MEMORANDUM

TO: Chair and Members of PSI

FROM: Joe Kubicki, Director – Transportation and Parking Management Department

DATE: Meeting of January 16, 2014

SUBJECT: An Intersection Public Safety Program – Stop On Red
Annual Performance Evaluation – 2013
Yellow Time Policy – Update

INTRODUCTION

City Council, on April 21, 2011 approved Resolution No. 2011-166 awarding a contract to furnish, install, operate and maintain a traffic infraction detector program to American Traffic Solutions ("ATS"). City Council directed staff to consider a program that focused on public safety with a goal of reducing the amount of red light running occurrences by motorists, by changing their current behavior, through enforcement.

The Intersection Public Safety Program – Stop On Red ("Program") is coupled with an ongoing public awareness campaign, and conventional police enforcement. In addition, the Transportation Department continually monitors and evaluates the Program's success, to ensure the Program coincides with its initial goals to:

1. Enhance safety at signalized intersections in St. Petersburg by reducing the frequency and/or severity of crashes caused by red-light running.
2. Provide an additional method of violation enforcement so that police can use resources to fulfill other objectives.
3. Raise awareness of safe driving practices in St. Petersburg.

An annual report of the effectiveness of the traffic safety cameras is conducted in order to ensure that the Program's goals are being achieved. This review is focused on two essential components of the Program; crashes and violations. Analysis of each of these components is attached under separate cover to this report.

The following page provides a summary of the Stop On Red Program in St. Petersburg over the last two years. The full 2013 Annual Performance Evaluation will be presented with this memorandum at the time of the meeting.

Summary of the Stop On Red Program In St. Petersburg

- Number of Traffic Safety Cameras: 22 cameras at 10 intersections.
  3.0% of the total signalized intersections.
  2.0% of the total signalized approaches.

- Number of Notice of Violations Issued: 36,185 (2012); 25,943 (2013) a 28% Reduction

- Funds Received from NOV's:

$70.00 to State -	$2,814,851
$10.00 to State Health Fund -	$ 402,122
$3.00 to State Brain Spinal Fund -	$ 120,636
$54.00 to Administrate Program -	$2,177,570
$21.00 to City General Fund -	$ 841,862
$158.00 Total NOV – to Date	$6,357,191

- Who Receives NOV's: 64% of Red Light Runners live outside the City (1st Yr)
  58% of Red Light Runners live outside the City (2nd Yr)

- Repeat Their Violations: 92% did not receive a second Notice of Violation (1st Yr)
  94% did not receive a second Notice of Violation (2nd Yr)

GOAL 1.

- Did the Program Reduce Crashes at Intersection Approaches with Traffic Safety Cameras?

  42.5% annual reduction in total red light running crashes.
  70.0 % annual reduction in red light running injury crashes.
  50.0 % annual reduction in red-light running rear-end crashes.

GOAL 2.

- Did we effectively increase Police Red Light Running Enforcement?

  PD continues to conduct weekly red light running enforcement details -
  = 1,601 citations;
  Stop On Red Program at 22 approaches -
  = 62,128 Notice of Violations;

GOAL 3.

- Did awareness of safe driving practices in St. Petersburg increase during year two?

  58% of drivers cited for running a red light live outside of the City.
  94% of drivers did not receive a second Notice of Violation.
  28% fewer Notice of Violations' were issued at the same 22 approaches in 2013.

BACKGROUND

The Program started with a 45-day warning period and a regional Public Information Program combined with the City of Tampa, whose Traffic Safety Camera Program started at the same time as ours. The first Notice of Violations started on October 29, 2011. Performance of the Program has been monitored and evaluated for the period of October 29, 2011 thru October 31, 2013. Even though this is a relatively short period of time to develop trends, there are many signs that the Program has been a success thus far with 22 Intersection Traffic Safety Cameras located at 10 intersections.

Notice of Violations: Notice of Violations were analyzed to determine the frequency and characteristics of red-light running. (Copy attached). The number of traffic safety camera Notices of Violation issued in the past year was 25,943, compared to 36,185 through the first year of the Program, a **28% reduction**. The numbers of Notice of Violations being issued from the traffic safety cameras are trending down, decreasing over the year, which was anticipated as motorists learn to adjust their driving behavior. It is anticipated that this trend will continue; however, an analysis of comparable months over time will be required to monitor trends. During the same two year period the Police Department issued 1,601 Uniform Traffic Citations, for the remaining 1,031 signalized intersection approaches, not monitored by Traffic Safety Cameras.

It is also important to note that the City's Business Rules, related to the issuing of Notice of Violations is very conservative and 52% of all possible violations sent to the City by ATS as possible infractions are rejected after review by a Traffic Infraction Enforcement Officer. After a full review of those Notice of Violations issued, 24% were issued for Left-turns, 45% were issued for thru movements, and 31% issued for Right-turns. During the second year of the Program, the majority of the violations 58% have been issued to vehicle owners registered outside of the City. In addition, Program data analysis shows the message is getting through so clearly that most drivers don't need to be told twice. Ninety-four percent of those that have received a red-light running violation have not received another, indicating a high level of compliance with the Program and a low rate of recidivism.

Rate of Violations: The number of violations per one million vehicles entering the intersection is used to compare approaches with one another. Analysis determined that the order of locations by violation rate varies slightly when compared to the total Notice of Violations issued. Violation rates between camera locations do however vary sharply between 62 violations per million vehicles entering the intersection to 421 violations. Southbound 34th Street / 38th Avenue S has the top violation rate and the right-turn movement is the direction with the highest rate.

When reviewing the violation rate for each of the 22 camera approaches by movement (Left, Thru, Right), 2 left-turn movement violations ranked the highest and 11 approaches had thru movements, leaving 9 as right-turn movements that ranked the highest for that camera approach. This illustrates that there isn't a particular emphasis on right-turn enforcement, as some Programs experience.

Crash Summary – Crash data was analyzed comparing the 10 intersections with traffic safety cameras for the second year of the Program to the first year and the average over 3 years prior to the Program, to calculate the *Crash Frequency and Annual Average Crashes*. A detailed listing is illustrated in Table 7 through 12. Not only were crashes within the whole intersection analyzed, but crashes were evaluated based on whether they were associated with a camera approach, non-camera approach or at 10 comparable intersections without traffic safety cameras. A review of this analysis also illustrates that the Program is showing signs the City is heading in the correct direction, with crashes diminishing within all categories associated with red-light running.

A few of the critical categories, at approaches with Traffic Safety Cameras, comparing the average number of annual crashes for the first and second year to the average of three years prior to the program are as follows:

Annual Average Crash Comparison (at the 22 approached with Traffic Safety Cameras)

- **All** Red Light Running & Red Light Running Related - 42.5%
- Red Light Running **Injury** & Red Light Running Related Injury - 70.0%
- Red Light Running Related **Rear-End** - 50.0%
- Total **Intersection** Crashes - 6.5%

Revenue - Although safety, not revenue, is the key impetus for the Program, through the first year of the program, the City collected $3,589,149 in red-light running violations, compared to $2,768,042 this year. Over the two years, a total of 44% or $2,814,851 was transferred to the State; 6% or $402,144 to the Health Administration Trust Fund (for Statewide Trauma Centers); and, 4% or $120,636 to the Brain / Spinal Cord Injury Trust Fund. A total of 47% or $2,177,570 stayed with the City, of which 34% was utilized to off-set Program expenses incurred by the City's Budget, Police and Transportation Departments, leaving $841,862 for the General Fund.

Yellow Change Interval – On September 20, 2013 the Florida Department of Transportation (FDOT) revised the method of calculating yellow change intervals. In their Bulletin they state that in recent studies, researches have determined that a motorists' perception reaction time has increase and that 1.4 seconds should be used verses 1.0 seconds, when using the Institute of Transportation Engineers formula for calculating the yellow interval at signalized intersections.

The City of St. Petersburg has complied with the September 20, 2013 Memorandum at all intersections with Traffic Safety Cameras and will update the remaining signalized intersections prior to the June 30, 2015 deadline, as part of our traffic signal system software update currently underway. As we have reported previously, many of our signalized approached already meet or exceed the new timing required.

New Public Hearing Process 2013 - Changes in state legislation regarding traffic safety cameras (the Mark Wandall Traffic Safety Act) required the City make the following changes to the "Stop On Red" Program that took effect at midnight July 1, 2013.

Right on Red Violations: Prohibits issuance of a violation if the driver of the vehicle came to a complete stop before turning right, if permissible at a red light, but failed to stop before crossing over the stop bar or other point at which stopping is required.

> The City already had implemented a much less restrictive procedure allowing a motorist complete a right-on-red at 12 MPH or less, if done in a safe and prudent manner.

Notice of Violation: A person who receives a notice of violation (NOV) may request a hearing within 60 days of mailing the notification or pay $158 fine (previously 30 days, and no hearing on the NOV was permitted). Payment of fee may not be required before the hearing. The NOV must be accompanied by information on the persons' right to request a hearing and on all court costs that may be associated with the local hearing request (or direct the person to a website that contains that information). If an affidavit is submitted by the owner of the motor vehicle identifying another as the driver of the vehicle at the time of the violation, a NOV may be reissued to the driver within 30 days after receipt of the affidavit. Previously, the law allowed for transfer of the violation, but only at the higher fine amount.

> The City has implemented such a program and appeals are heard by a hearing master on the last Friday of the month at 1:30 PM in the Council Chambers. To date 46 appeals have been heard.

Uniform Traffic Citation: A person shall be issued a Uniform Traffic Citation (UTC) if they have not made payment or requested a hearing to challenge a NOV within 60 days of the mailing of the NOV.

> The City has also implemented this program which effectively gives additional 30-days to pay their Notice of Violation, in comparison to the original State Statute.

With these new amendments the program has addressed many concerns that had been raised, including those of the County Clerk of Court Ken Burke, and the moratorium imposed by the Mayor on March 7, 2013 on issuing UTC's to those who swear in an affidavit that they were not driving the vehicle at the time of the infraction, was lifted at the time the legislation became effective on July 1, 2013

NEXT STEPS

On April 21, 2011 the City initiated the Stop On Red Program. The provisions of this contract allow the City the option to terminate the contract after 12 months if determined appropriate. Administration is also authorized to add or delete traffic safety cameras as needed, up to the appropriation amount Council authorizes. Traffic safety cameras have been located based on a comprehensive evaluation including 21 separate factors, (see attached) categorized under: Danger Index, Feasibility Index and a Human Factors Index. Installation was initially selected at 10 intersections and 22 individual approaches.

There are 298 signalized intersections in the City, with 1,053 approaches and only 22 or 2.0% of the intersection approaches have traffic safety cameras. Many of the intersections with the highest reported crashes related to red-light running are not able to be equipped for traffic safety cameras for various reasons. These intersections are left to the Police Department to enforce with conventional means.

Administration has confirmed that since the initial installation of 22 - traffic safety cameras the effectiveness of the Program and its' goals are being achieved and should continue.

CONCLUSION

The second annual evaluation of the Program provides indications that the goals of the Program are being met in that crashes related to red-light running continue to decrease. Administration has therefore verified that the traffic safety cameras are in the interest of public safety. Using traffic safety cameras to identify and control red-light running remains the best approach to supplement the City's ongoing traffic safety Programs, and reduce the number of motorists that run red-lights and the resulting red-light related crashes, injuries and deaths.

Without this Program, the City and the Police Department will not have the full resources necessary to reduce significant incidents and serious crashes associated with red light running. Also, without this Program, enforcement efforts will continue to have limited effect on changing driver behavior because of the very limited opportunity to cite red-light runners.

Based on the ongoing review of the Program, including violations issued and crash data analyzed, evidence overwhelmingly suggests that the City should continue the Program.

RECOMMENDATION

The City of St. Petersburg's Administration has determined that the Program has and should continue to provide additional reductions in severity and in the overall frequency of collisions at signalized intersections. A well-executed Program, including a clear, well-defined process can and does reduce crashes and injuries caused by red-light running. Based on the technical evaluation of crashes and Notice of Violations, after the first two years of the Program, it is recommended:

- That the Intersection Public Safety Program – Stop On Red be continued, to reduce the occurrences of red light running, through a photo enforcement program using traffic safety camera technology, with ATS as the City's contractor;

- That performance evaluation reports be provided to City Council on an annual bases.

COST / FUNDING ASSESSMENT INFORMATION

Expenses for the Stop On Red Program are being off-set by the fees from the Notice of Violation being issued to motorists' for failure to stop for a solid red traffic signal indication.

ATTACHEMENTS

Traffic Safety Camera – Installation Criteria
Annual Performance Evaluation - Notice of Violations
Annual Performance Evaluation – Crash Analysis
FDOT September 20, 2013 Memorandum (Standardization of Yellow Change Intervals)

JK/mjf

An Intersection Public Safety Program
Stop On Red

Traffic Safety Camera – Installation Criteria

In reviewing candidate intersections for traffic safety cameras, consideration of several factors that would contribute to the propensity of motorists to run a red signal as well as the predisposition to modify driver behavior, are considered. So, as part of our full Intersection Public Safety Program, the criteria used to determine the location of traffic safety cameras is as follows:

1. Danger Index

- ✓ Overall Crash Frequency
- ✓ Overall Angle Crashes
- ✓ Overall Right-On-Red Crashes
- ✓ Red-Light Running Crashes
- ✓ Red-Light Running Crash Severity

2. Feasibility Index

- ✓ Congestion Level
  - Volume of Traffic
  - Vehicle Level of Service
  - Number of Vehicle Travel Lanes
  - Design of Left and Right Turn Lanes
  - Signal Timing
  - Signal Progression/Coordination
  - Violation Expectation

- ✓ Constructability
  - Sight Obstructions
  - Residential Areas
  - Obstructions
  - Intersection Design / Width

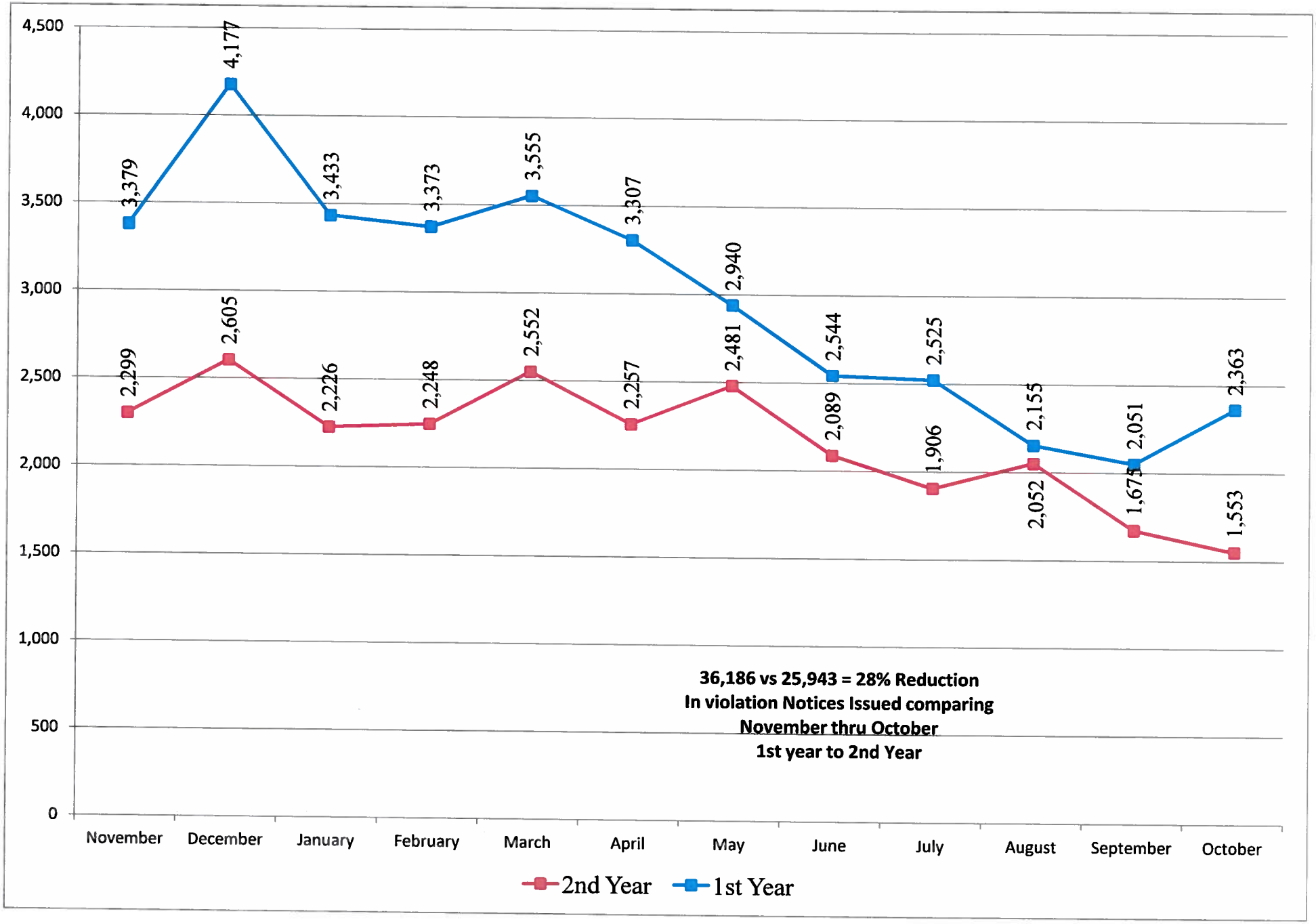
3. Human Factors Index

- ✓ Behavior Modification
- ✓ Geographical Distribution
- ✓ Halo Effect
- ✓ Education
- ✓ Enforcement by Police

City of St. Petersburg
Department of Transportation

Total Notice of Violations per Month
1st Year vs 2nd Year

Stop On Red.



I:\Transportation Planning\Neighborhood\Red Light Running\Performance Summaries\Monthly Performance Summary 2nd Year

Chart No 1

Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD, P.E.
SECRETARY

TRAFFIC OPERATIONS BULLETIN 02-13

Date: May 31, 2013

To: District Traffic Operations Engineers, District Maintenance Engineers, District Design Engineers, District Directors of Operations, and District Secretaries

From: Mark C. Wilson, P.E., State Traffic Operations Engineer

Copies: Brian Blanchard, Tom Byron, Duane Brautigam, Tim Lattner, Lora Hollingsworth

Subject: Standardization of Yellow Change Intervals for Signalized Intersections

Background

Section 3.6 of the Department's *Traffic Engineering Manual (TEM)* describes the methodology to be used to establish yellow change intervals and red clearance intervals at signalized intersections. The function of yellow change interval is to warn traffic of an impending change in the right-of-way assignment to provide a safe transition between two conflicting traffic signal phases. The function of the red clearance interval is to provide additional time following the yellow change interval to clear the intersection before conflicting traffic is released.

The TEM has historically used the Institute of Transportation Engineer's (ITE) kinematic equation for the computation of the yellow change interval and still does today. The 2009 FHWA Manual on Uniform Traffic Control Devices (MUTCD) states that a yellow change interval should have a minimum duration of 3 seconds and a maximum duration of 6 seconds. And, the duration of the yellow change interval shall be determined using engineering practices.

For years traffic engineers have generally used 1.0 second in the ITE formula for the perception/reaction time in the calculation, and many state and local agencies throughout the U.S. still do.

Recent research by the National Cooperative Highway Research Program (NCHRP), administered by the Transportation Research Board (TRB) indicates that using a PRT value greater than 1.0 second would encompass the reaction times of a greater proportion of the driver population. The research found that the 85th percentile PRT value was 1.33 seconds.

Implementation Process

Based on the research results the Department has decided to increase the PRT to 1.4 seconds.

This increased PRT value will allow additional time for Florida drivers to perceive the traffic signal change from green to yellow and to react. This effectively will increase the Department's current minimum yellow change interval by 0.4 seconds.

All new traffic signal installations, new Traffic Infraction Detector installations, signal phasing changes, geometric changes affecting the timing or phasing, or corridor re-timing projects must comply with these requirements immediately upon implementing timing changes or the new installations.

Intersections with existing Traffic Infraction Devices must be in compliance with this bulletin by December 31, 2013. All other existing signalized intersections on the state highway system must be in compliance by June 30, 2015.

The *Traffic Engineering Manual*, Section 3.6 will be revised to reflect these requirements.

MCW/fhh

Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD, P.E.
SECRETARY

MEMORANDUM

Date: September 20, 2013

To: District Traffic Operations Engineers, District Maintenance Engineers, District Design Engineers, District Directors of Operations, and District Directors of Production

From: Mark C. Wilson, P.E., State Traffic Operations Engineer

Copies: Ananth Prasad, Brian Blanchard, Tom Byron, Duane Brautigam, Tim Lattner, Lora Hollingsworth, and District Secretaries

Subject: **Traffic Engineering Manual Section 3.6 Revision** - Standardization of Yellow Change and Red Clearance Intervals for Signalized Intersections

Section 3.6 of the Department's *Traffic Engineering Manual (TEM)* Standardization of Yellow Change and Red Clearance Intervals for Signalized Intersections has been revised and is attached.

All new signal installations, intersections with Traffic Infraction Detectors, signal phasing changes, geometric changes affecting the timing or phasing, or corridor re-timing projects must comply with these guidelines immediately upon implementing timing changes.

Intersections with existing Traffic Infraction Detectors must be in compliance with the revisions by December 31, 2013. All other existing signalized intersections on the state highway system must be in compliance by June 30, 2015.

The revisions include:

- Perception/Reaction Time (PRT) to be used is 1.4 seconds
- Minimum yellow change interval is 3.4 seconds
- Round computations up to the nearest 1/10th of a second
- Red clearance interval minimum raised to 2.0 seconds

Also attached are the revised Traffic Infraction Detector Placement and Installation Specifications that the Department is required to develop pursuant to *F.S., 316.0776 Traffic infraction detectors; placement and installation.*

Please forward the documents to the local maintaining agencies in your Districts.

Section 3.6

STANDARDIZATION OF YELLOW CHANGE AND RED CLEARANCE INTERVALS FOR SIGNALIZED INTERSECTIONS

3.6.1 PURPOSE

The purpose of the yellow change and red clearance intervals is to provide a safe transition between two conflicting traffic signal phases. The function of yellow change interval is to warn traffic of an impending change in the right-of-way assignment and the function of the red clearance interval is to provide additional time following the yellow change interval to clear the intersection before conflicting traffic is released. The Manual on Uniform Traffic Control Devices (***MUTCD***) states that a yellow change interval should have a minimum duration of 3 seconds and a maximum duration of 6 seconds and a red clearance interval should have duration not exceeding 6 seconds. The intent of this section is to provide a standard for uniform application of yellow and red intervals.

All new signal installations, intersections that have a Traffic Infraction Detectors installed, any signal that has signal phasing changes, geometric changes affecting the timing or phasing, or corridor re-timing projects must comply with these standards immediately upon implementing timing changes. All other existing signalized intersections on the State Highway System must be in compliance with standards of this section by June 30, 2015.

3.6.2 STANDARD

(1) ***Section 316.075(3)(a), F.S.*** states that no traffic control signal device shall be used which does not exhibit a yellow or "caution" light between the green or "go" signal and the red or "stop" signal. The Statute is silent on the yellow clearance interval duration and does not mention nor mandates the use of a red clearance interval.

(2) The Institute of Transportation Engineers (ITE) formula shall be used to calculate yellow change interval. Yellow change intervals shall not be lower than the values shown in Table 3.6-1 for a given posted speed limit (PSL) even if the ITE formula produces a lower value. Yellow change intervals calculated to be lower than 3.4 seconds shall be set at no less than 3.4 seconds. The yellow interval shall not exceed 6 seconds. Any yellow change intervals that are greater than the standard yellow change intervals presented in Table 3.6-1 of this section, for a given PSL, are allowed, but they shall be based on *MUTCD's Section 4D.26*, engineering practice and the ITE formula. However, for a given PSL, the yellow change intervals shall not be less than the standard values presented in Table 3.6-1.

(3) A Perception Reaction Time (PRT) of 1.4 seconds shall be used. Yellow change and red clearance interval times shall be rounded up to the nearest 0.1 second.

(4) Approach speed used in this section is the PSL for the approach being analyzed.

3.6.2.1 Yellow Change Interval

(1) Recent research has found that the 85th percentile PRT value was 1.33 seconds. Based on the research results, a PRT of 1.4 seconds shall be used.

(2) The Florida yellow change intervals shown in ***Table 3.6-1***, are computed using ***Formula 3.6-1*** (found in ***ITE's Traffic Engineering Handbook***) with a PRT of 1.4 seconds and a grade of 0%. These intervals are the required standard minimum values.

Table 3.6-1. Florida Yellow Change Interval (0.0 % Grade) Standards*

APPROACH SPEED (MPH)	YELLOW INTERVAL (SECONDS)
25	3.4
30	3.7
35	4.0
40	4.4
45	4.8
50	5.1
55	5.5
60	5.9
65	6.0
* For approach grades other than 0%, use ITE Formula.	

Formula 3.6-1

$$Y = t + \frac{1.47v}{2(a + Gg)}$$

Where:

Y = length of yellow interval, sec.
t = perception-reaction time (use 1.4 sec.)
v = speed of approaching vehicles, in mph.
a = deceleration rate in response to the onset of a yellow indication (use 10 ft/sec^2)
g = acceleration due to gravity (use 32.2 ft/sec^2)
G= grade, with uphill positive and downhill negative (percent grade /100)

3.6.2.2 Red Clearance Interval

A red clearance interval must be used. Providing adequate red clearance intervals can significantly impact intersection safety by reducing the probability of occurrence of right angle crashes, even if drivers run the red signal indication. The red clearance interval shall be

determined using engineering practices. The values are typically computed using ***Formula 3.6-2,*** found in ***ITE's Traffic Engineering Handbook***.

Formula 3.6-2

$$R = \frac{W + L}{1.47v}$$

Where:

R = length of red interval, sec.
W = width of the intersection, in feet, measured from the near-side stop line to the far edge of the conflicting traffic lane along the actual vehicle path.
L = Length of vehicle (Use 20 ft.)
v = speed of approaching vehicles, in mph.

