

## Florida Red Light Camera Programs

February 7, 2014

As directed by the Legislature, OPPAGA examined red light camera programs implemented by Florida cities and counties and answered five questions.

1. How do Florida's local governments implement and operate red light camera programs?
2. How much revenue do Florida's local government red light camera programs generate?
3. What has been the experience in other states with red light camera programs?
4. How many violations and crashes are occurring in Florida jurisdictions with red light camera programs?
5. Are there options for modifying red light camera programs in Florida?

### Background

Traffic infraction detectors, also known as "red light cameras," are used to enforce traffic laws by automatically photographing vehicles whose drivers run red lights. A red light camera is connected to sensors that monitor traffic flow at a crosswalk or stop line and is connected either to another sensor that detects when the traffic light changes color or to an infrared camera that can detect when the light has changed to red. The system continuously monitors the traffic signal, and the camera is triggered by any vehicle entering the intersection above a pre-set minimum speed and following a specified time after the signal has turned red. A second photograph typically shows the red light violator in the intersection. In some cases, video cameras are also used. Cameras record the license plate number, date, time, time elapsed since the beginning of the red signal, and vehicle speed. Red light cameras have been used in at least 33 countries since the 1970s.

In 2010, the Florida Legislature created the Mark Wandall Traffic Safety Program via Ch. 2010-80, Laws of Florida, authorizing the Department of Highway Safety and Motor Vehicles (DHSMV), counties, and municipalities to use cameras to detect a driver's failure to stop at a traffic signal.<sup>1</sup> Under the law, DHSMV may install or authorize installation of red light cameras on any state road under the original jurisdiction of the Department of Transportation (DOT), when permitted by DOT.<sup>2</sup> Counties may install or authorize installation on streets and highways in unincorporated areas of the county in accordance with DOT standards and on state roads in unincorporated areas of the county when permitted by DOT. Municipalities may install or authorize installation of red light cameras on streets and highways in accordance with DOT standards and on state roads within the incorporated area when permitted by the department. Municipalities and counties are not required to have a permit when the road is not under DOT jurisdiction, but they must be in accordance with DOT placement and installation specifications.

<sup>1</sup> Violation of ss. 316.074(1) and 316.075(1)(c)1., F.S.

<sup>2</sup> To obtain a permit for a red light camera, a jurisdiction must apply for a DOT General Use Permit and attach a letter in support of a red light camera at the location requested; permits are valid for five years. The permittee must follow the department's *Special Provisions to General Use Permit for New Installations of Traffic Infraction Detectors on the State Highway System*, which includes information that a jurisdiction should consider in the process of installing a red light camera; conditions under which cameras need to be relocated; and camera activation notification requirements. In addition, related construction plans must be signed and sealed by a Florida licensed professional engineer.

The law provides processes regarding required notifications, the issuance of citations to registered owners of motor vehicles, and defenses available to vehicle owners. The law also requires that local governments implement a public awareness campaign if they intend to use red light cameras. In addition, the law requires each governmental entity that operates a traffic infraction detector to submit to DHSMV an annual report that details the results of the detectors and the procedures for enforcement. The department must subsequently submit an annual summary report to the Governor and Legislature. The report must include a review of the information submitted by the counties and municipalities and any recommendations or suggested legislation.

