



Public Safety and Justice Committee Meeting Agenda

September 12, 2019 6:00 PM – 7:30 PM
Riverton Room

PS&J Councilmembers:
Pam Fernald, Chair
Mayor Erin Sitterley
Stanley Tombs

Note: A quorum of the Council may be present.

PS&J Staff Coordinator: Jon Mattsen – Chief, SeaTac PD

ITEM	TOPIC	PROCESS	WHO	TIME
1	Call to Order		Chair	
2	Public Comment	Please raise your hand if you'd like to speak so the Chair can call on you. Public comments are limited to 10 minutes total and three minutes per individual speaker. Time may be reduced for each speaker to stay within the 10-minute time limit.	Chair	10
3	Review of the 07/11/19 minutes	Approval	J. Mattsen	5
4	SCORE ILA Agreement Amendment	Discussion/Approval	G. Pilo	15
5	Red Light/School Zone Cameras	Discussion	T. Ramsaur J. Mattsen	10
6	Code Compliance Review/Process	Discussion	S. Pilcher G. Schenk	30
7	Future Meeting Topics <ul style="list-style-type: none"> • Vehicle Trespass Ordinance • Mailbox Program update 	Poll Committee		10
	Adjourn		Chair	

Next Meeting Date: October 10, 2019

#3

07/11/2019

Minutes



Public Safety and Justice Council Committee Meeting Minutes

Thursday, July 11, 2019
5:00 PM
Riverton Room

Members:	Present:	Absent:	Commence:	5:01PM
			Adjourn:	6:01PM
Pam Fernald, Chair	X			
Mayor Erin Sitterley	X			
Stanley Tombs	X			

Staff Coordinator: Jon Mattsen
 Other Council Members Present: Peter Kwon, Deputy Mayor Clyde Hill, Joel Wachtel
 Other Staff Present: Troy Smithmeyer, Mary Mirante-Bartolo, Cindy Corsilles, Carl Cole, Mason Giem, Mark Johnson, Will Appleton

1. Call to Order	Chair Fernald called the meeting to order at 5:01PM
2. Public Comment	<p><u>Comment:</u> There is a commercial box truck that parks in driveway at S 152nd St / 31st Ave S.</p> <p><u>Comment:</u> Complaint that the City didn't notify residents of a three story building being built in neighborhood.</p> <p><u>Comment:</u> Complaint that Windsor Heights residents can't park in permit parking zone and there was no communication from City Hall.</p> <p><u>Comment:</u> Parking permit pilot program has been worked on for 5 years by Council. 13,000 residents have received notice.</p>
3. Review of 6/13/19 Minutes	<p><u>X</u> Approval</p> <p>Committee approved the meeting minutes as written.</p>
4. Permit Parking Program update/issues/Ordinance review	<p><u>X</u> Discussion – Carl stated the Permit Parking Program is a pilot program and the City is working to resolve complaints and do what's best for the community. The City recognizes that multi-family developments present a unique challenge due to residential densities and inadequate on-site parking conditions. Will presented a revision of the previous Permit Parking Program draft. Under SMC 9.5.040: 1) it allows Townhouse or Multi-family dwellings to obtain parking permits, but limits it to one permit per address. 2) it allows City Manager to adjust number of permits issued to multi-family dwellings and allows staff to make adjustments without having to go back to Council.</p> <p>Discussion / Questions followed.</p> <p>Committee to take revised Permit Parking Program to Council for approval.</p>

5. Fireworks in SeaTac/stats on 4th	<p><u>X</u> Discussion – Jon stated that it was somewhat of a war zone this year and it was very hard to handle/enforce the fireworks ban. Not many cities can handle firework complaints but police made their ‘presence’ a priority. July 4th and December 31st are designated dates for fireworks. All extra officers were focused on Angle Lake to provide safety and allow fireworks. Sgt. Smithmeyer said there is not enough officers to enforce the ban and confiscating fireworks overloads other resources (bomb squad). SeaTac will continue to keep the ban in effect as it shows precedence and commitment to safety.</p> <p>Discussion / Questions followed.</p>
6. Law Enforcement Information Flow	<p><u>X</u> Discussion – Jon would like to ascertain how the police department should disseminate and/or present information to the Community and to Council. Further discussion will be necessary.</p> <p>Discussion / Questions followed.</p>
7. Future Meeting Topics	<p>Vehicle Trespass Ordinance Mailbox Program Red Light Cameras Gun Thefts</p>
	<p><i>Next Meeting: Thursday, August 8, 2019 6:00PM – 7:30PM</i></p> <p>Potential topics for next meeting: TBD</p>
Adjourn	<p>Chair Fernald adjourned the meeting at 6:01PM</p>

#4

**SCORE ILA Agreement
Amendment**



MEMORANDUM

To: Public Safety and Justice Committee
Through: Carl Cole, City Manager
From: Gwen Pilo, Finance And Systems Director
Date: September 12, 2019
Re: SCORE Jail Interlocal Agreement

HISTORY:

In September 2018, the City of Federal Way informed the SCORE jail Administrative Board of its intent to withdraw from the Interlocal Agreement (ILA) and contract for jail services elsewhere effective December 31, 2019. The City confirmed its intent April 1, 2019.

Following the receipt of Federal Way's notice of withdrawal, the SCORE Administrative Board assembled a sub-committee of Member City leaders and contracted with BERK Consulting to provide a comprehensive study of financial alternative for SCORE. The sub-committee was charged with examining alternatives to reduce costs, increase revenues, and restructure the allocation of funding obligation among agencies. The study concluded in February of 2019 with several alternatives to consider.

The Finance Advisory Committee worked with SCORE staff to explore the options related to refinancing outstanding capital obligations for debt service savings and create a plan going forward to restructure the budget to incorporate the alternatives identified in the study. From these efforts the City of SeaTac's contribution to SCORE for 2020 has significantly decreased from 2019, from \$1.3 million to an estimated \$784,000.

The Finance Advisory Members have also been working with their respective legal teams to amend the ILA to remove the City of Federal Way and reallocate the debt service allocation in preparation to refund and reissue bonds at approximately 14% savings.

ANALYSIS:

A summary of the changes to the ILA is provided below:

- 1) Add the City of Des Moines as an Owner City and terminate the Host City Agreement.

- 2) Remove the City of Federal Way from the Owner Percentage assigned for Debt Service and equity allocations.
 - a. Federal Way is still responsible for their 17% of Debt Service.
- 3) Add two decimal points to the percentage.
 - a. SeaTac was 3% is now 3.62%.
- 4) Add the responsibility to determine the allocation of Member City's Maintenance and Operations costs by Super Majority Vote of the Administrative Board.
 - a. Previously this had to be done by amending the ILA.

RECOMMENDATION:

In order to amend the ILA all owner cities must approve the document by Ordinance. City Manager Cole and Finance and Systems Director Pilo have been involved at all steps of this process and recommend the Ordinance and ILA, attached as Exhibit A, be recommended to the full council for approval in substantially similar format at their October 8 meeting.

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF SEATAC, WASHINGTON, REGARDING THE CITY'S PARTICIPATION IN THE SOUTH CORRECTIONAL ENTITY (SCORE); AUTHORIZING THE EXECUTION OF AN AMENDED AND RESTATED INTERLOCAL AGREEMENT RELATING TO SCORE; APPROVING THE CITY'S CAPITAL CONTRIBUTION RELATED TO REFUNDING BONDS TO BE ISSUED TO REFINANCE THE SCORE FACILITY; AND APPROVING OTHER MATTERS RELATED THERETO.

WHEREAS, the City of SeaTac, Washington (the "City") is authorized by chapter 70.48 RCW to contract for, establish and maintain correctional facilities in furtherance of public safety and welfare; and

WHEREAS, pursuant to an ordinance adopted by the City Council and chapter 39.34 RCW, the Interlocal Cooperation Act, the City entered into a SCORE Interlocal Agreement with the other parties thereto dated February 25, 2009 and subsequently amended and restated on October 1, 2009 (as amended and restated, the "Original Interlocal Agreement"), to form a separate governmental administrative agency known as the South Correctional Entity ("SCORE"); and

WHEREAS, the South Correctional Entity Facility Public Development Authority (the "Authority"), a public corporation chartered by the City of Renton, pursuant to RCW 35.21.730 through 35.21.757, issued its Bonds, Series 2009A (the "2009A Bonds") and Bonds, Series 2009B (Taxable Build America Bonds—Direct Payment) (the "2009B Bonds," and together with the 2009A Bonds, the "2009 SCORE Bonds") on November 4, 2009, in the aggregate principal amount of \$86,235,000; and

WHEREAS, proceeds of the 2009 SCORE Bonds were used to finance a portion of the costs of acquiring, constructing, developing, equipping and improving a regional misdemeanor correctional facility located in Des Moines, Washington (the "SCORE Facility"), operated by SCORE; and

WHEREAS, pursuant to an ordinance adopted by the City Council, the City pledged its full faith and credit toward the payment of its allocable proportion of the debt service due on the 2009 SCORE Bonds issued by the Authority; and

WHEREAS, the 2009 SCORE Bonds are subject to defeasance and/or redemption prior to their stated maturity dates; and

WHEREAS, after due consideration it appears to the Board of Directors of the Authority that the 2009 SCORE Bonds may be defeased and/or redeemed prior to maturity by proceeds of

refunding bonds (the "Refunding Bonds") and other legally available funds for overall debt service savings; and

WHEREAS, the City now desires to pledge its full faith and credit to the City's allocable portion of the Refunding Bonds and to amend and restate the Original Interlocal Agreement to provide for such refunding and other matters as provided herein;

THE CITY COUNCIL OF THE CITY OF SEATAC, WASHINGTON DOES ORDAIN AS FOLLOWS:

Section 1. Definitions. Terms defined in the recitals of this resolution are incorporated as if fully set forth herein. Terms not otherwise defined in this resolution shall have the meanings set forth in the Interlocal Agreement (defined in Section 2).

Section 2. Approval of Interlocal Agreement. The City hereby approves the Amended and Restated SCORE Interlocal Agreement substantially in the form attached hereto as Exhibit A and incorporated herein by this reference (the "Interlocal Agreement"). The City Manager is hereby authorized and directed to execute the Interlocal Agreement, on behalf of the City, with such changes as determined to be appropriate by such representative and in the best interest of the City. On the Effective Date, the Interlocal Agreement shall amend and restate, in its entirety, the Original Interlocal Agreement.

The City Manager is hereby designated, together with his or her designee, as the "Designated Representative" for purposes of the Interlocal Agreement. The Interlocal Agreement may be further amended from time to time as provided therein. The City hereby authorizes and confirms the authority vested in the Administrative Board as provided in the Interlocal Agreement.

Section 3. City Contributions. The Authority has proposed to issue one or more series of refunding bonds (the "Refunding Bonds"), the proceeds of which will be used, together with other legally available funds, to refund the outstanding 2009 SCORE Bonds for overall debt service savings.

The City hereby irrevocably covenants and agrees to pay its capital contribution in the percentage provided for in the Interlocal Agreement, which is equal to the City's allocated owner percentage as shown in the following chart (the "Owner Percentage"), to pay debt service on the Refunding Bonds as the same shall become due and payable and to pay administrative expenses of the Authority with respect to the Refunding Bonds (the "Capital Contribution"). The Owner Percentage allocated to the City is as follows:

<u>Owner City</u>	<u>Owner Percentage</u>
Auburn	34.94%
Renton	40.96
Tukwila	9.64
Des Moines	6.02
Burien	4.82
SeaTac	3.62
Total	100.00%

The authorization contained in this ordinance is conditioned upon the issuance of Refunding Bonds not exceeding the aggregate principal amount of \$56,000,000 without obtaining additional Council approval.

The City recognizes that it is not obligated to pay the Capital Contribution of any other Member City; the Capital Contribution of the City shall be limited to its Owner Percentage allocable share of such obligations; all such payments shall be made by the City without regard to the payment or lack thereof by any other jurisdiction; and the City shall be obligated to budget for and pay its Capital Contribution unless relieved of such payment in accordance with the Interlocal Agreement.

The City's obligation to pay its Capital Contribution shall be an irrevocable full faith and credit obligation of the City, payable from property taxes levied within the constitutional and statutory authority provided to cities without a vote of the qualified electors on all of the taxable property within the City and other sources of revenues available therefor. The City hereby obligates itself and commits to budget for and pay its Capital Contribution and to set aside and include in its calculation of outstanding nonvoted general obligation indebtedness an amount equal to the principal component of its Capital Contribution for so long as any Refunding Bonds issued by the Authority remain outstanding.

All payments with respect to the Refunding Bonds shall be made to SCORE in its capacity as administrator and servicer of the Refunding Bonds to be issued by the Authority.

Section 4. General Authorization; Ratification. The City Manager, the City Finance Director, the City Clerk, and other appropriate officers of the City are authorized and directed to undertake all action necessary for the prompt execution and delivery of the Interlocal Agreement, the issuance of the Refunding Bonds by the Authority, and to execute all closing certificates, agreements, contracts and documents required to effect the closing and delivery of each series of the Refunding Bonds, the implementation of the Interlocal Agreement, and the withdrawal of Federal Way as a Member City of SCORE effective December 31, 2019. Such documents may include, but are not limited to, an undertaking to provide ongoing disclosure in connection with Securities and Exchange Commission Rule 15c2-12 (the "Rule") under the Securities Exchange Act of 1934, as amended; any disclosure documents delivered for purposes of the Rule in connection with the issuance of the Refunding Bonds and pertaining to the City; and documents regarding to the status of any Refunding Bonds issued on a tax-exempt basis under the Internal

Revenue Code of 1986, as amended. All acts taken pursuant to the authority of this ordinance but prior to its effective date are hereby ratified.

Section 5. Effective Date. This ordinance shall take effect and be in force from and after passage and publication as provided by law.

PASSED by the City Council of the City of _____, this ____ day of _____, 20__, and signed in authentication of its passage this _____ day of _____, 20__.

CITY OF SEATAC

Erin Sitterley, Mayor

ATTEST:

Kristina Gregg, City Clerk

Approved as to form:

Mary E. Mirante Bartolo, City Attorney

[Effective Date: _____]

EXHIBIT A

**Form of Amended and Restated SCORE Interlocal Agreement
(attached)**

AMENDED AND RESTATED SCORE INTERLOCAL AGREEMENT

among

CITY OF AUBURN,

CITY OF DES MOINES,

CITY OF RENTON,

CITY OF TUKWILA,

CITY OF BURIEN,

AND

CITY OF SEATAC, WASHINGTON

Dated as of _____, 2019

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AMENDED AND RESTATED SCORE INTERLOCAL AGREEMENT

THIS AMENDED AND RESTATED SCORE INTERLOCAL AGREEMENT is effective as of the date written below and is by and among the Cities of Auburn, Des Moines, Renton, Tukwila, Burien and SeaTac, Washington, all of which are municipal corporations under the laws and statutes of the State of Washington:

RECITALS:

WHEREAS, the Member Cities (as defined herein) are authorized by chapter 70.48 RCW to contract for, establish and maintain correctional facilities in furtherance of public safety and welfare; and

WHEREAS, chapter 39.34 RCW, the Interlocal Cooperation Act, authorizes municipalities in Washington to enter into agreements for the joint undertaking of certain projects as provided therein; and

WHEREAS, in 2009 the Member Cities formed a separate governmental administrative agency pursuant to an interlocal agreement and RCW 39.34.030(3) known as the South Correctional Entity ("SCORE") to establish and maintain a consolidated correctional facility to be located in the City of Des Moines (the "SCORE Facility") to serve the Member Cities and federal and state agencies and other local governments that may contract with SCORE in the future to provide correctional services essential to the preservation of the public health, safety and welfare; and

WHEREAS, the Member Cities now desire to amend and restate the formation interlocal agreement as provided herein;

NOW THEREFORE, it is hereby agreed and covenanted among the undersigned as follows:

Section 1. Definitions. Capitalized terms used in this SCORE Interlocal Agreement shall have the meanings given such terms in the recitals hereof and as follows:

"Administrative Board" means the governing board of SCORE created pursuant to Section 5 of this SCORE Interlocal Agreement.