The minimum red clearance interval shall be 2.0 seconds and the maximum red clearance interval should normally not exceed 6.0 seconds. Longer red intervals than the minimum 2.0 seconds can be used at the engineer's discretion where width of intersection, sight distance, complex intersections, crash history and any unique conditions exist that may warrant longer red times. The determination shall be based on engineering judgment. The National Cooperative Highway Research Program (NCHRP) Report 731 recommends using a modified ITE formula that allows for 1.0 second reduction due to reaction time delay from the conflicting movement. Therefore, a 1.0 second reduction may be made in the values computed from Formula 3.6-2 and applying engineering judgment. However, the red clearance interval shall be no less than 2.0 seconds.

Traffic Infraction Detector
Placement and Installation Specifications
September 20, 2013

Section 1.0 General

The "Mark Wandall Traffic Safety Act" was signed into law with an effective date of July 1, 2010. The law authorizes the use of Traffic Infraction Detectors, commonly known as red light running cameras, on state, county, and municipal roads, streets, and highways in the State of Florida.

Section 316.0776, Florida Statutes, was created and directs that placement and installation of Traffic Infraction Detectors must be in accordance with placement and installation specifications developed by the Florida Department of Transportation (FDOT).

The specifications described below establish such requirements for placement and installation of Traffic Infraction Detectors. (Placement on state roadways will also be subject to FDOT general use permit requirements and special provisions.)

Section 2.0 Placement and Installation Requirements

The following requirements apply to placement and installation of Traffic Infraction Detectors:

1. The placement and installation of Traffic Infraction Detectors or the required signs shall not reduce, impede, restrict, or obstruct driver view of any existing traffic control device placed at or on the approach to signalized intersections.

2. Where a traffic signal is interconnected to railroad active warning devices (railroad preemption), Traffic Infraction Detectors may be installed on the approaches, except on the approach that crosses the railroad tracks.

3. Traffic Infraction Detectors may be installed at traffic signals located at entrance and exit ramps, except on the exit ramp approach to the traffic signal.

4. Above ground structures shall be breakaway and crashworthy in accordance with National Cooperative Highway Research Program (NCHRP) Report 350 or AASHTO's Manual for Assessing Safety Hardware (MASH) 2009 publication.

   Traffic Infraction Detectors shall not be located in medians or within sidewalks unless all other alternatives are deemed impractical. For sidewalks, at least 4 feet of sidewalk clearance must be provided. Any placements in sidewalks with

less than 4 feet clearance must meet or exceed then-current minimum American's with Disabilities Act (ADA) requirements and be approved by the State Traffic Operations Engineer for state roads, the County Engineer for county roads, or the Municipal Engineer for local roads (or their designees, respectively) For urban curb and gutter intersection approaches and posted speeds of less than or equal to 45 MPH, placement shall be located no closer than 4 feet from face of curb. No less than 2.5 feet from face of curb will be allowed only when all other alternatives are deemed impractical.
For all other intersection approaches, placement shall be located no closer than 12 feet from the travelled way, unless placed behind existing barrier.

5. Traffic Infraction Detectors that are connected to the traffic signal cabinet, traffic signal power service, or roadway lighting power service shall be equipped with lightning suppression and grounding devices.

6. Traffic signal controller timings for the yellow change interval shall be in accordance with the following provisions.

Yellow Change Interval Computation (Allowable Through December 30, 2013):

A. The Institute of Transportation Engineers (ITE) formula shall be used to calculate yellow change interval.
B. Approach speed used is the posted speed or the 85th percentile approach speed for the lanes being analyzed. Through lane and turn lane approach speeds on an approach may be different.
C. Yellow change and red clearance intervals specified herein are minimums, and should be increased as necessary, based on professional engineering judgment, to fit site conditions at any particular intersection.
D. The Florida yellow change intervals shown in Table 1, are computed using the ITE formula (found in ***ITE's Traffic Engineering Handbook***). These intervals are the required minimums. If necessary and due to equipment limitations, round computed values up to the next 0.5 second.

Table 1. Florida Yellow Change Interval (0.0 % Grade)*

APPROACH SPEED (MPH)	YELLOW INTERVAL (SECONDS)
25	3.0
30	3.2
35	3.6
40	4.0
45	4.3

50	4.7
55	5.0
60	5.4
65	5.8
* For approach grades other than 0%, Use ITE Formula.	

$$Y = t + \frac{1.47v}{2(a + Gg)}$$

Where:

Y= length of yellow interval, sec.
t = perception-reaction time, (Use 1 sec.).
v = speed of approaching vehicles, in mph.
a =deceleration rate in response to the onset of a yellow indication. (Use 10 ft/sec^2)
g = acceleration due to gravity. (Use 32.2 ft/sec^2)
G= grade, with uphill positive and downhill negative. (percent grade /100)

Yellow Change Interval Computation (Effective December 31, 2013):
Intersections with existing Traffic Infraction Detectors must be in compliance with the following yellow change interval specification provisions by December 31, 2013. The provisions of the following specification may be implemented prior to December 31, 2013.

The Institute of Transportation Engineers (ITE) formula shall be used to calculate yellow change interval.

$$Y = t + \frac{1.47v}{2(a + Gg)}$$

Where:

Y= length of yellow interval, sec.
t = perception-reaction time (use 1.4 sec.)
v = speed of approaching vehicles, in mph.
a =deceleration rate in response to the onset of a yellow indication (use 10 ft/sec^2)
g = acceleration due to gravity (use 32.2 ft/sec^2)
G= grade, with uphill positive and downhill negative (percent grade /100)

A. A Perception Reaction Time (PRT) of 1.4 seconds shall be used.
B. Yellow change interval times shall be rounded up to the nearest 0.1 second.
C. Approach speed used in this section is the PSL for the approach being analyzed.
D. Yellow change intervals calculated to be lower than 3.4 seconds shall be set at no less than 3.4 seconds.
E. The yellow interval shall not exceed 6 seconds.

The Florida yellow change intervals shown in the Table 2 are computed using the ITE formula (found in ***ITE's Traffic Engineering Handbook***) with a PRT of 1.4 seconds and a grade of 0%. These intervals are the required standard minimum values. Any yellow change intervals that are greater than the standard yellow change intervals presented in Table 2 of this section, for a given posted speed limit (PSL), are allowed, but they shall be based on Manual on Uniform Traffic Control Devices (*MUTCD) Section 4D.26*, engineering practice and the ITE formula. However, for a given PSL, the yellow change intervals shall not be less than the standard values presented in Table 2, even if the ITE formula produces a lower value.

Table 2. Florida Yellow Change Interval (0.0 % Grade) Standards*

APPROACH SPEED (MPH)	YELLOW INTER*VAL (SECONDS)*
25	3.4
30	3.7
35	4.0
40	4.4
45	4.8
50	5.1
55	5.5
60	5.9
65	6.0
* For approach grades other than 0%, use ITE Formula.	

7. All traffic signal timings must be prepared by or under the responsible charge of a Florida licensed Professional Engineer qualified to perform traffic signal timing.

8. Traffic Signal Photo Enforced signs meeting FDOT standards (see Attachment A) shall be posted *in advance of each* intersection approach equipped with a Traffic Infraction Detector and shall be shown accordingly on the construction plans. The supplemental panel with the legend "INCLUDES RIGHT TURN" shall be included on all Traffic Infraction Detector approaches where the right turn lane is controlled by the traffic signal. The Traffic Signal Photo Enforced sign shall be located on the right-hand side of the roadway far enough in advance of the stop line to provide adequate notice to approaching road users. On one-way streets or where a median of sufficient width is present, an additional Traffic Signal Photo Enforced sign may be placed on the left-hand side of the roadway. The Traffic

Signal Photo Enforced sign shall be located such that it does not block or obscure the road user's view of other signs or traffic control devices.

Below is guidance for advance placement of Traffic Signal Photo Enforced signs.

Advance Placement Distance (measured from the Stop Line)	
Speed MPH	Distance Ft. (minimum*)
20	100
25	125
30	150
35	200
40	250
45	300
50	350
55	400
60	450
65	500

*Minimum may be reduced by no more than 10% for features making it impractical to increase the distance.

9. Traffic Infraction Detectors shall not affect the traffic signal indication display or the operation of the traffic signal.

10. If a Traffic Infraction Detector uses a flash or illuminator device, it shall be mounted, positioned, filtered or angled to limit effects on the driver's visual field of view while entering or exiting the intersection.

Red Clearance Interval (Effective December 31, 2013):

A red clearance interval must be used. Providing adequate red clearance intervals can significantly impact intersection safety by reducing the probability of occurrence of right angle crashes, even if drivers run the red signal indication. The red clearance interval shall be determined using engineering practices. Refer to MUTCD Section 4D.26.

Section 3.0 Public Awareness Campaign

Any county or municipality (or the Department of Highway Safety and Motor Vehicles) that begins a Traffic Infraction Detector enforcement program for the first time shall make a public announcement and conduct a public awareness campaign of the proposed use of Traffic Infraction Detectors at least 30 days before commencement of the enforcement program.

The Federal Highway Administration – Office of Safety has detailed information, guidance, and suggestions on how to conduct a red light camera public awareness campaign.

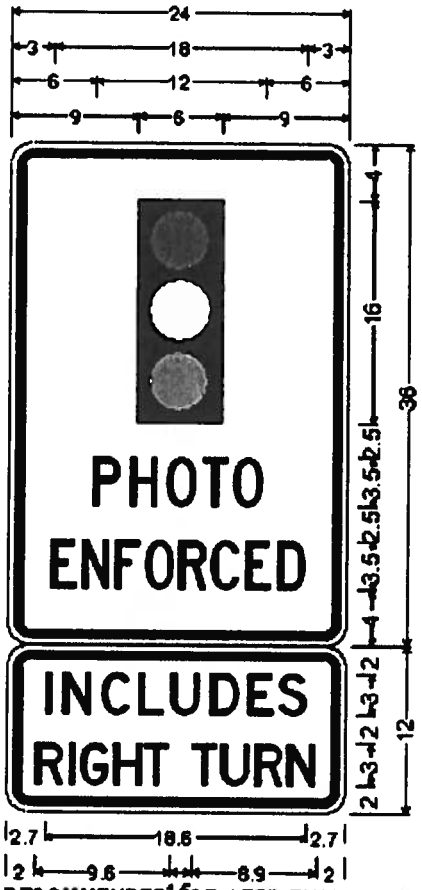
Below is a link to information from that technical resource:

http://safety.fhwa.dot.gov/intersection/redlight/

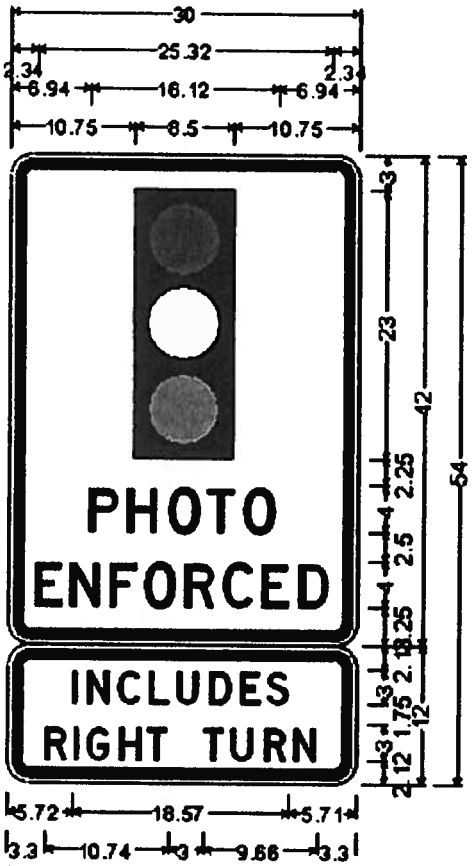
Outreach Support: Implementing a Stop Red-Light Running Program
Provides educational and outreach materials to help raise awareness about the dangers of red-light running including a Step-by-Step Guidebook for implementing a Stop Red-Light Running program or campaign, some ideas for how communities can support National Stop on Red Week, and supporting marketing materials such as presentations; public service announcement (PSA) scripts for radio and television; sample press releases; letters to support coalition-building and media support materials. http://safety.fhwa.dot.gov/intersection/redlight/outreach/

ATTACHMENT A

Sign sizes for less than 40 miles per hour and 40 mph or greater approach speeds.



RECOMMENDED FOR LESS THAN 40 MPH;
FTP - MINIMUM , TRAFFIC PHOTO ENFORCED;
1.5" Radius, 0.5" Border, 0.5" Indent, Black on White;
"PHOTO" C 2K;
"ENFORCED" C 2K specified length;
AUX PANEL, FTP MIN ;
1.5" Radius, 0.5" Border, 0.5" Indent, Black on White;
"INCLUDES" D 2K;
"RIGHT TURN" D 2K 50% spacing;



RECOMMENDED FOR 40 MPH OR MORE;
R10-18a, (IA-12) MUTCD TRAFFIC PHOTO ENFORCED 12/10;
1.88" Radius, 0.75" Border, 0.50" Indent, Black on White;
"PHOTO" D 2K;
"ENFORCED" D 2K 80% spacing;
AUXILLIARY PANEL;
1.88" Radius, 0.75" Border, 0.50" Indent, Black on White;
"INCLUDES" D 2K;
"RIGHT TURN" D 2K;

** The supplemental panel with the legend "INCLUDES RIGHT TURN" shall be included on all Traffic Infraction Detector approaches where the right turn lane is controlled by the traffic signal.

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An Intersection Public Safety Program

Stop On Red

Second Annual Performance Evaluation

Department of Transportation

January 2014

An Intersection Public Safety Program
Stop On Red

ANNUAL PERFORMANCE EVALUATION

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An Intersection Public Safety Program
Stop On Red

ANNUAL PERFORMANCE EVALUATION - NOTICE OF VIOLATION

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– CITY OF ST. PETERSBURG –
AN INTERSECTION PUBLIC SAFETY PROGRAM
STOP ON RED

2013 ANNUAL PERFORMANCE EVALUATION

INTRODUCTION

The City of St. Petersburg implemented the *Stop On Red Program* in October 2011. The focus of this report is on Notice of Violations issued and evaluated crashes that compare data through the first two years of the Program with the average of the previous 3-years of data prior to the start of the program. So, unless otherwise stated, all after violation and crash data evaluated is from October 29th, 2011 through to October 31, 2013.

The Stop On Red Program employs traffic safety cameras at 10 intersections with 38 approaches. These intersections have 22 intersection approaches with traffic safety camera enforcement and 16 approaches that are not enforced with traffic safety cameras. The intersections with traffic safety camera enforcement are listed in TABLE No 1.

This report provides considerable technical data, charts and graphs to illustrate analysis related to crash data and violation notices issued by each camera by day, month, year, etc. A detailed analysis of this data is intended to highlight situations or characteristics that have a relative impact to the performance of the program in order to determine if our program goals are being achieved. Additional analysis of the data is always possible and may be developed in the future, as we move forward with the program.

PROGRAM GOALS

The City of St. Petersburg established three goals for the Stop On Red Program. These goals function as precepts for program decision making:

- Enhance safety at signalized intersections in St. Petersburg, by reducing the frequency and/or severity of crashes caused by red-light running.
- Provide additional method of violation enforcement so that the Police can use resources to fulfill other objectives.
- Raise awareness of safe driving practices in St. Petersburg.

While the Annual Performance Evaluation report related to crashes, analyzes whether or not we are achieving our goals toward crash reduction, a detail analysis of violations issued will also help us understand if the program has addressed other goals by helping the Police as a force multiplier and if the motoring public has altered their behavior toward traffic safety and the running of red-lights.

REVIEW AND SUMMARY OF VIOLATIONS

Notice of Violations Issued: During the first two years of the Stop On Red Program, the City of St. Petersburg Police Department issued a total of 62,128 Notice of Violations (NOV) to motorists that ran a red traffic signal indication, as detected by 22 Traffic Safety Cameras at 10 signalized intersections. A total of 36,185 NOV's were issued in the first year and 25,943 in the second year, which is a reduction of 28.3%. CHART No. 1 details the Notice of Violations issued by all Traffic Safety Cameras for each month of the program over the first two years.

Police personnel however actually reviewed a total of over 118,000 potential events in order to determine if a violation met the City's Business Rules for red-light running under the program. Therefore, the actual issuance rate compared to those Notices reviewed is 52.2%. See CHART No 2. The break-down of Notice of Violations issued by direction is as follows:

Direction	1st Yr	2nd Yr	Total	Percentage
Left	7,885	6,312	14,197	23%
Thru	14,572	11,675	26,247	42%
Right	13,728	7,956	21,684	35%
Total	36,185	25,943	62,128	100%

The number of Traffic Safety Camera, Notices of Violations issued continues to indicate the scope of the concerns for this public safety issue. The numbers of Notices being issued from the Traffic Safety Cameras have decreased by 28%, as we indicated it would prior to the start of the program (30%). We also anticipate this to continue as a trend with an additional 15% reduction in subsequent years, however an analysis of comparable months over time will be required to monitor these trends.

Over the full period of the program, the Police Department continued its special enforcement details on a weekly basis, paying attention to intersections with high incidence of red-light running crashes that are not being enforced by Traffic Safety Cameras. The special enforcement details utilize a minimum of 6 officers and have issued a total of 576 Citations compared to 1,025 last year for a total of 2.6% of the total violations issued by Traffic Safety Cameras. This highlights two issues; first there is much more red-light running occurring than the Police can possibly address and second the Traffic Safety Cameras are a force multiplier.

A review of CHART No 3 highlights the number of Notice of Violations issued by each individual camera by location, per month and per day. While the average number of Notice of Violations issued varies, not only by location but over time, these charts help to illustrate the distribution of the red-light running problem.

The three locations with the highest number of Notice of Violations issued over two years are as follows:

Location	1st Year	2nd Year
• S/B - 34th Street / 38th Avenue N.	= 4,255 Notices	2,935 Notices
• S/B - 34th Street / 1st Avenue S.	= 3,023 Notices	2,335 Notices
• N/B – 34th Street / 22nd Avenue S	= 2,486 Notices	2,226 Notices

The three locations with the fewest Notices issued are as follows:

Location	1st Year	2nd Year
• N/B – 66th Street / 22nd Avenue N	= 952 Notices	467 Notices
• N/B – 4th Street / 54th Avenue N	= 956 Notices	562 Notices
• E/B – 4th Street / Gandy Blvd.	= 984 Notices	466 Notices

The average number of Notices issued at all approaches was 3.94 daily per camera for the first year and 3.79 for the second year, with a high of 10.04 per day and 9.46 at S/B - 34th Street / 38th Avenue N and a low of 1.59 at . the first year and 1.41 at E/B – 4th Street / Gandy Blvd. and 1.41 at N/B - Gandy / 4th Street the second year.

It is apparent that some intersection approaches have higher incidence of red-light running then others and a detailed analysis of violations over time, as illustrated in CHART No. 4 through Chart No. 26, helps determine these trends. It would however appear that violations are generally decreasing over time, as expected.

Violation Rate: While an analysis of total violations is important, the rates of violations based on vehicle volume helps to better compare each approach with one another. Therefore, an analysis was conducted for each approach, to determine if there were any locations that displayed unusual trends. TABLE No. 2 highlights the number of violation for one million vehicles entering the intersection. Locations are listed by the highest total rate per camera. Additional data lists the actual rate per direction of travel.

Violation rates vary sharply between a high of 572 violations to a low of 62 violations per million vehicles. When looking at violation rates through the first year of the program, S/B - 4th Street / Gandy Blvd ranks as the top location and the right-turn movement is the direction with the highest rate. This location has a dedicated right-turn lane with "right-on-red" prohibited during the north-south left-turn phase. There are two electronic signs posted during this phase to restrict right-on-red. The enforcement of this movement is critical, as in our initial consultant review of crashes, this location ranked No. 8 of all signalized intersections for the number of red-light running crashes. Through enforcement however this movement has now reduced violations to a rate of 308 from 493 comparing the two years of the program.

Also highlighted on this Table No 2 are the individual rates of violation by movement (left, thru, right). There are 9 locations with the right-turn movement as the highest for that approach and 11 locations with the through movement with the highest rate. Two locations have the left-turn with the highest rate for that location. This helps to illustrate that there is not an unbalance that heavily favors any one movement.

Illustrated in bold type is the yellow interval by approach. These timings are the result of evaluation and implemented to provide uniformity and a standard interval for all approaches. In most cases the timing for the approach with the lower speed limit was increased to match the approaches with the highest speed limit, in order to meet driver expectation.

The approaches with additional yellow time are distributed fairly evenly through the ranking by rate, which would indicate that any additional yellow time does not appear to necessarily help reduce the rate of red-light running. In fact, 4 of the top 5 locations with the highest rate of red-light running have additional yellow time ranging from 0.5 to 0.3 seconds. (The yellow change interval and red clearance phase are discussed in detail on page 8 and 9 of this report).

Summary by Location:

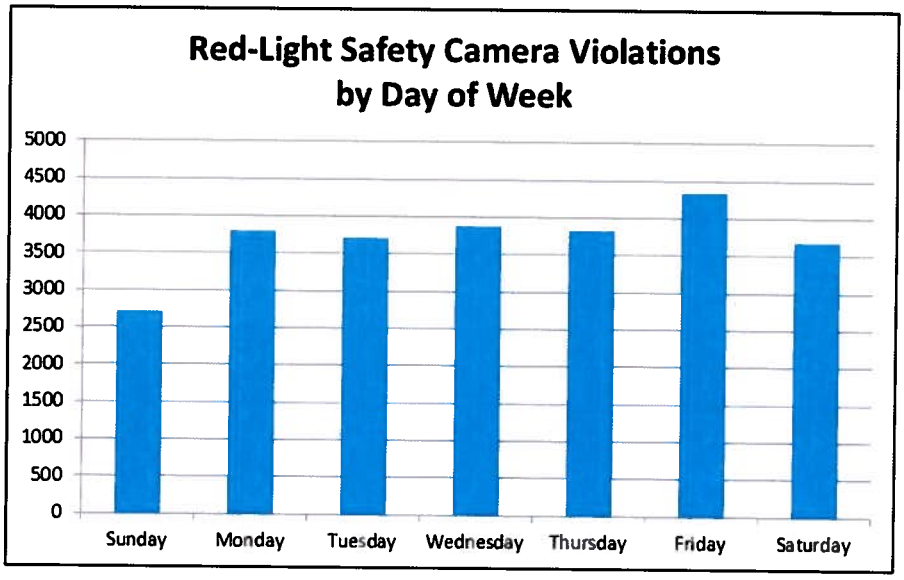
Rank		Red-Light	Street	Cross Street	Direction
RATE	Violations	Crash Rank*			
1	5	8	4th Street	Gandy Boulevard	(S/B)
2	1	7	34th Street	38th Avenue N	(S/B)
3	2	11	34th Street	1st Avenue S	(S/B)
4	3	43	34th Street	22nd Avenue S	(N/B)
5	11	17	4th Street	22nd Avenue N	(E/B)
6	4	99	66th Street	Tyrone Boulevard	(E/B)
7	8	7	34th Street	38th Avenue N	(W/B)
8	7	17	4th Street	22nd Avenue N	(S/B)
9	10	83	4th Street	54th Avenue N	(N/B)
10	6	54	66th Street	38th Avenue N	(E/B)
11	9	17	4th Street	22nd Avenue N	(N/B)
12	14	6	34th Street	38th Avenue N	(E/B)
13	12	1	34th Street	1st Avenue N	(N/B)
14	16	43	34th Street	22nd Avenue S	(S/B)
15	13	11	34th Street	1st Avenue S	(E/B)
16	15	54	66th Street	38th Avenue N	(S/B)
17	22	8	4th Street	Gandy Boulevard	(N/B)
18	18	83	4th Street	54th Avenue N	(S/B)
19	17	8	4th Street	Gandy Boulevard	(E/B)
20	19	49	66th Street	22nd Avenue N	(S/B)
21	21	49	66th Street	22nd Avenue N	(N/B)
22	20	99	66th Street	Tyrone Boulevard	(N/B)

* Rank based on report "Intersection Public Safety Program. Kimley-Horn – February 2011, of top 100 high red-light running crash intersections.

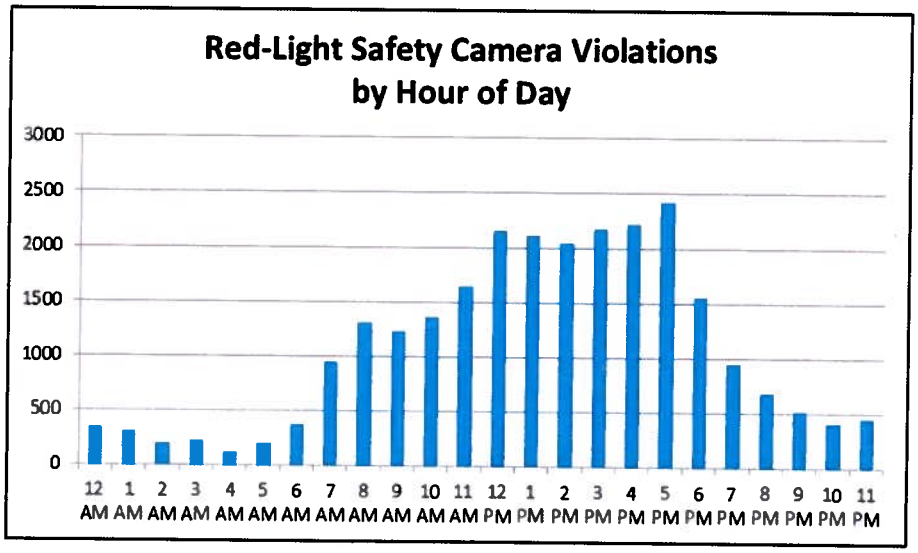
As illustrated by the ranking of locations by violation rate, issued and crash rank, the individual rankings only vary slightly between factors, with few exceptions. For example, with a crash ranking of 99, 66th Street / Tyrone – E/B also has a low ranking for violations. With a high crash ranking of 8, 4th Street / Gandy – E/B also ranks towards the top for violations. A detailed crash analysis by approach, to analyze the significance of these factors is included starting on page 11.