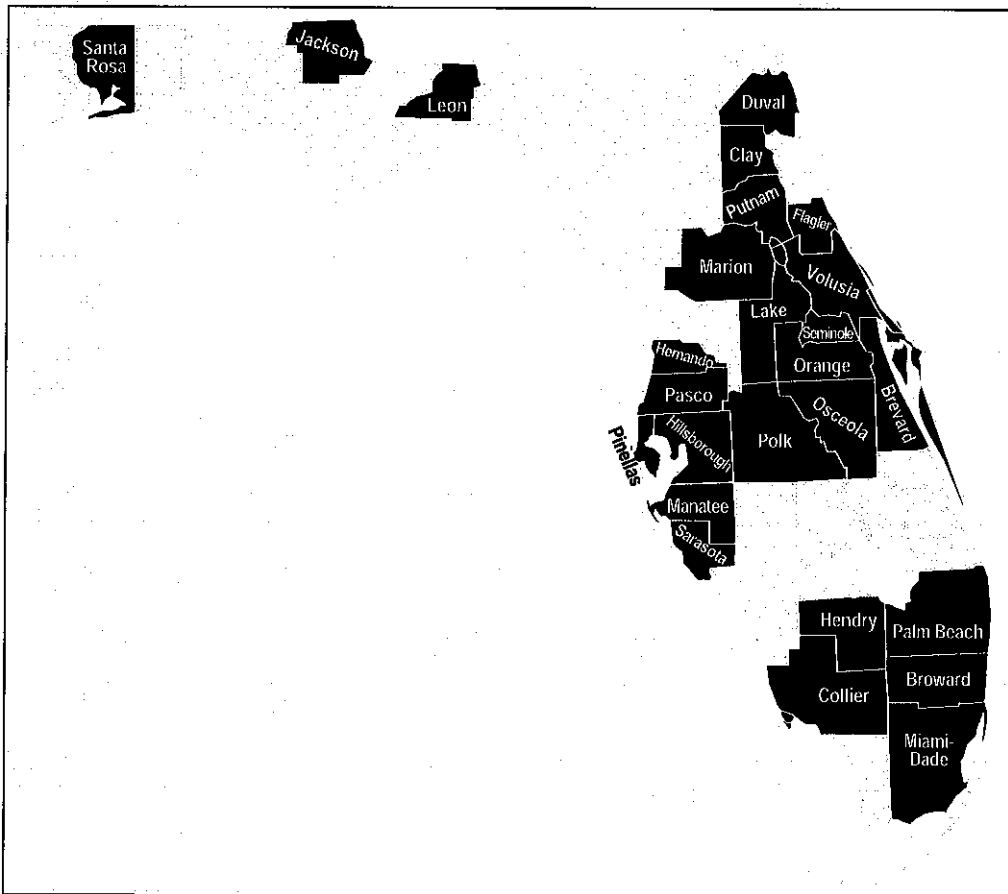
## Questions and Answers

### *How do Florida's local governments implement and operate red light camera programs?*

At the end of Fiscal Year 2012-13, 79 jurisdictions (74 municipalities, 5 counties) operated red light camera programs in 26 Florida counties.<sup>3,4</sup> Municipalities ranged in size from small cities with populations as low as 224, to large cities with populations over 413,000. The local governments with red light camera programs are located throughout the state, with most programs operating in Central and South Florida. (See Exhibit 1.)

## Exhibit 1

### There Are Red Light Camera Programs In 26 Florida Counties



Source: Department of Revenue.

<sup>3</sup> Although authorized to do so by state law, DHSMV has not implemented a red light camera program.

<sup>4</sup> Although they were active during Fiscal Year 2012-13, due to registration issues, red light camera programs operating in Duval County did not remit revenues to the Department of Revenue until January 2014.

The Department of Highway Safety and Motor Vehicles' most recent survey of local governments operating red light camera programs found that, as of June 30, 2013, cameras were installed at 922 approaches to intersections; there can be multiple cameras at each intersection.<sup>5</sup> According to Department of Transportation data for state roads, the majority of red light cameras were activated following the creation of the Mark Wandall Traffic Safety Program in 2010, although some jurisdictions had active cameras prior to 2010. In addition, DOT's data shows that the number of intersections on state roads with newly activated red light cameras steadily increased each year from 2007 to 2011. (See Exhibit 2.)

## Exhibit 2

### The Number of Red Light Camera Activations on State Roads Increased Significantly from 2007 to 2011

Year	Number of New Intersections Where Red Light Cameras Were Activated	Number of New Red Light Cameras Activated
2007	2	2
2008	12	16
2009	37	45
2010	82	145
2011	97	167
<b>Total</b>	<b>230</b>	<b>375</b>

Source: OPPAGA analysis of Department of Transportation data.

**Local governments consider several criteria when making red light camera placement decisions; use of countermeasures at red light intersections varies among jurisdictions.** OPPAGA's survey of local governments operating red light camera programs asked what criteria and/or methods jurisdictions use to identify red light camera locations.<sup>6</sup> Most respondents (66%) cited traffic crash data as the most important factor in red light camera placement decisions, with police observation cited as the next most important factor (33%). DHSMV's 2013 survey yielded similar results. When the department asked respondents to rank the importance of several criteria for red light camera placement decisions, traffic crash data (61%) was the most frequently reported criterion for red light camera placement, followed by law enforcement observations (32%).

Using information about a variety of factors, engineering countermeasures can be developed to help reduce the occurrence of hazardous driver behaviors such as red light running.<sup>7</sup> Countermeasures for red light running include ensuring that the traffic signal is visible from a sufficient distance and captures the motorists' attention; increasing the likelihood of stopping for the red signal once it has been seen; addressing intentional violations; and eliminating the need to stop. Selecting the most appropriate countermeasures for red light running depends on individual intersection characteristics and can only be determined after conducting an engineering study that investigates existing intersection design elements and intersection safety as related to red light running and the occurrence of red light violations.

<sup>5</sup> As required by law, DHSMV surveyed 79 jurisdictions with red light camera programs; the department received 75 responses (a 95% response rate). The survey collected information on notices of violation and uniform traffic citations; intersection selection; effects on safety; personnel; right-turn on red; other uses of red light camera images; and consideration for ordinance repeal. Survey questions related to activities from July 1, 2012 through June 30, 2013.