"Bonds" mean bonds, notes or other evidences of borrowing issued by the SCORE Facility Public Development Authority to finance and/or refinance the SCORE Facility and for any other SCORE purpose.

"Budget" means the budget prepared by the Facility Director in consultation with the Operations Board, and submitted to the Administration Board for its approval in accordance with Section 5 and Section 9 of this SCORE Interlocal Agreement, which budget shall set forth (a) an estimate of the costs of capital improvements required to be

made to the SCORE Facility within the applicable year, (b) on a line item basis, all anticipated revenues and expenses for the operation and maintenance of the SCORE Facility for the applicable year, and (c) any information required by policies adopted by the Administrative Board pursuant to Section 9(b) of this SCORE Interlocal Agreement.

“Capital Contribution” means, for each Owner City, that Owner City’s Owner Percentage multiplied by the principal of and interest on Bonds as the same shall become due and payable.

“Code” means the Internal Revenue Code of 1986, as amended.

“Costs of Maintenance and Operation” means all reasonable expenses incurred by SCORE in causing the SCORE Facility to be operated and maintained in good repair, working order and condition, and all costs of administering SCORE.

“Designated Representative” means the Mayor or the City Manager, as selected by each Member City, or his or her designee.

“Effective Date” has the meaning set forth in Section 19 of this Agreement.

“Facility Director” means the director of the SCORE Facility selected by the Administrative Board pursuant to Section 7 of this SCORE Interlocal Agreement.

“Finance Committee” means the committee formed pursuant to Section 6 of this SCORE Interlocal Agreement.

“Host City” means the City of Des Moines, Washington.

“Host City Agreement” means the Host City Agreement among the cities of Renton, Federal Way, Auburn and Des Moines and SCORE dated as of October 1, 2009.

“Member Cities” mean the Owner Cities and, until the date provided for in Section 20, the City of Federal Way.

“Operations Board” means the board formed pursuant to Section 6 of this SCORE Interlocal Agreement.

“Owner Cities” mean the Cities of Auburn, Renton, Tukwila, Burien, Des Moines and SeaTac, Washington.

“**Owner Percentage**” means the percentage assigned to each Owner City, as follows:

<u>Owner City</u>	<u>Owner Percentage</u>
Auburn	34.94%
Renton	40.96
Tukwila	9.64
Des Moines	6.02
Burien	4.82
SeaTac	3.62
Total	100.00%

“**Presiding Officer**” means the member of the Administrative Board selected pursuant to Section 5 of this SCORE Interlocal Agreement.

“**SCORE**” means the governmental administrative agency established pursuant to RCW 39.34.030(3) by the Member Cities.

“**SCORE Facility**” means the consolidated correctional facility acquired, constructed, improved, equipped, maintained and operated by SCORE.

“**SCORE Facility Public Development Authority**” means the South Correctional Entity Facility Public Development Authority chartered by the City of Renton, Washington.

“**SCORE Interlocal Agreement**” or “**SCORE Formation Interlocal Agreement**” means this Amended and Restated SCORE Interlocal Agreement among the Member Cities, as amended from time to time.

“**Subscribing Agencies**” mean the federal and state agencies, municipal corporations, and other local governments, other than the Member Cities, that contract with SCORE for correctional services at the SCORE Facility pursuant to the terms of this SCORE Interlocal Agreement.

“**2009 SCORE Bonds**” mean the SCORE Facility Public Development Authority Bonds, Series 2009A and Bonds, Series 2009B (Taxable Build America Bonds—Direct Payment) issued on November 4, 2009, in the aggregate principal amount of \$86,235,000.

Section 2. SCORE Facility; Authority.

(a) Administrative Agency. There is hereby established a governmental administrative agency pursuant to RCW 39.34.030(3) to be known as the South Correctional Entity (“SCORE”). SCORE shall consist of the Member Cities.

(b) Powers of SCORE. SCORE shall have the power to acquire, construct, own, operate, maintain, equip, and improve a correctional facility known as the "SCORE Facility" and to provide correctional services and functions incidental thereto, for the purpose of detaining arrestees and sentenced offenders in the furtherance of public safety and emergencies within the jurisdiction of the Member Cities. The SCORE Facility may serve the Member Cities and Subscribing Agencies which are in need of correctional facilities. Any agreement with a Subscribing Agency shall be in writing and approved by SCORE as provided herein.

(c) Administrative Board. The affairs of SCORE shall be governed by the Administrative Board formed pursuant to Section 5 of this SCORE Interlocal Agreement. The Administrative Board shall have the authority to:

- (1) Recommend action to the legislative bodies of the Member Cities;
- (2) Approve the Budget, adopt financial policies and approve expenditures;
- (3) Establish policies for investing funds and incurring expenditures of Budget items for the SCORE Facility;
- (4) Review and adopt a personnel policy for the SCORE Facility;
- (5) Establish a fund, or special funds, as authorized by chapter 39.34 RCW for the operation of the SCORE Facility;
- (6) Conduct regular meetings as may be designated by the Administrative Board;
- (7) Determine what services shall be offered at the SCORE Facility pursuant to the powers of SCORE and under what terms they shall be offered;
- (8) Enter into agreements with third parties for goods and services necessary to fully implement the purposes of this SCORE Interlocal Agreement;
- (9) Establish rates for services provided to members, subscribers or participating agencies;
- (10) Direct and supervise the activities of the Operations Board and the Facility Director;
- (11) Enter into an agreement with a public corporation or otherwise to incur debt;
- (12) Make purchases or contract for services necessary to fully implement the purposes of this SCORE Interlocal Agreement;

(13) Enter into agreements with and receive and distribute funds from any federal, state or local agencies;

(14) Receive and account for all funds allocated to the SCORE Facility from its members;

(15) Purchase, take, receive, lease, take by gift, or otherwise acquire, own, hold, improve, use and otherwise deal in and with real or personal property, or any interest therein, in the name of the SCORE Facility;

(16) Sell, convey, mortgage, pledge, lease, exchange, transfer and otherwise dispose of property and assets;

(17) Sue and be sued, complain and defend, in all courts of competent jurisdiction in its name;

(18) Make and alter bylaws for the administration and regulation of its affairs;

(19) Enter into contracts with Subscribing Agencies to provide correctional services;

(20) Employ employees as necessary to accomplish the terms of this SCORE Interlocal Agreement;

(21) Establish policies and procedures for adding new parties to this SCORE Interlocal Agreement; and

(22) Engage in any and all other acts necessary to further the goals of this SCORE Interlocal Agreement.

Section 3. Duration of Agreement.

The initial duration of this SCORE Interlocal Agreement (commencing from February 25, 2009, the date of the original interlocal agreement relating to SCORE) shall be for a period of ten (10) years and, thereafter, shall automatically extend for additional five (5) year periods unless terminated as provided in this SCORE Interlocal Agreement. Notwithstanding the foregoing, this SCORE Interlocal Agreement shall not terminate until all Bonds issued by the SCORE Facility Public Development Authority as provided in Section 15 of this SCORE Interlocal Agreement are no longer outstanding.

Section 4. Withdrawal and Termination.

(a) Subject to Section 4(g) below, any Member City may withdraw its membership and terminate its participation in this SCORE Interlocal Agreement by providing written notice and serving that notice on the other Member Cities on or before

December 31 in any one-year. After providing appropriate notice as provided in this Section, that Member City's membership withdrawal shall become effective on the last day of the year following delivery and service of appropriate notice to all other Member Cities.

(b) Subject to Section 3 above, four (4) or more Member Cities may, at any one time, by written notice provided to all Member Cities, call for a termination of SCORE and this SCORE Interlocal Agreement. Upon an affirmative supermajority vote (majority plus one) by the Administrative Board, SCORE shall be directed to terminate business, and a date will be set for final termination, which shall be at least one (1) year from the date of the vote to terminate this SCORE Interlocal Agreement. Upon the final termination date, this SCORE Interlocal Agreement shall be fully terminated.

(c) Subject to Section 4(g) below, in the event any Member City fails to budget for or provide its applicable annual funding requirements for SCORE as provided in Section 15 hereof, the remaining Member Cities may, by majority vote, immediately declare the underfunding City to be terminated from this SCORE Interlocal Agreement and to have forfeited all its rights under this SCORE Interlocal Agreement as provided in Section 4(e). The remaining Member Cities may, at their option, withdraw SCORE's correctional services from that City, or alternatively, enter into a Subscribing Agency agreement with that City under terms and conditions as the remaining Member Cities deem appropriate.

(d) Time is of the essence in giving any termination notice.

(e) If an individual Owner City withdraws its membership in SCORE, the withdrawing City will forfeit any and all rights it may have to SCORE's real or personal property, or any other ownership in SCORE, unless otherwise provided by the Administrative Board.

(f) Upon termination of this SCORE Interlocal Agreement, all property acquired during the life of this SCORE Interlocal Agreement shall be disposed of in the following manner:

(1) All real and personal property acquired pursuant to this SCORE Interlocal Agreement shall be distributed to the Owner Cities based on the Owner Percentages; and

(2) All unexpected funds or reserve funds shall be distributed based on the percentage of average daily population at the SCORE Facility for the last three (3) years prior to the termination date of those Member Cities still existing on the day prior to the termination date.

(g) Notwithstanding any of the other rights, duties or obligations of any Member City under this Section 4, the withdrawal of any Owner City from this SCORE

Interlocal Agreement shall not discharge or relieve the Owner City that has withdrawn pursuant to Section 4(a) or been terminated pursuant to Section 4(c) of its obligation to pay debt service on Bonds issued by the SCORE Facility Public Development Authority. An Owner City may be relieved of its obligation under this SCORE Interlocal Agreement to make payments with respect to its Capital Contribution if the Administrative Board, by supermajority vote (majority plus one), authorizes such relief based on a finding that such payments are not required to pay debt service on Bonds issued by the SCORE Facility Public Development Authority.

Section 5. Administrative Board.

(a) Formation. An Administrative Board composed of the Designated Representative from each Member City shall govern the affairs of SCORE.

(b) Allocation of Votes. Each Board member shall have an equal vote and voice in all Board decisions.

(c) Voting Requirements. Votes regarding (1) debt; (2) approval of the Budget; (3) employment of the Facilities Director; (4) cost allocations made prior to the issuance of Bonds pursuant to Section 16 of this SCORE Interlocal Agreement; and (5) approval of labor contracts, shall require an affirmative vote of a supermajority (majority plus one) of the Member Cities, two (2) of which shall have the highest and the second highest average daily population in the SCORE Facility for the 12-month period ending June 30 (or other such date as the Administrative Board shall determine as set forth in its financial policies) of the preceding year.

Votes regarding (1) the conveyance of real property; (2) the addition of additional services pursuant to Section 11 of this SCORE Interlocal Agreement not directly incidental to correctional services (such as providing court services); and (3) matters addressed in Sections 4(b) and (g) and Section 15(d)(2)(iv) of this SCORE Interlocal Agreement, shall require an affirmative vote of a supermajority (majority plus one) of the Member Cities.

(d) Parliamentary Authority. Unless otherwise provided, Robert's Revised Rules of Order (newly revised) shall govern all procedural matters relating to the business of the Administrative Board.

(e) Officers of the Administrative Board. Members of the Administrative Board shall select a Presiding Officer from its members, together with such other officers as a majority of the Administrative Board may determine. Subject to the control of the Administrative Board, the Presiding Officer shall have general supervision, direction and control of the business and affairs of SCORE. On matters decided by the Administrative Board, the signature of the Presiding Officer alone is sufficient to bind SCORE.

(f) Meetings of the Administrative Board. There shall be a minimum of two (2) meetings each year. Unless otherwise designated by the Presiding Officer, the first meeting shall be held on the second Tuesday of February of each year to review the prior years' service. The second meeting shall be on the second Tuesday of September of each year to consider and adopt a Budget for the following fiscal year. Other meetings may be held upon request of the Presiding Officer or any two members. All meetings shall be open to the public to the extent required by chapter 42.30 RCW.

Prior to January 1, 2020, five (5) members, and after January 1, 2020, four (4) members of the Administrative Board must be present at any meeting of the Administrative Board to comprise a quorum, and for the Administrative Board to transact any business. Proxy voting shall not be allowed. Members of the Administrative Board may participate in a meeting through the use of any means of communication by which all members and members of the public participating in such meeting can hear each other during the meeting. Any members of the Administrative Board participating in a meeting by such means is deemed to be present in person at the meeting for all purposes including, but not limited to, establishing a quorum.

(g) Bylaws. The Administrative Board shall be authorized to establish bylaws that govern procedures of the Administrative Board and the SCORE Facility's general operations.

(h) Administrative Board Review. A general or particular authorization or review and concurrence of the Administrative Board by majority vote shall be necessary for all capital expenditures or contracts in excess of \$50,000.

Section 6. Operations Board; Finance Committee; Other Committees.

(a) Operations Board. There is established an Operations Board which shall be advisory to the SCORE Director, staff and Administrative Board on operational matters of SCORE. The Administrative Board shall establish the specific purpose and duties of the Operations Board.

The Operations Board shall consist of up to nine (9) members selected as provided in this paragraph. One (1) member shall be designated by each of the Member Cities, and up to three (3) at-large members shall be selected, by majority vote, by the Subscribing Agencies to represent the police departments of the Subscribing Agencies. At the time set for election of the at-large members, only the representatives of the Subscribing Agencies, then in attendance, will participate in the election. The Member Cities' Operations Board representatives shall not participate in the at-large member elections. The at-large members shall serve one-year terms, unless otherwise determined by majority vote of the Operations Board. Each member of the Operations Board shall have an equal vote in all Operations Board decisions. The Operations Board shall be authorized to establish bylaws and/or procedures that govern its operations. The Operations Board shall elect a presiding

officer from its members and shall determine the time and place of its meetings. All meetings shall be open to the public if and to the extent required by chapter 42.30 RCW.

(b) Finance Committee. There is established a Finance Committee, which shall be advisory to the SCORE Director, staff and Administrative Board on finance matters of SCORE. The Administrative Board shall establish the specific purpose and duties of the Finance Committee. The Finance Committee shall consist of the finance directors or managers of each of the Member Cities. Each member of the Finance Committee shall have an equal vote in all Finance Committee decisions. The Finance Committee shall be authorized to establish bylaws and/or procedures that govern its operations. The Finance Committee shall elect a presiding officer from its members and shall determine the time and place of its meetings. All meetings shall be open to the public if and to the extent required by chapter 42.30 RCW.

(c) Standing or Temporary Committees. The Administrative Board may, from time to time, establish permanent and/or temporary committees to assist in its operations and operations of the SCORE Facility.

Section 7. Facility Director.

Day to day operations of SCORE and the SCORE Facility shall be administered by a Facility Director, who shall be appointed by the Administrative Board after receiving the recommendation of the Operations Board. The Administrative Board may accept or reject the Operations Board recommendation. Such Facility Director shall be responsible to the Administrative Board, shall develop the Budget in consultation with the Operations Board and other appropriate means in order to fully implement the purposes of this SCORE Interlocal Agreement. The Facility Director shall administer SCORE and the SCORE Facility in its day-to-day operations consistent with the policies adopted by the Administrative Board. Such Facility Director shall have experience in technical, financial and administrative fields, and such appointment shall be on the basis of merit only.

Section 8. Personnel Policies.

(a) The Operations Board shall from time to time submit proposed personnel policies or proposed amendments to existing personnel policies to the Administrative Board for their approval, rejection or modification. All of such modifications or revisions shall be subject to the final approval of the Administrative Board.

(b) Such personnel policies shall provide for the initial appointment to the SCORE Facility's staff from the personnel presently, permanently appointed or assigned as corrections officers in the Member Cities. Additional employees shall be appointed by the Facility Director upon meeting the qualifications established by the Operations Board and adopted by the Administrative Board. None of such employees shall be commissioned members of any emergency service, but may be eligible for membership under the Public

Employees Retirement Systems (PERS), or Public Safety Employees Retirement System (PSERS), as provided by law.