WHEN DOES RED-LIGHT RUNNING HAPPEN IN ST. PETERSBURG

Distribution of Notices Issued by Day of the Week. The distribution of violations by day of week is shown below. The largest percentage of violations during the week has occurred on Fridays. The number of violations during the work week is roughly the same for Monday through Thursdays.



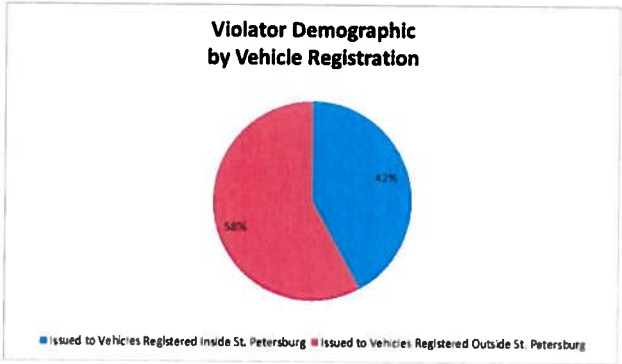
Distribution of Citations Issued by Hour of the Day. The distribution of violations throughout the day is shown below.

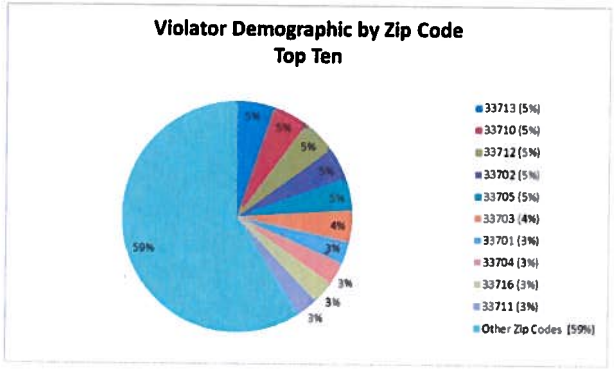


- Red-light running violations are most prevalent on Friday, less on Sunday.
- Red-light running violations are most common between the hours of 3 p.m. to 5 p.m.

Violator Demographics: When examining violator demographics for the second year of the program, registration demographics show that the majority of drivers that register their vehicle in the city of St. Petersburg adhere to the rules of the road. Only 58% of the violations issued have been issued to vehicles registered within the city during the second year of the program.

Top Violator- Registration / Zip Codes



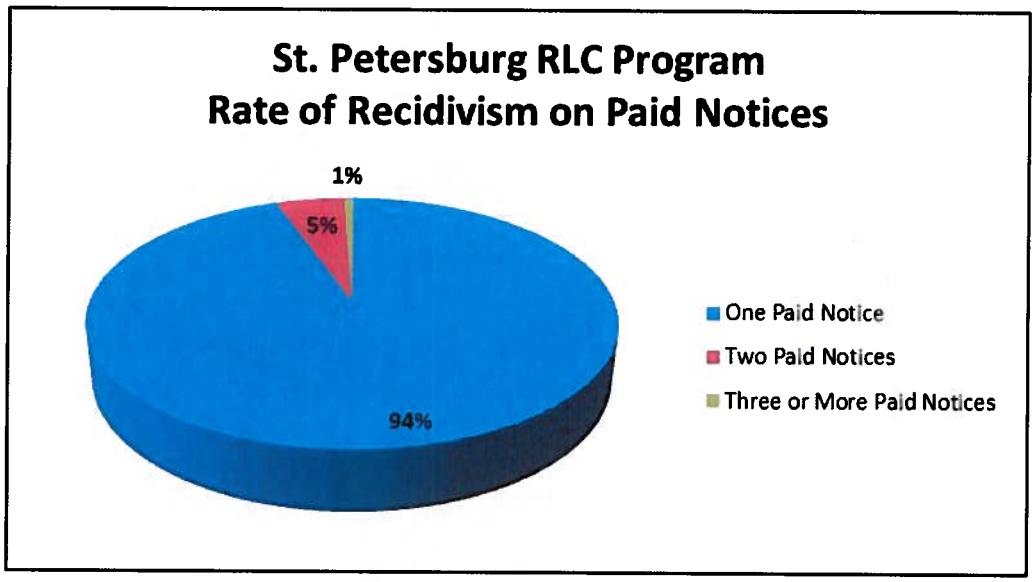


Changing Driver Behavior

Ninety-four percent of the license plates identified in red-light running violations have not been issued a second violation after the fine was paid. This indicates a high level of compliance with the program and a low rate of recidivism.

Percentage of Paid RLC Violations based on License Plates – 2nd Year		
Number of Violations Received	Number of Violators	Percentage of Total Violators
Violators Receiving 1 Violation	21,255	94.00%
Violators Receiving 2 Violations	1,105	5.00%
Violators Receiving 3 or More Violations	138	1.00%
Total	22,498	100.00%

After receiving a Notice, 94% of drivers have changed their behavior, up from 92% in the first year of the program. Only 5% of motorists have been issued a second Notice of Violation, down from 7% in the first year of the program. As few as 1% of the violators have been issued 3 or more Notices, which is unchanged from the first year of the program. We will however continue to monitor all aspects of violations issued, tracking demographics, rate of recidivism, crash rates, and many other factors in order to ensure the program is trending correctly and meeting our initial program goals.



Traffic Safety Cameras Save Lives and Lower Costs in St. Petersburg

Every traffic collision exacts its own financial costs on families, vehicle owners and the community at large. Medical care, vehicle removal and repair, and the attention from police and other emergency response personnel are just a few of the measurable costs associated with traffic crashes. Traffic safety cameras are intended to help reduce vehicle collisions by changing driver behavior. As a result, injuries and fatalities decrease, along with the tax burden to communities for emergency services and other costs tied to every traffic collision. Traffic safety cameras also allow police departments to provide uninterrupted traffic enforcement without assigning an officer to watch the intersection. This provides a force multiplier, enabling the department to enhance its enforcement efforts without added costs, providing a cost-savings to the community.

A report by John Dunham & Associates "Cost-Benefit Analysis of Red Light Safety Cameras"– (Appendix No. 1), determined that one Traffic Safety Camera in St. Petersburg at one intersection could save the city and its residents $187,440 in the first year of operation and $846,849 over five years, in 2011 dollars. Using a comprehensive set of data from nationally recognized sources, the savings is calculated by applying total crash costs over a victim's expected lifetime against expected crash reductions from traffic safety cameras. Similar economic benefits can be found in other communities with traffic safety cameras, but the most important benefit in every case remains the lives that are saved. To date a total of 52.7 red light related/running type crashes have been reduced at the 22 approaches with traffic safety cameras.

Public Safety Value

The value of the St. Petersburg Intersection Public Safety Program hasn't just been in terms of public safety. An additional value for taxpayers is the availability of traffic safety camera videos to police investigators. **The police have requested videos more than 250 times as a tool for investigating collisions, felonies and serious crimes including hit-and-run collisions, robberies, homicides and various other police investigations.** The availability of these videos helps reduce police operating costs when a video can help reconstruct a crash scene or provide another view of unrelated incidents at intersections.

The primary goal of all Intersection Public Safety Programs is to make streets safer for all roadway users - drivers, bicyclists and pedestrians. The benefits of traffic safety cameras though extend beyond public safety. The Mark Wandall Traffic Safety Act allocates a portion of traffic fines collected from safety cameras to Florida's trauma centers and to The Miami Project to Cure Paralysis. The Miami Project's research into spinal cord and brain injuries has a direct impact on the many victims of motor vehicle accidents that suffer these types of life-altering injuries.

The Florida Department of Revenue has reported that during fiscal year 2012, starting July 1, 2011, St. Petersburg's Stop On Red Program has contributed $1,308,787. These civil fines go directly back to the community, and in some cases, are dedicated toward parks, hospitals, medical research and schools. During fiscal year 2013, the city of St. Petersburg contributed $1,585,901 toward those services. See TABLE No 3.

YELLOW CHANGE INTERVAL:

The yellow signal indication warns vehicle traffic of an impending change in right-of-way. It is displayed following every green signal indication. The amount of time that the yellow signal is displayed is referred to as the yellow interval. The duration of this interval is based on the driver's perception-reaction time, deceleration rate, the approach speed, and the approach grade. The duration of the yellow interval should allow, at a minimum, for a driver to comfortably decelerate to a stop prior to entering the intersection

Driver dilemma, the condition when a driver must decide whether to stop or proceed through the intersection safely, will always continue regardless of traffic safety efforts. Drivers however need to heed the yellow phase and prepare to stop instead of accelerating to proceed through the intersection at the risk of causing a dangerous and often deadly collision.

A review of the City's 298 signalized intersections has determined that there are 1,053 separate approaches. Many of these approaches have a longer yellow interval than required, based on the highest speed limit approaching the intersection.

The additional time added to the yellow interval has been in place since before the Stop On Red Program was in place and implemented in consultation with the Florida Department of Transportation. The purpose is to provide a uniform and standard interval for all approaches to an intersection in order to meet driver expectation, generally increasing the time slightly for the approach with the lower speed limit, to match the time for the approach with the highest speed limit.

In September of this year the Florida Department of Transportation (FDOT) modified the standardization of the Yellow Change Interval based on their analysis for motorists changing perception / reaction time (PRT). The formula used to calculate the Yellow Change Interval has remained unchanged since 1965 and uses a PRT of 1.0 second. In recent national studies it was determined that the PRT ranged between 0.7 and 1.6 seconds. Therefore, the FDOT has decided to use a PRT value of 1.4 seconds in the formula for calculation the Yellow Change Interval. All intersections with Traffic Safety Cameras had their timings modified before the December 31st deadline to meet this new FDOT standard. The balance will be modified before the July 1, 2015 deadline.

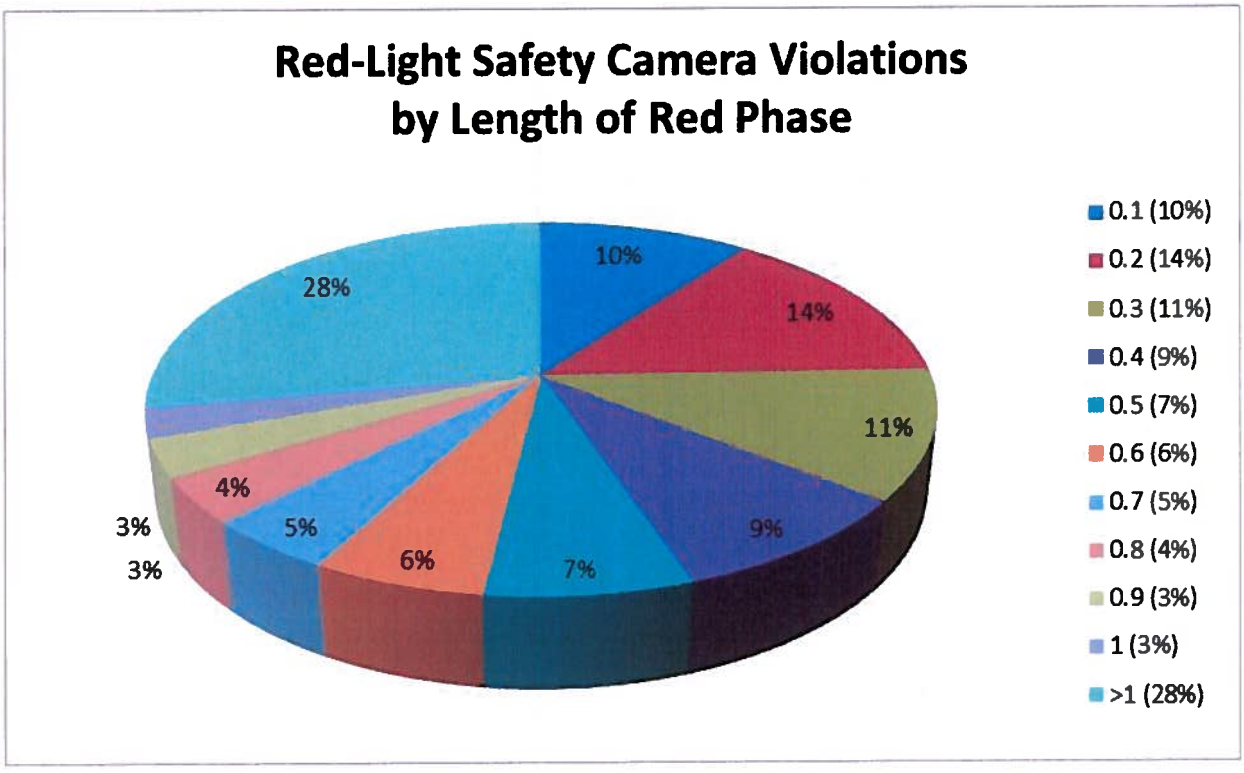
TABLE No 4 highlights the existing and new Yellow Change Intervals based on the posted speed limit.

RED CLEARANCE INTERVAL:

Most people would agree that running a red light is a dangerous driving behavior. A red clearance interval is a period when a red signal indication is displayed to most, if not all, vehicular traffic approaches. The duration of the red clearance interval is based on intersection width, vehicle length, and the speed at which the vehicle traverses the intersection. The duration of the red clearance interval allows additional time as a safety factor for a driver that legally entered the intersection at the very last instant of the yellow change interval, such as a motorist completing a left-turn, to avoid conflict with traffic releasing from an adjacent opposing intersection approach.

Providing adequate red clearance intervals can significantly impact intersection safety by reducing the probability of occurrence of right angle crashes, even if drivers run the red signal indication. A motorist that makes a conscience decision to accelerate through the yellow interval instead of stopping, and ends up running the red-light during the start of red interval or all-red phase put left-turning motorists at risk. Typically, a left-turning motorist is already "in" the intersection, waiting for the signal to change and once they see the red indication usually move through to complete their turn, **with the legal right-of-way**. This is the instant that poor decisions cause a crash. These are the high speed angled type crashes that are the most severe and have the highest injury and fatality rate.

A review of the red-light running violations issued by the Police during the second year of the program has determined that a total of 57% were to motorists that ran the red signal by more than half a second, up from 55% during the first year of the program.



Forty-two percent of the red-light running violations issued have been issued for violations occurring between 0.1 to 0.5 seconds after the signal has changed to red, down from 45% for the first year of the program.

Notice of Violations issued between 0.1 and 0.5 seconds:

Length of Red Phase	1st Year	2nd Year	Total	% of Total
0.1 seconds	2,694	2,666	5,360	8.63%
0.2 seconds	3,592	3,714	7,306	11.76%
0.3 seconds	2,994	2,883	5,877	9.46%
0.4 seconds	2,395	2,362	4,757	7.66%
0.5 seconds	1,796	1,542	3,338	5.37%
Sub Total	13,472	13,167	26,639	42.88%
Total	**36,186**	**25,943**	**62,129**	**100%**

We can conclude from this data that red-light running is a severe issue at the start of the red interval and a factor in the potential for high impact crashes. Also, over the first year of the Stop On Red Program the number of violations issued has consistently diminished over time. Therefore, it appears that enforcement of red-light running, through traffic safety cameras as well as conventional Police details, coupled with ongoing education has shown over this first year to be changing driver behavior.

The St. Petersburg staff has confirmed that the red clearance intervals used within the City comply with the requirements within the FDOT Traffic Engineering Manual, which states:

> "All new signal installations, intersections with Traffic Infraction Devices, signal phasing changes, geometric changes affecting the timing or phasing, or corridor re-timing projects must comply with these guidelines [in the November 2012 edition] immediately upon implementing timing changes. All other existing signalized intersections on the state highway system must be in compliance with guidelines of this Section by January 1, 2015."

The new guidelines state as follows:

$$\text{All Red: } R = \frac{W + L}{1.47v}$$

Where: R = length of all-re interval in seconds
W = total traversed width, from the approach stop bar to the far side of no conflict point
L = length of vehicle (Use 20ft.)
V = speed of approaching vehicles in MPH.

City of St. Petersburg staff has confirmed that all intersections with traffic safety cameras meet this standard and that updating the remaining red clearance intervals across the City are scheduled to meet the January 1, 2015 date as required by the FDOT.

REVIEW AND SUMMARY OF CRASHES

Introduction

The City of St. Petersburg is dedicated to maintaining and improving the transportation system for the safe and efficient movement of people, goods, and services. In pursuit of this goal, the City consistently evaluates and monitors the transportation system in search of deficiencies that may be remedied through maintenance and enhancement programs. The City is pleased with the satisfactory levels-of-service at intersections and along corridors as well as with the level of safety experienced by drivers traveling throughout the transportation network. Although the City is experiencing great success with its transportation system in comparison with other municipalities, areas for further opportunities become evident through intermittently occurring traffic congestion and the social and economic repercussions resulting from traffic collisions.

In pursuit of advancing the quality of life for the residents of the City of St. Petersburg and the motorists who travel within the city, the City consistently evaluates and monitors the transportation system in search of deficiencies that may be remedied through maintenance and enhancement programs as outlined in the City of St. Petersburg Comprehensive Plan. The Comprehensive Plan details Transportation System Safety and Efficiency as a major issue in the Transportation Element section of the document and offers several objectives to mitigate this concern.

Objective T5 describes the City's commitment to safety: ***"The City shall ensure the safe accommodation of motorized and nonmotorized traffic while reducing the incidence of vehicular conflicts within the City's major transportation corridors."***

The "Stop on Red" Annual Performance Evaluation for 2013 has been prepared to provide the City Council with an analysis of the first two years of the "Stop on Red" Program. The "Stop on Red" campaign is proposed to be evaluated on an annual basis, while the third full year (expanded) analysis will provide for an increase sample size of data (3-years prior to "Stop on Red," 3-years with "Stop on Red," all 298 signalized intersections within the City) to allow a "regression to the mean analysis," which will allow for comparison with the other traffic safety camera analysis throughout the nation.

As described in the St. Petersburg *Intersection Public Safety Program* document (by Kimley-Horn and Associates, Inc.) dated February 2011, the City has proactively implemented various engineering countermeasures to reduce red light running. With conventional options exhausted, the City deployed a Traffic Safety Camera Enforcement Program, "Stop on Red", in an attempt to modify driver behavior and reduce the frequency and severity of crashes caused by red light running. See TABLE No 5.

Over the past 10 years the City of St. Petersburg has implemented extensive programs to specifically address intersection safety and red light running.

Including the following:

- Installed 12" LED Traffic Signals at all 298 signalized intersections within the City
- Installed White Enforcement Lights at Major Intersections for Police to enforce Red Light Running
- Installed a separate signal head for each through lane
- Installed Reflective Traffic Signal Backplates to make signal heads more visible
- Checked Yellow Intervals to make sure they met or exceeded standards
- Checked All Red Clearance Intervals to make sure they met or exceeded standards
- Identified the Dilemma Zone with marked solid lane lines in advance of stop bars
- Reduced the need to stop by synchronization / coordination of major corridors
- Performed Intersection Safety Evaluations and Analysis to determine deficiencies
- Adopted the Capital Improvement Program (CIP) – Intersection Modification Program within the CIP to address engineering deficiencies
- Implemented High Visibility Police Enforcement Program on a weekly basis at key intersections
- Continued the ongoing Public Education Program through media, neighborhoods and Public TV

Crash Analysis of City Intersections

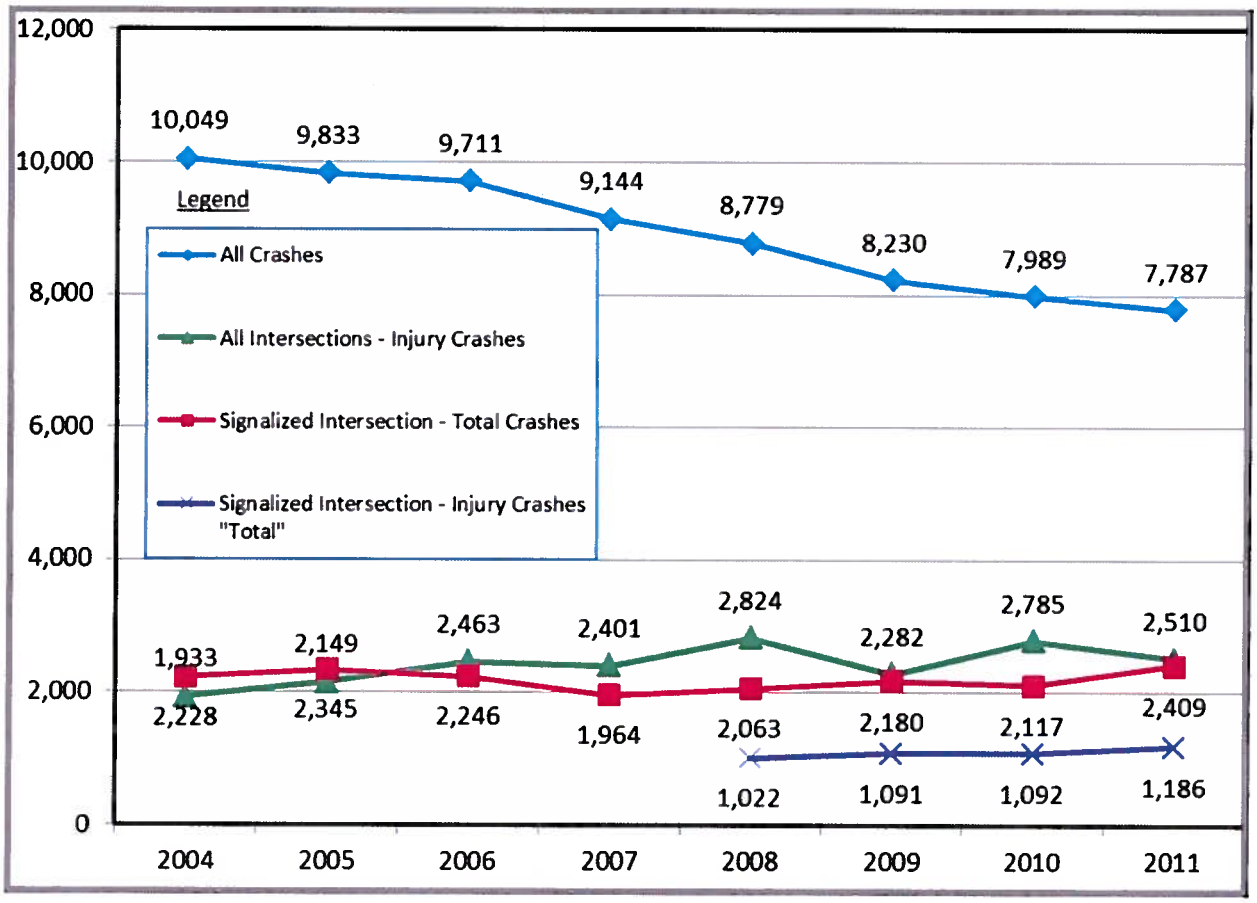
The desired result of the "Stop on Red" campaign is to reduce red light running violations because of their direct correlation to intersection collisions. The before "Stop on Red" crash data at the analyzed intersections were reviewed and summarized by the City of St. Petersburg staff for the period of November 2008 through October 2011. Crash data was also reviewed and summarized by the City of St. Petersburg staff for the "Stop on Red" campaign's first two years (November 2011 through October 2013) of enforcement at the intersections with traffic safety camera enforcement, and at the analyzed high crash intersections which do not have traffic safety camera enforcement (Appendix 2 "Terminology" for the description of the terms used).

Source Data

The three year period of summarized crash data (November 2008 through October 2011) represents the three years prior to the "Stop on Red" Program. The two years of summarized crash data (November 2011 through October 2013) represents the first two years during the period of enforcement for the "Stop on Red" Program. Analyses of the summarized crash data were performed to provide comparisons for measuring the performance and safety effects of the "Stop on Red" Program.

The City-wide crash history from 2004 to 2011 is shown in FIGURE No 1. This figure includes the first two months of enforcement through the "Stop on Red" campaign, November and December of 2011. The historical information shows that the composite of all types of crashes within the City has been trending lower, while the crashes at signalized intersections and injury crashes at all intersections have increased between 2004 and 2011. The signalized intersection injury crashes "total" data is available from 2008 to 2011, and shows an overall increase as well.

FIGURE 1: City of St. Petersburg Crash History Trends



It was in part based on these trends that the City determined that additional countermeasures were required to address intersection crashes, and more specifically, red-light running type crashes at intersections. So, it is through the ongoing analysis of crash data at the 10 intersections with traffic safety camera enforcement that we will determine if the implementation of this new traffic safety countermeasure will have any substansive effect on reducing crashes, injuries and fatalaties.

The City of St. Petersburg currently has 10 intersections with traffic safety camera enforcement. These intersections have 22 intersection approaches with traffic safety camera enforcement and 16 approaches that are not enforced with traffic safety cameras. See TABLE No 1.

These 10 intersection with traffic safety camera enforcement are compared to the next highest crash intersections which do not have traffic safety camera enforcement. These intersections are comprised of the 10 highest ranking signalized intersections from the St. Petersburg Police Department's "2011 Top 25 Intersection Related Traffic Crash Rate" list excluding the intersections with traffic safety camera enforcement. These analyzed high crash intersections have a total of 40 intersection approaches, none of which have camera enforcement.

The analyzed high crash intersections, which do not have traffic safety camera enforcement are the Police Department's "Top Intersection Related Traffic Crash - 2011" are shown in Table 5.

BEFORE AND AFTER CRASH ANALYSIS

Red Light Related and Red Light Running Crashes

An analysis was performed using the summarized Red Light Related and Red Light Running crash data at the intersection approaches before the traffic safety cameras were installed and after the cameras were installed. The comparison of the Red Light Related and Red Light Running crash data for "before and after" is shown in Figure 3 for the 22 intersection approaches with traffic safety camera enforcement, the comparison for 16 approaches without camera enforcement at the 10 intersections that have an enforcement camera located on at least one approach and the comparison for analyzed high crash intersections which do not have traffic safety camera enforcement.

