

Clause embodied in Report No. 7 of the Works Committee, as adopted by the Council of the City of Toronto at its meeting held on September 22, 23, 24 and 25, 2003.

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Intersection Safety Program to Reduce Red-Light Running

(City Council on September 22, 23, 24 and 25, 2003, adopted this Clause, without amendment.)

The Works Committee recommends the adoption of the following report (August 27, 2003) from the Commissioner of Works and Emergency Services:

Purpose:

The purpose of this report is to provide information on the safety benefits experienced during the red-light cameras pilot project between November 2000 and November 2002, and to recommend that City Council request the Government of Ontario to extend the appropriate legislation (Bill 102, as amended by Bill 149) for an indefinite period to provide the City of Toronto the option to operate red-light cameras beyond November 2004.

Financial Implications and Impact Statement:

No specific funding approvals are being requested at this time. In early 2004, staff will report to Works Committee on the necessary steps and approvals required by City Council to extend red-light camera operations in the City of Toronto, beyond November 2004. The follow-up report will provide information on additional intersections under consideration, site selection criteria, optional operational models, funding requirements and approvals required to extend the red-light camera project beyond November 2004. This report, in early 2004, will also provide the necessary information for City Council to make a decision regarding the future of red-light camera operations in the City of Toronto.

Recommendation:

It is recommended that Council request the Government of Ontario, through the Ontario Ministry of Transportation, to extend the red-light camera legislation (Bill 102, as amended by Bill 149) for an indefinite period.

Background:

On December 18, 1998, the Red Light Cameras Pilot Projects Act, 1998 (Bill 102) received Royal Assent. The Act amended the Highway Traffic Act to enable municipalities, for a period of two years, to use evidence obtained from red-light cameras to issue violation notices.

In announcing Bill 102, the Province stipulated that municipalities wishing to introduce a red-light camera pilot project would be required to:

- (a) conduct stepped-up police enforcement at other high-risk intersections;
- (b) participate in a comprehensive “before and after” statistical evaluation to determine the combined effect of red-light camera systems and police enforcement on the frequency of red-light running; and
- (c) reimburse the Province for all of its costs associated with the program.

Six municipalities in Ontario were designated by the Ministry of Transportation, Ontario as red-light camera pilot areas, namely, City of Toronto, City of Hamilton, City of Ottawa, Regional Municipality of Halton, Regional Municipality of Peel, and the Regional Municipality of Waterloo.

On November 20, 2000, the Lieutenant Governor proclaimed Bill 102 and on the same day, the City of Toronto and the participating municipalities began operation of the red-light cameras.

On February 13, 14 and 15, 2002, City Council adopted Clause No. 8 of Works Committee Report No. 2, recommending that:

“City Council request the Government of Ontario, through the Minister of Transportation, Ontario to extend Bill 102 for an additional two years, until November 20, 2004.”

At its meeting on July 30, 31, and August 1, 2002, City Council granted approval to continue operation of the red-light cameras pilot project from November 2002 to November 2003 at a cost of \$1,910,000 gross subject to the Province of Ontario extending the legislation for the use of red-light camera systems.

On November 19, 2002, Bill 149 received Royal Assent extending the red light cameras pilot project to November 20, 2004. Bill 149 also provides the Lieutenant Governor the authority to extend the Red Light Cameras Pilot Projects legislation indefinitely, by proclamation, before November 20, 2004.

At its meeting on June 24, 25, and 26, 2003, City Council granted approval to continue operation of the red-light cameras pilot project from November 2003 to November 2004 at a cost of \$1,845,000 gross.

Discussion:

This report discusses the following items:

- (1) Summary of the Provincial “before and after” safety evaluation;
- (2) Summary of City of Toronto supplementary “before and after” collision analysis; and
- (3) Request to the Government of Ontario to extend the red-light camera legislation indefinitely.

(1) Summary of the Provincial “Before and After” Safety Evaluation:

The Ministry of Transportation, Ontario retained a consultant to conduct a “before and after” evaluation study covering the six participating municipalities. The purpose of the evaluation study is to determine, with statistical significance, the combined effect that red-light cameras and police enforcement have had on safety and to determine the benefit-cost ratio for the pilot project.

The evaluation study included 48 sites in total located within the six municipalities which were designated as red-light camera pilot areas, with approximately equal numbers of red-light camera sites, stepped-up police enforcement sites, and control sites. The distribution of red-light camera and evaluation study sites is listed in Table 1.

Table 1: Red-Light Camera and Evaluation Site Distribution

Red-Light Camera Sites			Evaluation Study Sites		
Municipality	# of Red-Light Cameras	# of Camera Sites	# of Camera Sites	# of Police Enforcement Sites	# of Control Sites
Toronto	10	38	7	4	6
Hamilton	2	8	1	2	2
Ottawa	2	8	5	2	0
Halton	1	4	3	3	4
Peel	2	6	2	5	0
Waterloo	1	4	1	1	0
Totals	18	68	19	17	12

In order to measure the combined effectiveness of red-light cameras and police enforcement, with statistical significance, a robust statistical tool known as the “Empirical Bayes” method was used to conduct the safety evaluation. Collision, traffic volume and red-light violation data for the years 1995 to 1999, representing the period “before” red-light cameras were introduced, were used to develop an average safety performance curve for the 48 study sites. Similar data was collected for the years 2001 and 2002, representing the period “after” red-light cameras were introduced. The safety performance for the “before” and “after” periods was compared to provide the basis of the safety evaluation at each of the 48 study sites. The combined effect that both red-light cameras and police enforcement had on the study sites, in terms of collisions, is shown in Table 2.