Section 9. Budget, Policies and Operations.

(a) The Facility Director shall distribute a proposed Budget to the Operations Board on or before August 1 of each year, which Budget, including any amendments by the Operations Board thereto, shall then be provided to the Administrative Board no later than September 1 of such year. Thereafter, the Member Cities shall be advised of the programs and objectives as contained in said Budget, and of the required financial participation for the ensuing year.

(b) The Administrative Board shall develop financial policies for SCORE as part of the budgetary process. Such policies may include, but are not limited to, (1) items to be provided for in the Budget, (2) a minimum contribution amount for each Member City to pay for Costs of Maintenance and Operation, (3) the process for allocating unexpended amounts paid by the Member Cities for Costs of Maintenance and Operation and assessing the Member Cities in the event of cost overruns, (4) establishing and maintaining reserve accounts, if any, and (5) the process for adding a new party to this SCORE Interlocal Agreement.

(c) The allocation of prorated financial participation among the Member Cities shall be calculated as provided in Section 15 hereof. Each Member City shall be unconditionally obligated to provide its allocable share of costs as provided in this SCORE Interlocal Agreement.

Section 10. Contracts and Support Services.

(a) The Administrative Board (or the Operations Board or the Facility Director, if so designated by the Administrative Board) shall, as necessary, contract with local governments for the use of space for its operations, auxiliary services including but not limited to records, payroll, accounting, purchasing, and data processing, and for staff prior to the selection of a Facility Director for the SCORE Facility.

(b) The Member Cities hereby agree to furnish legal assistance, from time to time, as approved by the Administrative Board. The Administrative Board may contract with the City Attorney of a Member City, other local government, or independent legal counsel as necessary.

Section 11. Policy and System Evaluation.

The Facility Director shall actively and continually consider and evaluate all means and opportunities toward the enhancement of operations effectiveness for correctional services so as to provide maximum and ultimate benefits to the members of the general

public. The Facility Director shall present his or her recommendations to the Operations Board from time to time. Any substantive change or deviation from established policy shall be subject to the prior approval of the Administrative Board.

Section 12. Additional Services Authorized.

The Administrative Board shall evaluate and determine the propriety of including additional correctional services for local governments, whenever so required, and shall determine the means of providing such services, together with its costs and effects. These additional services may include, but shall not be limited to the following: alternatives to incarceration, inmate transportation systems, and consolidated court services.

Section 13. Inventory and Property.

(a) Equipment and furnishings for the operation of the SCORE Facility shall be acquired by SCORE as provided by law. If any Member City furnishes equipment or furnishings for SCORE's use, title to the same shall remain with the respective local entity unless that equipment is acquired by SCORE.

(b) The Facility Director shall, at the time of preparing the proposed Budget for the ensuing year, submit to the Operations Board a complete inventory together with current valuations of all equipment and furnishings owned by, leased or temporarily assigned to SCORE. In case of dissolution of SCORE, such assigned or loaned items shall be returned to the lending governmental entity and all other items, including real property, or funds derived from the sale thereof, shall be distributed in accordance with Section 4(f) above.

(c) Title to real property purchased or otherwise acquired shall be held in the name of SCORE; provided however, that for valuable consideration received, SCORE may convey ownership of any real property as may be approved by supermajority vote (majority plus one) of the Administrative Board.

Section 14. Local Control.

Each Member City and Subscribing Agency shall retain the responsibility and authority for the operation of its police departments, and for such equipment and services as are required at its place of operation to utilize the SCORE Facility.

Section 15. SCORE Facility Financing and Construction; SCORE Facility Public Development Authority.

(a) SCORE Facility. In order to provide necessary services for the Member Cities and the Subscribing Agencies, SCORE has and/or shall acquire, construct, improve,

equip, maintain and operate the SCORE Facility. The SCORE Facility is currently located in the City of Des Moines, Washington.

(b) Contracts for the SCORE Facility. The Administrative Board shall authorize, and the Presiding Officer of the Administrative Board, or his or her approved designee, will execute contracts for the development, improvement and maintenance of the SCORE Facility. These contracts may include, without limitation, contracts for architectural design and engineering, project management services; real estate acquisition, and construction.

(c) SCORE Facility Public Development Authority. In order to finance and refinance costs of acquiring, constructing, improving and equipping the SCORE Facility, the City of Renton has chartered the SCORE Facility Public Development Authority. The purpose of the SCORE Facility Public Development Authority is to issue Bonds to finance and refinance the acquisition, construction, improvement and equipping of the SCORE Facility and for any other SCORE purpose. The Administrative Board shall serve *ex officio* as the Board of Directors of the SCORE Facility Public Development Authority as further provided in the Authority's organizational charter. Upon issuance of Bonds by the SCORE Facility Public Development Authority, Bond proceeds shall be deposited on behalf of SCORE and used for the purposes set forth herein. SCORE shall be obligated to make payments to the SCORE Facility Public Development Authority at the time and in the amounts required to pay principal of and interest on the Bonds and any administrative costs of the SCORE Facility Public Development Authority.

(d) SCORE Facility Financing.

(1) *Capital Contributions.* Each Owner City shall be obligated to pay an amount equal to its Capital Contribution without regard to the payment or lack thereof by any other Owner City. No Owner City shall be obligated to pay the Capital Contribution of any other Owner City, and each Owner City shall be obligated to budget for and pay its Capital Contribution. The obligation of each Owner City to pay its Capital Contribution shall be an irrevocable full faith and credit obligation of such Owner City, payable from property taxes levied within the constitutional and statutory authority provided without a vote of the electors of the Owner City on all of the taxable property within the Owner City and other sources of revenues available therefor. Each Owner City has or will set aside and include in its calculation of outstanding nonvoted general obligation indebtedness an amount equal to the principal component of its Capital Contribution for so long as Bonds remain outstanding, unless relieved of such payment in accordance with Section 4(g). Each Owner City's obligation to pay the Capital Contribution shall not be contingent on the receipt of any revenues from other sources, including but not limited to Subscribing Agencies or any Member Cities.

An Owner City may prepay its Capital Contribution in a manner that is consistent with the authorizing documents for the Bonds; provided, however, that any such

prepayment of one or more Owner Cities shall not affect the Capital Contribution of the remaining Owner Cities. Any Owner City that elects to prepay its Capital Contribution shall be responsible for paying all costs associated with such prepayment.

(2) *Costs of Maintenance and Operation.* Subject to the terms of the financial policies established by the Administrative Board, each Member City shall be obligated to pay its allocable portion of Costs of Maintenance and Operation of the SCORE Facility, including any debt issued to finance such costs, as determined in this subsection.

(i) Until the end of the first calendar year of operations of the SCORE Facility (estimated to be December 31, 2012), the allocable portion that each Member City shall be obligated to pay of Costs of Maintenance and Operation in such year shall be equal to the Member City's 2007 average daily population in all correctional facilities (as provided in the SCORE financial policies) multiplied by the Costs of Maintenance and Operation.

(ii) Commencing with the calendar year following the first calendar year of operations, the allocable portion that each Member City shall be obligated to pay of Costs of Maintenance and Operation shall be based on the Member City's average daily population in the SCORE Facility, as supplemented as necessary with the average daily population allocable to the Member Cities in all correctional facilities, for the 12-month period ending June 30 of the preceding year.

(iii) Commencing with the third calendar year of operations, the allocable portion that each Member City shall be obligated to pay of Costs of Maintenance and Operation shall be based on the Member City's average daily population in the SCORE Facility for the 12-month period ending June 30 (or other such date as the Administrative Board shall determine as set forth in its financial policies) of the preceding year.

(iv) Commencing with the calendar year beginning January 1, 2020, the allocable portion that each Member City shall be obligated to pay of Costs of Maintenance and Operation shall either (A) be based on the Member City's average daily population in the SCORE Facility for the 12-month period ending June 30 (or other such date as the Administrative Board shall determine as set forth in its financial policies) of the preceding year, or (B) be based on the methodology approved by an affirmative vote of a supermajority (majority plus one) of the Member Cities.

(e) Billing and Allocation of Revenues. Each Member City shall be billed for its Capital Contribution and its portion of Costs of Maintenance and Operation, as applicable, on a semiannual basis, or more frequently as determined by the Administrative

Board, calculated as provided above. Revenues received in a calendar year from Subscribing Agencies or from sources other than the contributions described above shall be allocated among the Member Cities either as set forth in the SCORE financial policies or as follows: (i) each Member City shall receive a credit against its obligation to pay Costs of Maintenance and Operation based on that Member City's proportional average daily population as calculated as provided above, and (ii) each Owner City shall receive a credit against its Capital Contribution based on that Owner City's proportional Owner Percentage.

(f) Host City. Pursuant to RCW 35.21.740, the City of Des Moines, as the Host City, hereby authorizes the City of Renton to operate the SCORE Facility Public Development Authority within the corporate limits of the City of Des Moines in a manner consistent with the terms of this SCORE Interlocal Agreement.

(g) Tax-Exemption. The Member Cities shall not (1) make any use of the proceeds from the sale of Bonds issued on a tax-exempt basis or any other money or obligations of the SCORE Facility Public Development Authority or the Member Cities that may be deemed to be proceeds of such Bonds pursuant to Section 148(a) of the Code that will cause such Bonds to be "arbitrage bonds" within the meaning of said Section and said regulations, or (2) act or fail to act in a manner that will cause such Bonds to be considered obligations not described in Section 103(a) of the Code.

(h) Additional Financing. Notwithstanding anything to the contrary in this SCORE Interlocal Agreement, bonds, notes or other evidences of borrowing may be issued from time to time by the SCORE Facility Public Development Authority or another issuer pursuant a separate agreement between one or more Member Cities and other entities to provide additional financing for the SCORE Facility on terms as agreed upon by the parties thereto.

(i) Special Facility Designation. The SCORE Facility, including all equipment, furnishings, and fixtures are critical to the ability of the Member Cities and the Subscribing Agencies to provide necessary and secure correctional services and assure public safety. Consequently, the SCORE Facility is essential to the preservation of the public health, safety, and welfare. As a result, the SCORE Facility's equipment, furnishings, and fixtures are special facilities subject to unique standards. Accordingly, based on the facts presented in this subsection, it is hereby resolved that the established policy of the Member Cities is that the SCORE Facility constitutes a "special facility" under RCW 39.04.280(1)(b), and all purchases of any kind or nature for the SCORE Facility shall be exempt from competitive bidding requirements as prescribed by Washington State statute but shall be governed by the procurement policy established by the Administrative Board as amended from time to time.

Section 16. Compliance with Continuing Disclosure Requirements

To the extent necessary to meet the conditions of paragraph (d)(2) of United States Securities and Exchange Commission Rule 15c2-12 (the "Rule"), as applicable to a participating underwriter or remarketing agent for Bonds, each Owner City will enter into an undertaking in a form acceptable at the time to the participating underwriter or remarketing agent, as the case may be.

Section 17. Miscellaneous

(a) Interlocal Agreement. The Member Cities agree:

(1) This SCORE Interlocal Agreement is intended to create a separate administrative entity within the meaning of RCW 39.34.030(3) and not a "joint board" within the meaning of RCW 39.34.030(4)(a);

(2) The Designated Representative of each Member City is appointed as the "administrator" within the meaning of RCW 39.34.030(4)(a) responsible for administering the Member City's rights and duties set forth in this SCORE Interlocal Agreement; and

(3) The Parties will file or post this Agreement as required by RCW 39.34.040.

(b) Governing Law. This SCORE Interlocal Agreement shall be governed by and construed in accordance with the laws of the State of Washington. If any dispute arises between the Member Cities under any of the provisions of this SCORE Interlocal Agreement, resolution of that dispute shall be available only through the jurisdiction, venue and rules of the King County Superior Court, King County, Washington.

(c) Non-Waiver of Breach. The failure of any Member City to insist upon strict performance of any provision of this SCORE Interlocal Agreement or to exercise any right based upon a breach thereof or the acceptance of any performance during such breach shall not constitute a waiver of any right under this SCORE Interlocal Agreement.

(d) Compliance with all Laws. SCORE and the Member Cities shall comply with all federal, state and local laws, rules, regulations, resolutions and ordinances applicable to the performance of this SCORE Interlocal Agreement.

(e) Continuation of Performance. In the event that any dispute or conflict arises between the Member Cities while this SCORE Interlocal Agreement is in effect, the Member Cities hereto agree that, notwithstanding such dispute or conflict, they shall continue to make a good faith effort to cooperate and continue work toward successful completion of assigned duties and responsibilities.

Section 18. Severability

If any part, paragraph, section or provision of this SCORE Interlocal Agreement is adjudged to be invalid by any court of competent jurisdiction such adjudication shall not affect the validity of any remaining section, part or provision of this SCORE Interlocal Agreement.

Section 19. Effective Date; Amend and Replace Original Interlocal Agreement

This SCORE Interlocal Agreement shall become effective on _____, 2019, the date of defeasance (the "Effective Date") of all of the outstanding 2009 SCORE Bonds. On the Effective Date, this SCORE Interlocal Agreement shall amend and restate, in its entirety, the Amended and Restated SCORE Interlocal Agreement effective October 1, 2009.

Section 20. Federal Way Refunding Bonds; Agreement Between SCORE and Federal Way

The City of Federal Way ("Federal Way") and SCORE will enter into an agreement (the "SCORE/Federal Way Agreement") to be dated the date of defeasance of all of the outstanding 2009 SCORE Bonds. Pursuant to the SCORE/Federal Way Agreement: (a) Federal Way acknowledges that the parties hereto will enter into this SCORE Interlocal Agreement; (b) until the effective date of its withdrawal from SCORE (December 31, 2019), Federal Way will be considered a "Member City" for purposes of this SCORE Interlocal Agreement, but shall not be considered an "Owner City" and shall not in any way be responsible for paying any share of any Bonds or other debt obligations of SCORE or the SCORE Facility Public Development Authority; (3) Federal Way agrees to issue bonds and to use the proceeds thereof to repay its capital contribution with respect to the 2009 SCORE Bonds (the "Federal Way Refunding Bonds"); and (d) for as long as the Federal Way Refunding Bonds, and any bonds issued to refund such bonds, issued on a tax-exempt basis are outstanding (which as of their date of issuance are scheduled to mature on January 1, 2039), SCORE covenants that it will not provide to nongovernmental persons special legal entitlements to use the SCORE Facility in a manner that will adversely impact the tax-exempt status of any such bonds. SCORE shall monitor the use of the SCORE Facility to ensure that it complies with the terms of the SCORE/Federal Way Agreement for so long as such Federal Way Refunding Bonds, or any bonds issued to refund such bonds, are outstanding. The parties hereto approve SCORE entering into the SCORE/Federal Way Agreement.

Section 21. Termination of Host City Agreement

Pursuant to Section 5 of the Host City Agreement, the parties hereto agree that the Host City Agreement shall terminate as of the Effective Date of this SCORE Interlocal

Agreement. As of the Effective Date of this SCORE Interlocal Agreement, Des Moines shall be an Owner City of SCORE with the same rights and privileges as the other Owner Cities as provided herein.

Section 22. Execution and Amendment

This SCORE Interlocal Agreement shall be executed on behalf of each party hereto by its Designated Representative, or other authorized officer, and pursuant to an appropriate motion, resolution or ordinance of such party.

This SCORE Interlocal Agreement may not be effectively amended, changed, modified or altered, except by an instrument in writing duly executed by the Designated Representative, or other authorized officer, of each party hereto and pursuant to an appropriate motion, resolution or ordinance of such party. Notwithstanding the foregoing, so long as the Bonds are outstanding, any such amendment, in the opinion of the SCORE Facility Public Development Authority or its counsel, shall not materially adversely affect the owners of the Bonds or affect the tax-exempt status of the interest paid on the Bonds.