FIGURE 3:
All Red Light Related and All Red Light Running Crashes

	Annual Average % Change				
Location	**3-Years Prior**	1st Yr	2nd Yr	**Average**	% Change
22 Camera Approaches	**24.3**	17.0	11.0	**14.0**	- 42.5%
16 Non Camera Approaches	**17.3**	17.0	11.0	**14.0**	- 19.2%
Total Camera Intersections	**41.6**	34.0	22.0	**28.0**	- 32.8%
10 Comparison Intersections	**26.3**	34.0	15.0	**24.5**	- 7.0%

A comparison of the change in red light related and red light running crashes was performed between the 22 intersection approaches with traffic safety enforcement cameras against the Police Department's analyzed high crash intersections which do not have traffic safety camera enforcement. The comparison of red light related and red light running crash data for the camera enforced approaches vs. the Police Department's 10 High Crash Intersections; Non-Camera Enforced (from Figure 3) is shown below in Figure 4.

FIGURE 4:
All Red Light Related and All Red Light Running Crashes

Intersection Approaches with Camera Enforcement
VS
Police Department's 10 High Crash Intersections (Non-Camera Enforced)

Crash Type	**22 Camera Approaches**	**10 Comparison Intersections**
Red Light Related and Red Light Running Crashes	- 42.5%	- 7.0%
Net Difference	- **35.5%**	

Red Light Related and Red Light Running Injury Crashes

An analysis was performed using the summarized Red Light Related and Red Light Running injury crash data at the intersection approaches before the traffic safety cameras were installed and after the cameras were installed. The comparison of Red Light Related and Red Light Running injury crash data for "before and after" is shown in Figure 5 for the 22 intersection approaches with traffic safety camera enforcement, the comparison for 16 approaches without camera enforcement at the 10 intersections that have an enforcement camera located on at least one approach, and the comparison for analyzed high crash intersections which do not have traffic safety camera enforcement.

FIGURE 5:
Red Light Related Injury and Red Light Running Injury Crashes

	Annual Average % Change				
Location	**3-Years Prior**	1st Yr	2nd Yr	**Average**	% Change
22 Camera Approaches	**11.7**	5.0	2.0	**3.5**	- 70.0%
16 Non Camera Approaches	**6.7**	7.0	3.0	**5.0**	- 25.0%
Total Camera Intersections	**18.4**	12.0	5.0	**8.5**	- 53.6%
10 Comparison Intersections	**10.0**	16.0	4.0	**10.0**	0.0%

A comparison of the change in Red Light Related and Red Light Running injury crash rates was performed between the 22 intersection approaches with traffic safety enforcement cameras against the Police Department's analyzed high crash intersections which do not have traffic safety camera enforcement. The comparison of red light related and red light running injury crash data for the camera enforced approaches vs. the Police Department's 10 High Crash Intersections, Non- Camera Enforced (from Figure 5) is shown below in Figure 6.

FIGURE 6:
Red Light Related Injury and Red Light Running Injury Crashes

Intersection Approaches with Camera Enforcement
VS
Police Department's 10 High Crash Intersections (Non-Camera Enforced)

Crash Type	**22 Camera Approaches**	**10 Comparison Intersections**
Red Light Related and Red Light Running Crashes	- 70.0%	0.0%
Net Difference	- **70.0%**	

Red Light Related Rear End Crashes

An analysis was performed using the summarized Red Light Related rear end crash data at the intersection approaches before the traffic safety cameras were installed and after the cameras were installed. The comparison of Red Light Related rear end crash data for "before and after" is shown in Figure 7 for the 22 intersection approaches with traffic safety camera enforcement, the comparison for 16 approaches without camera enforcement at the 10 intersections that have an enforcement camera located on at least one approach, and the comparison for analyzed high crash intersections which do not have traffic safety camera enforcement.

FIGURE 7:
Red Light Related Rear End Crashes,

Annual Average % Change					
Location	**3-Years Prior**	1st Yr	2nd Yr	**Average**	% Change
22 Camera Approaches	**67.0**	47.0	20.0	**33.5**	- 50.0%
16 Non Camera Approaches	**48.0**	39.0	28.0	**33.5**	- 30.2%
Total Camera Intersections	**115.0**	86.0	48.0	**67.0**	- 41.7%
10 Comparison Intersections	**100.3**	93.0	20.0	**56.5**	- 43.7%

A comparison of the change in Red Light Related rear end crash rates was performed between the 22 intersection approaches with traffic safety enforcement cameras against the Police Department's analyzed high crash intersections which do not have traffic safety camera enforcement. The comparison of Red Light Related rear end crash data for the camera enforced approaches vs. the Police Department's 10 High Crash Intersections, Non-Camera Enforced (from Figure 7) is shown below in Figure 8.

FIGURE 8:
Red Light Related Rear End Crash Rate

Intersection Approaches with Camera Enforcement
VS
Police Department's 10 High Crash Intersections (Non-Camera Enforced)

Crash Type	**22 Camera Approaches**	**10 Comparison Intersections**
Red Light Related and Red Light Running Crashes	- 50.0%	- 43.7%
Net Difference	- **6.3%**	

Total Intersection Crashes

An analysis was performed using the summarized crash data at the intersection approaches before the traffic safety cameras were installed and after the cameras were installed. The comparison crash data for "before and after" is shown in Figure 9 for the 22 intersection approaches with traffic safety camera enforcement, the comparison for 16 approaches without camera enforcement at the 10 intersections that have an enforcement camera located on at least one approach, and the comparison for analyzed high crash intersections which do not have traffic safety camera enforcement.

FIGURE 9:
Total Intersection Crashes

Annual Average % Change					
Location	**3-Years Prior**	1st Yr	2nd Yr	**Average**	% Change
22 Camera Approaches	**193.7**	191	171	**181.0**	- 6.5%
16 Non Camera Approaches	**133.3**	138	134	**136.0**	+ 2.0%
Total Camera Intersections	**327.0**	329	308	**318.5**	- 2.6%
10 Comparison Intersections	**294.7**	270	266	**268.0**	- 9.0%

A comparison of the change in Red Light Related rear end crash rates was performed between the 22 intersection approaches with traffic safety enforcement cameras against the Police Department's analyzed high crash intersections which do not have traffic safety camera enforcement. The comparison of Red Light Related rear end crash data for the camera enforced approaches vs. the Police Department's 10 High Crash Intersections, Non-Camera Enforced (from Figure 9) is shown below in Figure 10.

FIGURE 10:
Total Intersection Crash

Intersection Approaches with Camera Enforcement
VS
Police Department's 10 High Crash Intersections (Non-Camera Enforced)

Crash Type	**22 Camera Approaches**	**10 Comparison Intersections**
Red Light Related and Red Light Running Crashes	- 6.5%	- 9.0%
Net Difference	- **2.5%**	

Crash Comparison

All crash data has been summarized and compared based on multiple crash causing types (15) that identify in detail as to whether the crash was reported to have a causational factor related to red light running or not. Each report that was identified at the 10 intersections with traffic safety cameras and the Police Department's 10 High Crash Intersections were read and coded to these crash types. See TABLE No 7, 8, 9, 10, and 11. All the data from these crashes was analyzed and illustrated on TABLE No 12.

All crash types that are pertinent to Red Light Running and Red Light Running Related crashes have also been graphically represented on various charts. These charts also compare the average number of crashes at the 22 approaches with traffic safety cameras to the 16 approached without traffic safety cameras and the Police Department's 10 High Crash Intersections. See Charts 27 thru 30. A more comprehensive analysis of these crash types is illustrated in Chart 31 thru 39.

In all cases we can say emphatically that in every crash type related to or caused by red light running since the start of the Stop On Red Program that crashes are declining.

Pedestrian Crashes

A comprehensive review of pedestrian crashes is integral to the evaluation of the Stop On Red Program, as one of the most vulnerable roadway users their safety at signalized intersections is paramount. A pedestrian trip within a complex urban environment is often challenging and multifaceted and compounded if one has limited mobility. The simple task of crossing the roadway is made more difficult at a signalized intersection as traffic is in near constant motion and seemingly always at odds with the pedestrian. Issues often include, but are not limited to, motorists stopping over the crosswalk, or not stopping at all; free flowing right-turns where the driver is looking left for vehicles and not right for pedestrians crossing with the right-of-way; left-turning vehicles crossing over the path of a pedestrian with the right-of-way. This ballet that takes place between motorist and human can be more complex than one can handle and thus many pedestrians often feel that it is safer to cross the roadway away from the protection provided by the signalized intersection. Unfortunately, their perception is not reality.

As you know, the Tampa Bay area, including St. Petersburg ranks as one of the worst in the country for pedestrian crashes. We have come a long way since the start of our CityTrails Program in 2003 and pedestrian crashes have lessened. There still however is more that can be done to address pedestrian safety at and near signalized intersections and Traffic Safety Cameras can help. They accomplish this by slowing traffic as they approach the intersection; making motorist more aware of conditions at the intersection and most importantly, reducing the illegal free-flow right-turn on-red.

A review of our pedestrian crash data between 1999 and 2012 has verified that there is still much to be done to meet the goals of the Stop On Red Program by preventing mid-block crossings away from the traffic control signal and make crossings at signalized intersections safer.

- 241 pedestrian crashes occurred where the traffic control was noted as signalized, representing 13.7% of the pedestrian crashes. (Average 17.2 per year).

- 118 pedestrian crashes or 49% of those occurred outside the signalized intersection with distances ranging from 2' to 810' (Average 8.4 per year).

- 115 pedestrian crashes or 47.7% occurred within 150' of the signalized intersection. (Average 8.2 per year).

- 25' was the average distance away from the signalized intersection while the median distance was 14'.

- 15.9% of **all** pedestrian crashes were incapacitating or fatal pedestrian crashes

- 24.5% of the pedestrian crashes, where the traffic control was noted to be signalized, reported to include an incapacitating or fatal injury.

Bicycle Crashes

A review of our bicycle crash data between 1999 and 2012 has verified that there is a high percentage of bicycle crashes at signalized intersection. A more detailed analysis is required in order to determine causation factors and cyclist / motorists behaviors that caused these crashes, in order to determine any positive countermeasures. This evaluation is currently underway and will be reported separately in our CityTrails Program update later in 2014.

- 1400 bicycle crashes occurred where the traffic control was noted as signalized, representing 58% of the total bike crashes

- 178 bicycle crashes or 12.7% occurred outside the signalized intersection with distances ranging from 1' to 300',

- 27' was the average distance away from the signalized intersection while the median distance was 15'.

- The percentage of severe and fatal bicycle injuries is much lower amongst crashes occurring where the traffic control was noted as signalized.

- 13.7% of **all** bicycle crashes were incapacitating or fatal bike crashes.

- 6% of the bicycle crashes, where the traffic control was noted to be signalized, reported to include an incapacitating or fatal injury.

Additional "Stop on Red" Program Enforcement Locations

Based on the first two years of crash data and the historical crash data which was reviewed and analyzed, the Red Light Running and Red Light Related crashes have been reduced by 42.5%, and the net reduction on approaches with camera enforcement beyond the reduction seen at the analyzed Police Department's 10 High Crash Intersections which do not have traffic safety camera enforcement is - 35.5%.

The American Association of State Highway and Transportation Officials (AASHTO) publication, *Highway Safety Manual*, First Edition, provides a crash modification factor which can help project the safety benefits of certain treatments, such as traffic safety cameras. The *Highway Safety Manual* projects a crash modification factor of 0.74 for right-angle and left-turn (opposite direction) crashes when traffic safety camera enforcement is implemented, which is a 26 percent reduction. A direct comparison of our crash reduction to this applied crash modification factor will be included in our comprehensive analysis after the third year of the program. This will give us a minimum number of years of both before and after crash data to analysis in the comparison.

CONCLUSIONS

The City of St. Petersburg has established a goal for the Intersection Public Safety Program's "Stop on Red" campaign of enhancing safety at signalized intersections in St. Petersburg by reducing the frequency and/or severity of crashes caused by red-light running. The Comprehensive Plan details Transportation System Safety and Efficiency as a major issue in the Transportation Element section of the document and offers several objectives to mitigate this concern. Objective T5 describes the City's commitment to safety:

"The City shall ensure the safe accommodation of motorized and non-motorized traffic while reducing the incidence of vehicular conflicts within the City's major transportation corridors."
The "Stop on Red" Annual Performance Evaluation for 2012 has been prepared to provide the City Council with an analysis of the first full year of the "Stop on Red" program. The "Stop on Red" program is proposed to be evaluated on an annual basis, while the third full year (expanded) analysis will provide the desired sample size of data (3-years prior to "Stop on Red," 3-years with "Stop on Red," all 298 signalized intersections within the City) to allow a "regression to the mean analysis," which will allow for comparison with the other traffic safety camera analysis throughout the nation.

The review of the first two years of traffic safety camera enforcement has shown a 42.5 percent reduction in the Red Light Related and Red Light Running crash rate at the 22 intersection approaches with traffic safety camera enforcement (10 intersections with camera enforcement). A reduction of 7 percent in the Red Light Related and Red Light Running crash rate was observed at the Police Department's 10 high crash intersections without traffic safety camera enforcement. The intersection approaches with traffic safety camera enforcement had a Red Light Related and Red Light Running crash rate net reduction of 35.5 percent beyond the reduction at the Police Department's 10 high crash intersections without traffic safety camera enforcement.

The review of the first two years of traffic safety camera enforcement has shown a 70 percent reduction in the Red Light Related and Red Light Running injury crash rate at the 22 intersection approaches with traffic safety camera enforcement (10 intersections with camera enforcement). No reduction in the Red Light Related and Red Light Running injury crash rate was observed at the Police Department's 10 high crash intersections without traffic safety camera enforcement, when comparing last year to the first year of the Program.

The review of the first two years of traffic safety camera enforcement has shown a 50 percent reduction in the Red Light Related rear end crashes at the 22 intersection approaches with traffic safety camera enforcement (10 intersections with camera enforcement). A decrease of 43.7 percent in the Red Light Related rear end crashes was observed at the Police Department's 10 high crash intersections without traffic safety camera enforcement. The intersection approaches with traffic safety camera enforcement had a Red Light Related rear end crash net reduction of 6.3 percent beyond the reduction at the Police Department's 10 high crash intersections without traffic safety camera enforcement.

The review of the first two years of traffic safety camera enforcement has shown a 6.5 percent reduction in total intersection crashes at the 22 intersection approaches with traffic safety camera

enforcement (10 intersections with camera enforcement). A decrease of 9.0 percent in the total intersection crash was observed at the Police Department's 10 high crash intersections without traffic safety camera enforcement. Therefore the intersection approaches with traffic safety camera enforcement had a total intersection crash decrease of 2.5 percent less than the reduction at the Police Department's 10 high crash intersections without traffic safety camera enforcement.

The analysis of our crash data provides an opinion as to whether we are achieving our first goal – Enhance safety at signalized intersections by reducing the frequency and/or severity of crashes caused by red-light running. Also, future analysis will consider an additional public awareness campaign as well as a review of red-light running crashes to determine the zip code of the drivers. A seasonal evaluation of motorists involved in red-light running crashes will also help determine if crashes are being caused by motorist from outside the area are a factor.

The yellow interval time for the intersection approaches with traffic safety camera enforcement was found to comply with guidance from the Federal Highway Administration, the Institute of Transportation Engineers, and from the Florida Department of Transportation. Based upon the data analyzed for the 22 approaches with traffic safety camera enforcement, there is no evidence that extending the yellow interval beyond the criteria provides a reduction in red light running (and red light related) crash rates.

The Police Department has continued its special enforcement details, paying attention to intersections with high incidence of red-light running crashes that were not being enforced by Traffic Safety Cameras. This provides a force multiplier that allows technology, in conjunction with police personnel, to provide a needed outreach to the motoring public regarding a severe safety problem and that this combined approach has started to change driver behavior.

The City's own crash statistics have illustrated the impact of red-light running on the community, highlighting the impact on our residents. The economic impact of red-light running collisions on families and our community in medical care, vehicle repair and police response alone are measurable. Analysis has determined that only one Traffic Safety Camera will save a total of $187,440 in the first year of operation and would save $846,849 over a five year program. The most important benefit in every case remains the lives that are saved.

This detailed evaluation and analysis of Notice of Violations issued by the Police Department to motorists that ran a red traffic signal, during the first two year of the Stop On Red Program, clearly indicates a downward trend that motorists are changing their behavior.

As predicted at the outset of the program:

- The number of Notice of Violations issued has decreased over time,
- 58% of Notices are issued to non-St. Petersburg residents,
- 94% of motorists receive only one Notice of Violation,
- Traffic Safety Cameras save lives and lower costs in St. Petersburg
- Camera video has proven to be a benefit to the Police in investigations,
- Locations with increased yellow intervals do not appear to reduce red-light running

1. Enhanced safety at signalized intersections in St. Petersburg has been observed by reducing the crash rate and reducing injury crashes caused by red light running. The crash data analyzed during "Stop on Red" campaign has shown the campaign is an effective tool for reducing red light running crashes and injury crashes.

2. Provided an additional method of violation enforcement, which allows Police Officers to fulfill other critical law enforcement objectives.

3. Raised awareness of safe driving practices in St. Petersburg through the advertisement campaign, news reports, and identification signs along roadways among other information outlets.

Similar safety benefits at additional intersection approaches, beyond the existing traffic safety camera locations, are expected to be realized in a net reduction in Red Light Running and Red Light Related crashes and injury crashes which were attributable to drivers disregarding the traffic signal.

The City of St. Petersburg's transportation and public safety department's feel that the addition of red-light photo enforcement has and will continue to provide an additional public awareness to the severe effects of running red-lights and be a force multiplier for the Police Department.

The continuance of a well-executed Stop On Red Program, including a clear, well-defined process coupled with good legislation from inception, will increase effectiveness, facilitate public acceptance and improve long term success.

Red-Light Safety Cameras Save Lives and Lower Costs in St. Petersburg

Every traffic collision exacts its own financial costs on families, vehicle owners and the community at large. Medical care, vehicle removal and repair, and the attention from police and other emergency response personnel are just a few of the measurable costs associated with traffic crashes. Red-light safety cameras help reduce vehicle collisions by changing driver behavior. As a result, injuries and fatalities decrease, along with the tax burden to communities for emergency services and other costs tied to every traffic collision. Red-light safety cameras also allow police departments to provide uninterrupted traffic enforcement without assigning an officer to watch the intersection. This enables a department to enhance its enforcement efforts without added costs, providing a cost-savings to the community.

Red-Light Safety Cameras Benefit St. Petersburg by Reducing Costs Associated with Red-Light-Running Related Collisions

- One red-light safety camera in St. Petersburg at one intersection could save the city and its residents $187,440 in the first year and $846,849 over five years in 2011 dollars. Using a comprehensive set of data from nationally recognized sources, the savings is calculated by applying total crash costs over a victim's expected lifetime against expected crash reductions from red-light safety cameras.

Savings per Year Over Five Years

Year	Savings	Cumulative Savings
2011	$187,440	$187,440
2012	$177,855	$365,295
2013	$168,839	$534,134
2014	$160,354	$694,488
2015	$152,361	$846,849

- One red-light safety camera saves St. Petersburg and its residents an average of $169,370 a year. Similar economic benefits can be found in other communities with red-light safety cameras, <u>but the most important benefit in every case remains the lives that are saved</u>.

Red-Light Safety Cameras Reduce Intersection Collisions, which Are a Serious Problem in St. Petersburg and Across the Country

- In the United States, an average of 885 people died and another 165,000 were injured in red-light running collisions each year, from 2000 to 2009.[1]
- Federal Highway Administration research estimates the cost of a fatal car crash to be between $5 million and $5.4 million.[2] Injury related traffic crashes are estimated to cost $500,000 to $540,000 and property damage only crashes are estimated to cost from $25,000 and $28,000.
- These figures were confirmed in a more recent study conducted for the AAA, which found that a fatal car crash costs a community about $6 million. These estimates include medical, insurance, legal, and emergency service costs, as well as lost work productivity and travel delays.[3]

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1 Figure based on: U.S. Federal Highway Administration, *Intersection Safety Data and Statistics. Red Light Running Fatalities. Available at: http://safety.fhwa.dot.gov/intersection/redlight/data/rlr_fatal/. And available at: http://safety.fhwa.dot.gov/intersection/redlight/*

2 Costs are based on the KABCO scale and have been adjusted for inflation to 2010 dollars from the original source: U.S. Department of Transportation National Highway Traffic Safety Administration, *The Economic Impact of Motor Vehicle Crashes, 2002.*

3 See: *Crashes vs. Congestion, What's the Cost to Society?* Prepared for the AAA by Cambridge Systematic, Inc., November 2011.

TERMINOLOGY: **APPENDIX No. 2**

The crash data reviewed for the Annual Performance Evaluation is from November 1, 2011 through February 29, 2013. The crash data by intersection is provided in the Appendix. The historical crash data used for the analyses is for the period of November 1, 2008 through October 31, 2011. The crash data by intersection is provided in the Appendix.

An intersection approach is defined as the side of one leg of an intersection which the vehicles arrive at the junction with the cross street. As a specific example, there are 10 intersections that have at least one approach with camera enforcement and some of these intersections have two or three approaches with camera enforcement. The 10 intersections with camera enforcement have 22 approaches with camera enforcement and 16 approaches without camera enforcement, for a total of 38 approaches.

Vehicle crashes identified as Red Light Running crashes were identified as a collision caused by disregarding the traffic signal by the reporting law enforcement officer.

Vehicle crashes identified as Red Light Related crashes were collisions that a driver disregarded the traffic signal, based on the review of the law enforcement officer's crash report, however the officer did not issue a citation due to inability to determine which driver was the violator.

Red Light Related Rear End crashes were identified as rear end crashes that, based on a review of the law enforcement officer's crash report, occurred due to vehicles stopping for a red light. These Red Light Related Rear End crashes do not include rear end crashes occurring on the far side of an intersection, or due to a driveway near the intersection, etc.

An angle crash is defined as two vehicles approaching from angular directions colliding. These crashes can occur between vehicles on adjacent approaches (e.g. eastbound and northbound), or between a through vehicle and opposing left turning vehicle (e.g. eastbound through and westbound left with a permissive green signal indication) who may have entered the intersection legally but not cleared from the intersection upon the onset of the conflicting movement's green signal. The City of St. Petersburg confirmed that the crash data categorized and summarized as angle crashes in this report were not Red Light Running or Red Light Related crashes.

The yellow signal indication warns vehicle traffic of an impending change in right-of-way. It is displayed following every green signal indication. The amount of time that the yellow signal is displayed is referred to as the yellow interval. The duration of this interval is based on the driver's perception-reaction time and deceleration rate, the approach posted speed limit, and the approach grade. The duration of the yellow interval should allow, at a minimum, for a driver to comfortably decelerate to a stop prior to entering the intersection.

A red clearance interval is a period when a red signal indication is displayed to most, if not all, vehicular traffic approaches. The duration of the red clearance interval is based on intersection width, vehicle length, and the posted speed. The duration of the red clearance interval allows additional time as a safety factor for a driver that legally enters the intersection at the very last instant of the yellow change interval to avoid conflict with traffic releasing from an adjacent opposing intersection approach.