<sup>6</sup> OPPAGA conducted a survey of jurisdictions currently operating red light camera programs. We sent surveys to 80 jurisdictions and received 61 completed responses (a 76% response rate). We asked respondents to report on red light camera program start date; the number of intersections and approaches monitored; camera location criteria; countermeasures implemented; types of violations enforced; third-party vendor roles and contract structure; yellow light change interval criteria; revenues and expenses; and red light camera violation data. Sixty of our 61 survey respondents reported cameras at 741 approaches to 465 intersections as of June 30, 2013. In analyzing responses, we excluded respondents that did not provide a complete response to the question.

<sup>7</sup> Factors include demographic characteristics (e.g., age and gender); human behavioral factors (e.g., driver inattention and speeding); vehicular characteristics (e.g., larger-sized vehicles); and intersection characteristics (e.g., traffic volumes and time of day).

Although national and state transportation organizations strongly recommend the use of countermeasures, OPPAGA's survey results indicate that most (56%) of the respondents did not implement countermeasures prior to installing red light cameras. Of the jurisdictions that did implement countermeasures prior to installing red light cameras (44%), the most frequent types of countermeasures were

- installation of signal ahead signs;
- use of LED signal lenses;
- modification of signal-cycle length; and
- alteration of yellow light change intervals.

**Yellow light change intervals are relevant to red light camera programs because altering their duration can affect the frequency of red light running.** A study published in 2004 that examined before-and-after effects of increasing the yellow light change interval on red light running found that increasing yellow light duration by 0.5 seconds to 1.5 seconds decreased red light violations by at least 50%.<sup>8</sup> Similarly, a 2007 report by the Insurance Institute for Highway Safety found that in the city studied, yellow light timing changes reduced red light violations by 36%.<sup>9</sup> Most recently, a 2012 National Cooperative Highway Research Program report noted that the "best estimate" of the effect of increasing yellow light change intervals, "based on better designed studies," is about a 36% to 50% reduction in red light running.<sup>10</sup>

The Institute of Transportation Engineers has a formula that calculates the yellow light interval as a function of driver perception/reaction time, speed of approaching vehicles, deceleration rate, acceleration due to gravity, and grade of road. For years, traffic engineers used 1.0 second for the perception/reaction time in the calculation of the formula. However, recent research indicates that using a value greater than 1.0 second would encompass the reaction times of a larger proportion of the driver population. Based on these research results, the Florida Department of Transportation recently revised requirements for yellow light timing across all of the state's jurisdictions. DOT increased the perception/reaction time to 1.4 seconds, effectively increasing the department's previous minimum yellow light change interval by 0.4 seconds. This increase will allow additional time for Florida drivers to perceive the traffic signal change from green to yellow. Intersections with existing red light cameras were required to comply with the new standards by December 31, 2013.

DOT officials reported that the department enters into traffic signal maintenance agreements with counties and municipalities, and these agreements are the mechanism for ensuring that jurisdictions comply with yellow light timing and other traffic signal standards. In addition, department staff conducts field tests and quality assurance reviews that encompass a number of issues, including yellow light interval timing. According to OPPAGA's survey of counties and municipalities that operate red light camera programs, most (58%) jurisdictions reported using DOT standards for yellow light interval timing, while some (43%) jurisdictions reported not having the authority to change yellow light interval timing, as it is often managed at the county level for many cities and towns.<sup>11</sup>

<sup>8</sup> Bonneson, J.A. and K.H. Zimmerman. "Effect of Yellow-Interval Timing On Red-Light-Violation Frequency at Urban Intersections." In: Proceedings of the Transportation Research Board 83<sup>rd</sup> Annual Meeting, Washington, D.C., 2004.

<sup>9</sup> Retting, R.A., S.A. Ferguson, and C.M. Farmer. "Reducing Red Light Running Through Longer Yellow Signal Timing and Red Light Camera Enforcement: Results of a Field Investigation." Insurance Institute for Highway Safety, January 2007.

<sup>10</sup> McGee, H., K. Moriarty, K. Eccles, M. Liu, T. Gates, and R. Retting. "Guidelines for Timing Yellow and All-Red Intervals at Signalized Intersections." National Cooperative Highway Research Program, Report 731, 2012.

<sup>11</sup> These percentages are not additive because some jurisdictions reported both, i.e., that yellow light timing is not under their jurisdiction and that DOT standards are being followed.

**Jurisdictions use red light cameras to enforce several types of traffic infractions.** In addition to using red light cameras to enforce red light running, OPPAGA's survey found that jurisdictions use the devices for other traffic infractions. For example, some jurisdictions also use cameras to enforce right turns on red without making a complete stop (57%) and right turns on red at intersections with "No Turn on Red" signs (30%).<sup>12</sup> (See Exhibit 3.)

### Exhibit 3

#### Local Governments Use Red Light Cameras to Enforce Several Types of Violations

Infraction	Percentage of Jurisdictions Enforcing Violation
Running a red light	100%
Turning right on red without coming to a complete stop	57%
Turning right on red when a "No Turn on Red" sign is posted	30%

Source: 2013 OPPAGA Red Light Camera Local Jurisdiction Survey.

