cameras for the program. The importance of evaluating the impacts of SSC programs on reductions in speeds and crashes also was felt to be important.

Consideration of equity issues was also mentioned to ensure that it was not just the most affluent neighbourhoods benefiting from an SSC program.

Other cited elements included putting net revenues back into traffic safety initiatives instead of general revenue funds and having an external auditor regularly assess the program.

Several jurisdictions in Ontario cited that having all municipalities working together on procurement, communication, and other program features to ensure consistency was also important. It was reported that this consistency within the same geographic area promoted community support and reduced opportunities for loopholes to be exploited by offenders.

## 2. Were there any aspects of SSC program planning or implementation you would do differently?

Overall, interviewees reported being very satisfied with the current state of their SSC programs. There were, however, some elements mentioned that could be improved.

One issue mentioned was focusing on fixed sites more than mobile SSC units. There were two issues frequently identified with respect to mobile enforcement. The first was related to vandalism of the cameras because mobile units were not mounted out of the reach of the public. The second related to legal requirements for posting signs informing the public that an SSC was coming soon or is currently in operation at each enforced location. The burden of moving signs around enforcement locations strains municipal employees.

As noted previously, several Ontario municipalities had Toronto's JPC process offences for them. At least one of these municipalities, however, was changing to their own processing centre as the JPC did not have the capacity to process all tickets received. This same municipality indicated they underestimated the requests for additional cameras from the public and the lack of processing capacity limited program expansion.

One jurisdiction indicated the existing legislation enabling SSCs was outdated and not flexible. As a result, they can use only older camera technology that is outdated and results in problems when equipment needs repair.

One municipality indicated they would like the provincial legislation to change to allow for the capturing of front license plates, which would allow for speed enforcement on green and high-occupancy-vehicle lanes.



**3. Are there any future planned changes to the SSC program? If so, how do you expect to improve it?**

Interviewees did not report any planned changes to their SSC programs with one exception. Currently in the province of Ontario, charges are laid using the court system, which lacks capacity. As such, legislation is being modified to adopt an administrative penalties model that will allow municipalities to handle contested citations outside of the court system. This change will facilitate SSC program expansion.

**4. What issues arose with vendors, and how were they resolved?**

Interviewees did not report any major issues with vendors. Minor issues included maintaining equipment, responding to vandalism of cameras, and obtaining additional equipment in a timely manner.

**5. What information about the SSC program was shared with the public?**

Jurisdictions with SSC programs typically made a concerted effort to share program information, for example, through their websites. Common information included enforcement locations, the number of citations issued, measured speeds, and other program statistics. Some jurisdictions also reported detailed background information on SSCs, and how locations are selected. In addition, some jurisdictions provided request forms for new SSCs enforcement locations, copies of evaluation reports on the effectiveness of the program, and the revenue generated.

**6. What is your assessment of community support for SSCs and has it changed over time? What influenced community support either positively or negatively?**

All jurisdictions reported that community support for SSC programs was high prior to implementation and remained high afterwards. Several jurisdictions noted that, anecdotally, they received more requests to install additional SSCs than complaints about the programs. One jurisdiction noted they made a concerted effort to tie SSCs to their Vision Zero program in their messaging.

**7. If the SSC program included mobile enforcement, how was the intensity and pattern of camera rotation determined?**

For jurisdictions using mobile SSCs, there was no reported formal assessment of the number of cameras to use. Rather, the number of cameras in use was limited as programs started up and then increased based on capacity. Similarly, the pattern of rotation among enforcement locations was selected not through a formal analysis but on an ad hoc basis, for example, rotating every three months.

Some jurisdictions did indicate that they seek to establish rotations that represented broad geographic coverage to achieve a halo effect (where effects are seen at nearby unenforced locations) of speed reductions.



# Discussion

The jurisdictional scan and interviews summarized in this report provide a snapshot of how SSC programs are implemented in Canada. The study examined related laws and policies, the technology used, location types where implemented, private partnerships, and how data are used to support and evaluate programs. The objective was to document how SSC programs are managed in Canada and identify challenges and lessons learned. The overall consensus of jurisdictions employing SSCs was that they are effective programs with considerable public support.

This final section of the report compares Canadian SSC programs with best practices, and briefly discusses the role of SSCs in the Safe System Approach, alternative adjudication solutions, effective program features, and public acceptance of SSC programs.