TABLE 1: List of Intersections with Traffic Safety Camera Enforcement

No	Street	Cross Street	Direction
1	34th Street	1st Avenue N	NB
2	34th Street	1st Avenue S	SB
3	4th Street	22nd Avenue N	EB
4	4th Street	22nd Avenue N	NB
5	34th Street	1st Avenue S	EB
6	34th Street	22nd Avenue S	SB
7	34th Street	22nd Avenue S	NB
8	34th Street	38th Avenue N	SB
9	34th Street	38th Avenue N	EB
10	34th Street	38th Avenue N	WB
11	4th Street	22nd Avenue N	SB
12	4th Street	Gandy Boulevard	NB
13	4th Street	Gandy Boulevard	SB
14	66th Street	38th Avenue N	EB
15	4th Street	54th Avenue N	NB
16	4th Street	54th Avenue N	SB
17	4th Street	Gandy Boulevard	EB
18	66th Street	22nd Avenue N	NB
19	66th Street	22nd Avenue N	SB
20	66th Street	38th Avenue N	SB
21	66th Street	Tyrone Boulevard	NB
22	66th Street	Tyrone Boulevard	EB

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program

Notice of Violation Rate

STOP ON RED

Site ID	Street	Cross Street	Direction	Approach Volume	Yellow Time	Violation Rate - 1st Year				Violation Rate - 2nd Year			
				2012	ITE Standard	Left	Thru	Right	Total	Left	Thru	Right	Total
STP 01	34th Street	/ 1st Avenue N	(N/B)	16,642	4.0	17.82	28.68	48.87	95.37	37.04	**115.25**	15.27	174.19
STP 04	34th Street	/ 38th Avenue N	(S/B)	21,060	4.0	14.05	37.85	106.98	158.88	52.28	**201.09**	127.40	380.78
STP 05	34th Street	/ 38th Avenue N	(E/B)	15,738	4.0	56.93	33.17	0.25	90.35	28.47	**141.66**	10.94	181.07
STP 06	34th Street	/ 38th Avenue N	(W/B)	13,458	4.0	42.74	**141.03**	8.21	199.64	20.71	**82.43**	16.85	119.98
STP 07	4th Street	/ Gandy Boulevard	(N/B)	12,055	4.5	76.03	**286.72**	189.28	552.03	14.73	26.29	**64.59**	105.62
STP 08	4th Street	/ Gandy Boulevard	(E/B)	19,360	4.5	82.81	**148.78**	1.04	232.63	0.14	**116.57**	13.27	129.98
STP 12	34th Street	/ 1st Avenue S	(S/B)	17,444	4.0	47.30	65.78	**248.50**	361.58	158.82	**192.34**	14.57	365.73
STP 13	34th Street	/ 1st Avenue S	(E/B)	19,316	4.0	0.14	**135.77**	2.96	138.87	27.87	**88.55**	8.77	125.18
STP 14	4th Street	/ 22nd Avenue N	(E/B)	9,363	4.0	204.24	**265.80**	3.45	473.49	100.38	42.60	**155.54**	298.52
STP 15	4th Street	/ 22nd Avenue N	(N/B)	15,000	4.0	43.71	**134.52**	0.99	179.22	39.53	**185.79**	47.91	273.22
STP 16	4th Street	/ 22nd Avenue N	(S/B)	14,500	4.0	119.64	55.74	**252.71**	428.09	36.74	**149.43**	90.64	276.80
STP 17	66th Street	/ 22nd Avenue N	(N/B)	19,624	4.3	47.54	**206.19**	53.55	307.29	15.45	19.49	**30.07**	65.02
STP 18	66th Street	/ 22nd Avenue N	(S/B)	20,431	4.3	43.53	**184.85**	127.38	355.76	9.76	18.19	**34.64**	62.59
STP 19	34th Street	/ 22nd Avenue S	(S/B)	14,364	4.3	12.97	18.45	**95.88**	127.31	27.01	**101.38**	25.68	154.07
STP 20	4th Street	/ 54th Avenue N	(N/B)	11,939	4.3	35.95	**93.40**	65.05	194.40	15.79	**215.35**	37.53	268.67
STP 21	4th Street	/ 54th Avenue N	(S/B)	17,581	4.3	22.43	**276.22**	52.86	351.51	4.04	40.87	**42.43**	87.34
STP 22	66th Street	/ 38th Avenue N	(S/B)	21,313	5.0	1.55	59.99	**87.03**	148.57	46.41	11.15	**62.69**	120.25
STP 23	66th Street	/ 38th Avenue N	(E/B)	19,041	5.0	52.05	20.00	**103.84**	175.88	23.25	8.61	**83.66**	115.51
STP 24	66th Street	/ Tyrone Boulevard	(N/B)	21,500	4.3	24.68	10.33	**282.68**	317.69	**72.18**	28.21	2.16	102.55
STP 25	66th Street	/ Tyrone Boulevard	(E/B)	16,000	4.3	**298.67**	96.65	3.59	398.91	**254.61**	79.92	6.15	340.68
STP 26	4th Street	/ Gandy Boulevard	(S/B)	11,004	4.5	0.74	78.71	**493.11**	572.57	13.16	40.97	**308.88**	363.01
STP 27	34th Street	/ 22nd Avenue S	(N/B)	14,423	4.3	76.53	83.54	**310.87**	470.94	54.37	81.65	**285.67**	421.69
TOTAL / AVARAGE - Notice of Violations Rate						1322.1	2462.2	2539.1	6331.0	1052.7	1987.8	1485.3	4532.5

Table No. 2

TABLE No. 3

RED LIGHT CAMERA STATE PORTION COLLECTION BY STATE of FLORIDA

JURISDICTION - ST PETERSBURG

Jan-12	$307,173
Feb-12	$220,856
Mar-12	$221,785
Apr-12	$235,097
May-12	$163,521
Jun-12	$160,356
TOTAL	**$1,308,787**

Jul-12	$188,843
Aug-12	$158,153
Sep-12	$76,360
Oct-12	$126,100
Nov-12	$140,928
Dec-12	$114,929
Jan-13	$122,421
Feb-13	$127,688
Mar-13	$131,476
Apr-13	$164,728
May-13	$122,390
Jun-13	$111,884
TOTAL	**$1,585,901**

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program

Stop On Red

Intersection Yellow Change Interval and All Red Clearance

Street	Cross Street	Direction	Speed	Yellow Change		Red Clearance		Timing
			Limit	Left	Thru	Left	Thru	Date
4th Street	22nd Avenue N	NB	35	4.0	4.0	2.0	2.0	10/01/13
4th Street	22nd Avenue N	SB	35	4.0	4.0	2.0	2.0	10/01/13
4th Street	22nd Avenue N	EB	35	4.0	4.0	2.2	2.2	10/01/13
4th Street	54th Avenue N	NB	45	4.8	4.8	2.0	2.0	10/14/13
4th Street	54th Avenue N	SB	45	4.8	4.8	2.0	2.0	10/14/13
4th Street	Gandy Boulevard	NB	40	na	4.5	na	7.0	12/20/13
4th Street	Gandy Boulevard	SB	40	na	4.5	na	7.0	12/20/13
4th Street	Gandy Boulevard	EB	40	4.8	4.8	4.8	6.0	12/20/13
34th Street	1st Avenue N	NB	35	4.0	4.0	2.2	2.2	09/30/13
34th Street	1st Avenue S	SB	35	4.0	4.0	2.0	2.0	09/30/13
34th Street	1st Avenue S	EB	40	4.4	4.4	na	2.0	09/30/13
34th Street	22nd Avenue S	NB	45	4.8	4.8	2.3	2.3	10/02/13
34th Street	22nd Avenue S	SB	45	4.8	4.8	2.3	2.3	10/02/13
34th Street	38th Avenue N	SB	40	4.4	4.4	2.2	2.2	11/02/13
34th Street	38th Avenue N	EB	40	4.4	4.4	2.3	2.3	11/02/13
34th Street	38th Avenue N	WB	40	4.0	4.4	2.3	2.3	11/02/13
66th Street	22nd Avenue N	NB	45	4.8	4.8	2.2	2.2	10/04/13
66th Street	22nd Avenue N	SB	45	4.8	4.8	2.2	2.2	10/04/13
66th Street	38th Avenue N	SB	45	4.8	4.8	2.0	2.0	10/04/13
66th Street	38th Avenue N	EB	40	4.4	4.4	2.4	2.2	10/04/13
66th Street	Tyrone Boulevard	NB	45	4.8	4.8	5.7	5.7	12/20/13
66th Street	Tyrone Boulevard	EB	45	4.8	4.8	3.6	3.6	12/20/13

TABLE No 4

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program

Traffic Safety Camera Intersections Countermeasures

Stop On Red

Counter Measure	4th Street / 22nd Avenue N	4th Street / 54th Avenue N	4th Street / Gandy Blvd.	34th Street / 1st Avenue N	34th Street / 1st Avenue S	34th Street / 22nd Avenue S	34th Street / 38th Avenue N	66th Street / 22nd Avenue N	66th Street / 38th Avenue N	66th Street / Tyrone Blvd.
Jurisdiction	State	State	State	State	State	State	State	State	State	State
Reflective Back Plates	●		●	●	●	●	●	●	●	◕
Signal Head Per Lane	●	●	●	●	●	W/B	●	●	●	●
12 Inch Signal Heads	●	●	●	●	●	●	●	●	●	●
Mast Arm Signal Post	●		●	●	●	●	●	●		●
LED Signal Display	●	●	●	●	●	●	●	●	●	●
Traffic Safety Camera	●	●	●	●	●	●	●	●	●	●
Protected Left-Turn			●			E/W	●	●	N/S	●
Flashing Yellow Arrow							●			
Dilemma Zone Marked	●	●	●	●	●	●	●	●	●	●
Yellow Interval = TEM	●	●	●	●	●	●	●	●	●	●
All Red Interval = TEM	●	●	●	●	●	●	●	●	N/S	●
Street Lighting	●	●	●	●	●	●	●	●	●	●
Pavement Markings	●	●	●	●	●	●	●	●	●	●

Table No. 5

City of St. Petersburg
Department of Transportation

Table No. 6

Top Intersection Related Traffic Crashes - 2011

Rank	Intersection		Status	Crashes
1	22nd Avenue S.	34th Street	**Camera**	47
2	38th Avenue N.	66th Street	**Camera**	47
3	Tyrone Blvd.	66th Street	**Camera**	45
4	38th Avenue N	34th Street	**Camera**	42
5	Gandy Blvd.	4th Street	**Camera**	41
6	Gandy Blvd.	Dr. MLK St.	**High Crash**	39
7	Roosevelt Blvd. N	Dr. MLK St.	**High Crash**	37
8	38th Avenue N	Tyrone Blvd	**High Crash**	36
9	22nd Avenue N	66th Street	**Camera**	33
10	38th Avenue N	49th Street	**High Crash**	33
11	22nd Avenue N	34th Street	**High Crash**	32
12	5th Avenue N	34th Street	**High Crash**	32
13	38th Avenue N	4th Street	**High Crash**	30
14	22nd Avenue N	28th Street	**High Crash**	29
15	54th Avenue S.	31st Street	**High Crash**	28
16	38th Avenue N	58th Street	**High Crash**	25
17	38th Avenue N	Dr. MLK St.		24
18	18th Avenue N	66th Street	-	23
19	9th Avenue N	34th Street		22
20	54th Avenue S.	34th Street		21
21	5th Avenue N	66th Street		21
22	Central Avenue	Pasadena Avenue		21
23	1st Avenue N	58th Street		20
24	22nd Avenue N	4th Street	**Camera**	20
25	30th Avenue N	34th Street		20
26	1st Avenue N	34th Street	**Camera**	19
27	18th Avenue S.	34th Street		18
28	22nd Avenue N	Dr. MLK St.		17
29	54th Avenue N	Dr. MLK St.		17
30	62nd Avenue N.	Dr. MLK St.		17

Note: Number is based on crashes reported through the City of St. Petersburg Police reporting system and reflect the exact intersection related crashes.

= Intersections with existing traffic safety camera(s).

= Police Departments 10 high crash intersections without traffic safety camer

Ranking based on the 2011 number of crashes.

City of St. Petersburg
Department of Transportation

Traffic Safety Cameras
Crash Data Summary
2008 thru 2013

An Intersection Public Safety Program

Camera Intersections — **November 2012 thru October 2013** — **Table No. 7**

Intersection	Direction of Vehicle No. 1	Red Light Related Crashes	Red Light Running Crashes	Side Swipe	Rear End Crashes	Red Light Related Rear End Crashes	Red Light Related Injury Crashes	Red Light Related Rear End Injury	Red Light Running Injury	Red Light Related Rear End Fatality	Red Light Running Fatality	Red Light Related Crash Fatalities	Angle Crash	Right on Red Crashes	Bicycle / Pedestrian / SMV	Total Crashes
4th Street / Gandy Blvd.	NB			2	8	2										12
	SB				5	1									1	7
	EB		2		5	1		1	1							10
	WB		1	2	4	2		1	1				1		1	13
4th Street / 54th Avenue N	NB				2											2
	SB			1	4	1							2			8
	EB		1	1	1								2		1	6
	WB												1		1	2
4th Street / 22nd Avenue N	NB			1	7											8
	SB			2	3			1					2		2	10
	EB				1								1			2
	WB				1											1
34th Street / 38th Avenue N	NB			2	3	1		1					1			8
	SB			1	12	1							5		1	20
	EB			1	5										1	7
	WB			3	2	1							1			7
34th Street / 1st Avenue N	NB		1													1
	SB		2	2	7	1	1									13
	EB			3												3
	WB				1								1		2	4
34th Street / 1st Avenue S	NB		1		3	1									1	6
	SB		3	1	2										1	7
	EB			4									2		1	7
	WB															0
34th Street / 22nd Avenue S	NB		2	1	3	1							1			8
	SB		1	2	4								1		1	9
	EB				1				1				2		1	5
	WB	1		3	2	1		1								8
66th Street / 38th Avenue N	NB		1	4	8	1									2	16
	SB			4	3	2	1	1					1			12
	EB			2	2	2		2					2		1	11
	WB				6	1		1					3		1	12
66th Street / Tyrone Blvd.	NB			2	2								2			6
	SB		1	1	10	1		1					1		1	16
	EB			1	3	1								1		6
	WB			1	1	3									1	6
66th Street / 22nd Avenue N	NB			3	3	1										7
	SB			3		1										4
	EB			2		11							2			15
	WB			3												3
22 - Camera Approaches		0	9	34	76	15	1	5	1	0	0	0	20	1	9	171
16 - Non Camera Approaches		1	7	24	48	23	1	5	2	0	0	0	14	0	12	137
TOTAL 10 - Intersections		1	16	58	124	38	2	10	3	0	0	0	34	1	21	308

City of St. Petersburg
Department of Transportation

Traffic Safety Cameras
Crash Data Summary
2008 thru 2013

An Intersection Public Safety Program

Camera Intersections — **November 2011 thru October 2012** — **Table No. 8**

Intersection	Direction of Vehicle No. 1	Red Light Related Crashes	Red Light Running Crashes	Side Swipe	Rear End Crashes	Red Light Related Rear End Crashes	Red Light Related Injury Crashes	Red Light Related Rear End Injury	Red Light Running Injury	Red Light Related Rear End Fatality	Red Light Running Fatality	Red Light Related Crash Fatalities	Angle Crash	Right on Red Crashes	Bicycle / Pedestrian / SMV	Total Crashes
4th Street / Gandy Blvd.	NB		2	4	3	1			1							11
	SB		1		2	4		1								8
	EB			4	2	3							1			10
	WB	1	2	3	9	3	1	1								20
4th Street / 54th Avenue N	NB	1		1	2	2							2			8
	SB		1	1	1											3
	EB				1								2			3
	WB															0
4th Street / 22nd Avenue N	NB			2		2		1					1			6
	SB			1	5	4			1				1	1	1	14
	EB			3		2							1			6
	WB			1		1										2
34th Street / 38th Avenue N	NB	1		2	1	6	2						1		1	14
	SB		1		2	2		2					2		2	11
	EB				1	1		2					1	1	1	7
	WB		1	2	1	3		2					1			10
34th Street / 1st Avenue N	NB	1	2	4	1				1							9
	SB			1	1	4		2	1					1		10
	EB															
	WB			1	1				1						1	4
34th Street / 1st Avenue S	NB			1	3	2		1					1			8
	SB		1	3	1		1									6
	EB			5											1	6
	WB															0
34th Street / 22nd Avenue S	NB				6	1		1					4			12
	SB			1	3	1			1				3		2	11
	EB		3		1								3			7
	WB			1	1	1								2		5
66th Street / 38th Avenue N	NB		1	1	11	6	1		1						1	22
	SB			4	4	3		1								12
	EB		1	4	2	2							4		2	15
	WB			2	2	2							2	1	2	11
66th Street / Tyrone Blvd.	NB			1	4											5
	SB		1	4	5	7		1							1	19
	EB				9	1										10
	WB			1	2	1										4
66th Street / 22nd Avenue N	NB				2	4										6
	SB			3	1	1										5
	EB			1	3								1	1		6
	WB	1		1		1										3
22 - Camera Approaches		2	10	43	52	37	1	10	4	0	0	0	21	2	9	191
16 - Non Camera Approaches		3	7	20	41	34	4	5	3	0	0	0	10	5	6	138
TOTAL 10 - Intersections		5	17	63	93	71	5	15	7	0	0	0	31	7	15	329

City of St. Petersburg
Department of Transportation

Traffic Safety Cameras
Crash Data Summary
2008 thru 2013

An Intersection Public Safety Program

Intersection	Direction of Vehicle No. 1	Red Light Related Crashes	Red Light Running Crashes	Side Swipe	Rear End Crashes	Red Light Related Rear End Crashes	Red Light Related Injury Crashes	Red Light Related Rear End Injury	Red Light Running Injury	Red Light Related Rear End Fatality	Red Light Running Fatality	Red Light Related Crash Fatalities	Angle Crash	Right on Red Crashes	Bicycle / Pedestrian / SMV	Total Crashes
Camera Intersections		**November 2010 thru**				**October 2011**										**Table No. 9**
4th Street / Gandy Blvd.	NB			4	1	5									2	12
	SB			1	1	3		2								7
	EB				2	2		1	1							6
	WB	1	2	1	1	3	2	3								13
4th Street / 54th Avenue N	NB	1		1	1	1							2			6
	SB				5										1	6
	EB				1								2		1	4
	WB															0
4th Street / 22nd Avenue N	NB		1	2		1			1				5			10
	SB				3	1							1			5
	EB				1	1										2
	WB				1	1								1	1	4
34th Street / 38th Avenue N	NB			2	3	5	1								1	12
	SB		1	1		6		1	1	1			2			13
	EB				3	3			1		1		2	1	2	13
	WB			2	2	3										7
34th Street / 1st Avenue N	NB														1	1
	SB				1	8								2		11
	WB	1		3											4	8
34th Street / 1st Avenue S	NB		3		2	3										8
	SB		1	2			1						1			5
	EB		1	2												3
	WB															
34th Street / 22nd Avenue S	NB				1	2		1					1			5
	SB			1	3	1		1	1				3		1	11
	EB				2	1	1						1	1		6
	WB		1	2	4	2	2							1	1	13
66th Street / 38th Avenue N	NB			1	3	5	1	1	1							12
	SB			2	8	5	1	3								19
	EB			2	2	1							3		1	9
	WB				1	2									1	4
66th Street / Tyrone Blvd.	NB		1		3	9	1									14
	SB		1	3	3	3	1	1								12
	EB				3	2								2		7
	WB			2	1	2										5
66th Street / 22nd Avenue N	NB			3	2	4		2					1			12
	SB		1	1		3									1	6
	EB		2	1									1		1	5
	WB			1		1										2
22 - Camera Approaches		1	6	24	41	53	3	11	5	1	1	0	21	3	9	179
16 - Non Camera Approaches		2	9	16	23	36	8	5	1	0	0	0	4	5	10	119
TOTAL 10 - Intersections		3	15	40	64	89	11	16	6	1	1	0	25	8	19	298

City of St. Petersburg
Department of Transportation

Traffic Safety Cameras
Crash Data Summary
2008 thru 2013

An Intersection Public Safety Program

Camera Intersections — **November 2009 thru October 2010** — **Table No. 10**

Intersection	Direction of Vehicle No. 1	Red Light Related Crashes	Red Light Running Crashes	Side Swipe	Rear End Crashes	Red Light Related Rear End Crashes	Red Light Related Injury Crashes	Red Light Related Rear End Injury	Red Light Running Injury	Red Light Related Rear End Fatality	Red Light Running Fatality	Red Light Related Crash Fatalities	Angle Crash	Right on Red Crashes	Bicycle / Pedestrian / SMV	Total Crashes
4th Street / Gandy Blvd.	NB			1	5	1			1						2	10
	SB		1	1	2	4	3	1	1							13
	EB	1		4	4	4			2							15
	WB			1	2	5	1						1		3	13
4th Street / 54th Avenue N	NB			2		1										3
	SB	1			3	3							1			8
	EB			1	1										1	3
	WB															0
4th Street / 22nd Avenue N	NB		1	2			2									5
	SB		1	2	1	1	3						2			10
	EB				1	1	1						1			4
	WB		1										1			2
34th Street / 38th Avenue N	NB			2	1	2		1	1				2	1		10
	SB		1		7	4		1	1				2		1	17
	EB				1	3		2						1		7
	WB			3	2	4							2			11
34th Street / 1st Avenue N	NB	2	3	1	1				1				1		1	10
	SB	1		1		3		3					1			9
	WB	1	2	3	1											7
34th Street / 1st Avenue S	NB		2		1	4	1	1								9
	SB		1	1	1				1							4
	EB	2	2	5	2	2									1	14
34th Street / 22nd Avenue S	NB		1	1	1	6							1		1	11
	SB	1		4	1		1								2	9
	EB			4	1	4	1									10
	WB			4	1	1							1			7
66th Street / 38th Avenue N	NB			1	7	10		2	1				1	1		23
	SB		1	2	4	8			2						1	18
	EB				2	4							1	1	2	10
	WB			3	2	4	1						1			11
66th Street / Tyrone Blvd.	NB		1	5	3	1			1					1		12
	SB		2	3	2	8	1	1							1	18
	EB			2	1	7							1	1		12
	WB		1	1	3	3							1			9
66th Street / 22nd Avenue N	NB		1	3	1	3										8
	SB			1	1			1					1			4
	EB		1	4		2										7
	WB			1	1								1			3
22 - Camera Approaches		7	14	40	44	57	10	5	10	0	0	0	13	4	11	215
16 - Non Camera Approaches		2	9	29	23	46	5	8	2	0	0	0	10	2	5	141
TOTAL 10 - Intersections		9	23	69	67	103	15	13	12	0	0	0	23	6	16	356

City of St. Petersburg
Department of Transportation

Traffic Safety Cameras
Crash Data Summary
2008 thru 2013

An Intersection Public Safety Program

Camera Intersections — **November 2008 thru October 2009** — **Table No. 11**

Intersection	Direction of Vehicle No. 1	Red Light Related Crashes	Red Light Running Crashes	Side Swipe	Rear End Crashes	Red Light Related Rear End Crashes	Red Light Related Injury Crashes	Red Light Related Rear End Injury	Red Light Running Injury	Red Light Related Rear End Fatality	Red Light Running Fatality	Red Light Related Crash Fatalities	Angle Crash	Right on Red Crashes	Bicycle / Pedestrian / SMV	Total Crashes
4th Street / Gandy Blvd.	NB			2	3				1							6
	SB		1	1	6	9	1							1	1	20
	EB			1	4	9	1						1			16
	WB	1		1	2	2		1	1							8
4th Street / 54th Avenue N	NB				1	1							1			3
	SB			1	1	2		1							1	6
	EB	1		1	1	1									1	5
	WB															0
4th Street / 22nd Avenue N	NB			1	1											2
	SB		1	2		5		2					2		2	14
	EB			2	1	3										6
	WB															0
34th Street / 38th Avenue N	NB		1	2	3	2		1					2		2	13
	SB	1	1		6	2		1	1				2		1	15
	EB		1		3	3									1	8
	WB			1		3							1			5
34th Street / 1st Avenue N	NB		2	2	1	1	1									7
	SB	1		2	1	5		2					2		1	14
	WB		2	3	1	2									2	10
34th Street / 1st Avenue S	NB		2	3		2		1					1			9
	SB	2					1									3
	EB			2	1											3
34th Street / 22nd Avenue S	NB			2	1	4		1					6			14
	SB		1	1	3	1		1					3			10
	EB		2	1	1	4							3		1	12
	WB			4	2	2		1								9
66th Street / 38th Avenue N	NB			1	5	8		2	1				1	3	1	22
	SB				1	6			1				1			9
	EB			2	1	1							2			6
	WB			1	3	2		1	1				3		1	12
66th Street / Tyrone Blvd.	NB				1	3							1		1	6
	SB			1	1	3		2					1		1	9
	EB			1	2	3		4					1	1		12
	WB				2	3							1		2	8
66th Street / 22nd Avenue N	NB			2	2	5		2					1			12
	SB			2		2										4
	EB			2		2								2		6
	WB			1					1						1	3
22 - Camera Approaches		3	7	25	39	63	4	12	3	0	0	0	22	2	7	187
16 - Non Camera Approaches		3	7	23	22	38	0	11	4	0	0	0	14	5	13	140
TOTAL 10 - Intersections		6	14	48	61	101	4	23	7	0	0	0	36	7	20	327

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Stop On Red
CRASH COMPARISON