These results are consistent with DHSMV's 2013 survey, which found that 59% of survey respondents reported issuing notices of violation for right turns. However, the department's survey also found that only 15 jurisdictions reported having policies that define "careful and prudent," the standard used to determine if a notice of violation should be issued. According to DHSMV, definitions of "careful and prudent" varied widely by jurisdiction.

#### *How much revenue do Florida's local government red light camera programs generate?*

**State and local red light camera revenue has increased more than 200% since Fiscal Year 2010-11.** Section 316.0083, *Florida Statutes*, establishes the penalty for violations detected by red light cameras. Violators must pay \$158 to the jurisdiction that issued the notice of violation. The statute also establishes a schedule for allocating penalty revenues to the state and local government. If a county or municipality operates the red light camera program, the jurisdiction retains \$75 and remits \$83 to the Department of Revenue (\$70 for the General Revenue Fund; \$10 for the Department of Health Emergency Medical Services Trust Fund; and \$3 for the Brain and Spinal Cord Injury Trust Fund).<sup>13</sup> Funds deposited into the Emergency Medical Services Trust Fund are distributed as provided in s. 395.4036(1), *Florida Statutes*, and those deposited into the Brain and Spinal Cord Injury Trust Fund are distributed quarterly to the Miami Project to Cure Paralysis.

Red light camera program revenues have increased significantly over the last three fiscal years. Between Fiscal Year 2010-11 and Fiscal Year 2012-13, total revenues grew from \$37.6 million to \$118.9 million, an increase of 215%. (See Exhibit 4.)

<sup>12</sup> In addition, some OPPAGA survey respondents noted that their jurisdictions have used video footage from red light cameras for other criminal investigations. For example, two municipalities reported that red light camera footage has been used to investigate hit and run collisions, homicides, aggravated assaults, abductions, thefts, and other cases.

<sup>13</sup> If DHSMV operated a red light camera program, the revenue distribution would be \$100 to the General Revenue Fund; \$10 to the Department of Health Emergency Medical Services Trust Fund; \$3 to the Brain and Spinal Cord Injury Trust Fund; and \$45 to the local government.

**Exhibit 4**

**Red Light Camera Revenues Have Increased Significantly Since Fiscal Year 2010-11**

Revenue Allocations	Fiscal Year 2010-11	Fiscal Year 2011-12	Fiscal Year 2012-13
General Revenue Fund	\$16,666,670	\$43,070,985	\$52,663,609
(Department of Health Emergency Medical Services Trust Fund <sup>1</sup> )	(2,379,860)	(6,143,495)	(7,534,049)
(Brain and Spinal Cord Injury Trust Fund)	(728,321)	(1,851,361)	(2,257,262)
(County or Municipality <sup>2,3</sup> )	(17,868,841)	(46,143,833)	(56,435,169)
<b>Total</b>	<b>\$37,643,692</b>	<b>\$97,209,674</b>	<b>\$118,890,089</b>

<sup>1</sup> Prior to enactment of Ch. 2012-181, *Laws of Florida*, these funds were deposited into the Department of Health Administrative Trust Fund.

<sup>2</sup> Although they were active during Fiscal Year 2012-13, due to registration issues, red light camera programs operating in Duval County did not remit revenues to the Department of Revenue until January 2014; these revenues are not included in the table.

<sup>3</sup> County or municipality amounts are extrapolated from the total amount based on the known proportion received by the Department of Revenue.

Source: OPPAGA analysis of Department of Revenue data.

Of the local governments that reported revenues to the Department of Revenue in Fiscal Year 2012-13, a small number of jurisdictions accounted for a large portion of the \$56.4 million in local red light camera revenues. During the period, 6 jurisdictions accounted for 30% of total local revenues, 10 jurisdictions accounted for 40%, and 15 jurisdictions accounted for 51%. (See Exhibit 5.)

**Exhibit 5**

**Fifteen Jurisdictions Accounted for Half of Local Revenue from Red Light Camera Violations in Fiscal Year 2012-13**

Jurisdiction	Jurisdiction Revenue	Cumulative Percentage of Total Revenue to Jurisdictions
1. Miami	\$5,841,750	10%
2. Miami Gardens	2,889,975	15%
3. (Tampa)	(2,786,695)	(20%)
4. Apopka	1,835,625	24%
5. North Miami	1,822,345	27%
6. Orlando	1,725,300	<b>30%</b>
7. Hollywood	1,587,225	33%
8. Boca Raton	1,435,173	35%
9. (St Petersburg)	(1,433,043)	(38%)
10. Aventura	1,423,125	<b>40%</b>
11. Hillsborough County	(1,317,810)	(43%)
12. Kissimmee	1,310,775	45%
13. Sweetwater	1,254,290	47%
14. Fort Lauderdale	1,217,546	49%
15. Brooksville	1,114,650	<b>51%</b>

Source: OPPAGA analysis of Department of Revenue data.