Section 23. Third Party Beneficiaries

The SCORE Facility Public Development Authority and the holders from time to time of the Bonds shall be third party beneficiaries hereof and the commitments made in Section 15 herein shall be for their further benefit.

Section 24. Hold Harmless

The parties to this SCORE Interlocal Agreement shall defend, indemnify and save one another harmless from any and all claims arising out of the performance of this SCORE Interlocal Agreement, except to the extent that the harm complained of arises from the sole negligence of one of the participating members. Any loss or liability resulting from the negligent acts errors or omissions of the Administrative Board, Operations Board, Facility Director and or staff, while acting within the scope of their authority under this SCORE Interlocal Agreement shall be borne by SCORE exclusively.

Section 25. Counterparts

This SCORE Interlocal Agreement may be executed in any number of counterparts, each of whom shall be an original, but those counterparts will constitute one and the same instrument.

IN WITNESS WHEREOF, the parties hereto have executed this SCORE Interlocal Agreement as of the day and year first written above.

[Signature blocks to follow]

#5

**Red Light/
School Zone Cameras**



**VERRA
MOBILITY™**

June 6, 2019

Mr. Tim Ramsaur
Sr. Management Analyst
City of SeaTac
4800 South 188th Street
SeaTac, Washington 98188

Re: Automated Traffic Enforcement in SeaTac

Dear Mr. Ramsaur:

American Traffic Solutions, Inc. dba Verra Mobility (Verra Mobility) appreciates the opportunity to provide the City of SeaTac with information regarding automated traffic enforcement.

We were excited when the City selected us as their safety partner in 2017 and were disappointed when the City decided not to move forward with the program. Since then, we continue to be Washington's—and the nation's—photo enforcement market leader. This year alone, Seattle and Lynnwood have renewed their red-light and speed safety camera programs with us; and later this month, Lake Forest Park is scheduled to approve a five-year contract extension of their own. Also this year, one of our existing school zone speed safety clients, the City of Kent, has contracted with us to add 11 red-light safety cameras to their program. Additionally, earlier this year, the Cities of Kirkland and Edgewood executed contracts with us for school zone speed safety enforcement in their communities. Their programs are expected to become operational later this year. Lastly, Bellevue School District partnered with us to launch its school bus stop-arm camera program, and Issaquah School District and Renton School District recently contracted with us for their school bus stop-arm camera safety programs. Needless to say, we are excited about our continued growth in the region.

The City of SeaTac will benefit from our experience implementing and supporting successful and compliant red-light, speed, and school bus stop arm camera programs across the State of Washington. As the leading provider in the county, state and in the country, we know what it takes to help the City successfully restart its program. More importantly, the City will benefit from our relationship with the King County Sheriff's Office and from our experience implementing and operating an electronic interface with the Washington Administrative Office of the Courts (AOC) for many of our Washington clients.

Following this letter are our responses to the City's questions regarding Automated Traffic Safety Enforcement. We hope that you find this information beneficial. If you have any questions, please contact me by email at ray.pedrosa@verramobility.com or by phone at 562.201.0807.

Sincerely,

Ray Pedrosa
Director of Account Management

Responses to City's Questions

Questions 1

Does Automated Traffic Safety Improve or reduce safety, reduce or increase accidents, improve traffic flow, save lives, impacts in school zone enforcement, and can data be captured with respect to speed, volume of cars, and collisions.

Road Safety Cameras Enhance Safety

Yes, Automated Traffic Safety enhances safety, reduces collisions, saves lives, and positively impacts school zone speed enforcement. In nearby Seattle, our red-light and speed safety cameras proved to be successful at changing dangerous driver behavior:

- Between the program's inception in 2006 and the end of 2017, the **average number of red-light running violations** issued per camera per month has **decreased by 59 percent**¹,
- The total number of issued school zone **speed violations decreased by 62 percent** when comparing 2016 to 2013².

On a national level, the Insurance Institute for Highway Safety (IIHS) has found through studies in Oxnard, California, and Fairfax, Virginia, that **red-light violations dropped by about 40 percent after red-light safety cameras were installed**.³ Another IIHS study showed that **large cities with red-light cameras experienced a reduction of 21 percent in fatal red-light running crashes**, when compared to large cities that do not have red-light cameras in their communities.⁴

The IIHS also found that **speed safety cameras in Montgomery County, Maryland were associated with a 10 percent decrease in mean speeds**.⁵

Verra Mobility's red-light and speed safety cameras have also helped enhance safety in New York City:

- The **number of people killed or seriously injured in collisions in school zones has decreased by more than 21 percent** after our speed safety cameras became operational.⁶
- Our red-light safety cameras helped **reduce the average number of violations per day per location by more than 75 percent, and right-angle crashes at signalized intersections have decreased by 71 percent** across the city. The number of **severe injuries associated with right-angle crashes also went down by more than 83 percent. Rear-end collisions at signalized intersections also decreased by 41 percent, and severe injuries associated with rear-end collisions were reduced by 63 percent**.⁷

In addition to enhancing safety, red-light and speed safety cameras help improve traffic flow by reducing collisions associated with red-light running and speeding, as stated above. Reducing the number of collisions can lead to smoother traffic around the camera sites.

¹ Source: Verra Mobility program data from 2006 through end of 2017

² Source: City of Seattle's 2016 School Safety Traffic and Pedestrian Improvement Fund Annual Report

³ Source: <https://www.iihs.org/topics/red-light-running#effectiveness-of-cameras>

⁴ Source: <https://www.iihs.org/topics/red-light-running#effectiveness-of-cameras>

⁵ Source: <https://www.iihs.org/topics/speed#speed-cameras>

⁶ Source: <http://www.nyc.gov/html/dot/downloads/pdf/speed-camera-report-june2018.pdf>

⁷ Source: <http://www.nyc.gov/html/dot/downloads/pdf/nyc-red-light-camera-program.pdf>

Captured Data

Verra Mobility can provide the City with helpful data captured by its camera systems. Our systems capture vehicle speeds and traffic volume at the camera sites, which are summarized into reports that are accessible by clients through our web-enabled Axis™ Violation Processing System. If the City has access to collision data, we can work with the City on gathering that information and reporting the effects of automated enforcement on the rate of crashes at the photo-enforced locations. Please see the Sample Reports section for an example of a program analysis that we would provide to the City.

Site Analysis

What type of analysis would your company perform, along with costs, in determining intersections that would be eligible for automated traffic safety cameras, including the most appropriate legs of the intersections. The school zones will also need to be identified.

As part of our 2017 RFP response, we completed a preliminary site analysis of the red-light camera sites that were part of the City's previous program and have found potential new sites. Our site analysis tool uses a unique and proven model that identifies the variables that influence the rates of safety violations, as well as the strength of those influences. We use a combination of visual elements and numerical inputs to determine the probable behavior of a location, coupled with a robust understanding of local and state requirements, in order to efficiently and accurately pinpoint locations that can benefit the most from road safety camera solutions.

The following are a list of the intersections where red-light camera systems were operational (in bold) and where Verra Mobility proposes to install new cameras. The map to the right also shows the existing and new camera locations. We will work closely with you to finalize the list of intersections where the traffic control signal photo violation monitoring systems will be installed.

- > 176th St/S 178th St @ Military Rd S
- > **Military Rd S @ S 188th St**
- > Military Rd S @ S 200th St/US 5 SB Ramp
- > S 188th St @ US 5 SB Ramp
- > International Blvd/Pacific Hwy S/SR 99 @ S 170th St
- > **International Blvd/Pacific Hwy S/SR 99 @ S 200th St**
- > International Blvd/Pacific Hwy S/SR 99 @ S 208th St
- > S 160th St @ International Blvd/Pacific Hwy S/SR 99
- > **S 188th St @ International Blvd/Pacific Hwy S/SR 99**
- > International Blvd/Pacific Hwy S/SR 99 @ S 182nd St

At no cost to the City, we will schedule and perform site analysis field speed surveys at the schools provided by the City, which are listed on the following page. We estimate that we will be able to deliver the completed report to the City within



three to four weeks. An example of the report that we will provide to the City is in the Sample Reports section.

Chinook Middle School
18650 42nd Avenue South
SeaTac, WA 98188

Glacier Middle School
2450 South 142nd Street
SeaTac, WA 98166

Bow Lake Elementary School
18237 42nd Avenue South
SeaTac, WA 98188

Madrona Elementary School
20301 32nd Avenue South
SeaTac, WA 98198

McMicken Heights Elementary School
3708 South 168th Street
SeaTac, WA 98188

Kent Mountain View Academy
22420 Military Rd S
SeaTac, WA 98188

Date: 6/26/19

Timed Fixed Speed Study – SeaTac, WA

School	Street	Lanes	Beacon Times	Direction	Beacon Speed	Traffic Volume	AM +6 mph	PM +6 mph	Total	%
McMicken Heights Elementary School	S 166 th St	1	8:15 AM - 8:45 AM & 3:15 PM - 3:45 PM	EB	20	28	3	6	9	32
		1		WB	20	38	7	5	12	32
	S 168 th St	1		EB	20	45	4	2	6	13
		1		WB	20	119	1	3	4	3
Madrona Elementary School	32nd Ave	1	8:15 AM - 8:45 AM & 3:15 PM - 3:45 PM	NB	20	206	7	13	20	10
		1		SB	20	94	24	9	33	35
	S 204th St	1		EB	20	155	41	33	74	48
		1		WB	20	48	2	1	3	6
Bow Lake Elementary School	42nd Ave	1	8:15 AM - 8:45 AM & 3:15 PM - 3:45 PM	NB	20	217	22	27	49	23
		1		SB	20	222	2	10	12	5
	182nd Ave	1		EB	20	58	4	6	10	17
		1		WB	20	75	17	16	33	44
Chinook Middle School	42nd Ave	1	7:35 AM - 8:05 AM & 2:35 PM - 3:05 PM	NB	20	204	46	40	86	42
		1		SB	20	152	29	60	89	59
Kent Mountain View Academy	SW Genesee St	1	7:10 AM - 7:40 AM & 2:20 PM - 2:50 PM	NB	20	575	219	191	410	71
		1		SB	20	394	84	295	379	96

*TOTAL is derived from one day speed study. Violations captured at speeds ≥ 26MPH during hours of enforcement

All data collected on 6/18/2017

The information provided in this report is actual but does not guarantee expected volume after deployment



Sample Reports

Sample Program Analysis Report

City of MyTown, MyState

Speed Safety Camera Program Analysis



FEBRUARY 2018

SUBMITTED BY VERRA MOBILITY





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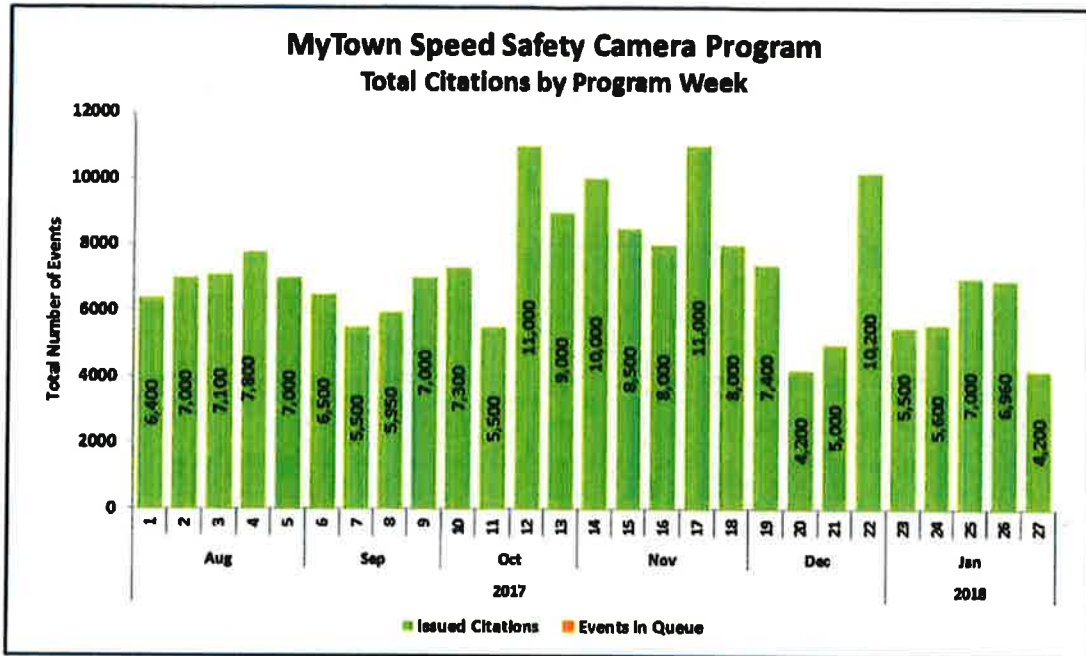




Citation Overview

1.1 Total Citations

Since August 1st, the MyTown Speed Safety Camera Program has issued 194,810 citations with 25 cameras.



City of MyTown, MyState - Total Program Issued Citations

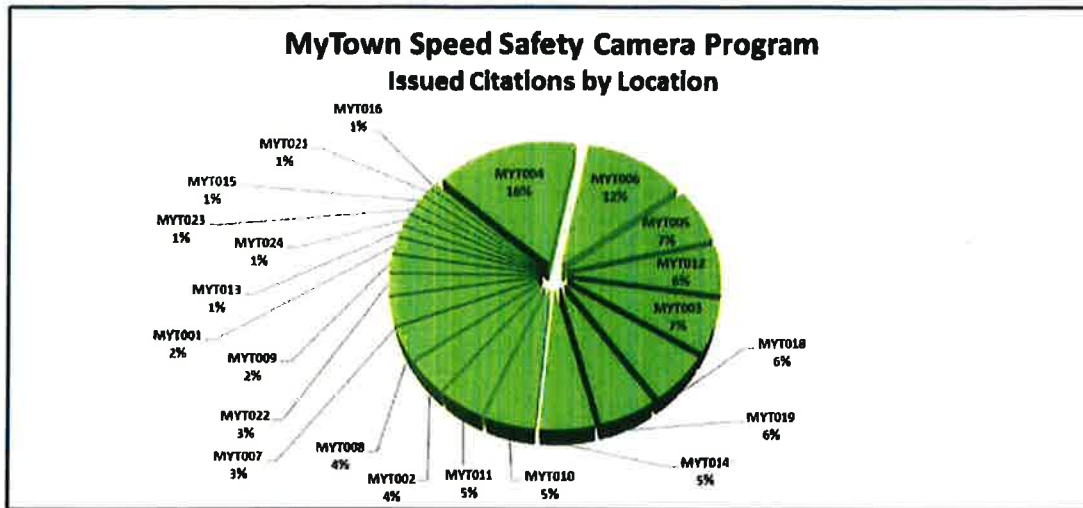
Program Month	2017					2018	Total
	Aug	Sep	Oct	Nov	Dec	Jan	
Total Issued Citations	33,900	24,830	32,800	49,500	26,800	29,280	194,810
<i>Total Events Still In Queue</i>	0	0	0	0	0	0	0
Active Safety Camera Locations	10	15	24	25	23	25	25
Average Issued Citations per Camera per Day	153.5	106.2	77.4	87.3	58.1	56.3	81.4





1.2 Citations by Location

Since the MyTown Speed Safety Camera Program inception, the location with the most issued citations is at the 1000 block of North Main Avenue Eastbound, accounting for 32,200 and 16% of the total program issued citations.