Table No. 12

COMPARISON	ANNUAL AVERAGE CRASH RATE				ANNUAL AVERAGE CRASHES			
	3-Yrs Prior	1st Year	2nd Year	Average Annual	3-Yrs Prior	1st Year	2nd Year	Average Annual
	Nov '08 to Oct '11	Nov '11 to Oct '12	Nov '12 to Oct '13	% Change	Nov '08 to Oct '11	Nov '11 to Oct '12	Nov '12 to Oct '13	% Change
Table A	**Red Light Running Crash Rate**				**Red Light Running Crashes**			
22 Camera Approaches	0.066	0.084	0.060	-8.5%	9.0	10.0	9.0	-5.6%
16 Non Camera Approaches	0.105	0.083	0.073	25.5%	8.3	7.0	7.0	16.0%
Total Camera Intersections	0.070	0.076	0.071	-5.0%	17.3	17.0	16.0	4.8%
10 Comparison Intersections	0.044	0.038	0.049	2.9%	9.3	7.0	9.0	14.3%
Table B	**Red Light Running Injury Crash Rate**				**Red Light Running Injury Crashes**			
22 Camera Approaches	0.047	0.033	0.006	59.4%	6.0	4.0	1.0	58.3%
16 Non Camera Approaches	0.017	0.027	0.025	-53.6%	2.3	3.0	2.0	-7.1%
Total Intersection	0.039	0.031	0.013	42.6%	8.3	7.0	3.0	40.0%
10 Comparison Intersections	0.048	0.059	0.011	27.4%	4.0	10.0	2.0	-50.0%
Table C	**Red Light Running Related Crash Rate**				**Red light Running Related Crashes**			
22 Camera Approaches	0.030	0.020	0.000	66.2%	3.7	2.0	0.0	72.7%
16 Non Camera Approaches	0.025	0.035	0.016	-0.4%	2.3	3.0	1.0	14.3%
Total Camera Intersections	0.031	0.027	0.004	48.9%	6.0	5.0	1.0	50.0%
10 Comparison Intersections	0.372	0.453	0.102	25.5%	7.0	11.0	2.0	7.1%
Table D	**Red Light Running Related Injury Crash Rate**				**Red Light Running Related Injury Crashes**			
22 Camera Approaches	0.051	0.007	0.006	87.2%	5.7	1.0	1.0	82.4%
16 Non Camera Approaches	0.063	0.031	0.010	66.8%	4.3	4.0	1.0	42.3%
Total Camera Intersections	0.052	0.022	0.009	70.1%	10.0	5.0	2.0	65.0%
10 Comparison Intersections	0.028	0.054	0.027	-46.7%	6.0	6.0	2.0	33.3%
Table E	**Rear-End Crash Rate (Not related to RLR)**				**Rear-End Crashes (Not related to RLR)**			
22 Camera Approaches	0.309	0.367	0.557	-49.3%	41.3	52.0	76.0	-54.8%
16 Non Camera Approaches	0.253	0.421	0.507	-83.4%	22.7	41.0	48.0	-96.3%
Total Camera Intersections	0.289	0.414	0.552	-67.3%	64.0	93.0	124.0	-69.5%
10 Comparison Intersections	0.041	0.032	0.011	47.8%	53.7	62.0	148.0	-95.7%
Table F	**Red Light Running Related Rear-End Crash Rate**				**Red Light Running Related Rear-End Crashes**			
22 Camera Approaches	0.413	0.279	0.117	52.1%	57.7	37.0	15.0	54.9%
16 Non Camera Approaches	0.427	0.339	0.343	-20.1%	40.0	34.0	23.0	-28.8%
Total Camera Intersections	0.431	0.316	0.169	-43.6%	97.7	71.0	38.0	-44.2%
10 Comparison Intersections	0.113	0.049	0.005	-76.1%	94.3	84.0	19.0	-45.4%
Table G	**Red Light Running Rear-End Injury Crash Rate**				**Red Light Running Rear-End Injury Crashes**			
22 Camera Approaches	0.060	0.072	0.043	-3.7%	9.3	10	5	-19.6%
16 Non Camera Approaches	0.063	0.048	0.056	-16.3%	8.0	5	5	-37.5%
Total Camera Intersections	0.070	0.067	0.045	-20.4%	17.3	15	10	-27.9%
10 Comparison Intersections	0.000	0.000	0.000	#DIV/0!	6.0	9	1	-16.7%
Table H	**Red Light Running Fatality Crash Rate**				**Red Light Running Fatality Crashes**			
22 Camera Approaches	0.003	0.000	0.000	100.0%	0.3	0	0	100.0%
16 Non Camera Approaches	0.000	0.000	0.000	#DIV/0!	0.0	0	0	#DIV/0!
Total Camera Intersections	0.002	0.000	0.000	100.0%	0.3	0	0	100.0%
10 Comparison Intersections	0.000	0.005	0.000	#DIV/0!	0.0	0	0	#DIV/0!
Table I	**Red Light Running Related Fatality Crash Rate**				**Red Light Running Related Fatality Crashes**			
22 Camera Approaches	0.000	0.000	0.000	#DIV/0!	0.0	0	0	#DIV/0!
16 Non Camera Approaches	0.000	0.000	0.000	#DIV/0!	0.0	0	0	#DIV/0!
Total Camera Intersections	0.000	0.000	0.000	#DIV/0!	0.0	0	0	#DIV/0!
10 Comparison Intersections	0.049	0.005	0.005	-88.9%	0.0	1	0	#DIV/0!
Table J	**Red Light Running Related Rear-End Fatality Crash Rate**				**Red Light Running Related Rear-End Fatality Crashes**			
22 Camera Approaches	0.026	0.016	0.006	-56.7%	0.3	0	0	100.0%
16 Non Camera Approaches	0.046	0.078	0.000	-14.4%	0.0	0	0	#DIV/0!
Total Camera Intersections	0.002	0.031	0.004	833.6%	0.3	0	0	100.0%
10 Comparison Intersections	0.000	0.005	0.000	#DIV/0!	0.0	1	0	#DIV/0!
Table K	**Right on Red Crash Rate**				**Right on Red Crashes**			
22 Camera Approaches	0.002	0.000	0.000	100.0%	3.0	2	1	-50.0%
16 Non Camera Approaches	0.000	0.000	0.000	#DIV/0!	4.0	5	0	-37.5%
Total Camera Intersections	0.002	0.000	0.000	100.0%	7.0	7	1	-42.9%
10 Comparison Intersections	0.370	0.334	0.798	53.1%	7.0	2	1	-78.6%
Table L	**Angle Crash Rate (Not related to RLR)**				**Angle Crashes (Not related to RLR)**			
22 Camera Approaches	0.139	0.169	0.148	14.4%	18.7	21	20	9.8%
16 Non Camera Approaches	0.106	0.156	0.207	71.8%	9.3	10	14	28.6%
Total Camera Intersections	0.114	0.138	0.151	26.4%	28.0	31	34	16.1%
10 Comparison Intersections	0.312	0.156	0.124	-55.1%	45.3	29	23	-42.6%
Table M	**Side-swipe Crash Rate (Not related to RLR)**				**Side-swipe Crashes (Not related to RLR)**			
22 Camera Approaches	0.229	0.348	0.248	30.6%	29.7	43	34	29.8%
16 Non Camera Approaches	0.284	0.231	0.272	-11.4%	22.7	20	21	-9.6%
Total Camera Intersections	0.239	0.281	0.258	13.0%	52.3	63	58	15.6%
10 Comparison Intersections	0.227	0.167	0.135	-33.6%	33.0	31	25	-15.2%
Table N	**Bicycle / Pedestrian / Single Motor Vehicle Crash Rate**				**Bicycle / Pedestrian / Single Motor Vehicle Crashes**			
22 Camera Approaches	0.080	0.070	0.068	-14.1%	9.0	9	9	0.0%
16 Non Camera Approaches	0.097	0.065	0.140	5.5%	9.3	6	12	-3.6%
Total Camera Intersections	0.080	0.067	0.094	0.8%	18.3	15	21	-1.8%
10 Comparison Intersections	0.129	0.092	0.059	-41.3%	18.7	17	11	-25.0%
Table O	**Total Crashes – Crash Rate**				**Total Crashes**			
22 Camera Approaches	1.451	1.460	1.259	-6.3%	193.7	191	171	-6.5%
16 Non Camera Approaches	1.479	1.518	1.649	7.1%	133.3	138	134	2.0%
Total Camera Intersections	1.456	1.465	1.372	-2.6%	327.0	329	308	-2.6%
10 Comparison Intersections	2.030	1.455	1.434	-28.9%	294.7	270	266	-9.0%

City of St. Petersburg
Department of Transportation

Total Notice of Violations per Month
1st Year vs 2nd Year

Stop On Red

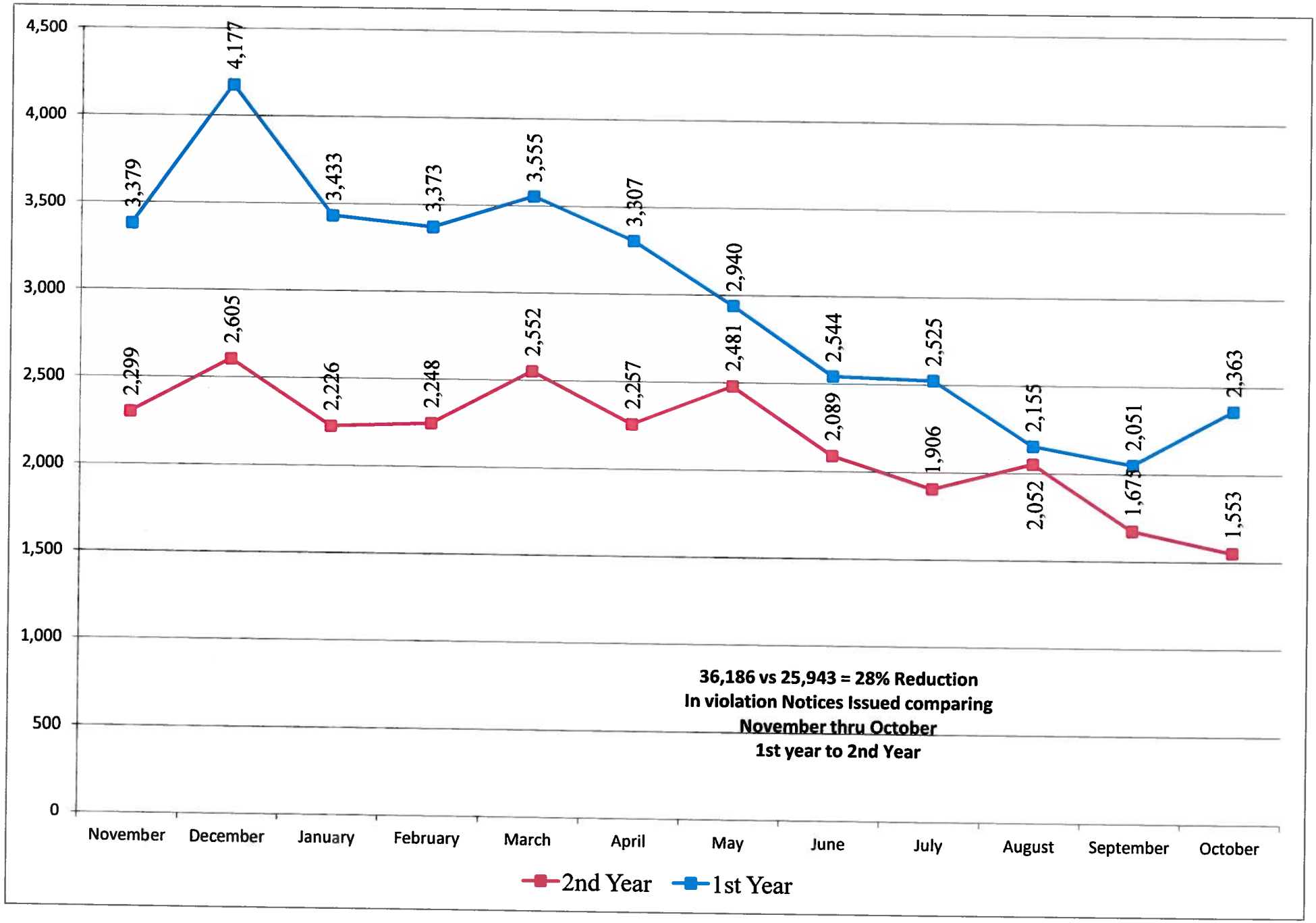

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Chart No 1

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program

Officer Approval Summary

Stop On Red

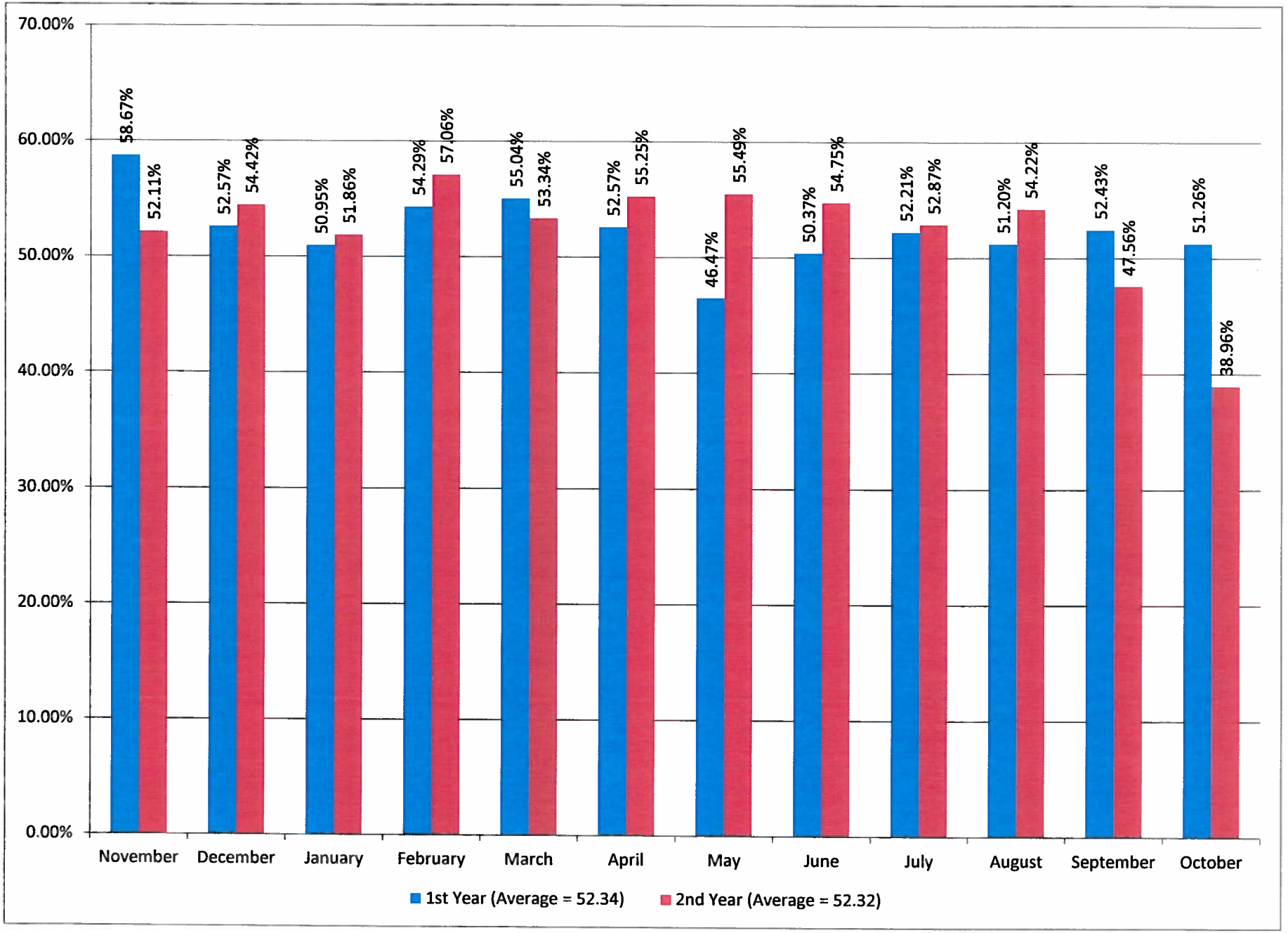

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Chart No. 2

City of St. Petersburg
Department of Transporation

An Intersection Public Safety Program
Traffic Safety Camera Summary
Average Notices of Violation Summary

STOP ON RED

From October 1, 2011 to October 31, 2012

Street	Cross Street	Direction	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Grand Total per Month	Per Day Average			
																	Left	Thru	Right	TOTAL
34th Street	/ 1st Avenue N	(N/B)	1.33	3.70	3.45	5.52	6.28	4.48	3.33	2.35	2.87	2.84	2.29	1.60	1.20	40	0.83	2.33	0.12	3.29
34th Street	/ 38th Avenue N	(S/B)		16.91	17.42	13.19	16.24	14.23	13.13	11.71	12.33	10.48	8.71	9.63	6.57	144	1.43	5.39	3.22	10.04
34th Street	/ 38th Avenue N	(E/B)		3.25	4.94	5.03	5.79	5.10	4.23	3.77	3.83	2.39	2.39	3.40	2.33	44	1.17	2.10	0.01	3.27
34th Street	/ 38th Avenue N	(W/B)		9.33	8.10	8.03	7.34	7.19	5.70	4.65	4.47	4.48	2.39	2.53	2.63	64	0.59	0.82	2.71	4.12
4th Street	/ Gandy Boulevard	(N/B)	1.67	3.60	2.32	2.23	2.24	2.03	2.10	1.81	1.63	1.65	1.10	0.97	1.23	23	0.15	0.41	1.03	1.59
4th Street	/ Gandy Boulevard	(E/B)	1.67	3.10	2.55	2.68	2.28	3.65	2.83	3.71	2.67	2.23	2.10	5.27	2.33	35	0.00	2.35	0.04	2.40
34th Street	/ 1st Avenue S	(S/B)	11.00	8.57	7.23	8.42	10.90	8.90	11.83	9.16	7.77	7.58	6.29	5.27	6.53	103	3.29	4.29	0.05	7.63
34th Street	/ 1st Avenue S	(E/B)	1.67	2.40	2.81	2.97	4.62	4.94	4.23	4.87	2.53	2.55	3.03	3.20	3.37	40	0.80	2.46	0.02	3.28
4th Street	/ 22nd Avenue N	(E/B)	9.33	6.63	4.39	4.00	4.59	5.03	4.40	3.23	3.17	3.48	2.74	2.93	2.77	54	1.00	0.47	1.92	3.39
4th Street	/ 22nd Avenue N	(N/B)	6.67	6.53	5.77	5.39	4.62	5.26	4.40	4.74	4.20	3.39	3.77	3.50	3.20	58	0.64	2.77	0.66	4.07
4th Street	/ 22nd Avenue N	(S/B)	13.00	6.77	7.00	5.71	5.24	5.26	5.60	4.45	4.83	4.00	3.26	4.10	4.60	69	0.57	2.41	1.50	4.47
66th Street	/ 22nd Avenue N	(N/B)	3.00	2.10	2.39	2.45	2.41	2.39	1.77	1.84	1.47	1.52	1.29	0.90	1.70	24	0.32	0.51	0.78	1.60
66th Street	/ 22nd Avenue N	(S/B)	6.33	4.77	4.97	3.32	3.72	3.77	2.30	1.81	1.63	1.32	1.10	0.90	1.07	36	0.24	0.34	1.55	2.13
34th Street	/ 22nd Avenue S	(S/B)	4.67	4.07	2.77	2.61	3.03	3.45	3.30	2.19	2.23	2.26	2.39	2.07	2.80	35	0.47	1.23	0.80	2.51
4th Street	/ 54th Avenue N	(N/B)	5.33	3.43	5.42	4.94	5.28	4.26	4.83	4.52	4.07	3.52	2.48	2.40	4.87	50	0.24	3.01	0.55	3.80
4th Street	/ 54th Avenue N	(S/B)	5.00	2.87	3.55	2.68	3.41	2.45	2.30	2.13	1.77	2.87	1.84	2.43	2.67	33	0.02	0.96	1.25	2.24
66th Street	/ 38th Avenue N	(S/B)	7.00	4.73	4.16	2.97	3.21	4.65	4.83	4.48	3.53	3.90	2.61	2.50	2.80	49	0.98	0.38	1.73	3.09
66th Street	/ 38th Avenue N	(E/B)	16.00	11.60	10.13	5.74	5.00	6.94	6.60	4.94	3.77	4.61	4.06	3.17	4.60	83	0.42	0.18	4.32	4.92
66th Street	/ Tyrone Boulevard	(N/B)	3.00	4.20	1.87	1.90	1.83	1.71	2.10	1.74	1.20	1.61	1.61	1.37	1.97	24	1.11	0.65	0.00	1.76
66th Street	/ Tyrone Boulevard	(E/B)	9.33	9.03	12.81	5.19	3.21	7.26	5.97	6.19	4.93	4.65	6.03	4.03	6.33	79	4.33	1.40	0.04	5.77
4th Street	/ Gandy Boulevard	(S/B)	16.67	10.03	9.10	7.68	8.45	4.97	5.90	4.06	4.40	4.97	4.26	5.53	4.97	86	0.01	0.78	4.55	5.34
34th Street	/ 22nd Avenue S	(N/B)	5.00	6.50	11.61	8.10	6.62	6.77	8.53	6.48	5.50	5.16	3.77	3.90	8.23	78	1.01	1.11	3.81	5.93
TOTAL - Notice of Violations Issued			**383**	**3,379**	**4,177**	**3,433**	**3,373**	**3,555**	**3,307**	**2,940**	**2,544**	**2,525**	**2,155**	**2,051**	**2,363**	**36,185**	**19.63**	**36.33**	**30.68**	**86.64**
Average Per Camera / Day			**6.72**	**5.71**	**6.12**	**5.03**	**5.29**	**5.21**	**5.01**	**4.31**	**3.85**	**3.70**	**3.16**	**3.11**	**3.58**		**0.89**	**1.65**	**1.39**	**3.94**

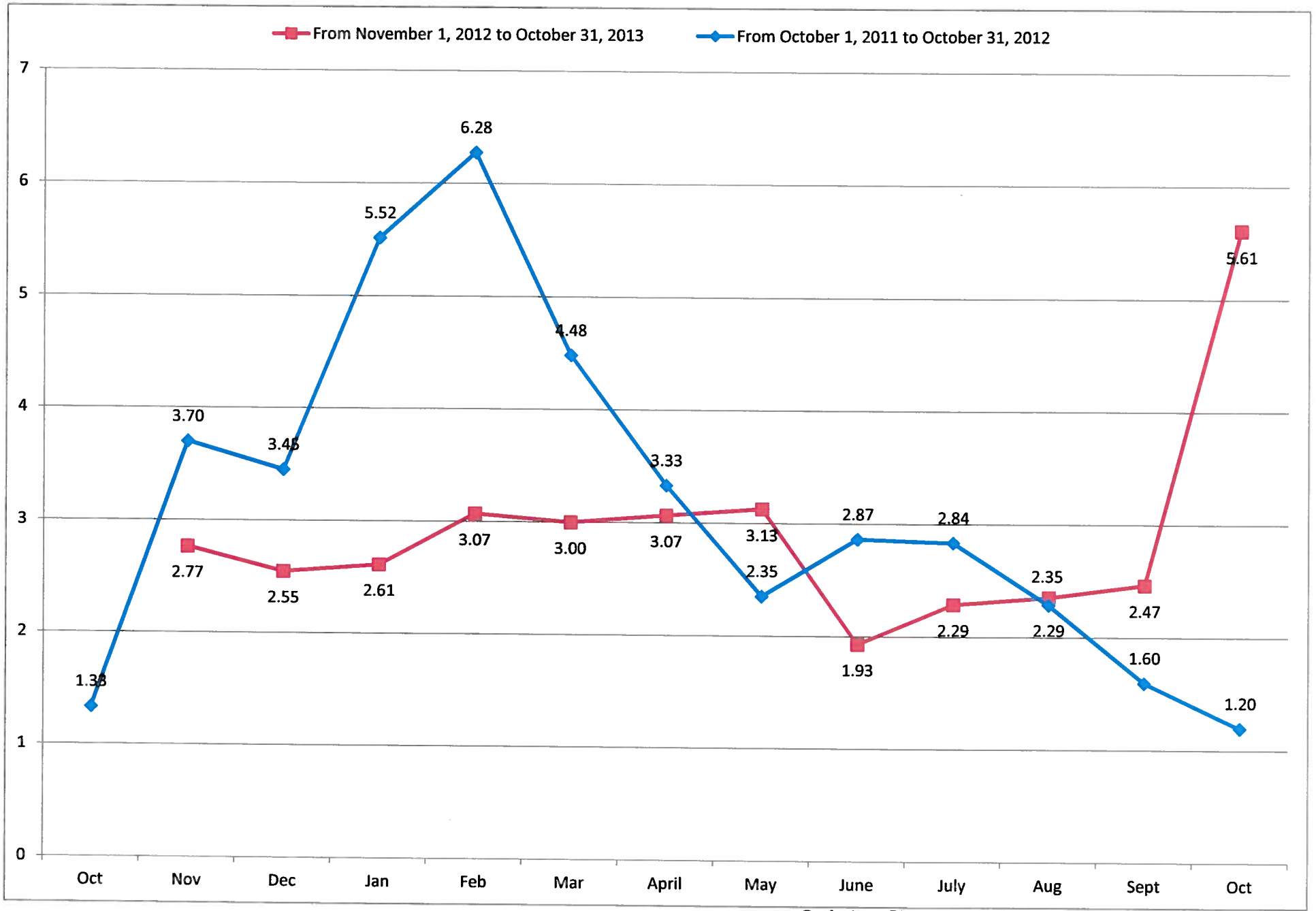
An Intersection Public Safety Program
Traffic Safety Camera Summary
Average Notices of Violation Summary

Street	Cross Street	Direction	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Grand Total per Month	Per Day Average			
From November 1, 2012 to October 31, 2013																	Left	Thru	Right	TOTAL
34th Street	/ 1st Avenue N	(N/B)		2.77	2.55	2.61	3.07	3.00	3.07	3.13	1.93	2.29	2.35	2.47	5.61	29	0.22	0.38	0.81	1.41
34th Street	/ 38th Avenue N	(S/B)		4.90	7.87	9.06	9.36	9.65	9.23	9.90	8.60	7.42	9.16	7.63	3.77	93	0.37	0.46	0.65	1.48
34th Street	/ 38th Avenue N	(E/B)		2.00	3.74	2.55	3.07	2.90	3.30	4.29	3.47	3.42	2.32	2.20	1.03	33	0.24	0.45	0.77	1.46
34th Street	/ 38th Avenue N	(W/B)		2.37	2.03	1.13	1.43	1.71	1.60	1.84	1.37	1.19	2.48	1.27	1.00	18	0.09	0.87	0.78	1.74
4th Street	/ Gandy Boulevard	(N/B)		1.60	1.16	1.10	1.93	1.77	1.20	1.35	1.10	1.16	1.19	0.90	0.90	14	0.34	1.34	0.27	1.95
4th Street	/ Gandy Boulevard	(E/B)		1.97	1.77	1.94	2.50	2.39	2.70	2.94	2.63	2.45	3.55	2.87	2.58	28	0.54	0.20	1.78	2.52
34th Street	/ 1st Avenue S	(S/B)		6.50	5.74	6.58	8.36	8.16	8.77	6.52	4.87	6.10	4.10	4.87	6.39	71	1.88	0.74	0.06	2.67
34th Street	/ 1st Avenue S	(E/B)		2.40	2.39	2.45	3.00	3.16	3.07	2.29	2.67	2.19	2.29	2.47	0.81	28	0.47	1.76	0.40	2.64
4th Street	/ 22nd Avenue N	(E/B)		3.57	2.77	3.16	3.18	3.29	3.03	3.77	2.47	2.03	2.52	2.03	1.84	32	0.65	2.07	0.21	2.93
4th Street	/ 22nd Avenue N	(N/B)		3.47	3.97	3.45	3.21	4.10	5.67	4.61	4.50	4.61	4.10	4.17	3.42	46	0.00	2.74	0.31	3.05
4th Street	/ 22nd Avenue N	(S/B)		4.57	3.90	3.77	4.43	4.03	2.70	4.65	4.57	4.55	4.16	3.27	3.71	45	1.20	0.29	1.47	2.96
66th Street	/ 22nd Avenue N	(N/B)		1.30	1.87	0.81	1.54	1.42	1.33	1.48	1.13	1.13	1.65	1.10	0.61	15	1.14	0.48	1.57	3.19
66th Street	/ 22nd Avenue N	(S/B)		1.33	1.58	1.55	1.36	1.26	0.97	0.94	1.30	1.10	2.00	0.93	1.06	14	0.54	2.70	0.21	3.45
34th Street	/ 22nd Avenue S	(S/B)		2.73	2.74	2.35	3.68	3.81	2.23	3.10	1.77	0.55	1.90	1.47	0.42	26	0.88	2.32	0.30	3.50
4th Street	/ 54th Avenue N	(N/B)		4.33	3.74	3.65	3.46	4.35	3.73	4.77	2.47	2.65	2.55	2.13	0.77	38	0.23	3.12	0.48	3.83
4th Street	/ 54th Avenue N	(S/B)		1.87	1.55	2.00	2.14	2.13	1.43	1.65	1.53	1.19	1.55	1.03	0.45	18	0.18	0.55	3.64	4.36
66th Street	/ 38th Avenue N	(S/B)		3.17	2.87	2.45	2.71	2.84	2.50	2.97	4.17	2.00	2.00	2.17	1.06	30	0.65	2.63	1.48	4.75
66th Street	/ 38th Avenue N	(E/B)		4.10	4.65	3.94	1.43	2.19	2.27	2.52	1.63	0.39	1.06	0.77	1.45	25	0.72	3.38	0.81	4.90
66th Street	/ Tyrone Boulevard	(N/B)		1.80	2.81	1.35	1.50	1.68	1.33	1.65	2.60	2.48	3.35	2.77	3.13	23	4.94	1.55	0.12	6.60
66th Street	/ Tyrone Boulevard	(E/B)		6.00	10.42	4.87	6.11	6.16	4.70	4.71	4.53	4.55	5.19	2.90	5.39	60	0.95	1.43	4.45	6.83
4th Street	/ Gandy Boulevard	(S/B)		5.17	5.35	4.77	5.54	5.06	4.30	3.90	3.93	2.90	1.97	2.40	2.90	45	3.36	4.07	0.30	7.73
34th Street	/ 22nd Avenue S	(N/B)		8.73	8.83	6.26	7.29	7.26	6.10	7.06	6.40	5.13	4.74	4.03	1.77	72	1.33	5.13	2.99	9.46
TOTAL - Notice of Violations Issued				**2,299**	**2,605**	**2,226**	**2,248**	**2,552**	**2,257**	**2,481**	**2,089**	**1,906**	**2,052**	**1,675**	**1,553**	**25,943**	**20.90**	**20.90**	**23.86**	**83.42**
Average Per Camera / Day				**3.48**	**3.83**	**3.26**	**3.65**	**3.74**	**3.42**	**3.64**	**3.17**	**2.79**	**3.01**	**2.54**	**2.28**		**0.95**	**1.76**	**1.08**	**3.79**