**Nearly 50% of fines collected by local governments are used to pay red light camera vendors.** Jurisdictions responding to OPPAGA's survey reported that their largest red light program expense is payments to vendors, which accounted for 49% of total money collected through red light violations over a three-year period. A majority of respondents (78%) reported excess revenue after payments to vendors and other program expenses. However, some jurisdictions (16%) have had difficulty generating sufficient revenue to make payments to vendors and have accrued outstanding balances. Of the respondents that had excess revenues, 76% reported that they allocate these funds to a general revenue fund. Other uses of excess revenue included public safety/police (14%) and road repair and maintenance and other municipal services (5%).

To examine the financial arrangement between jurisdictions and red light camera vendors, we reviewed 36 contracts and city ordinances from 20 unique jurisdictions.<sup>14</sup> We found that jurisdictions typically pay vendors between \$4,250 and \$4,750 per camera, per month. These payments cover costs associated with site selection; camera installation, operation, and maintenance; review of possible violations; violation issuance; payment collection; data collection; and customer service. In general, fees are fixed for the duration of a contract, although unit prices can increase based on changes in the Consumer Price Index.

Contracts vary in length, but generally range from three to five years with the option to extend for additional shorter terms (e.g., five years). Typically, contracts are approved and signed by the jurisdiction's governing entity (e.g., city council or county commission) and include terms and conditions for early termination. Contracts often state that either party may terminate the contract at any time without penalty for several reasons.

- State or federal statutes are amended to prohibit the operation of red light cameras or make it impractical to operate red light cameras or impose restrictions on revenues and uses contrary to the agreement.
- A court rules that a jurisdiction's red light camera program is invalid or inadmissible as evidence or makes it impracticable to operate red light cameras.
- A vendor fails to pay revenues to the jurisdiction as required by the contract.
- The other party commits any material breach of the contract.

If a jurisdiction terminates its contract with the vendor for any other reason, it may be required to pay an early termination fee. The vendor may charge a fee calculated on a per month, per fixed camera location basis for each month remaining in the contract. In other instances, the early termination fee is based on a lump sum per camera amount calculated on a pro rata basis depending on the number of months remaining in the contract.

### *What has been the experience in other states with red light camera programs?*

Estimates of the safety effects of other states' red light camera programs vary considerably. As of December 2013, 502 communities in the U.S. had red light camera programs. The experiences of other states and jurisdictions that have implemented red light camera programs vary widely. Many studies have concluded that red light cameras are effective at improving public safety, while some have drawn the opposite conclusion. Still many others have yielded inconclusive results about the safety effectiveness of red light camera programs.

For example, a 2002 study conducted in Oxnard, California found that injury crashes declined by 29%, angle crashes declined by 32%, and overall crash severity decreased by 68% at red light camera intersections.<sup>15</sup> Conversely, a study published in 2002 on Greensboro, North Carolina's program found a 40% increase in total crashes, a 40% to 50% increase in property damage and possible injury crashes, and a statistically significant increase in rear-end crashes at red light camera intersections.<sup>16</sup> Moreover, a study released in 2012 on Las Cruces, New Mexico's program reported inconclusive findings. The study's authors found positive traffic safety effects from red light cameras at one

<sup>14</sup> Some jurisdictions had multiple contracts available due to contract amendments or extensions since program inception.

<sup>15</sup> Retting, R. and S. Kyrychenko. "Reductions in injury crashes associated with red light camera enforcement in Oxnard, California." *American Journal of Public Health* 92(11): 1822-1825, 2002.

<sup>16</sup> Burkey, M.L. and K. Obeng. "A Detailed Investigation of Crash Risk Reduction Resulting From Red Light Cameras in Small Urban Areas." Updated Final Report. Urban Transit Institute, North Carolina Agricultural/Technical State University, Greensboro, July 2004.

intersection, negative traffic safety effects at two other intersections, and inconclusive results at another intersection.<sup>17</sup>

**Red light camera research results differ due to wide variation in factors examined; many studies have been limited by methodological concerns.** Many studies have reviewed the red light camera safety effectiveness literature and concluded that there is no well-accepted consensus on whether red light cameras are effective at improving public safety because of wide variation in research techniques and considerations. Studies differ significantly across many factors, including

- type of accident considered;
- degree to which accident severity is considered;
- area of study (e.g., camera intersections only versus jurisdiction-wide);
- use and designation of comparison intersections;
- treatment type (e.g., cameras only versus cameras plus warning signs);
- sample size;
- geographic location and scope (e.g., statewide versus jurisdiction); and
- statistical procedure.<sup>18</sup>

Moreover, most red light camera effectiveness studies to date have been limited by methodological difficulties that raise questions about their conclusions. Two significant methodological concerns found in the literature are regression to the mean and spillover effects. (Regression to the mean is the statistical tendency for locations chosen because of high crash histories to have lower crash frequencies in subsequent years even without treatment. Studies of red light camera effectiveness that do not account for regression to the mean are likely to result in exaggerated positive effects of red light cameras. Conversely, failure to account for spillover effects may lead to an underestimation of red light camera benefits.) Spillover effects refer to cases where the installation of a red light camera system at isolated locations may influence the behavior of motorists at any given traffic signal in a jurisdiction.