## Comparison with best practices

IIHS, the Governors Highway Safety Association, AAA, Advocates for Highway and Auto Safety, and the National Safety Council partnered to produce a best practices checklist for automated enforcement programs. The information obtained from Canadian jurisdictions with SSC programs was compared with the checklist to see in general which practices have been implemented and which were not. For checklist items considered generally not implemented in Canada, it is possible they may be implemented in one or more jurisdictions, but the information contained in the surveys and interviews did not specifically address this issue.

### Speed safety camera program checklist items generally implemented in full or partially implemented

#### 1. Identify problem intersections and roadways.

Most jurisdictions used data on crashes, speed violations, vehicle speeds, and traffic volumes to select sites for enforcement. Some jurisdictions considered road user input by allowing residents to request SSCs in specific locations.

#### 2. Ensure the speed limit is appropriate and accounts for all road users. Ensure that special conditions, such as work zones and school zones, have appropriate speed limits. Assess whether engineering changes could be made to promote compliance with the speed limit and ensure adequate posting of speed limits.

A majority of jurisdictions conducted a formal engineering study prior to approving a site for SSCs. Only two jurisdictions had a specific policy to consider other engineering-related changes prior to approving an SSC for a location under review. A formal assessment of the prevalence of speeding and speeding-related crashes in communities was not conducted prior to initiating the programs.

#### 3. Establish an advisory committee comprised of stakeholders.

Half of responding jurisdictions established an advisory committee to plan the SSC program. Potential stakeholders listed in the checklist that were not mentioned included victim advocates, equity and civil rights advocates, school officials, first responders, and health officials.

4. Automated enforcement programs should be data-driven and should prioritize safety, not revenue.

All jurisdictions reported selecting locations for enforcement based on data. In the majority of cases, crash data was considered as one of the factors. It is unknown whether considerations of potential revenues were involved in site selection in any way.

5. Establish a threshold that must be crossed before a vehicle is photographed for a violation.

Several jurisdictions reported a threshold while most indicated the threshold value was confidential or did not respond to the question. Based on the answers, it is believed that all jurisdictions do use a threshold value for issuing citations.

6. Programs should include a process for evidence review by appropriately trained personnel to determine if a violation occurred and issue a citation if warranted.

All jurisdictions had trained staff and a process for reviewing the images captured before citations were issued.

7. Establish clear procedures for contesting an alleged violation.

Nine of 12 jurisdictions reported having a process in place for dispute resolution, with eight of those requiring dispute resolutions in court. One jurisdiction required that disputes be conducted as part of an early resolution meeting with the prosecutor.

8. Use safety data to determine camera locations, ensuring that particular neighbourhoods are neither overlooked nor overrepresented.

While most jurisdictions did report using crash or other safety-related data in selecting enforcement sites, a minority reported a formal consideration of neighbourhoods to ensure fair representation.

9. Publicize the extent of the safety problem and the need for innovative solutions.

Most jurisdictions utilized announcements through TV or radio and social media when programs were initiated. A minority reported holding public meetings. However, it was unknown the extent to which the safety problem and innovative solutions were considered or assessed.

10. Secure a vendor and establish payment based on the vendor's actual costs, not the number of citations.

Most jurisdictions did not pay vendors based on the number of citations. Only two jurisdictions reported doing so.

11. Create a website and social media plan to publicize program details, such as how to pay and dispute tickets. Establish a method for answering questions accurately and in a timely manner.

Most jurisdictions implemented a website to publicize program details and provide contact information for questions from the public.

12. Install prominent warning signs.

Most jurisdictions used warning signs where SSCs were placed to alert drivers of upcoming installations or reinstallations.

13. Start with a probationary period during which only warnings are issued. Allow for due process. Minimize the number of days between the violation and citation issuance.

Five jurisdictions used a warning period before citations were issued, while eight reported a warning period was not used. Only one jurisdiction had no time limit for issuing a citation, while other jurisdictions had varied time limits from 14 days to six months.



## Speed safety camera program checklist items generally NOT implemented

The following items from the checklist were not reported as part of implementing SSC programs in Canada.

1. Meet with the media, including newspaper editorial boards, to build support and educate the public.

Although most jurisdictions indicated the media was used to make the public aware of new SSC programs, none reported working with media to build support for the program.

2. Communities should take into account racial and economic equity when making decisions about camera placement and fines.

No jurisdictions indicated the issues of equity or citation amounts were considered as part of the selection of camera locations.