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

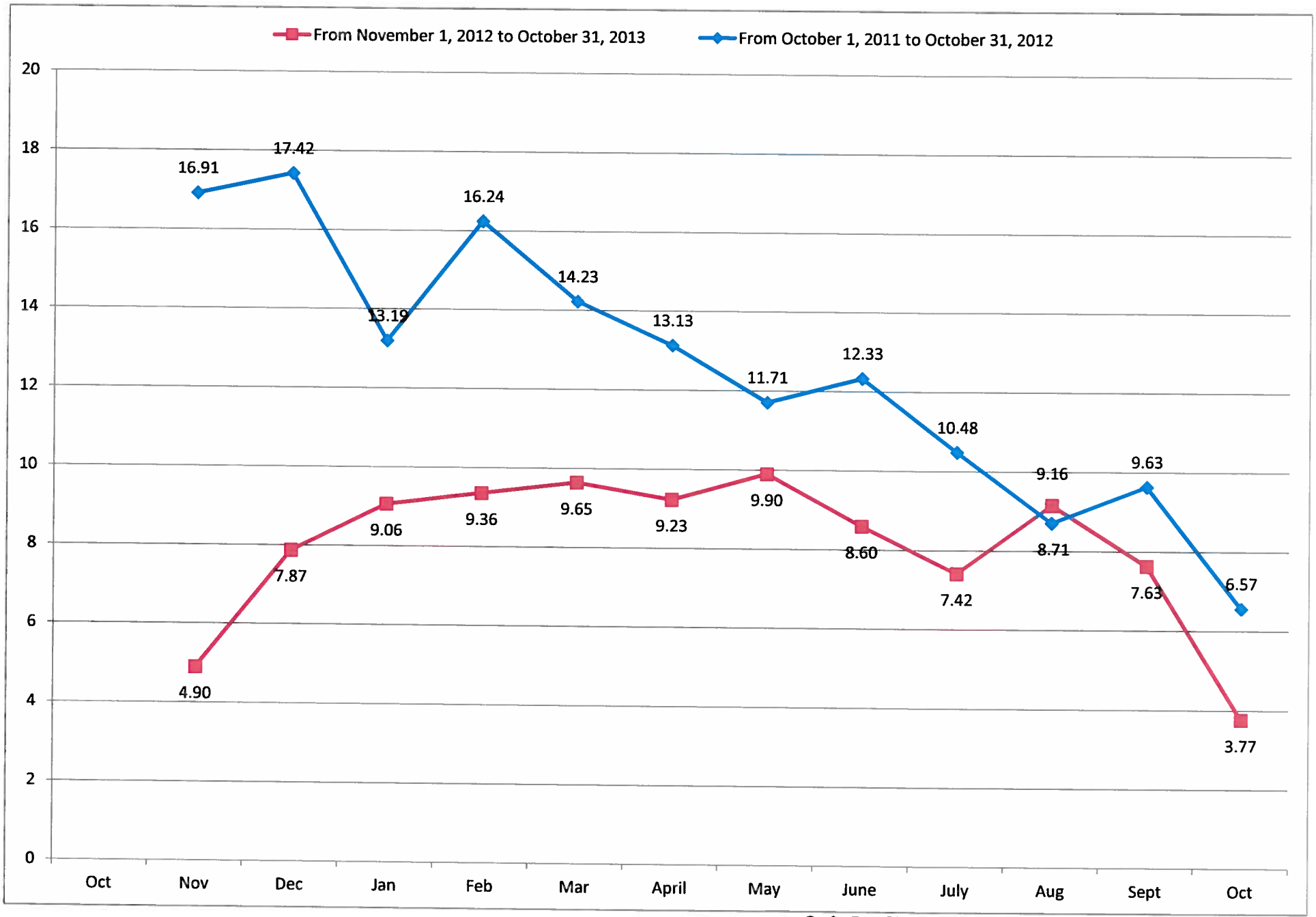


34th Street / 1st Avenue N - N/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

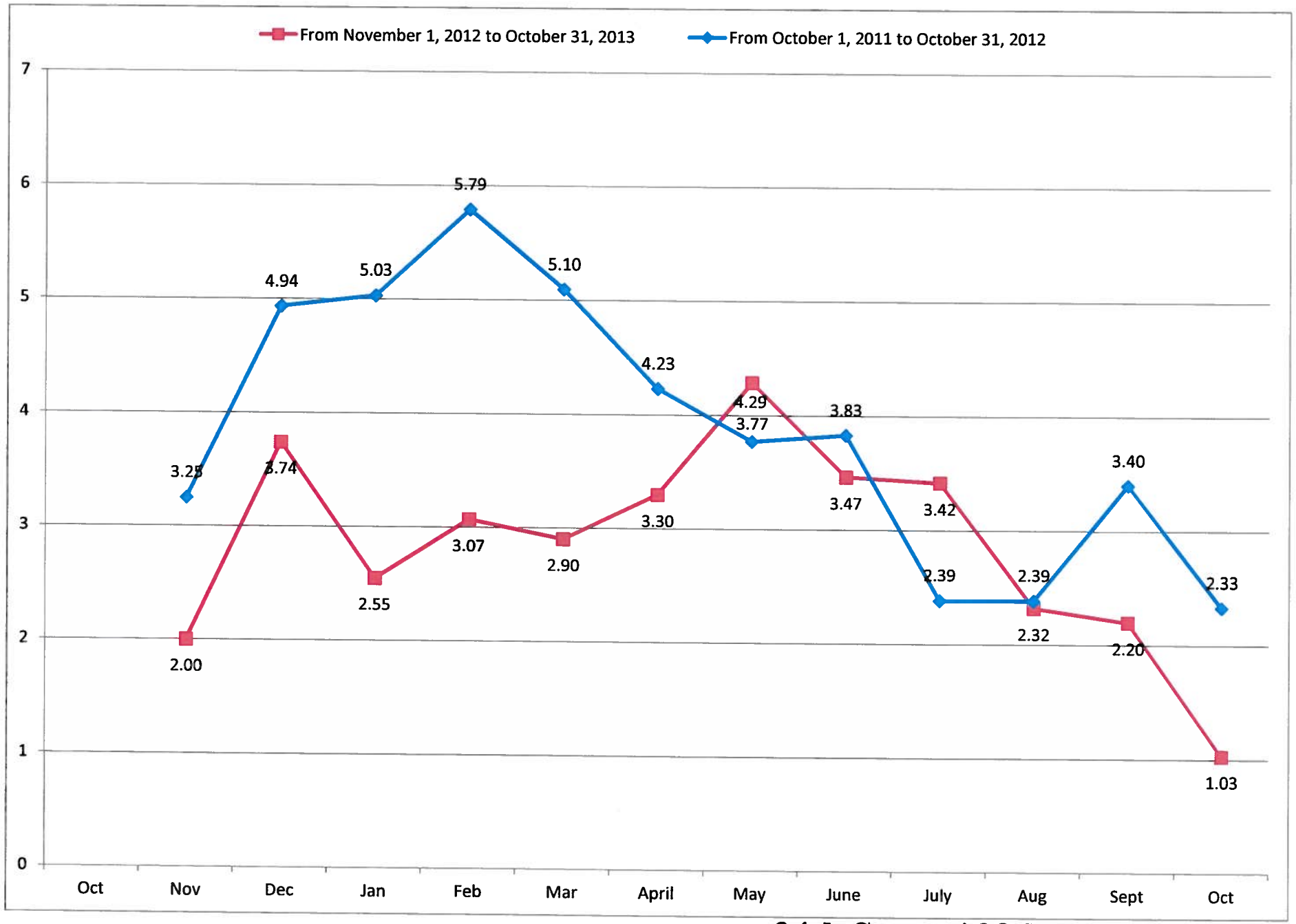


34th Street / 38th Avenue N - S/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

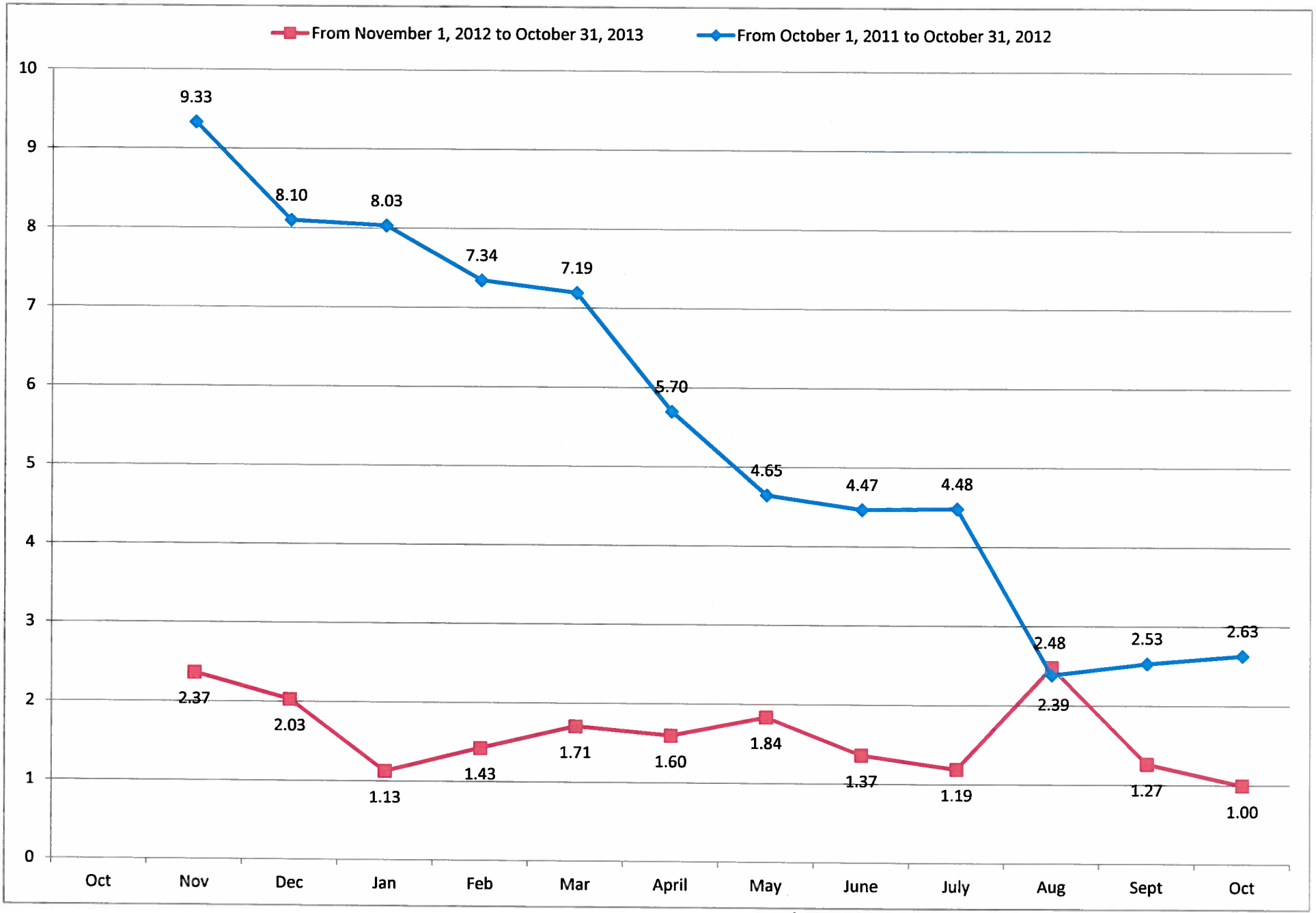


34th Street / 38th Avenue N - E/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

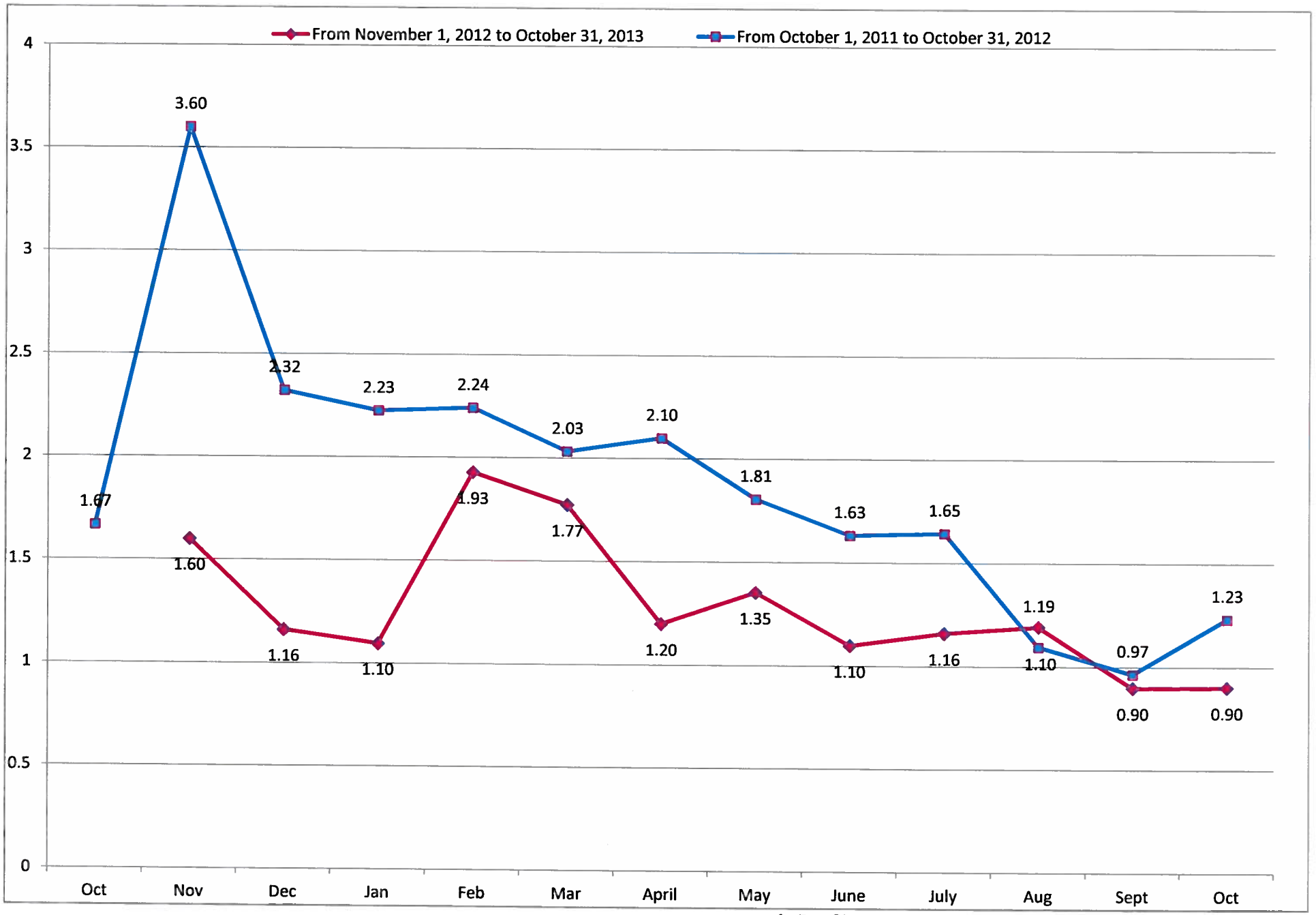


34th Street / 38th Avenue N - W/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

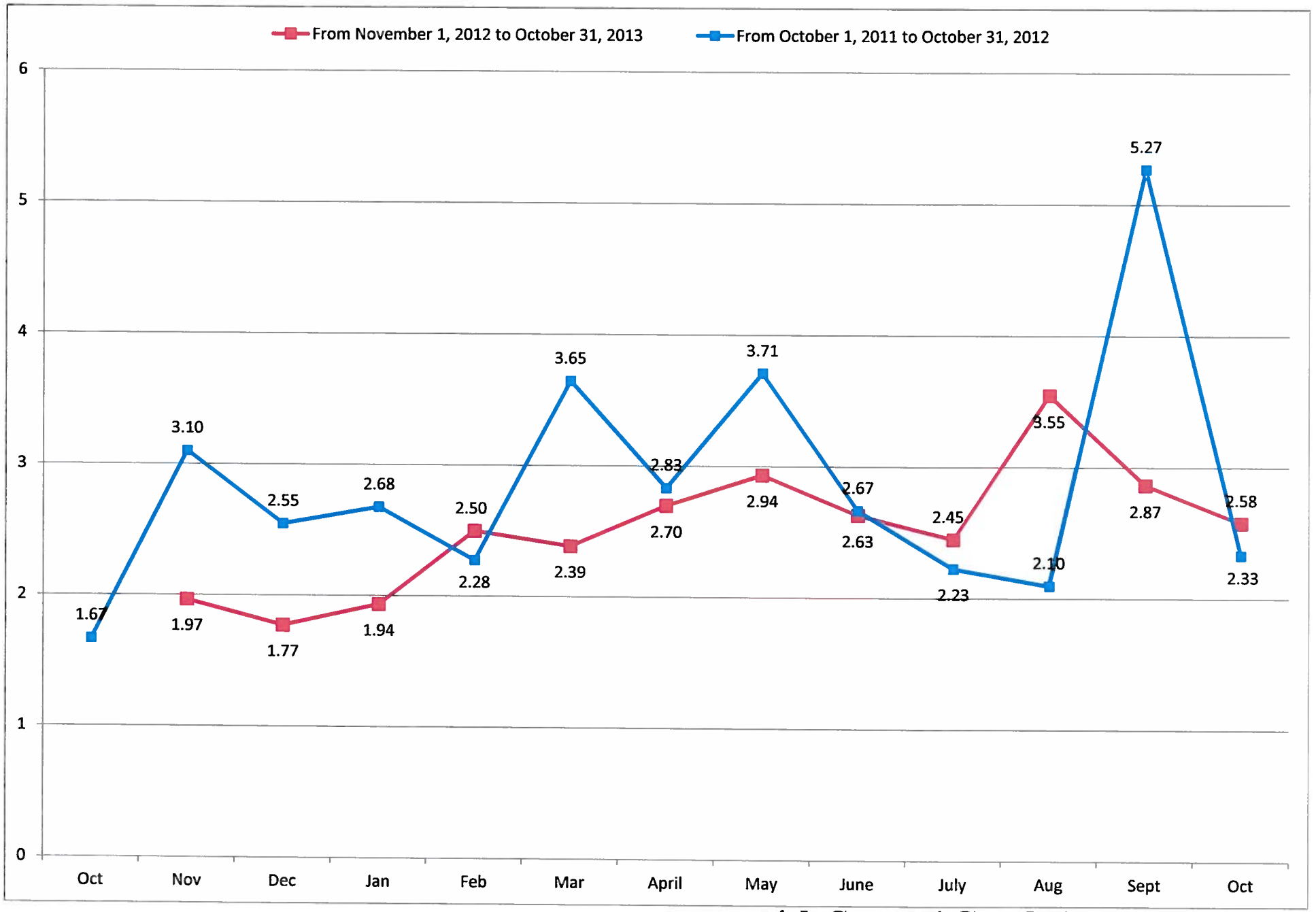


4th Street / Gandy Boulevard - N/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

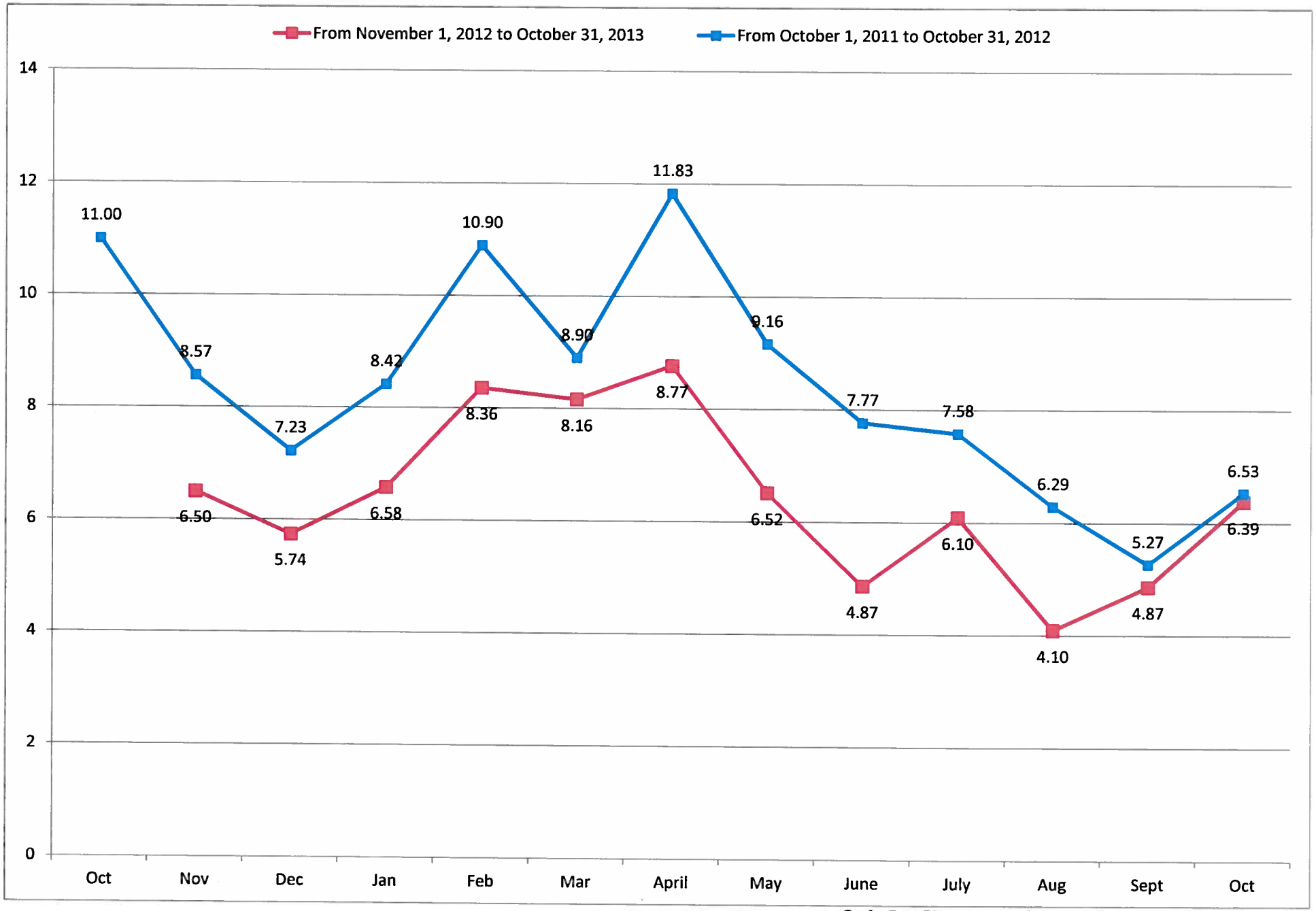


4th Street / Gandy Boulevard - E/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camer Performance Summary
Average Daily Notices of Violation