According to the National Cooperative Highway Research Program, a proper red light camera safety evaluation should employ a robust study design that uses multiple years of valid crash and roadway data (e.g., weather conditions and traffic volume), accounts for other factors that may cause changes in crash frequency, and employs defensible statistical procedures. The evaluation should consider not only the effects on overall crash frequency, but also the effects on crashes by type and severity. In most cases, some form of a comparison group of sites without red light cameras will be needed to account for other factors that may affect the frequency of crashes at red light camera locations.

### ***How many violations and crashes are occurring in Florida jurisdictions with red light camera programs?***

**Notices of violation and uniform traffic citations issued by jurisdictions with red light camera programs have increased significantly since Fiscal Year 2010-11.**<sup>19</sup> (Based on OPPAGA survey results, notices of violation issued and notices of violation paid increased significantly from Fiscal Year 2010-11 to Fiscal

<sup>17</sup> Moghimi, A., S. Meyer, A. Muhanga, K. Padilla, and H. Sohn. "Assessment of Impact of City of Las Cruces Safe Traffic Operations Program on Intersection Traffic Safety Before-and-After Analysis of Crash and Violation Data Preliminary Report." A Report on Research Sponsored by City of Las Cruces Public Works Department, August, 2012.

<sup>18</sup> Statistical procedures have included simple before-and-after comparisons, control group methods, and statistical modeling.

<sup>19</sup> Based on data from 27 survey respondents that provided complete responses to the questions on notices of violation and uniform traffic citations.



Year 2011-12, and increased slightly from Fiscal Year 2011-12 to Fiscal Year 2012-13.<sup>20</sup> Specifically, notices of violation issued increased by 72% from Fiscal Year 2010-11 to Fiscal Year 2011-12, but increased by only 4% from Fiscal Year 2011-12 to Fiscal Year 2012-13. With regard to uniform traffic citations, the number increased by 267% from Fiscal Year 2010-11 to Fiscal Year 2011-12, and then decreased by 49% from Fiscal Year 2011-12 to Fiscal Year 2012-13.<sup>21</sup> (See Exhibit 6.)

### Exhibit 6

#### Notices of Violation and Uniform Traffic Citations Increased Significantly in the First Year of Red Light Camera Program Implementation but Have Recently Experienced Smaller Increases or Have Decreased

Action	Percentage Change from FY 2010-11 to FY 2011-12	Percentage Change from FY 2011-12 to FY 2012-13
Notices of Violation Issued	+72%	+4%
Notices of Violation Paid	+81%	+9%
Notices of Violation Dismissed	+38%	-8%
Uniform Traffic Citations Issued	+267%	-49%

Source: 2013 OPPAGA Red Light Camera Local Jurisdiction Survey.

**Crashes resulting in fatalities decreased at red light camera intersections on state roads but rear-end and angle crashes increased.** The crash data available to OPPAGA forms the foundation of information necessary to conduct a robust estimation of red light camera safety effects. Due to the methodological issues described earlier, the available data has some limitations, which restricted our analysis to pre- and post-camera installation comparisons. The use of this data affects our ability to draw definitive conclusions regarding the safety effectiveness of red light cameras. However, we can use the data to examine overall crash trends in recent years at red light camera intersections.

Jurisdictions that operate red light camera programs do not uniformly gather or report crash data specific to red light camera intersections. Thus, OPPAGA had to rely upon crash data for red light camera intersections on state roads. To examine crash activity in Florida jurisdictions that have red light camera programs, we reviewed data on fatalities, injuries, crashes by type (e.g., rear-end, angle, sideswipe, etc.), and other characteristics of crashes that occurred at 230 intersections; the data was provided by the Department of Transportation.<sup>22</sup> The intersections have red light cameras that cover at least one state-owned road and are located across 18 counties. For each of the intersections, the data cover a period of 21 and 36 months before the camera activation date to between 21 and 36 months after activation.<sup>23</sup> We calculated before and after differences and percentage changes in crashes, fatalities, and injuries for each intersection statewide and by county.<sup>24</sup>

<sup>20</sup> A notice of violation for red light running must be sent to the registered owner of the motor vehicle involved in the violation within 30 days after the violation. The violator must pay the penalty of \$158 or request a hearing within 60 days following the date of the notification in order to avoid the issuance of a traffic citation.

<sup>21</sup> A uniform traffic citation is issued if a violator does not pay the penalty, furnish an affidavit in accordance with s. 316.0083(1)(d), F.S., or request a hearing within 60 days of issuance of the notice of violation.