Table 2: Safety Effectiveness of 48 Provincial Study Sites

48 Study Sites	Percentage Difference: (“Before” – “After”)	
	Fatal and Injury Collisions	Property Damage Only Collisions
All Collision Types	- 6.8 %	+ 18.5%
Angle Collisions	- 25.3 %	- 17.9 %
Rear End Collisions	+ 4.9 %	+ 49.9 %

Of all collisions that occur at signalized intersections, angle type collisions are the most indicative of red-light running. The results above indicate that collisions resulting in fatalities and personal injury were reduced by 25.3 percent and those resulting in property damage were reduced by 17.9 percent as a result of the pilot project.

The increase in “property damage only” collisions can be attributed to the large increase in rear end collisions which occurred at the study sites. In this regard, it is important to note that:

- (a) the increase in rear end collisions at the study sites may indicate an increase in motorist compliance with red traffic signal indications. This can often result in motorists who are driving too close or driving without due care and attention, such that they cannot bring their vehicle to a stop, colliding with the vehicle in front;
- (b) these results are similar to other studies on the effects of red-light cameras; and
- (c) Ontario Road Safety Annual Reports indicate that rear end type collisions have increased from 23 percent to 27 percent of all collisions, during the same period as the evaluation study. Therefore this can be seen as a general collision trend within the Province of Ontario.

Based on these findings, the red-light cameras pilot project has achieved the objective of reducing severe collisions.

A benefit and cost analysis is being finalized to determine the societal benefits of the pilot project using an assessment of all benefits and costs associated with the 48 study sites. The benefits include the reduction in fatal and injury collisions and the savings to society as resources are not expended for healthcare, police and other emergency services in responding to preventable deaths and injuries. A framework established by the Ministry of Transportation, Ontario is being used to establish the cost to society in terms of human consequences (fatalities and injuries, property damage, time and material expended) as a result of collisions. The benefit from a reduction in collisions is the avoidance of these costs. If a collision can be avoided, the resources consumed by that collision could be used elsewhere for the benefit of society.

(2) Summary of City of Toronto Supplementary “Before and After” Collision Analysis:

Only seven of the 38 City of Toronto red-light camera sites (18 percent) were used in the Provincial “before and after” safety evaluation. Therefore, a supplementary collision frequency analysis was conducted, using the same “before and after” periods as the Provincial safety evaluation. This supplementary analysis was conducted to determine:

- (a) the impact on collisions at all 38 City of Toronto red-light camera sites; and
- (b) the collision trend at all other signalized intersections within the City of Toronto during the same “before and after” period.

The results of this supplementary analysis are shown in the following tables.

Table 3: Collision Frequency Comparison – All Collision Types

Intersection Group	Percentage Difference: (“Before” – “After”)	
	Fatal and Injury Collisions	Property Damage Only Collisions
38 City of Toronto Red-Light Camera Sites	- 18.2 %	+ 4.0 %
All Other City of Toronto Signalized Intersections	+ 4.0 %	+ 27.6 %
48 Provincial Study Sites	- 6.8 %	+ 18.5 %

The results shown in Table 3 (All Collision Types) indicate that when comparing the “after” period to the “before” period:

- (i) fatal and injury collisions decreased by 18.2 percent at the 38 City of Toronto red-light camera sites whereas they increased by 4.0 percent at all other City of Toronto signalized intersections;
- (ii) fatal and injury collisions decreased by 6.8 percent at the 48 Provincial Study sites whereas they decreased by 18.2 percent at the 38 City of Toronto red-light camera sites;
- (iii) property damage only collisions increased by 4.0 percent at the 38 City of Toronto red-light camera sites whereas they increased by 27.6 percent at all other City of Toronto signalized intersections; and
- (iv) property damage only collisions increased by 18.5 percent at the 48 Provincial Study sites whereas they increased by 4.0 percent at the 38 City of Toronto red-light camera sites.

Table 4: Collision Frequency Comparison – Angle Type Collisions

Intersection Group	Percentage Difference: (“Before” – “After”)	
	Fatal and Injury Collisions	Property Damage Only Collisions
38 City of Toronto Red-Light Camera Sites	- 48.0 %	-26.2 %
All Other City of Toronto Signalized Intersections	- 29.1 %	- 7.4 %
48 Provincial Study Sites	- 25.3 %	- 17.9 %

The results shown in Table 4 (Angle Type Collisions) indicate that when comparing the “after” period to the “before” period:

- (i) fatal and injury collisions decreased by 48.0 percent at the 38 City of Toronto red-light camera sites whereas they decreased by 29.1 percent at all other City of Toronto signalized intersections;

- (ii) fatal and injury collisions decreased by 25.3 percent at the 48 Provincial Study sites whereas they decreased by 48.0 percent at the 38 City of Toronto red-light camera sites;
- (iii) property damage only collisions decreased by 26.2 percent at the 38 City of Toronto red-light camera sites whereas they decreased by 7.4 percent at all other City of Toronto signalized intersections; and
- (iv) property damage only collisions decreased by 17.9 percent at the 48 Provincial Study sites whereas they decreased by 26.2 percent at the 38 City of Toronto red-light camera sites.