3. Target violations with the greatest safety consequences. For example, you might decide not to ticket for right-turn-on-red violations when pedestrians, bicyclists, and oncoming vehicles are not present or to limit violations in work zones to when workers are present, provided the road configuration has not also been altered for construction.

No consideration of contextual factors was acknowledged as considerations in determining whether a citation should be issued.

4. Establish a reasonable fine structure. Create options for indigent violators such as payment plans or other alternatives.

No optional plans were reported for paying fines.

5. Fines in excess of program costs should be allocated to transportation safety programs.

Most jurisdictions did not invest net revenue in transportation safety-related programs. Rather, net funds typically were allocated to a general fund, the police agency or the court system.

6. Hold a kickoff event with advisory committee members. Introduce a well-developed and sustained public education campaign focused on improving safety by changing driver attitudes and behaviour.

Although most jurisdictions launched a campaign to make residents aware of the implementation of an SSC program, none reported a well-developed campaign aimed at driver attitudes and behaviour.

7. Monitor program operation and publicize results. Undertake periodic reviews and ensure racial, economic, and other equity issues and public concerns are addressed.

Most jurisdictions did not report performing formal and regular audits of the programs, and few reported any consideration of racial, economic, or equity issues.

8. Require regular evaluations of the traffic safety benefits of the program by collecting crash and infraction data. Before-and-after comparisons must use control intersections and roadways. Include control intersections and roadways that are not subject to spillover effects.

Most jurisdictions evaluated the safety effects of their SSC program using crash and infraction data. It is not known, however, if state-of-the-art methods were included in study designs, including the use of control sites and consideration of potential spillover effects.

9. Regularly meet with the advisory committee and media to review program status and sustain public support.

No jurisdictions reported regular meetings or collaboration with the media to share program status.

10. Consider other changes, including roadway design improvements, in order to reduce opportunities for unsafe driving.

Most jurisdictions implemented other measures in general to reduce speeding, such as traffic calming. However, only two specifically indicated these alternate measures were considered specifically at locations under consideration for SSCs prior to SSCs being approved.

11. Publicize changes, including new camera locations. Reinstate the probationary period before ticketing begins at new locations.

New camera locations were typically publicized but probationary periods were not applied for each new location.

## SSCs as a component of a Safe System Approach

The Safe System Approach recognizes that humans make mistakes, humans are vulnerable, responsibility is shared, safety is proactive, redundancy is crucial, and death and serious injuries are unacceptable (FHWA, 2020). To improve road safety, the Safe System Approach emphasizes the importance of multiple pillars that must be addressed using a comprehensive strategy. These pillars include safe roads, safe vehicles, safe people, safe speeds, and post-crash care. SSCs are an important part of the Safe System Approach and relevant to the issues of safe speeds and safe people. This tool can encourage safe speeds and reduce the risk of crashes as well as the severity of crashes that occur. SSCs can also prompt drivers to change their behaviour by reducing their speed, which can promote a safe driving culture.



To be most effective, SSCs should be complemented by other policies and interventions to improve road safety. The scan of Canadian jurisdictions revealed this was the case with various other measures being introduced in conjunction with SSCs, including:

- > Road geometry improvements such as narrowing lanes, adding active transportation facilities, and building roundabouts
- > Speed bumps, planter boxes, bulb-outs, and raised crosswalks
- > Speed board signs
- > Speed limit pavement markings
- > Centreline flex stakes
- > Reduced speed limits in residential areas
- > Stronger legislation and penalties for speeding, stunt driving, and race driving
- > Public communication campaigns
- > High-visibility police enforcement

The Province of Alberta formally adopted an approach that considered other approaches to address speeding before approving an SSC. Their Automated Traffic Enforcement Technology Guideline document stated that automated traffic enforcement was only allowable when "at least one other transportation safety tool has been tried previously to change behaviour and was unsuccessful over a period of at least four weeks." The other tools may fall under engineering, education, and conventional police enforcement. Listed examples include:

- > Setting of speed limits
- > Traffic calming
- > Road redesign
- > Advertising
- > Signage
- > Police enforcement blitz
- > Increased police presence on route

## Alternative adjudication solutions

A consistent concern across Canadian jurisdictions implementing SSCs was the ability of the designated system to process the number of citations issued. This concern is primarily related to court system capacity when citations are disputed by the vehicle owner. To address this concern, many municipalities opted to use or are considering transitioning to an administrative penalties system.