<sup>22</sup> A large portion of the data originates from the DHSMV *Florida Traffic Crash Report – Long Form*, which is completed by local law enforcement officers for each crash that involves driver and/or pedestrian injury, driver and/or pedestrian fatality, is alcohol- or drug-use-related, and/or involved someone not remaining at the scene of the accident. Crash reports are submitted to DHSMV electronically or by mail on a weekly basis; the department enters the data into a database and regularly shares the database with DOT. DOT staff has combined the DHSMV data with other DOT data for red light camera intersections on state roads.

<sup>23</sup> The length of the query period ranges from 21 to 36 months for the “before red light camera” and “after red light camera” periods because data availability varies across jurisdictions.

<sup>24</sup> The earliest camera activation date was April 1, 2007, and the latest camera activation date was August 3, 2011. The before and after differences represent crash trends over a period of three and a half to six years for intersections with red light cameras.

When examining crashes by type at red light camera intersections on state roads, we determined that statewide, crashes resulting in a disregarded traffic signal citation decreased by 19% and those resulting in fatalities decreased by 49%.<sup>25</sup> However, angle crashes (the crashes most commonly associated with *red light running*) increased by 22% at red light camera intersections. In addition, rear-end crashes (the crashes most commonly associated with the *presence of red light cameras*) increased statewide by 35% at red light camera intersections during the study period.<sup>25</sup> Total crashes at these intersections also increased by 12%. It should be noted that there were significant decreases in crashes not typically identified as associated with red light running; these include sideswipe and head-on crashes. (See Exhibit 7.)

### Exhibit 7

#### Crashes Resulting in Fatalities Decreased at Red Light Camera Intersections on State Roads; Rear-End, Angle, and Total Crashes Increased<sup>1</sup>

Crash Data		Number Before Camera Activation	Number After Camera Activation	Difference (Percentage) <sup>2</sup>
Rear End, Angle, and Other Crashes	Rear-End Crashes	4,032	5,454	1,422 (+35%)
	Angle Crashes	1,560	1,909	349 (+22%)
	Sideswipe Crashes	987	154	-833 (-84%)
	Head-On Crashes	363	262	-101 (-28%)
	Other Crashes	2,907	3,256	349 (+12%)
<b>Rear End, Angle, and Other Crashes Total</b>		<b>9,849</b>	<b>11,035</b>	<b>1,186 (+12%)</b>
Crash Results <sup>3</sup>	Crashes Resulting in Fatalities	37	19	-18 (-49%)
	Crashes Resulting in Injuries	5,091	5,023	-68 (-1%)
	Crashes Resulting in Failure-to-Yield Citation	975	1,032	57 (+6%)
	Crashes Resulting in Disregarded Traffic Signal Citation	491	396	-95 (-19%)

<sup>1</sup> Left-turn crashes were not reported for any intersections in the database used for the analysis.

<sup>2</sup> Weighted monthly averages of the crash data were calculated for before and after camera activation time periods and resulted in the same percent difference values.

<sup>3</sup> The crash data in the last four rows represent crash outcome rather than type. The data in these rows should not be summed because one crash may yield multiple outcomes.

Source: OPPAGA analysis of Department of Transportation data.

Among the counties with red light camera intersections on state roads, nearly 40% had increases in rear-end and angle crashes.<sup>26</sup> Seven of the 18 counties that we examined experienced increases in both rear-end and angle crashes during the study period, and 5 counties experienced decreases in both types of crashes. (See Exhibit 8.) Two counties did not experience a change in either type of crash, and four counties experienced mixed results.

Most of the increases in rear-end and angle crashes occurred in two counties: Miami-Dade County and Broward County. Miami-Dade County accounted for 71% and 76% of the statewide increases in rear-end and angle crashes, respectively. Broward County accounted for 24% and 17% of the statewide increases in rear-end and angle crashes, respectively. (The two counties accounted for 95% of the statewide increase in rear-end crashes and 93% of the statewide increase in angle crashes.)

<sup>25</sup> DHSMV's 2013 report on jurisdictions operating red light camera programs found that "although most jurisdictions reported a decrease in crashes at intersections with red light cameras, the crash data maintained by the Department indicates that crashes at traffic control signal intersections typically increased, both statewide and in the surveyed jurisdictions." According to the report, the increase was 21% from 2011 to 2012 for all signalized intersections.

<sup>26</sup> Our analysis does not include red light camera programs that are implemented exclusively on local (not state-owned) roads and therefore is not representative of all jurisdictions with red light camera programs.