Table 5: Collision Frequency Comparison – Rear End Type Collisions

Intersection Group	Percentage Difference: (“Before” – “After”)	
	Fatal and Injury Collisions	Property Damage Only Collisions
38 City of Toronto Red-Light Camera Sites	- 2.3 %	+ 10.1 %
All Other City of Toronto Signalized Intersections	+ 11.5 %	+ 42.9 %
48 Provincial Study Sites	+ 4.9 %	+ 49.9 %

The results shown in Table 5 (Rear End Collisions) indicate that during the same “before” and “after” periods:

- (i) fatal and injury collisions decreased by 2.3 percent at the 38 City of Toronto red-light camera sites whereas they increased by 11.5 percent at all other City of Toronto signalized intersections;
- (ii) fatal and injury collisions increased by 4.9 percent at the 48 Provincial Study sites whereas they decreased by 2.3 percent at the 38 City of Toronto red-light camera sites;
- (iii) property damage only collisions increased by 10.1 percent at the 38 City of Toronto red-light camera sites whereas they increased by 42.9 percent at all other City of Toronto signalized intersections;
- (iv) property damage only collisions increased by 49.9 percent at the 48 Provincial Study sites whereas they increased by 10.1 percent at the 38 City of Toronto red-light camera sites.

With the exception of rear end collisions, the operation of red-light cameras has reduced collisions at signalized intersections where red-light cameras were operating, particularly those collisions which result in personal injury and fatality.

(3) Request to the Government of Ontario to Extend the Red-Light Camera Legislation Indefinitely:

Bill 149, amending Bill 102, came into effect on November 19, 2002, to extend the red-light camera legislation until November 20, 2004. Bill 149 also provides the Lieutenant Governor the authority to extend the red-light camera pilot project legislation indefinitely, by proclamation, before November 20, 2004. If the legislation is not extended before this date, the authority to operate red-light cameras will expire.

The two primary reasons for recommending that the City of Toronto request the Government of Ontario to extend the red-light camera legislation indefinitely are:

- (a) the results from the first two years of operation of the red-light cameras indicate that the project has achieved the objective of reducing angle collisions, particularly those resulting in personal injuries and fatalities; and
- (b) there is strong public support for camera enforcement of red-light running.

Staff will prepare a report to Works Committee addressing such issues as project continuation, project cost, additional sites, contracted services options and terms. Should the Government of Ontario extend the red-light camera legislation indefinitely, the City of Toronto could take the following steps.

Table 6: Red-Light Camera Project Extension Timetable

Date:	Event:
February 2004	Council make a decision regarding project continuation, additional locations, contractual arrangements, etc.
February 2004	Assessment of other technologies and best practices
March 2004	Issue public tender for field equipment and operations, and ticket processing system
May 2004	New contract awarded by City Council
July 2004	Develop public awareness campaign
August 2004	Install additional camera sites
November 2004	Begin operation of additional cameras and sites
November 2004	Field service operation and maintenance commence

At this time, staff of the City of Hamilton, City of Ottawa, Regional Municipality of Peel, and the Regional Municipality of Waterloo are preparing similar reports to their respective councils regarding the safety benefits experienced during their red-light cameras pilot projects. Staff will also be recommending that their respective councils request the Government of Ontario to extend the red-light camera legislation (Bill 102, as amended by Bill 149) for an indefinite period. Should the Government of Ontario extend the red-light camera legislation, these municipalities will follow the same process identified in Table 6, including participation in the joint procurement of the required contracted services.

Conclusion:

The two primary reasons for recommending that the City of Toronto request the Government of Ontario to extend the red-light camera legislation indefinitely are:

- (1) the results from the first two years of operation of the red-light cameras indicate that the project has achieved the objective of reducing angle collisions, particularly those resulting in personal injuries and fatalities; and
- (2) there is strong public support for camera enforcement of red-light running.

City staff has initiated a consultation process with the Toronto Police Service regarding the results from the red-light cameras pilot project, noting the positive effect with respect to angle collisions but also noting the increase in rear end collisions. The intent is to explore opportunities for additional programs that will improve safety for all drivers, cyclists, and pedestrians in the City of Toronto.

Contacts:

Mike Brady
Manager, Red Light Camera Operations
Phone: (416) 397-5016
Fax: (416) 392-4919
E-mail: mbrady@toronto.ca

Les Kelman, P.Eng.
Director, Traffic Management Centre
Phone: (416) 392-5372
Fax: (416) 397-5011
E-mail: lkelman@toronto.ca