An administrative penalty system is an alternative adjudication arrangement in which an authorized employee designated by a municipality adjudicates the offence instead of a provincial court judge. Citations are issued by the municipality instead of using the Provincial Offences Act authority. This is the same model typically used for issuing and adjudicating parking tickets. Individuals who dispute a citation would do so through a person designated by the municipality, rather than the conventional court process.

The adoption of an administrative penalties system would reduce adjudication costs and resources, which could remove barriers to entry in jurisdictions considering an SSC program.

## Public acceptance

Public acceptance of SSCs can be positively influenced by concerted and transparent efforts to educate the public about their implementation and benefits. The extent to which such programs are ultimately supported is also likely dependent on prevailing cultural attitudes toward enforcement.

Table 15 shows the level of support of SSCs based on public surveys. Where SSC programs exist, support appears relatively comparable across North America. The national-level support in the U.S. is much lower, at 43%, which indicates that communities without SSC programs have much lower support.

Table 15 | Public support of SSC programs

Country	Jurisdiction	Public support	Support by location
Canada	City of Ottawa <sup>a</sup>	65%	School zone: 87% Playgrounds: 85% Hospital zones: 77% Near parks: 76% Near seniors' residences: 76%
	Alberta <sup>b</sup>	61%	n/a
	British Columbia <sup>c</sup>	76%	n/a
	Saskatchewan	52%	n/a
United States	National <sup>d</sup>	43%	n/a
	Cities of Seattle and Tacoma <sup>e</sup>	n/a	School zones: 72% High crash locations: 74% Construction zones: 58% Residential streets: 39%
	New York <sup>f</sup>	60%	School zones: 78%
	Washington, DC <sup>g</sup>	76%	n/a
	Montgomery County, MD <sup>h</sup>	62%	School zones: 86%

Note: n/a = not applicable.

a. Correspondence with City of Ottawa personnel.

b. [https://www.alberta.ca/system/files/custom\\_downloaded\\_images/trans-ate-program-review.PDF](https://www.alberta.ca/system/files/custom_downloaded_images/trans-ate-program-review.PDF)

c. <https://researchco.ca/2022/09/16/bc-speed/>

d. <https://aaaafoundation.org/wp-content/uploads/2023/09/202311-AAAF-Traffic-Safety-Culture-Index-2022.pdf>

e. [http://wtsc.wa.gov/wp-content/uploads/dlm\\_uploads/2015/03/Automated-Speed-Enforcement-Pilot\\_2011.pdf](http://wtsc.wa.gov/wp-content/uploads/dlm_uploads/2015/03/Automated-Speed-Enforcement-Pilot_2011.pdf)

f. <https://transalt.org/press-releases/new-poll-reveals-new-york-city-voters-support-automated-enforcement-to-make-streets-safer>

g. <https://www.tandfonline.com/doi/full/10.1080/15389588.2013.830212>

h. <https://pubmed.ncbi.nlm.nih.gov/27586103/>

# Conclusions

Canadian jurisdictions with SSC programs reported these programs were successful in reducing speeding and speeding-related crashes. While there were differences across jurisdictions with respect to certain program features, they largely shared a similar program structure.

These jurisdictions notably agreed an essential factor in creating a successful SSC program was to gain community support by being transparent in program delivery. It was emphasized that communities needed to accept and believe these programs will improve safety and are not simply a tool to generate revenue. This requires public education about the value of SSCs and how all components of the program work. Public education can occur using agency websites, traditional media, and social media. Another way to promote community support was to target, at least initially, school zones or designated community safety zones. Another factor in making a program successful was to make evidence-based decisions free from political influence. In particular, the selection of locations for enforcement should be based on crash and other safety-related data. Maintaining consistency across nearby jurisdictions regarding how programs are managed also promotes community support.

Comparing Canadian SSC programs to best practices, many recommendations have been implemented, and a few notable features could be improved:

1. Consideration of equity issues for camera site locations and citation amounts would ensure that certain demographic groups are not unduly targeted or punished. Equity was rarely reported as a consideration by survey respondents.
2. Although most jurisdictions reported conducting an engineering study before approving a site for camera enforcement, most did not have a clear policy of first considering alternate countermeasures. This approach would increase public confidence in SSC programs and could help ensure the most appropriate and effective countermeasures were implemented at each location.
3. Most jurisdictions did not dedicate net program revenues to safety-related programs. Doing so would also increase public acceptance of these programs and further the goal of reducing road crashes.





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