**Exhibit 8****When Comparing Crashes Pre- and Post-Red Light Camera Activation, Seven Counties Experienced Increases in Rear-End and Angle Crashes and Five Counties Experienced Decreases in Both Types of Crashes**

County	Rear-End Crashes		Angle Crashes	
	Before-After Difference (Percentage Change)		Before-After Difference (Percentage Change)	
Brevard	1	(+8%)	NA <sup>1</sup>	
Broward	378	(+40%)	71	(+30%)
Clay	3	(+20%)	3	(+60%)
Miami-Dade	1,126	(+61%)	314	(+31%)
Pasco	11	(+10%)	3	(+15%)
Pinellas	4	(+9%)	9	(+69%)
Santa Rosa	20	(+400%)	4	(+200%)
Collier	-17	(-40%)	-5	(-45%)
Hillsborough	-98	(-26%)	-5	(-7%)
Marion	-4	(-80%)	-1	(-100%)
Orange	-21	(-10%)	-19	(-25%)
Seminole	-4	(-57%)	-2	(-67%)

<sup>1</sup> There were no angle crashes at locations with red light cameras in the pre-activation period; therefore, the percentage change cannot be calculated.

Source: OPPAGA analysis of Department of Transportation data.

***Are there options for modifying red light camera programs in Florida?***

Since the implementation of the Mark Wandall Traffic Safety Program in 2010, Florida's red light camera programs have continued to be of interest to policymakers. (Most recently, the 2013 Legislature took action to improve the state's red light camera programs.) Chapter 2013-160, *Laws of Florida*, provided guidance to the Department of Highway Safety and Motor Vehicles and local governments as to what constitutes a "careful and prudent manner" for issuing a red light camera citation for a right-on-red violation. In addition, the law allows a person issued a notice of violation for a red light camera violation to elect to receive a hearing within 60 days of the notice of violation and provides that no payment or fee may be required in order to receive the hearing. To facilitate the hearings, local governments may use currently appointed code enforcement boards or special magistrates.

The Legislature could consider additional options for further enhancing jurisdictions' implementation of red light camera programs, including ensuring that cameras are the appropriate method for reducing red light running, improving the quality of program data to facilitate robust evaluations of safety effectiveness, and standardizing operational and fiscal procedures. These options include modifying the permitting process, establishing operational standards, enhancing data reporting, and clarifying the use of red light camera program revenues. (See Exhibit 9.)

An important consideration in evaluating these options is their impact on local governments. For example, requiring countermeasures and traffic engineering studies would have a fiscal impact on jurisdictions.<sup>27</sup> Increasing reporting requirements would also likely increase costs to local governments, due to expenses associated with gathering and tracking detailed information for every intersection with a red light camera. In addition, some counties and municipalities may view mandating a traffic engineering study and restricting the use of red light camera program revenues as impeding upon their home rule authority.

<sup>27</sup> DOT estimates the cost of a traffic engineering study to be \$6,000 to \$8,000 per intersection.

Exhibit 9

The Legislature Could Consider Options for Further Modifying the State's Red Light Camera Programs

**MODIFY THE PERMITTING PROCESS**

**OPTION 1 – Require local jurisdictions seeking permits from the Department of Transportation (DOT) to provide demonstrable evidence that there is a genuine safety need for the use of a red light camera at an intersection; (DOT should develop the criteria for what constitutes acceptable demonstrable evidence)**

Demonstrable evidence could include the

- accident rate for the intersection;
- rate of red light violations occurring at the intersection (number of violations per number of vehicles);
- difficulty experienced by law enforcement officers in patrol cars or on foot in apprehending violators;
- ability of law enforcement officers to apprehend violators safely within a reasonable distance from the violation; and
- evidence of implementation of countermeasures.

**ESTABLISH OPERATIONAL STANDARDS**

**OPTION 2 – Require local jurisdictions to conduct a traffic engineering study prior to installation of a red light camera; DOT should determine what elements are to be included in the study**

The engineering study could include information regarding

- the current clearance intervals (yellow and all-red);
- whether the signal is coordinated with other signals along the corridor; and
- the current condition of other safety features (e.g., lane markings, speed limits, and signage).

**OPTION 3 – Establish a penalty for local jurisdictions determined to be out of compliance with DOT yellow light change interval standards**

**OPTION 4 – Establish a (uniform standard) to be used by local jurisdictions that enforce right turn on red violations at red light camera intersections**

**ENHANCE DATA REPORTING**

**OPTION 5 – Ensure compliance with current statutory reporting requirements by establishing a penalty for jurisdictions that do not report complete data by September 30 each year**

**OPTION 6 – Require local jurisdictions to annually report specific data, by intersection**

Data points should include the

- number of intersections and approaches to intersections with red light cameras;
- number of crashes by type (e.g., angle and rear-end) and by contributing factor (e.g., disregarded traffic signal and failure to yield);
- number of violations recorded, adjudicated, and appealed; and
- total amount of fines issued and fines paid.

**OPTION 7 – Direct the Department of Highway Safety and Motor Vehicles to collaborate with DOT to analyze and annually report crash data for red light camera intersections on state roads**

**CLARIFY USE OF REVENUE**

**OPTION 8 – Restrict local jurisdictions' use of surplus revenue from red light cameras to public or traffic safety expenditures**

Source: OPPAGA analysis.