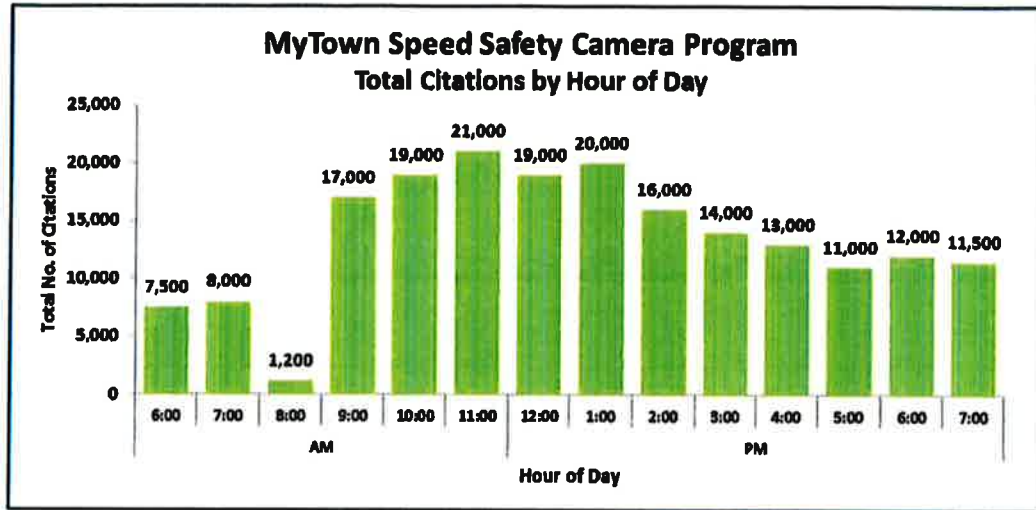
Site ID	Address	Aug	Sep	Oct	Nov	Dec	Jan	Total Issued
MYT004	1000 BLK NORTH MAIN AVE EB	7,900	6,900	5,300	4,500	3,600	4,000	32,200
MYT006	2000 BLK NORTH MAIN AVE SB	7,250	4,500	3,500	3,300	1,500	3,000	23,050
MYT005	1001 BLK NORTH 1ST AVE EB	2,700	1,700	1,800	3,100	2,000	1,900	13,200
MYT012	3000 BLK NORTH MAIN AVE EB	4,000	2,500	1,900	1,500	1,200	1,000	12,100
MYT003	4000 BLK NORTH MAIN AVE EB	2,500	2,000	1,700	2,600	2,200	2,000	13,000
MYT018	5100 BLK NORTH MAIN AVE EB			3,400	3,900	2,700	2,500	12,500
MYT019	1200 BLK NORTH MAIN AVE EB			3,300	4,000	2,200	2,000	11,500
MYT014	1300 BLK NORTH MAIN AVE EB		900	3,300	2,600	2,000	1,800	10,600
MYT010	1400 BLK NORTH MAIN AVE EB	2,900	1,780	1,350	1,400	1,200	1,300	9,930
MYT011	1500 BLK NORTH MAIN AVE EB	2,700	1,900	1,500	1,200	900	800	9,000
MYT002	1600 BLK NORTH MAIN AVE EB	2,200	1,700	1,400	1,120	900	950	8,270
MYT008	1700 BLK NORTH MAIN AVE EB		490	1,900	2,300	1,300	2,100	8,090
MYT007	1800 BLK NORTH MAIN AVE EB	1,800	1,230	1,100	980	800	800	6,710
MYT022	1900 BLK NORTH MAIN AVE EB			1,000	1,700	1,200	1,100	5,000
MYT009	6000 BLK NORTH MAIN AVE EB		300	1,200	1,100	910	750	4,260
MYT001	8000 BLK NORTH MAIN AVE EB	900	730	530	630	620	500	3,880
MYT013	1094 BLK NORTH MAIN AVE EB		220	810	575	550	510	2,665
MYT024	1234 BLK NORTH MAIN AVE EB			450	1,200	670	610	2,930
MYT023	1001 BLK NORTH MAIN AVE EB			750	850	470	385	2,405
MYT015	1050 BLK NORTH MAIN AVE EB		135	620	650	570	460	2,435
MYT021	1020 BLK NORTH MAIN AVE EB			400	720	550	682	2,352
MYT016	1080 BLK NORTH MAIN AVE EB			370	540	400	290	1,600
MYT017	1630 BLK NORTH MAIN AVE EB			225	380	135	120	860
MYT100	1890 BLK NORTH MAIN AVE EB				0		130	130
MYT101	1005 BLK NORTH MAIN AVE EB				0		80	80





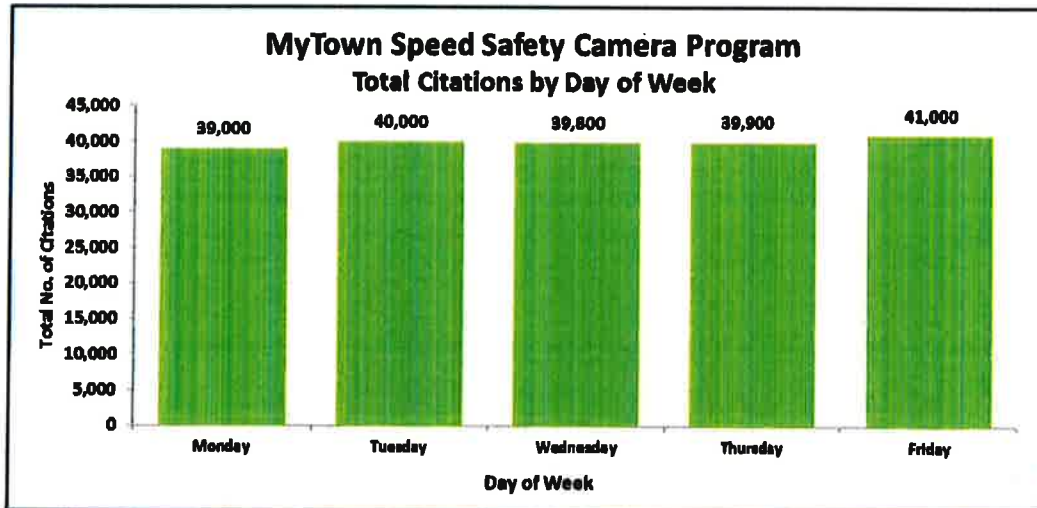
1.3 Citations by Time of Day

When looking at total citations by time of day, the most dangerous hour for speeding is 11 A.M. to 12 P.M., accounting for 11 percent of program citations. 39 percent of citations occurred before noon and 61 percent of citations occurred after noon.



1.4 Citations by Day of the Week

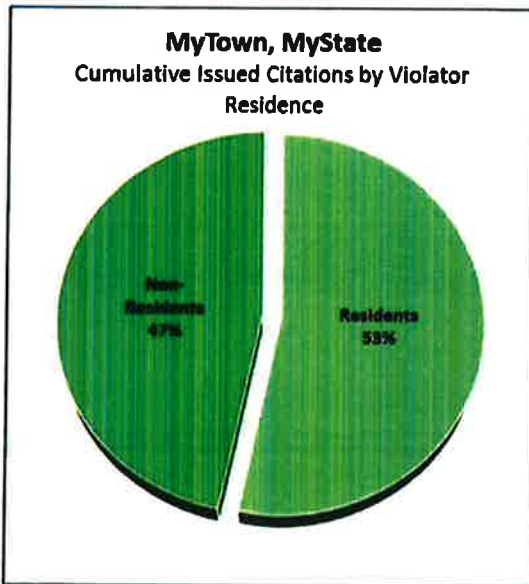
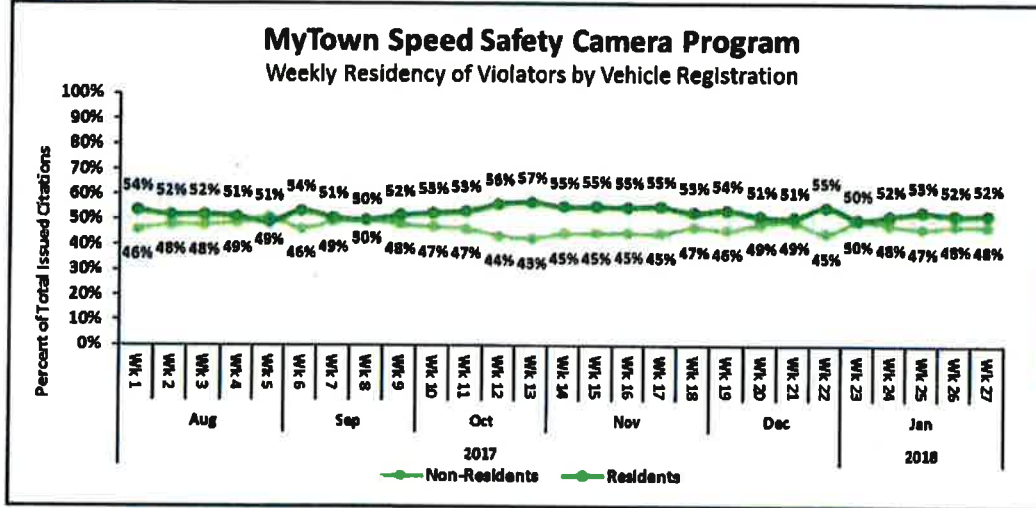
When looking at the total number of citations by day of the week, the day with the most citations is Friday, accounting for 21 percent of all citations.





1.5 Citations by Violator Residence

Vehicles registered in the city of MyTown were the recipients of 53 percent of all citations issued since the program's start.



Top 5 Violator Cities

City Name	Percent of Total Citations
MYTOWN, MY	53%
MYCITY, MY	2%
YOURTOWN, MY	2%
YOURCITY, MY	2%
THATTOWN, MY	2%



Sample Speed Survey



Site Selection TFS Study City of MyTown, MyState

Date: 6/5/2019

Timed Fixed Speed Study - MyTown, MyState

School	Street	Lanes	Enforce Times	Direction	Enforce Speed	Traffic Volume	AM +5 mph	PM +5 mph	Total	%
My Elementary School	SE Main St	2	7:00 AM-7:20 AM & 3:00 PM-3:40 PM	WB	20	400	45	25	70	16
		1		EB	20	300	50	30	80	27
Your Middle School	NW 1 st Ave	1	8:00 AM-8:20 AM & 4:00 PM-4:40PM	SB	20	500	40	50	90	18
		2		NB	20	900	110	45	155	17
Teenager High School	N 1 st St	2	7:00 AM-7:20 AM & 3:00 PM-3:40 PM	NB	20	450	50	60	110	24
		1		SB	20	995	150	185	335	34

TOTAL is derived from one-day speed study. Violations captured at speeds \geq 26MPH during hours of enforcement All data collected on 6/3/19.

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Tim Ramsaur
Sr. Management Analyst
City of SeaTac
4800 S. 188th St.
SeaTac, WA 98188

Dear Mr. Ramsaur,

Thank you for reaching out to Redflex concerning reinstating your red light photo enforcement program. We would be very interested in partnering with the City of SeaTac to evaluate the current need within your community and implementing a very important traffic safety program to compliment your city's current efforts.

Based upon your letter, I have responded below to the questions that were posed.

Does Automated Traffic Safety improve or reduce safety, reduce or increase accidents, improve traffic flow, save lives, impacts in school zone enforcement, and can data be captured with respect to speed, volume of cars, and collisions.

Several credible studies have examined the effectiveness of Automated Photo Enforcement and concluded that such programs reduce crashes and save lives. The Insurance Institute for Highway Safety is an excellent clearinghouse of information concerning the effectiveness of red light camera programs. When it comes to crash reductions, an IIHS study comparing large cities with red light cameras to those without found the devices reduced the fatal red light running crash rate by 21 percent and the rate of all types of fatal crashes at signalized intersections by 14 percent ([Hu & Cicchino, 2017](#)).

Researchers have not only looked at the effectiveness of implementing an Automated Photo Enforcement program but also the impact of turning systems off. A study in Houston, which turned off red light cameras in 2011, found that the camera deactivation was associated with a 23 percent increase in right-angle red light running crashes at the intersections that previously had cameras ([Ko et al., 2017](#)).

Traditional law enforcement is not enough. Automated enforcement serves to compliment law enforcement and address the risk of red-light running crashes. In 2017, 890 people were killed in crashes that involved red light running. Over half of those killed were pedestrians, bicyclists and people in other vehicles who were hit by the red-light runners. Automated Traffic

Enforcement serves as a force multiplier and allow police to manage their limited resources more effectively.

Several safety organizations have collaborated and developed a recommended process for implementing a red-light camera program. This collaborative group included; AAA, Advocates for Highway and Auto Safety, Insurance Institute for Highway Safety and the National Safety Council. This checklist identifies the best practices to evaluate the need, engaging the public and implementing a successful program. *(A copy of their checklist is included in this correspondence)*

In addition, there is supporting research that Automated Speed Enforcement is very effective. Based upon available evidence, the National Highway Traffic Safety Administration (NHTSA) believes that, when appropriately used as one component of an overall traffic safety and law enforcement system, automated enforcement programs can be an effective countermeasure for reducing crashes at high-risk locations. Automated enforcement systems do not replace the need for traditional enforcement operations, but provide an effective supplement when used as part of a comprehensive strategy for reducing traffic crashes. There are several studies that specifically examine the use of Automated Speed Enforcement (ASE) systems in school zones. NHTSA and the Federal Highway Administration recently endorsed the increased use of ASE across the nation.

Our systems collect significant data concerning not only information concerning detected violations but also the traffic at the monitored approach. With our new Alcyon back office platform, dashboards and customized reports can be easily created to examine traffic volume, vehicle types, peak flows, speed, and other related information. Combined with access to your city's crash data, a comprehensive program report can be produced regularly.

Q: The City is interested in the services available to perform by your company based upon the above council needs and which services would require compensation. In addition, based upon the RCW's, what type of analysis would your company perform, along with costs, in determining intersections that would be eligible for automated traffic safety cameras, including the most appropriate legs of the intersections. The school zones will also need to be identified.

To assist in the mutual selection of monitored intersections, the following process would be used at no cost to the city for a reasonable number of nominated intersections:

- City provides list of high crash intersections where right angle crashes or red light running is experienced. Other intersections could be considered based upon additional risk factors such as high pedestrian crossing locations.



- Redflex will conduct video surveys of select approaches at those identified intersections
- The video surveys are reviewed. Violations are identified and counted as:
 - Left turn
 - Straight thru
 - Right turn
- The amber timing, speed limit and traffic volume are notated as is part of the analysis
- Site analysis is conducted to determine whether a system can be constructed at the specific approach. Right of ways, utility conflicts, line of sight issues are contemplated.
- Visual inspection of the intersection also determines if there are other environmental factors that may be contributing to red light running.
- If an intersection was previously monitored by Redflex, the historical enforcement and safety information would be evaluated.
- Based upon the above information, approaches to be enforced by automated photo enforcement would be mutually selected.

To assist the city in selection of school zones for the utilization of automated speed enforcement, Redflex would conduct speed studies to determine the frequency and severity of speed violations. School zones surveyed should be based upon crash data or other specific risk factors. Such studies allow the city to create a "benchmark" to evaluate the effectiveness of automated enforcement after implementation. A reasonable number of speed studies would also be completed at no cost to the city.

With our previous experience with the City of Sea Tac, Redflex is poised to re-establish your photo enforcement program as quickly as possible. Since the court interface was already established, development time will be greatly reduced.

I would be more than happy to meet with you or the council members to discuss in further detail how an automated photo enforcement program could be evaluated and reintroduced in your community. Should you have any further questions, please do not hesitate to contact me.

Sincerely,

Rick Willing
5651 West Talavi Boulevard, Suite 200
Glendale AZ 85306-1893
630-453-1209

A Comprehensive, Data-Driven Solution



Redflex assists all clients with site selection, intersection/roadway optimization, regular and remote maintenance, verification of all incidents, citation processing and mailing, as well as a customer service suite for motorists.

Redflex also offers specialty solutions, including stop sign enforcement in busy pedestrian areas and at high-traffic railroad crossings.

Transparency and Community Engagement



Redflex can help you design and implement a community outreach program to educate drivers about dangerous behaviors and the role of traffic safety cameras in changing those behaviors. Beginning with site selection and carrying through to implementation of the program, reporting on results and gathering feedback, Redflex will be your partner in setting and achieving goals for public engagement.

Redflex

(866) 703-8097 | sales@redflex.com

Redflex.com

Redflex

Reach Vision Zero with Redflex Traffic Systems

Vision Zero is a strategy to eliminate all severe injuries, while increasing safe, h mobility for all. First implemented in Sw Vision Zero has spread across Europe momentum in the United States.

Redflex Traffic Systems is proud to help Vision Zero goals. Our automated enforcement are proven to reduce crashes, save lives, accountable and improve public safety.

Redflex is a contract vendor with these



Goal: Improve Pedestrian and Cyclist Safety

The ultimate Vision Zero goal is ZERO deaths for all road users, whether inside or outside a vehicle. Pedestrians and cyclists are especially vulnerable to dangerous driving behaviors, and cities can take steps to mitigate those risks.

PEDESTRIAN DANGER



On average, a pedestrian is **killed every 2 hours and injured every 8 minutes** in traffic crashes. *NHTSA, 2013*

Pedestrian deaths accounted for **14% of all traffic fatalities** in motor vehicle crashes. *NHTSA, 2013*

CYCLIST DANGER



There has been a **64% increase in cyclists traveling to work** from 2000 to 2012. *NHTSA*

Approximately **2 cyclists per day** were killed by motor vehicles in 2015. *NHTSA*

SAFETY SOLUTIONS



Cities have numerous tools and tactics at their disposal to improve pedestrian and cyclist safety. Automated photo enforcement is one. Others include public awareness campaigns, traffic calming initiatives, and clearly defined bike lanes and sidewalks.

Automated Photo Enforcement Saves Lives



RED-LIGHT CAMERAS

Redflex's red-light enforcement solutions help municipalities combat red-light running effectively, 24/7. They feature non-intrusive radars, state-of-the-art image recording and data capture technology, and can be configured to fit each municipality's zones, needs and regulations. They can even capture data of red-light running incidents across multiple lanes in low light or adverse weather conditions.



SPEED CAMERAS

Available in fixed, mobile and handheld units, Redflex's versatile speed enforcement solutions can detect and deter speeding in a variety of conditions – making them suitable for an array of cities, environments, challenges, terrains and other needs. A unique aspect of this system is secondary speed verification, which provides two independent data points for a speeding violation to help ensure accuracy and validity.

Goal: Reduce Dangerous Driving Behavior



SPEEDING



In 2016, **nearly 30% of all fatal crashes** involved speeding. *NHTSA*

RED-LIGHT RUNNING



In 2015, **771 people were killed and approximately 137,000 people were injured** in crashes that involved red light running. *IIHS*

ILLEGAL SCHOOL BUS PASSING



A 2017 survey of 30 states found **more than 78,000 vehicles illegally passed school buses** in a single day. That equates to more than 14 million violations in a 180-day school year. *NASDPTS*



SCHOOL BUS STOP-ARM CAMERA

Redflex's Student Guardian is a special camera attached to the stop-arm of a school bus. When the stop-arm is down, warning lights are displayed, and child passengers are alerted. Drivers do not need to record or mark violations, so they can stay focused on the children and the road.



Effects of Turning On and Off Red Light Cameras on Fatal Crashes in Large U.S. Cities

July 2016

Wen Hu

Insurance Institute for Highway Safety

Jessica B. Cicchino

Insurance Institute for Highway Safety

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iihs.org

Abstract

Introduction: Although numerous studies have demonstrated that automated enforcement reduces red light running, a growing number of communities have deactivated their red light camera programs in recent years. This study updates estimates of the effects of turning on cameras and offers a first look at the effects of turning them off.

Method: Among the 117 large U.S. cities with more than 200,000 residents in 2014, trends in citywide per capita rates of fatal red light running crashes and of all fatal crashes at intersections were compared between 57 cities that initiated camera programs during 1992-2014 and 33 cities without cameras during this period to examine the effects of activating camera programs. Trends also were compared between 19 cities that turned off cameras and 31 regionally matched cities with continuous camera programs to evaluate the effects of terminating camera programs. Because several cities turned cameras off during 2005-08, the estimated effects might have been confounded by the U.S. economic downturn immediately afterward. The primary analyses were limited to the 14 cities that turned off cameras during 2010-14 and compared trends in the 14 cities with those in 29 regionally matched cities with continuous camera programs. Poisson regression was used to examine the relationship of activating and deactivating camera programs with fatal crash rates.

Results: After controlling for temporal trends in annual fatal crash rates, population density, and unemployment rates, rates of fatal red light running crashes and of all fatal crashes at signalized intersections in cities with cameras programs were 21 and 14 percent lower, respectively, after cameras were turned on than what would have been expected without cameras. Rates of fatal red light running crashes and of all fatal crashes at signalized intersections in 14 cities that terminated cameras programs during 2010-14 were 30 and 16 percent higher, respectively, after cameras were turned off than would have been expected had cameras remained. Increases in rates of fatal red light running crashes (18%) and of all fatal crashes at signalized intersections (8%) in all 19 cities that turned cameras off were not significant.

Conclusions: The current study adds to the body of existing research indicating that red light cameras can reduce the most serious crashes at signalized intersections, and it is the first to demonstrate that terminating camera programs increases fatal crashes.

Practical applications: Communities interested in improving intersection safety should consider this evidence. Legislators and communities thinking about terminating camera programs should consider the impact to safety if programs end.

Keywords: Turning on red light cameras; Turning off red light cameras; Fatal crash rates; Signalized intersections; Large cities.

1. Introduction

In 2014, more than 2.5 million police-reported motor vehicle crashes in the United States occurred at intersections or were intersection-related, accounting for 43 percent of all police-reported crashes (Insurance Institute for Highway Safety, 2016a). These crashes resulted in about 55,000 serious nonfatal injuries and 7,697 deaths. More than a third of these deaths occurred at signalized intersections.

Running a red light is a common traffic violation, although drivers view red light running as dangerous. A 2015 national survey of drivers found that while 59 percent thought that running red lights was a very serious threat to personal safety, 39 percent reported driving through a traffic light that had just turned red in the past month (AAA Foundation for Traffic Safety, 2016). A study observing 19 intersections in four states found that there was an average of 3.2 red light running violations per intersection per hour (Hill & Lindy, 2003).

Red light running violations can have tragic consequences. In 2014, 709 people were killed and an estimated 126,000 were injured in police-reported red light running crashes, and more than half of those killed were pedestrians, bicyclists, or occupants of vehicles struck by red light runners (Insurance Institute for Highway Safety, 2016a).

Traditional police enforcement of red light running can help mitigate the problem, but other demands on police resources can limit its effectiveness. Red light cameras are a countermeasure that increases the public's perception that there is a high likelihood of being apprehended for running a red light. The installation of red light cameras has led to significant reductions in red light running violation rates at intersections with cameras, and at nearby signalized intersections without cameras (McCartt & Hu, 2014; Retting, Williams, Farmer, & Feldman, 1999a; Retting, Williams, Farmer, & Feldman, 1999b). Red light cameras also have been shown to reduce injury crashes (Aeron-Thomas & Hess, 2005; Retting & Kyrychenko, 2002). For example, Retting and Kyrychenko (2002) found that after the installation of red light cameras in Oxnard, California, injury crashes declined by 29 percent and right angle crashes involving injuries dropped by 68 percent at signalized intersections.

Hu, McCartt, and Teoh (2011) performed the first study that investigated the effects of red light cameras on fatal crashes in large U.S. cities. Among the 99 cities with more than 200,000 residents in 2008, 14 cities were identified with red light camera enforcement programs for all of 2004-08 but not at any time during 1992-96, and 48 cities were identified without camera programs during either period. Analyses compared the citywide per capita rate of fatal red light running crashes and the citywide per capita rate of all fatal crashes at signalized intersections during the two study periods, and rate changes were compared for cities with and without camera programs. After controlling for population density and land area, the rates of fatal red light running crashes and all fatal crashes at signalized intersections were 24 percent and 17 percent lower, respectively, in cities with cameras during 2004-08 than what would have been expected without cameras.

Surveys of residents of cities with red light camera programs have found that a large majority of residents in most cities favor the programs (Cicchino, Wells, & McCartt, 2014; McCartt & Eichelberger, 2012). Yet, despite public support and the clear benefits of red light cameras, the programs have been controversial. Although the number of U.S. municipalities using red light camera enforcement increased rapidly before peaking in 2012 at 533 communities, by 2015 this number declined to 467 communities. Although new camera programs continued to be added, 158 communities ended their red light camera programs between 2010 and 2015. Communities have ended programs for a variety of reasons including changes in state law disallowing red light cameras, public referendums where voters rejected cameras, decisions by local government, court rulings, and lapsed contracts with vendors. Numerous studies have examined the safety effects of red light camera enforcement, but few if any strong studies have examined the effects of terminating camera programs on crashes.

The goals of the current study were twofold. The first was to update Hu et al.'s (2011) estimates of the effects of installing red light cameras on per capita rates of fatal red light running crashes and per capita rates of all fatal crashes at signalized intersections in large cities. The current study accounted for the effects of the economy, used a more rigorous design that accounts for trends in crash rates over time within cities, and examined a larger number of cities with red light cameras than Hu et al. (2011). Trends

in per capita fatal crash rates over time were compared for cities with and without camera programs for each crash measure. The second goal was to assess the effects of deactivating red light camera programs on per capita rates of fatal red light running crashes and per capita rates of all fatal crashes at signalized intersections. For each fatal crash measure, temporal trends in crash rates were compared for cities that turned off cameras and cities with continuous camera programs.

2. Method

The first U.S. community with a camera program for traffic enforcement was New York City, which tested one red light camera in 1992 and turned on more cameras in the following year. The number of communities using red light cameras has increased dramatically since then (Insurance Institute for Highway Safety, 2016b). Fatal crash data at the time of the current study were available only through 2014, so analyses covered the period 1992-2014.

Large U.S. cities were defined as those with more than 200,000 residents; there were 117 such cities in 2014 (U.S. Census Bureau, 2014). Information on red light camera programs in these 117 cities was obtained from news reports and calls to city police departments or public works departments. For cities with camera enforcement, program start and end dates were obtained. Other historical information was sought but was not available for all cities, including the number of cameras and number of signalized intersections over time.

Among the 117 cities in this study, 57 cities turned on red light cameras at some point during 1992-2014, and the cameras remained on in 2014; 38 cities had no camera programs during the entire time period; 20 cities turned cameras on and later turned them off, including 3 cities (Los Angeles, CA; San Diego, CA; Houston, TX) that turned cameras off twice; and 2 cities (Virginia Beach, VA, and Arlington, VA) that turned cameras off and later turned them on.

Data on fatal crashes at intersections with signal lights in each city were extracted for 1992-2014 from the Fatality Analysis Reporting System (FARS), which contains detailed information on all fatal motor vehicle crashes occurring on U.S. public roads (National Highway Traffic Safety Administration,

1992-2014). Fatal red light running crashes were defined as the subset of these crashes that involved a driver traveling straight who was assigned the driver level contributing factor of “failure to obey traffic control devices.” This definition was developed jointly by the Insurance Institute for Highway Safety and Federal Highway Administration so that consistent estimates of red light running crash losses would be produced (Retting, 2006). Annual counts of fatal red light running crashes and all fatal crashes at signalized intersections were obtained for each of the 117 cities in each year during 1992-2014.

Annual population estimates for 1992-2014 were obtained for each city from the U.S. Census Bureau (1999, 2010a, 2014). For each city in each year, the annual per capita rates of fatal red light running crashes and rates of all fatal crashes at signalized intersections were calculated as the annual fatal crash counts divided by annual population estimates (crashes per million population). Census information on cities’ land areas is available only from the decennial reports (U.S. Census Bureau, 1990, 2000, 2010b). Therefore, the 1990 land area data were used for years 1992-99, the 2000 data for years 2000-09, and the 2010 data for years 2010-14. Six of the 117 cities in the study (Gilbert, AZ; Chula Vista, CA; Louisville, KY; Fayetteville, NC; Winston-Salem, NC; Laredo, TX) had substantial changes in land areas (more than 50% increase) during the study period. These six cities, of which five had no camera programs and the remaining one (Fayetteville, NC) had turned cameras off, were excluded from analyses.

The annual population density was calculated as the population divided by the land area. Hu et al. (2011) found that an increase in population density was associated with decreases in fatal crash rates, although not always significantly. A possible explanation is that denser populations generally lead to lower travel speeds and thus fewer fatal crashes (Cerrelli, 1997).

Annual unemployment rates during 1992-2014 were obtained for each city from the U.S. Bureau of Labor Statistics (1992-2014). Annual unemployment rate was included to account for potential effects of the economy on fatal crash rates. It is well-established that fatal crash rates and economic factors are associated with one another (Partyka, 1991).

2.1. Analyses of effects of turning on red light cameras

Years 1992-2014 represented the study period. The 57 cities that turned cameras on and kept them on comprised the camera group. The 33 non-camera cities without substantial changes in land areas comprised the control group. The 22 cities where cameras had been turned off during the study period were excluded from these analyses. Table 1 lists cities in the camera and control groups and the program start year in each camera city.

Using the city-specific data, Poisson regression models were used to rigorously examine the relationship of camera enforcement and other variables with fatal crashes. The Poisson models accounted for the autoregressive (first order) covariance structure due to repeated measures, because each independent unit of analysis (city) had 23 consecutive annual observations (years 1992-2014). Separate models were developed for the fatal red light running crashes and all fatal crashes at signalized intersections, with the annual crash counts as the dependent variable and annual population per million as the exposure variable. Independent variables in the models were number of years since 1992, individual city indicators, annual population density (in thousands of people per square mile), annual unemployment rate, and a camera indicator.

For each of the 57 camera cities, the camera indicator had a value of 0 for the years prior to the program start year and 1 for the years with active camera programs. For the 33 control cities, the camera indicator had a value of 0 for all years. After accounting for the effects of population density, unemployment rates, and other uncontrolled differences among cities, the camera indicator tested whether temporal trends in fatal crash rates in camera cities changed from before to after cameras were turned on, relative to the trends in control cities. The estimated change in annual crash rate trends in camera cities from before to after cameras were turned on, relative to the trends in control cities, was taken as the primary measure of effectiveness. It was interpreted as the change in annual fatal crash rates for cities with camera programs during the years cameras were active beyond what would have been expected absent the programs. For example, if the estimated parameter for the camera indicator was -0.2396 in the model of fatal red light running crashes, the average annual crash rate after cameras were turned on was

21.3 percent lower ($(\exp(-0.2396)-1) \times 100$) than would have been expected without cameras. Variables with p-values less than 0.05 were taken as statistically significant.

Table 1. Cities included in camera and control groups for analyses of effects of turning on cameras

City	Program start year*	City	Program start year*	City	Program start year*
Cities in camera group					
New York, NY	1993	Modesto, CA	2005	New Orleans, LA	2008
Mesa, AZ	1997	Philadelphia, PA	2005	Tacoma, WA	2008
Oxnard, CA	1997	Atlanta, GA	2006	Tucson, AZ	2008
San Francisco, CA	1997	Cleveland, OH	2006	Orlando, FL	2009
Scottsdale, AZ	1997	Columbus, OH	2006	Spokane, WA	2009
Sacramento, CA	1999	Plano, TX	2006	Aurora, IL	2010
Washington, DC	2000	Seattle, WA	2006	Memphis, TN	2010
Chandler, AZ	2001	Arlington, TX	2007	Newark, NJ	2010
Fremont, CA	2001	Corpus Christi, TX	2007	Chesapeake, VA	2011
Toledo, OH	2001	Dallas, TX	2007	Des Moines, IA	2011
Phoenix, AZ	2002	El Paso, TX	2007	Jersey, NJ	2011
Portland, OR	2002	Irving, TX	2007	Miami, FL	2011
Bakersfield, CA	2003	Riverside, CA	2007	Rochester, NY	2011
Santa Ana, CA	2003	St. Louis, MO	2007	Yonkers, NY	2011
Chicago, IL	2004	Austin, TX	2008	Jacksonville, FL	2012
Garland, TX	2004	Baton Rouge, LA	2008	St. Petersburg, FL	2012
Raleigh, NC	2004	Denver, CO	2008	Tampa, FL	2012
Stockton, CA	2004	Fort Worth, TX	2008	Richmond, VA	2013
Aurora, CO	2005	Montgomery, AL	2008	Norfolk, VA	2014
Cities in control group					
Anaheim, CA	—	Fort Wayne, IN	—	North Las Vegas, NV	—
Anchorage, AK	—	Henderson, NV	—	Oklahoma City, OK	—
Birmingham, AL	—	Huntington Beach, CA	—	Omaha, NE	—
Boise City, ID	—	Indianapolis, IN	—	Pittsburgh, PA	—
Boston, MA	—	Irvine, CA	—	Reno, NV	—
Buffalo, NY	—	Las Vegas, NV	—	San Antonio, TX	—
Cincinnati, OH	—	Lexington-Fayette, KY	—	San Jose, CA	—
Columbus, GA	—	Lincoln, NE	—	St. Paul, MN	—
Detroit, MI	—	Madison, WI	—	Tulsa, OK	—
Durham, NC	—	Milwaukee, WI	—	Honolulu, HI	—
Fontana, CA	—	Nashville, TN	—	Wichita, KS	—

*Note: If a program started prior to or on July 1 in a year, this year was coded as the start year. If cameras were turned on after July 1 in a year, the following year was coded as the start year.

2.2. Analyses of effects of turning off red light cameras

Unlike the camera cities in the analyses of turning cameras on that were scattered across the country, 13 of the 19 cities that turned cameras off without substantial changes in land areas during the study period were clustered in California, Arizona, Colorado, New Mexico, and Texas. The remaining six cities were located in North Carolina, Maryland, Minnesota, Missouri, and Florida. Among the 19

camera-off cities, the earliest year when cameras were turned on was 1998. To make control cities comparable with the camera-off cities, among the 57 cities with continuous camera programs, only those that regionally matched the camera-off cities and that turned on cameras in or after 1998 were included in analyses. Thirty-one cities with continuous camera programs were included in the control group. The 33 cities with no camera programs during the entire time period and the two cities that turned cameras off and then turned them back on were excluded from the analyses.

Of the 19 study cities that turned cameras off, five cities turned off cameras during 2005-08 and 14 cities turned off cameras within the latest 5 years for which fatal crash data were available (2010-14). Separate analyses were performed to evaluate the effects of ending camera programs by including the 14 cities that turned off cameras during 2010-14 as the camera-off city group and by including all the 19 cities as the camera-off city group.

The analyses that included 14 cities that ended camera programs during 2010-14 were the primary camera-off analyses in the study. Because the analyses with 19 camera-off cities included several that turned off cameras during 2005-08, the estimated effects of ending camera enforcement might have been confounded by the U.S. economic downturn immediately afterward and other changes that might have occurred during the relatively long periods after cameras were turned off. For the analyses including 14 camera-off cities, the control cities were limited to those 29 that regionally matched the camera-off cities.

Table 2 lists cities in the camera-off and control groups and the years when cameras were turned on and off, if applicable, in each city. No city with continuous camera programs activated the cameras in 1998. The programs in Houston, TX, and Long Beach, CA, were turned off in late 2010 (November and December) and the program end year for both cities was coded as 2011. Three of the camera-off cities turned cameras off twice. For Los Angeles and San Diego, CA, only the effects of the second camera-off event were evaluated by using observations in years since the second camera programs began. For Houston, TX, the second program lasted for less than 2 months (July 9-August 24, 2011). The effects of the first camera-off event were evaluated, and year 2011 was treated as a camera-off year. For each of the

cities included in the analyses, the study period started from the year when the cameras were turned on (as shown in Table 2) and ended in 2014. Observations in years before cameras were turned on were not included in the analyses.

Similar to the analyses of the effects of turning on cameras as described earlier, for both the analyses with 14 camera-off cities and 19 camera-off cities, Poisson regression models were used to examine the relationship of turning off camera enforcement and other variables with fatal crash rates. Analyses accounted for the autoregressive (first order) covariance structure due to repeated measures in each city. Independent variables in the model were number of years since cameras were turned on, individual city indicators, annual population density (in thousands of people per square mile), annual unemployment rate, and a camera-off indicator. For each of the camera-off cities, the camera-off indicator had a value of 0 for the years with an active camera program and 1 for the years after the camera program was terminated. For the control cities, the camera-off indicator had a value of 0 for all years.

The camera-off indicator tested whether temporal trends in fatal crash rates in camera-off cities changed from before to after cameras were turned off, relative to trends in cities with continuous camera programs, after accounting for the effects of population density and unemployment rates and other uncontrolled differences among cities. The estimated change in annual crash rate trends in camera-off cities from before to after cameras were turned off, relative to the trends in control cities, was taken as the primary measure of effectiveness. It was interpreted as the change in annual fatal crash rates for cities that turned off camera programs during the years cameras were off beyond what would have been expected had the programs not been terminated. For example, if the estimated parameter for the camera-off indicator was 0.2631 in the model of fatal red light running crashes, the average annual crash rate after cameras were turned off was 30.1 percent higher ($[\exp(0.2631)-1] \times 100$) than would have been expected if cameras had not been turned off. Variables with p-values less than 0.05 were taken as statistically significant.

Table 2. Cities included in camera-off and control groups for analyses of effects of turning off cameras

City	Program start year ¹	Program end year ²	City	Program start year ¹	Program end year ²
Cities that turned off red light camera programs					
Charlotte, NC ³	1998	2006	Moreno Valley, CA	2007	2013
Baltimore, MD	1999	2013	Glendale, AZ	2008	2011
Fresno, CA ³	2002	2006	Lubbock, TX ³	2007	2008
Long Beach, CA	2002	2011	Glendale, CA	2008	2012
Greensboro, NC ³	2003	2005	Kansas City, MO	2009	2014
San Diego, CA	2003	2013	Oakland, CA	2009	2014
Albuquerque, NM	2005	2012	Hialeah, FL	2010	2012
Minneapolis, MN ³	2005	2006	San Bernardino, CA	2010	2013
Los Angeles, CA	2006	2012	Colorado Springs, CO	2011	2012
Houston, TX	2007	2011			
Cities in control group					
Sacramento, CA	1999	—	Dallas, TX	2007	—
Washington, DC	2000	—	El Paso, TX	2007	—
Chandler, AZ	2001	—	Irving, TX	2007	—
Fremont, CA	2001	—	Riverside, CA	2007	—
Phoenix, AZ	2002	—	St. Louis, MO	2007	—
Portland, OR	2002	—	Austin, TX	2008	—
Bakersfield, CA	2003	—	Denver, CO	2008	—
Santa Ana, CA	2003	—	Fort Worth, TX	2008	—
Garland, TX	2004	—	Tucson, AZ	2008	—
Raleigh, NC ³	2004	—	Orlando, FL	2009	—
Stockton, CA	2004	—	Des Moines, IA ³	2011	—
Aurora, CO	2005	—	Miami, FL	2011	—
Modesto, CA	2005	—	Jacksonville, FL	2012	—
Plano, TX	2006	—	St. Petersburg, FL	2012	—
Arlington, TX	2007	—	Tampa, FL	2012	—
Corpus Christi, TX	2007	—			

¹ If a program started prior to or on July 1 in a year, this year was coded as the start year. If cameras were turned on after July 1 in a year, the following year was coded as the start year.

² If cameras were turned off on or after July 1 in a year, the camera-off period started from the following year; if cameras were turned off prior to July 1 in a year, the camera-off period started from this year.

³ These cities were included only in the analyses with 19 camera-off cities, and were not included in the analyses with 14 cities that turned off cameras during 2010-14.

3. Results

3.1. Effects of turning cameras on

Figure 1 shows the average annual per capita rates of all fatal crashes at signalized intersections (crashes per million population) across cities during 1992-2014 for the camera group and the control group. During the first several years of the study period, when most of the cities in the camera group had not turned on camera programs yet, rates of fatal crashes were relatively high in the camera group, and then the trends went downward for the rest of the study period. In the control group, the rates of fatal crashes remained relatively stable during the study period. The trends in the average annual rates of fatal

red light running crashes were similar to the trends in rates of all fatal crashes at signalized intersections for each city group.

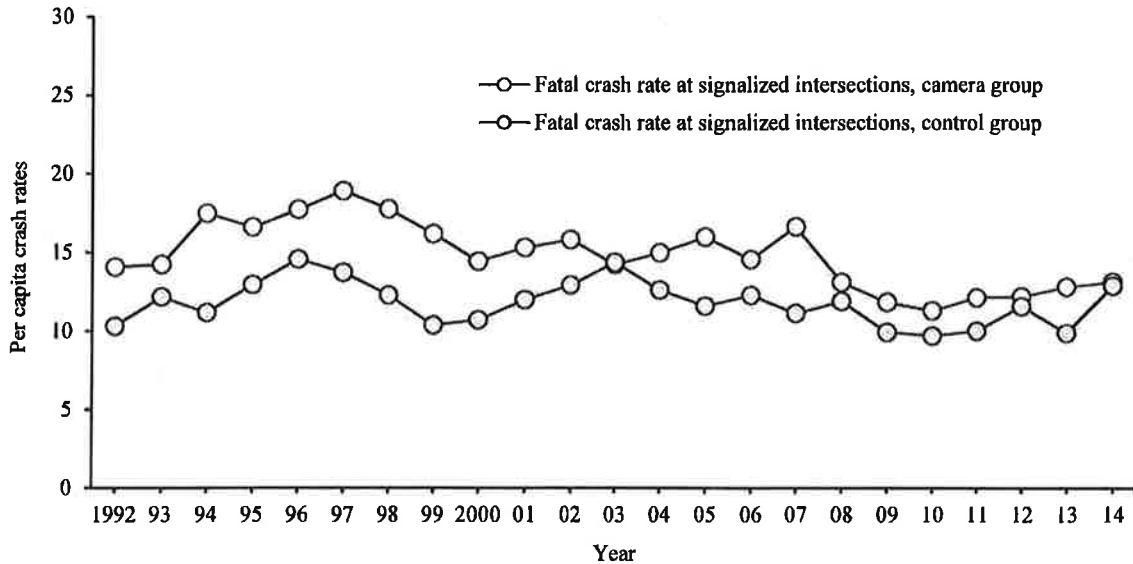


Figure 1. Average annual per capita rates of all fatal crashes at signalized intersections (crashes per million population) for camera and control groups for analyses of effects of turning on cameras, 1992-2014

Table 3 lists results of the Poisson regression model that estimated the effects of red light camera enforcement and other predictors on the per capita rate of fatal red light running crashes. The estimates for the city indicators are not included in Table 3 or in subsequent tables. After accounting for the effects of other predictors, the rate of fatal red light running crashes significantly decreased by 1.9 percent per year since 1992 in cities with no cameras. An increase in population density (in thousands of people per square mile) and one-point increase in the unemployment rate reduced the rate of fatal red light running crashes by an estimated 11.4 and 3.3 percent, respectively. Both changes were significant. The estimated effect of camera enforcement on the rate of fatal red light running crashes was obtained by interpreting camera-on indicator directly. Based on this parameter, the annual rate of fatal red light running crashes in cities with cameras programs after cameras were turned on was 21.3 percent lower than what would have been expected without cameras. This difference was significant.

Table 3. Poisson model of effects of red light camera enforcement on annual per capita rate of fatal red light running crashes

Parameter	Estimate	Percent change in crash rates*	Standard Error	Z	P value
Intercept	1.8613		0.5871	3.17	0.0015
Number of years since 1992	-0.0196	-1.9	0.0033	-5.97	<0.0001
Population density (in thousands of people per square mile)	-0.1208	-11.4	0.0342	-3.53	00.0004
Unemployment rate	-0.0337	-3.3	0.0081	-4.16	<0.0001
Camera on indicator (effect of cameras on fatal crash rates)	-0.2396	-21.3	0.0539	-4.45	<0.0001

*Note: Percent change in crash rates associated with one-unit increase in the corresponding independent variable.

Table 4 lists results of the Poisson regression model that estimated the effects of red light camera enforcement and other predictors on the per capita rate of all fatal crashes at signalized intersections. Based on the camera-on indicator, the annual rate of all fatal crashes at signalized intersections in cities with cameras programs after cameras were turned on was significantly 14.2 percent lower than what would have been expected without cameras.

Table 4. Poisson model of effects of red light camera enforcement on annual per capita rates of all fatal crashes at signalized intersections

Parameter	Estimate	Percent change in crash rates*	Standard Error	Z	P value
Intercept	3.2356		0.2604	12.43	<0.0001
Number of years since 1992	-0.0041	-0.4	0.0021	-1.95	0.051
Population density (in thousands of people per square mile)	-0.0979	-9.3	0.015	-6.54	<0.0001
Unemployment rate	-0.0228	-2.3	0.0049	-4.63	<0.0001
Camera on indicator (effect of cameras on fatal crash rates)	-0.153	-14.2	0.0328	-4.66	<0.0001

*Note: Percent change in crash rates associated with one-unit increase in the corresponding independent variable.

3.2. Effects of turning cameras off

Tables 5 and 6 list results of the Poisson regression models that estimated the effects of ending red light camera enforcement and other predictors on the per capita rate of fatal red light running crashes and on the per capita rate of all fatal crashes at signalized intersections, respectively, by using the 14 cities

that ended camera program during 2010-14. The estimated effects of turning off camera enforcement on the fatal crash rates were obtained by interpreting the camera off indicator directly. Based on this parameter, the annual rate of fatal red light running crashes in the 14 camera-off cities after cameras were turned off was 30.1 percent higher than what would have been expected had cameras not been turned off. The annual rate of all fatal crashes at signalized intersections in camera-off cities after cameras were turned off was 16.1 percent higher than what would have been expected with cameras on. Both increases were significant.

Table 5. Poisson model of effects of turning off red light camera enforcement on annual per capita rate of fatal red light running crashes, using 14 cities that turned off cameras during 2010-14

Parameter	Estimate	Percent change in crash rates*	Standard Error	Z	P value
Intercept	7.4598		2.2816	3.27	0.0011
Number of years since cameras were turned on	-0.0298	-2.9	0.0133	-2.24	0.0248
Population density (in thousands of people per square mile)	-0.5979	-45.0	0.2404	-2.49	0.0129
Unemployment rate	-0.0165	-1.6	0.0166	-0.99	0.3203
Camera off indicator (effect of turning off cameras on fatal crash rates)	0.2631	30.1	0.1213	2.17	0.0301

*Note: Percent change in crash rates associated with one-unit increase in the corresponding independent variable.

Table 6. Poisson model of effects of turning off red light camera enforcement on annual per capita rates of all fatal crashes at signalized intersections, using 14 cities that turned off cameras during 2010-14

Parameter	Estimate	Percent change in crash rates*	Standard Error	Z	P value
Intercept	6.1968		1.2157	5.1	<0.0001
Number of years since cameras were turned on	-0.0028	-0.3	0.0079	-0.36	0.7221
Population density (in thousands of people per square mile)	-0.3313	-28.2	0.1275	-2.6	0.0094
Unemployment rate	-0.0182	-1.8	0.0097	-1.87	0.0609
Camera off indicator (effect of turning off cameras on fatal crash rates)	0.1493	16.1	0.0705	2.12	0.0344

*Note: Percent change in crash rates associated with one-unit increase in the corresponding independent variable.

Tables 7 and 8 list results of the Poisson regression models that estimated the effects of ending red light camera enforcement and other predictors on the per capita rate of fatal red light running crashes and the rate of all fatal crashes at signalized intersections, respectively, by using all the 19 camera-off cities. Based on the camera off indicator, the annual rates of fatal red light running crashes and all fatal crashes at signalized intersections in the 19 camera-off cities after cameras were turned off were 17.9 and 8.4 percent higher, respectively, than would have been expected had cameras been on. Neither increase was significant.

Table 7. Poisson model of effects of turning off red light camera enforcement on annual per capita rate of fatal red light running crashes, using all 19 camera-off cities

Parameter	Estimate	Percent change in crash rates*	Standard Error	Z	P value
Intercept	6.0341		2.0902	2.89	0.0039
Number of years since cameras were turned on	-0.0342	-3.4	0.0125	-2.74	0.0061
Population density (in thousands of people per square mile)	-0.4372	-35.4	0.2193	-1.99	0.0462
Unemployment rate	-0.0274	-2.7	0.0157	-1.75	0.0809
Camera off indicator (effect of turning off cameras on fatal crash rates)	0.1647	17.9	0.1131	1.46	0.1454

*Note: Percent change in crash rates associated with one-unit increase in the corresponding independent variable.

Table 8. Poisson model of effects of turning off red light camera enforcement on annual per capita rates of all fatal crashes at signalized intersections, using all 19 camera-off cities

Parameter	Estimate	Percent change in crash rates*	Standard Error	Z	P value
Intercept	5.2662		1.166	4.52	<0.0001
Number of years since cameras were turned on	-0.0067	-0.7	0.0077	-0.88	0.3804
Population density (in thousands of people per square mile)	-0.2278	-20.4	0.1217	-1.87	0.0613
Unemployment rate	-0.0233	-2.3	0.0096	-2.44	0.0146
Camera off indicator (effect of turning off cameras on fatal crash rates)	0.0807	8.4	0.0685	1.18	0.2392

*Note: Percent change in crash rates associated with one-unit increase in the corresponding independent variable.

4. Discussion

Red light running is a frequent traffic violation with dangerous safety consequences. Prior research found that red light cameras were associated with reductions in red light running, not only at camera-equipped intersections but also at other signalized intersections without cameras (Retting et al., 1999a, 1999b), as well as citywide crash reductions at signalized intersections (Retting and Kyrychenko, 2002).

The current study updated Hu et al. (2011) by using a more rigorous methodology that accounted for trends in fatal crash rates over time within cities and unemployment rates, and by including four times as many cities with red light camera programs as in the original study. Consistent with prior research, the current study confirmed that establishing red light camera programs reduces fatal red light running crash rates and fatal crash rates at signalized intersections. The introduction of red light cameras in large cities cut citywide fatal red light running crash rates by 21 percent and fatal crash rates at signalized intersections by 14 percent, when compared with rates that would have been expected without red light camera enforcement. These estimates are similar in size to the estimated 24 percent decline in fatal red light running crash rates and a 17 percent reduction in fatal crash rates at signalized intersections found in the earlier study. The larger effect of camera enforcement on the rate of fatal red light running crashes would be expected because these are the crashes targeted by cameras. However, if the camera enforcement affected only red light running, then the overall effect at signalized intersections would be only about 6 percent (a 21 percent reduction in the 30 percent of signalized intersection fatal crashes that are coded as red light running). The significant reduction in the rate of all types of fatal crashes at signalized intersections is much larger, 14 percent. Although it is possible that the difference is partly due to undercounting of red light running crashes, the data suggest that cameras have a generalized effect on driver behavior at intersections that extends beyond running red lights.

Just as activating red light cameras has positive safety benefits, the current study found that deactivating them has safety disbenefits. This study is the first to our knowledge to evaluate the effects of terminating camera enforcement on fatal crashes. When red light camera programs were terminated

during 2010-14 in the 14 cities, fatal red light running crash rates increased 30 percent and fatal crash rates at signalized intersections increased 16 percent from what would have been expected if automated enforcement had continued. Laws are effective at changing behavior when drivers believe they will be detected and apprehended for violating them. Prior research has established that high visibility enforcement of laws governing issues such as seat belt nonuse and alcohol-impaired driving decreases unsafe behavior and crashes, but the prevalence of unsafe behavior and crashes rise when the heightened and publicized enforcement ends (e.g., Jonah & Smith, 1985; Tison & Williams, 2010; Williams & Wells, 2004; Wells et al., 1992; Williams et al., 1987). The current study demonstrates that this phenomenon extends to automated enforcement of red light running. Drivers likely no longer perceive that there is a high probability of receiving a ticket for running red lights when automated enforcement programs end, and thus become less attentive to the driving environment and more willing to violate the law, leading to increases in fatalities.

It is possible that police coding of crashes involving red light running at signalized intersections can be prone to bias, particularly in cities that have recently ended a high-profile automated enforcement program. It is possible, for example, that law enforcement officers may be unwittingly more likely to categorize a crash at a signalized intersection as a red light running crash if the circumstances were unclear. The bias in coding of red light running crashes could potentially inflate estimates of the effects of turning off red light cameras. It is confirming that effects of establishing and terminating red light camera programs were also found on fatal crashes at signalized intersections, where classification bias is not an issue.

The analyses of the effects of terminating camera programs that included all 19 cities that turned off cameras at any time also found increases in both fatal crash rates relative to what would have been expected had cameras remained on. However, the increases were smaller than what was found in the analyses of the 14 cities that turned off cameras during 2010-14 and were not significant. It is possible that the findings in the additional cities that ended camera programs during 2005-08 were confounded by the economic recession that occurred immediately after these cities turned off their cameras, beyond what

could be captured by controlling for unemployment rates. It could also be the case that the increases in fatalities that were seen in cities that shut off cameras recently do not persist at such high levels over time.

Several limitations of the study are worth noting. The definition of red light running crashes excluded some crashes such as those involving a driver making an illegal turn on red. Other factors not included in the study, such as the number of cameras and number of signalized intersections, may have influenced fatal crash rates for the camera cities but could not be examined due to limitations in the data. Attempts were made to obtain historical information on the numbers of red light cameras and signalized intersections in the cities included in the study, but the information could not be obtained for many of the cities. For the analyses of the effects of turning off cameras, most of the study cities that turned off cameras clustered in California, Arizona, Colorado, New Mexico, and Texas. The control cities were regionally matched to these cities that turned off cameras. The effect of turning off cameras in other regions may differ quantitatively, but it is noteworthy that the estimated effect of turning off cameras is statistically consistent with the estimate of the effect of turning on cameras, which is based on more cities in more regions.

The current study adds to the body of existing research indicating that red light cameras can reduce the most serious crashes. This evidence should be considered by communities interested in reducing injuries and fatalities at intersections. Despite the widespread support (Cicchino et al., 2014; McCartt & Eichelberger, 2012) and the safety benefits of red light camera enforcement, cameras remain controversial in some communities. During the past several years, more camera programs were discontinued than were initiated. The current study found that turning off cameras was associated with increases in citywide fatal crash rates at signalized intersections. Legislators and communities considering terminating camera programs should consider the impact to public safety if the programs end.

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THE FACTS DON'T LIE

TRAFFIC SAFETY CAMERAS

REDUCE CRASHES AND SAVE LIVES

THE REAL VICTIMS OF RED LIGHT RUNNING

 **709 DEATHS**
    **in 2014**


“


Red light runners account for a minority of the people killed in such crashes. Most of those killed are occupants of other vehicles, passengers in the red-light-running vehicles, pedestrians or bicyclists.”

Source: Insurance Institute for Highway Safety, "Turning off red light cameras cost lives, new research shows." July 28, 2016

TRAFFIC SAFETY CAMERAS SAVE LIVES

 **1,300 lives were saved**
in 79 U.S. cities **using cameras** through 2014

 **21%**
fewer fatal red light running crashes per capita

 **14%**
fewer fatal crashes of all types per capita at signalized intersections

than would have occurred
without cameras

IHS
HLDI
Insurance Institute for Highway Safety
Highway Loss Data Institute

Source: Insurance Institute for Highway Safety, "Turning off red light cameras cost lives, new research shows." July 28, 2016

DANGERS OF TURNING CAMERAS OFF

In cities that **TURNED OFF CAMERAS:**



30% ↑

more fatal red light
running crashes per capita



16%

more fatal crashes of
all types per capita at
signalized intersections

than would have occurred
without cameras

Source: Insurance Institute for Highway Safety, "Turning off red light cameras cost lives, new research shows." July 28, 2016

DATA FROM AROUND THE COUNTRY

WHEN CAMERAS WERE ON

WHEN CAMERAS WERE TURNED OFF



Newark,
New Jersey



40%-83%
reduction in all crashes



\$6 million
in crash-related costs avoided



116%
increase in red light
running in just 3
months

Source: City of Newark and Rutgers University



Houston,
Texas



15%
reduction in serious crashes



Fatalities cut in half



30%
increase in fatal crashes



116%
increase in total crashes

Source: Houston Police Department



Modesto,
California



48%
reduction in red light
running crashes



63%
reduction in rear end crashes



19%
increase in red light
running crashes



8%
increase in rear end crashes

Source: Modesto Police Department



State of
Arizona



Injury crashes down
28% to 48%



100%
increase in trauma
hospital admissions

Source: National Institutes for Health, Centers for Disease Control and Prevention



LIGHT CAMERA PROGRAM CHECKLIST

Photo enforcement is a proven, effective tool to make roads safer. Well-controlled before-and-after studies have found that red light cameras reduce violations and injury crashes, especially the violent front-into-side crashes most associated with red light running.

Successful programs have a strong public information component, are transparent, and emphasize safety over revenue. In fact, communities should expect that revenue will decline over time as fewer drivers run red lights. Some, though not all, studies indicate that rear-end crashes increase initially, but rear-enders are typically low-severity crashes compared with the high-speed right-angle collisions targeted by red light camera programs.

This checklist assumes your community is already legally authorized to set up a program. It is intended to help you operate a program to reduce crashes, prevent injuries, save lives, and maintain strong public support.



FIRST STEPS



SECOND STEPS



IMPLEMENTATION



LONG TERM

- Identify problem intersections:
 - Assess violation and crash data.
 - Conduct field observations.
 - Collect resident input.
 - Make changes necessary to ease compliance with the law:
 - Ensure the road geometry conforms with guidelines from the American Association of State Highway and Transportation Officials or state road design manuals.
 - Ensure that signal timing at a minimum conforms with the Manual on Uniform Traffic Control Devices and Institute of Transportation Engineers guidelines.
 - Remove sightline obstructions of signals and signage.
 - If photo enforcement is appropriate for the problem intersections, establish an advisory committee comprised of stakeholders, e.g., law enforcement, transportation department, victim advocates, school officials, community residents, first responders, health officials, and the courts. Outline the committee's role to advise on the development and implementation of the program.
 - Meet with the media and newspaper editorial boards to build support and educate the public.
- Select appropriate sites based on data from first steps.
 - Publicize the extent of the safety problem and need for innovative solutions.
 - Secure a vendor and establish payment based on the vendor's actual costs, not the number of citations.
 - Establish a grace period before a vehicle is photographed of up to 1/2 second and no less than 1/8 of a second after the light turns red.
 - Establish that law enforcement officers or other appropriately trained personnel employed by the locality will review evidence, identify violations, and issue citations.
 - Create a website and social media plan with program details, such as how to pay and dispute tickets.
 - Establish a method for answering questions accurately and in a timely manner.
 - Develop an emergency action plan for handling problems, such as system malfunctions.
- Hold a kickoff event with advisory committee members. Introduce a sustained public education campaign focused on improving safety by changing driver attitudes and behavior.
 - Connect the program to safety initiatives such as Vision Zero, Toward Zero Deaths, and Road to Zero.
 - Install prominent warning signs at camera locations and major roadways entering the jurisdiction.
 - Establish a probationary period during which only warnings are issued.
 - Target violations with the greatest safety consequences. Discard right-turn-on-red violations when pedestrians, bicyclists, and oncoming vehicles are not present.
 - Allow for due process. Minimize the number of days between the violation and citation issuance. Establish and publicize the available procedures for contesting an alleged violation.
 - To the extent feasible, allocate fines in excess of program costs to traffic safety programs.
- Publicize changes, including new camera locations. Reinstate the probationary period before ticketing begins at new locations.
 - Monitor program operation and publicize results.
 - Require regular field reviews. Verify monthly camera calibration and synchronization with signals.
 - Require regular program evaluation by collecting crash and infraction data. Avoid simple before-and-after comparisons by using proper control intersections. Include control intersections that are not subject to spillover effects.
 - Regularly meet with the advisory committee and media to review program status and sustain public support.

For more information on red light cameras, go to IHS.ORG/RED-LIGHT-RUNNING

Partner organizations:



ADVOCATES FOR HIGHWAY & AUTO SAFETY





Industry-leading programs and technologies help law enforcement agencies improve public safety

Speeding is involved in nearly one-third of all traffic fatalities nationwide, according to the National Highway Traffic Safety Administration. Prevention is critical to saving lives, improving public safety and protecting taxpayer funds.

Our solutions enable law enforcement agencies to detect and deter incidents on a 24/7 basis while changing driver behavior over time.

Benefits of Speed Cameras



Detect and Deter Speeding, Wherever and Whenever



Independently Proven to Change Driver Behavior



Decrease Violations and Crashes, Ultimately Saving Lives



Improves Officer Safety, Negating Need to Chase Violators



Maximize Police Resources and Time



Insightful Analytics to Monitor Traffic Trends



Protect Public Funds and First-Responder Resources



No Upfront Capital Investment

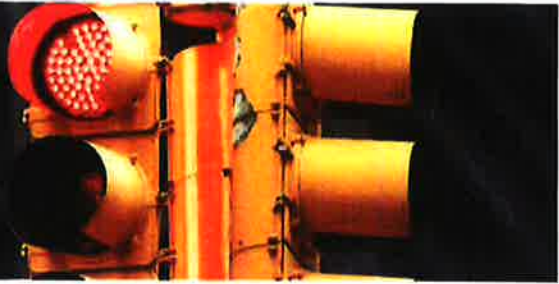


DEPLOYMENT SOLUTIONS FOR ANY ENVIRONMENT

Redflex speed solutions come in a variety of deployment options – including permanent, semi-permanent, mobile and handheld – to meet diverse municipality needs and regulations. They are suitable for an array of cities, environments, challenges and terrains.

Your Public Safety Partner

Trusted by cities and government agencies for more than two decades, Redflex delivers comprehensive, tailored solutions to combat traffic enforcement. We comply with AICPA 508 audit standards, and all operational processes are provided in-house, without outsourcing sensitive data. We are proud to offer you the highest level of care in our business practices.



Industry-leading Technology

- Dual speed detection providing two independent data points, eliminating the most common citizen court challenges
- Ability to capture concurrent and consecutive incidents across multiple lanes
- Evidence packages with HD video and clear photos, even in low-light or poor weather conditions
- Highly secure capture process, with all data digitally signed, encrypted and secured



Customizable, Turnkey Programs

- Includes all installation and ongoing maintenance
- Ability to select custom criteria for Redflex processing specialists to review
- Back office integration with agency's court database system to seamlessly exchange information about a violation's status
- Payment processing through a program lockbox or connected to the agency's system



Incident Verification & Processing

- Comprehensive verification process of each incident prior to submitting to law enforcement
- In-house citation printing and mailing, freeing up municipality time and resources



Customer Service Suite for Drivers

- In-house, multi-lingual call center where the public can speak with a customer service representative 11 hours a day, five days a week; as well as a 24/7 automated service for citation information and to submit payment
- Online support center where drivers can view images and video of violations, and make payments



Transparency & Community Engagement

- Assistance with site selection using traffic surveys, historical data and resident feedback
- Guidance designing and implementing a community outreach program to educate drivers about speeding and the role of photo enforcement

About Redflex Traffic Systems

Redflex Traffic Systems® develops and delivers innovative, trusted traffic safety solutions – reducing crashes, saving lives, protecting public funds, and improving security and mobility – in communities across the Americas. Redflex is a reliable, welcome partner to municipalities throughout the Americas. Since pioneering the Americas' first photo enforcement program more than 20 years ago, Redflex has partnered with more than 500 communities and government agencies to improve traffic safety and public security.

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**Code Compliance
Review/Process**

CODE COMPLIANCE PROCESS