STOP ON RED

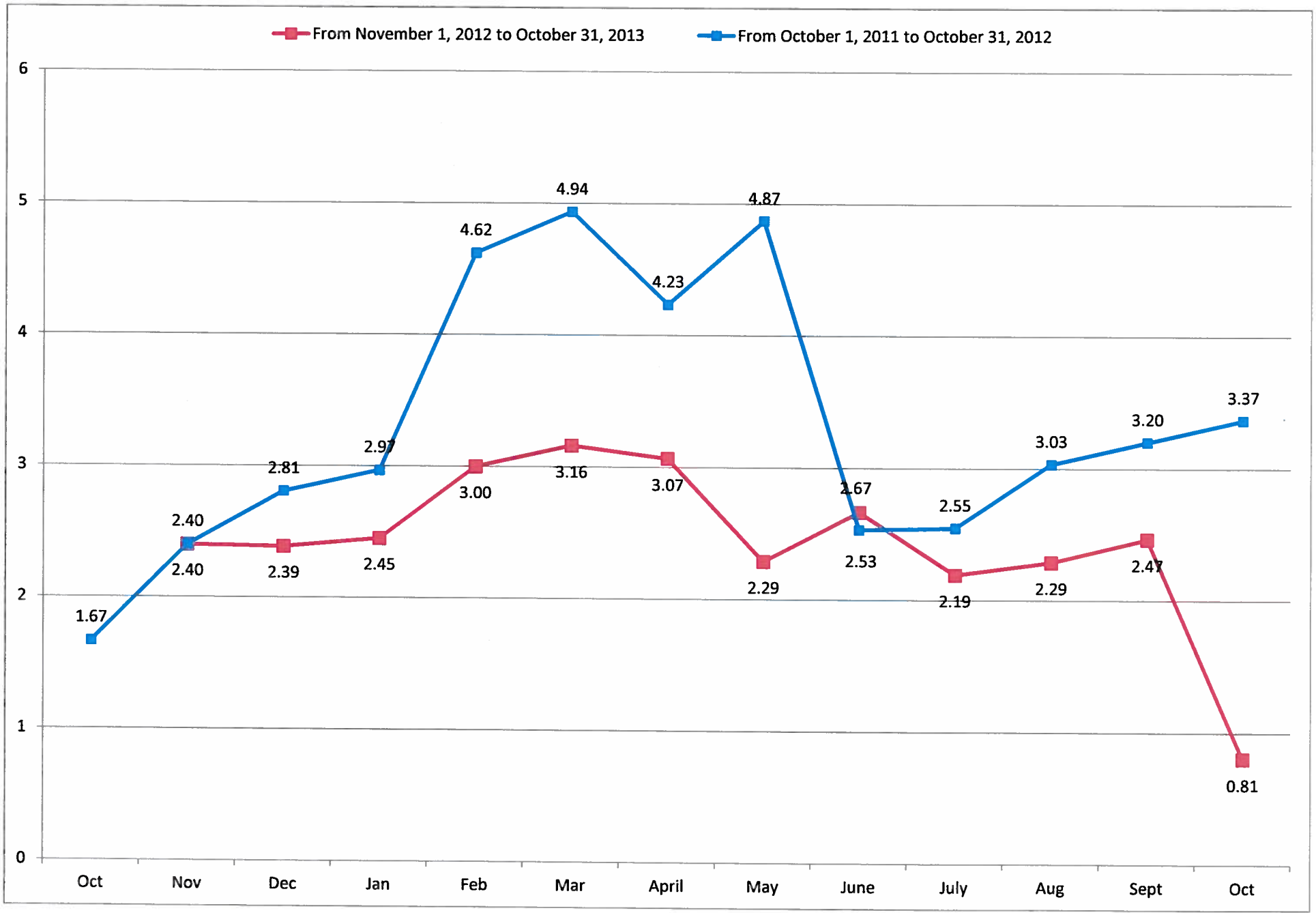


34th Street /1st Avenue S - S/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

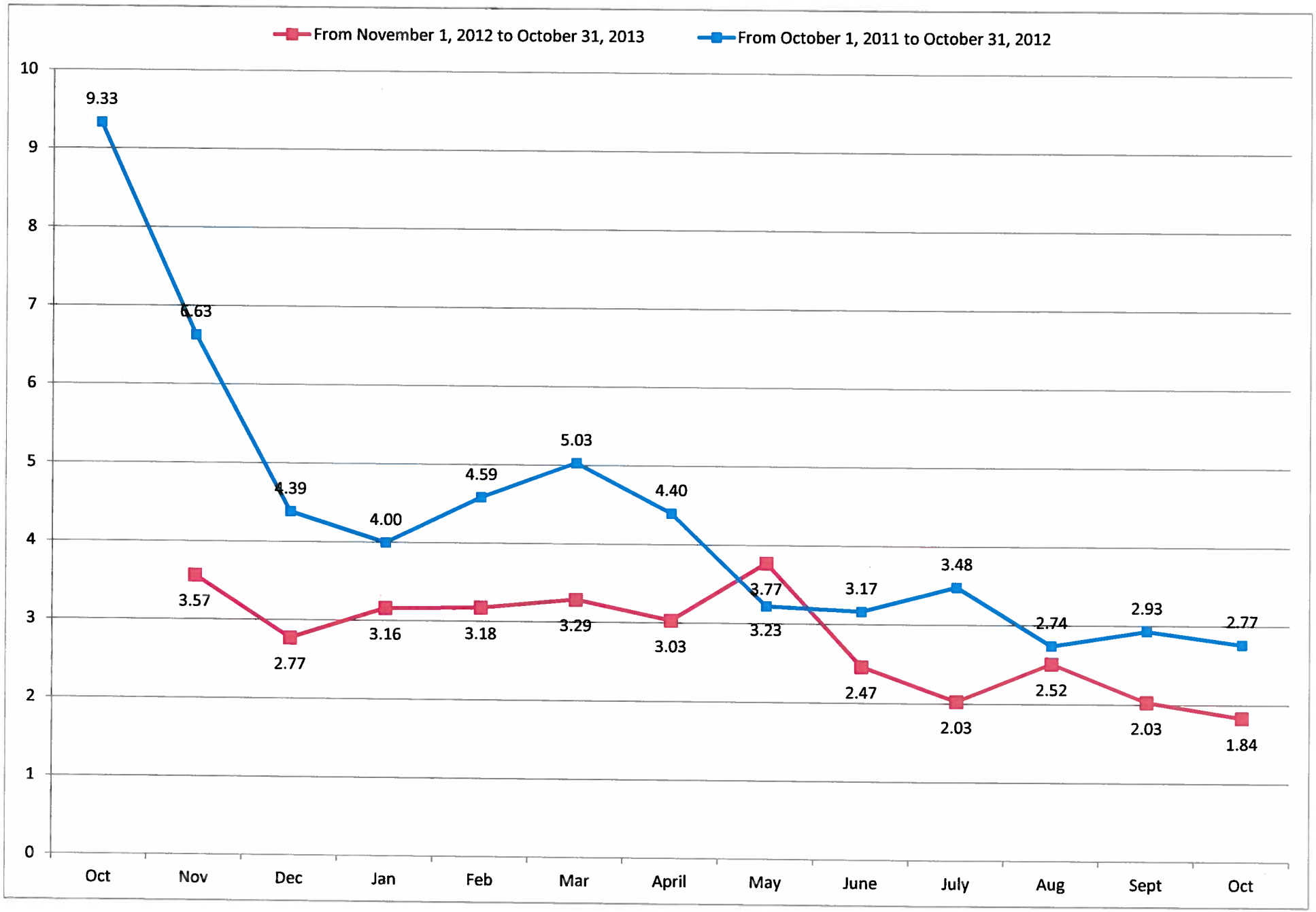


34th Street / 1st Avenue S - E/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

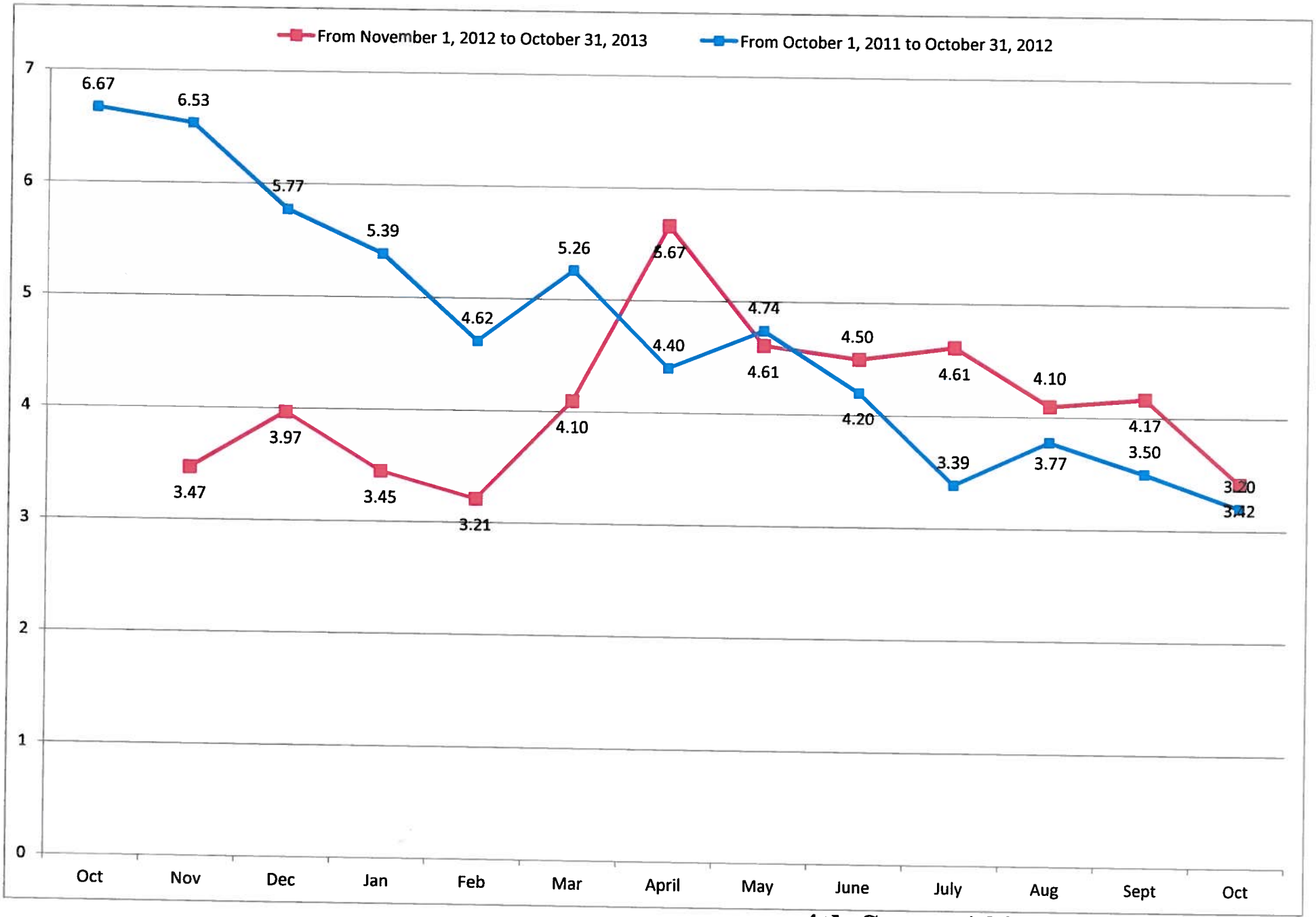


4th Street / 22nd Avenue N - E/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camer Performance Summary
Average Daily Notices of Violation

STOP ON RED

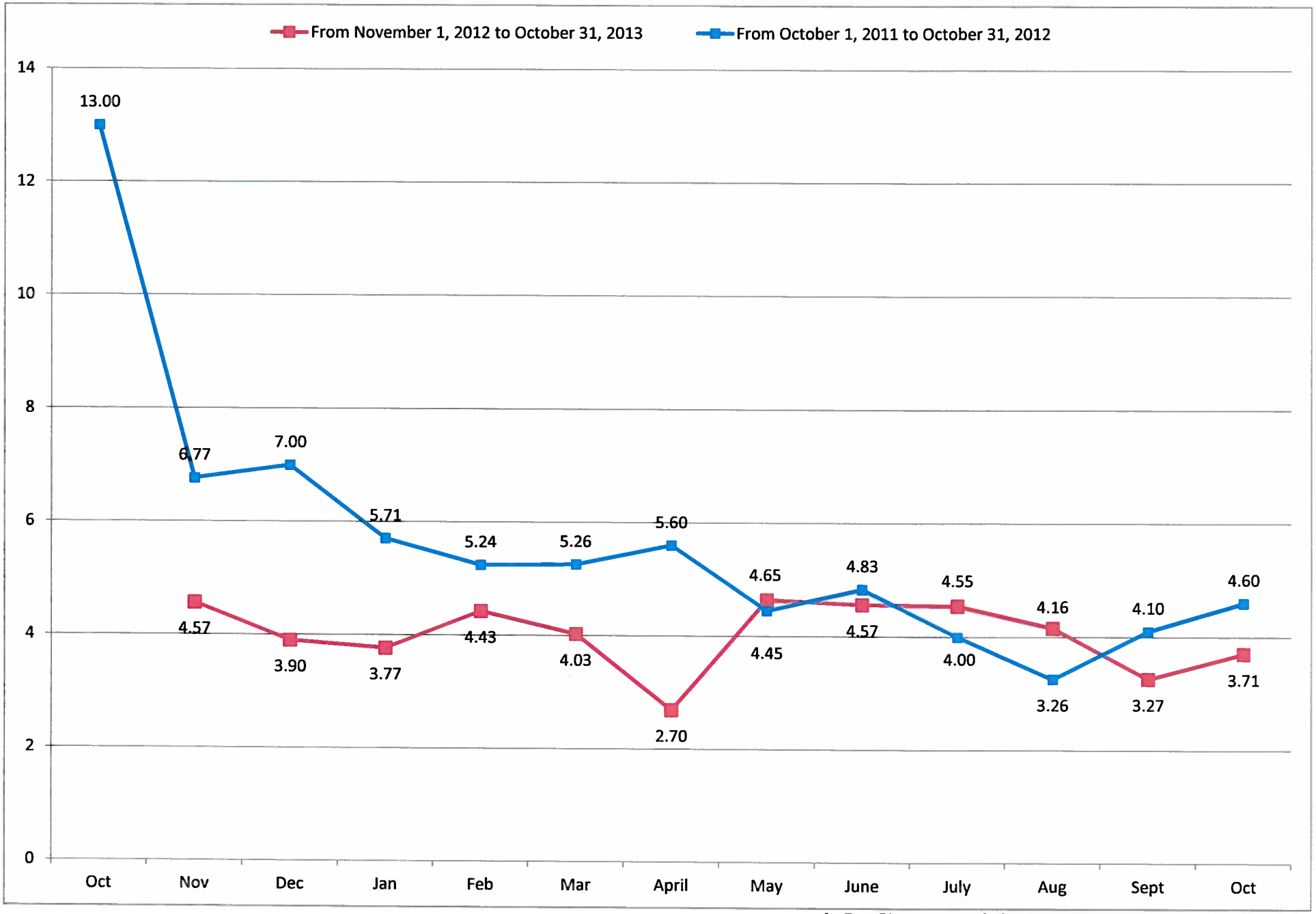


4th Street / 22nd Avenue N - N/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

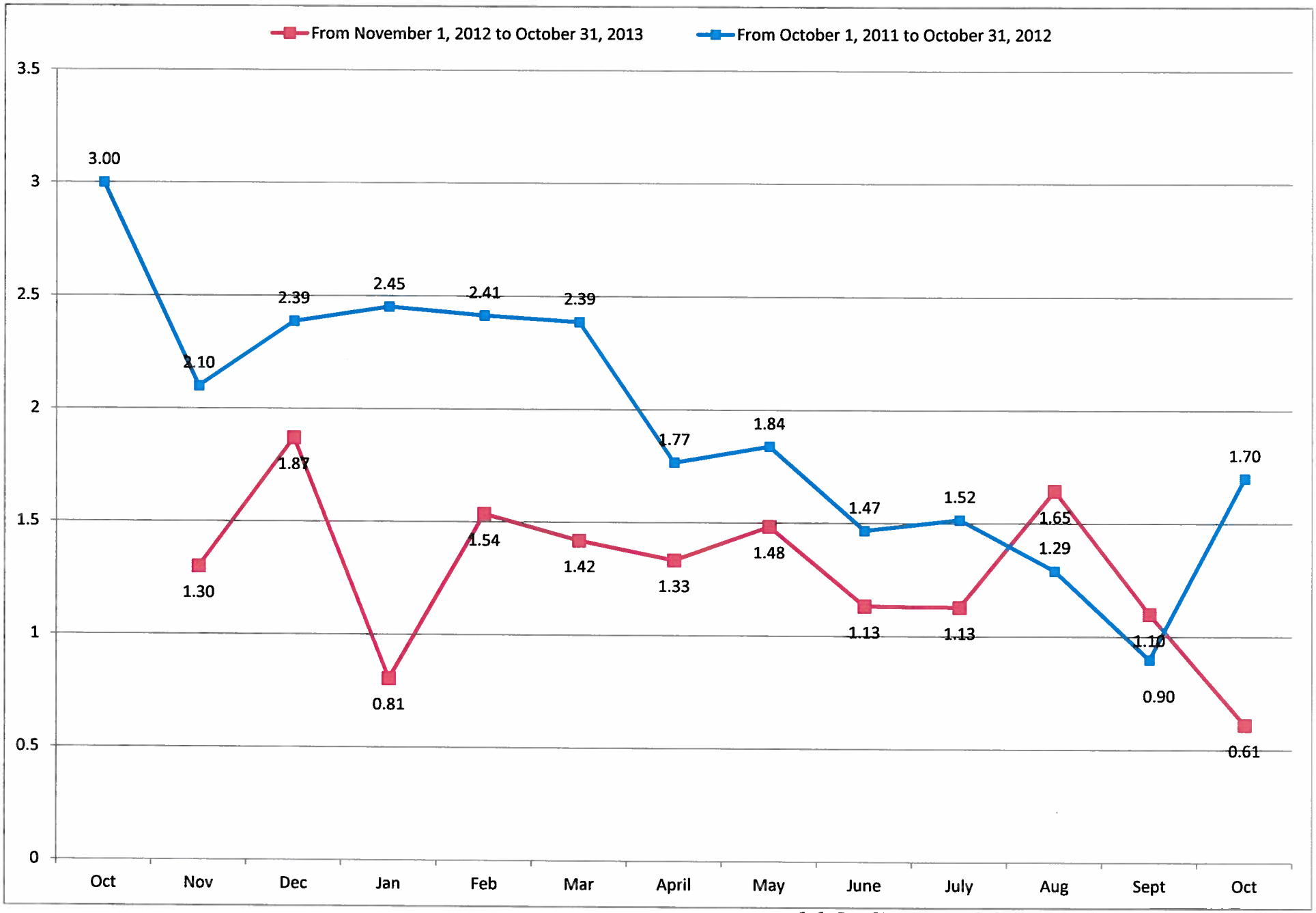


4th Street / 22nd Avenue N - S/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

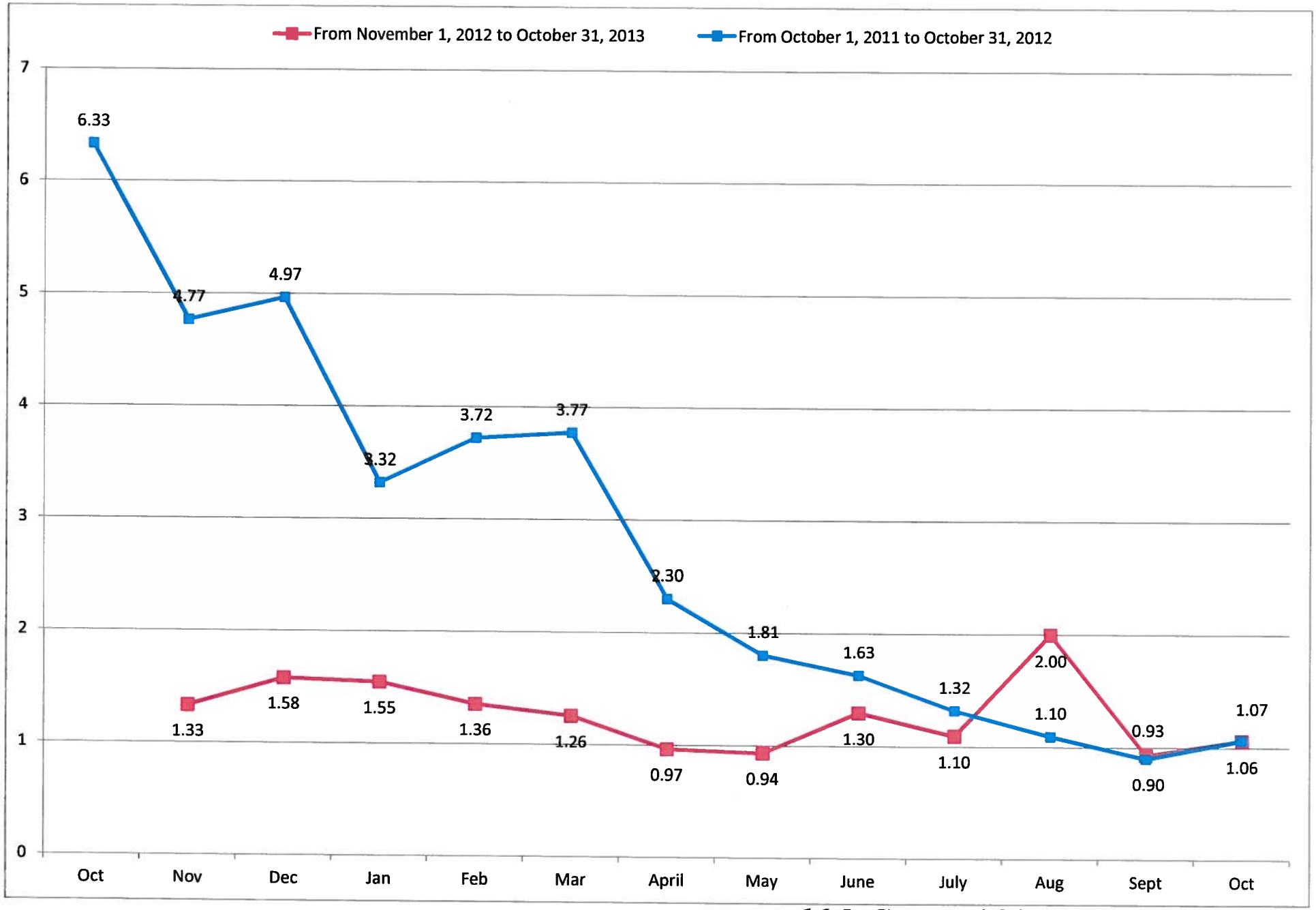


66th Street / 22nd Avenue N - N/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

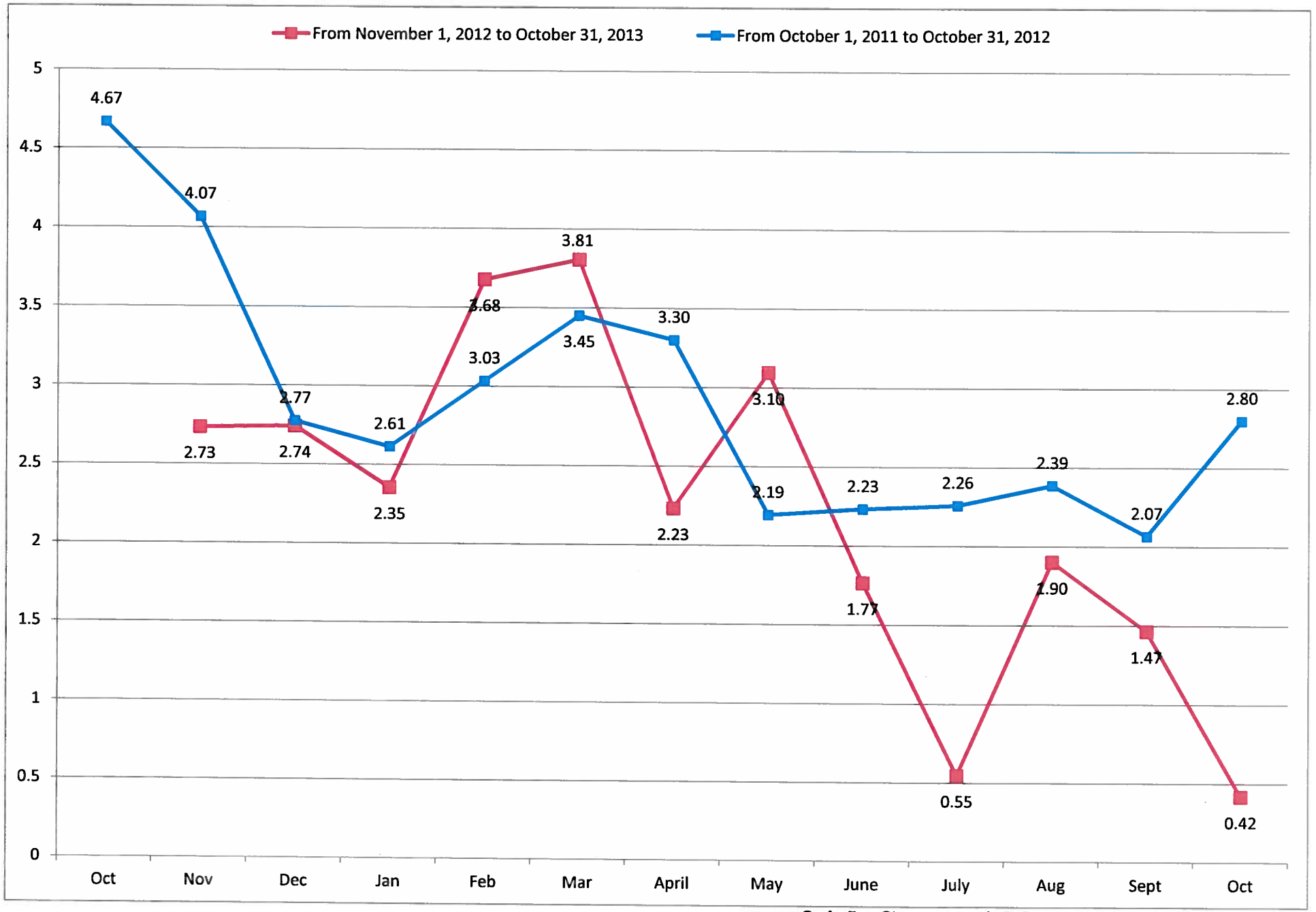


66th Street / 22nd Avenue N - S/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

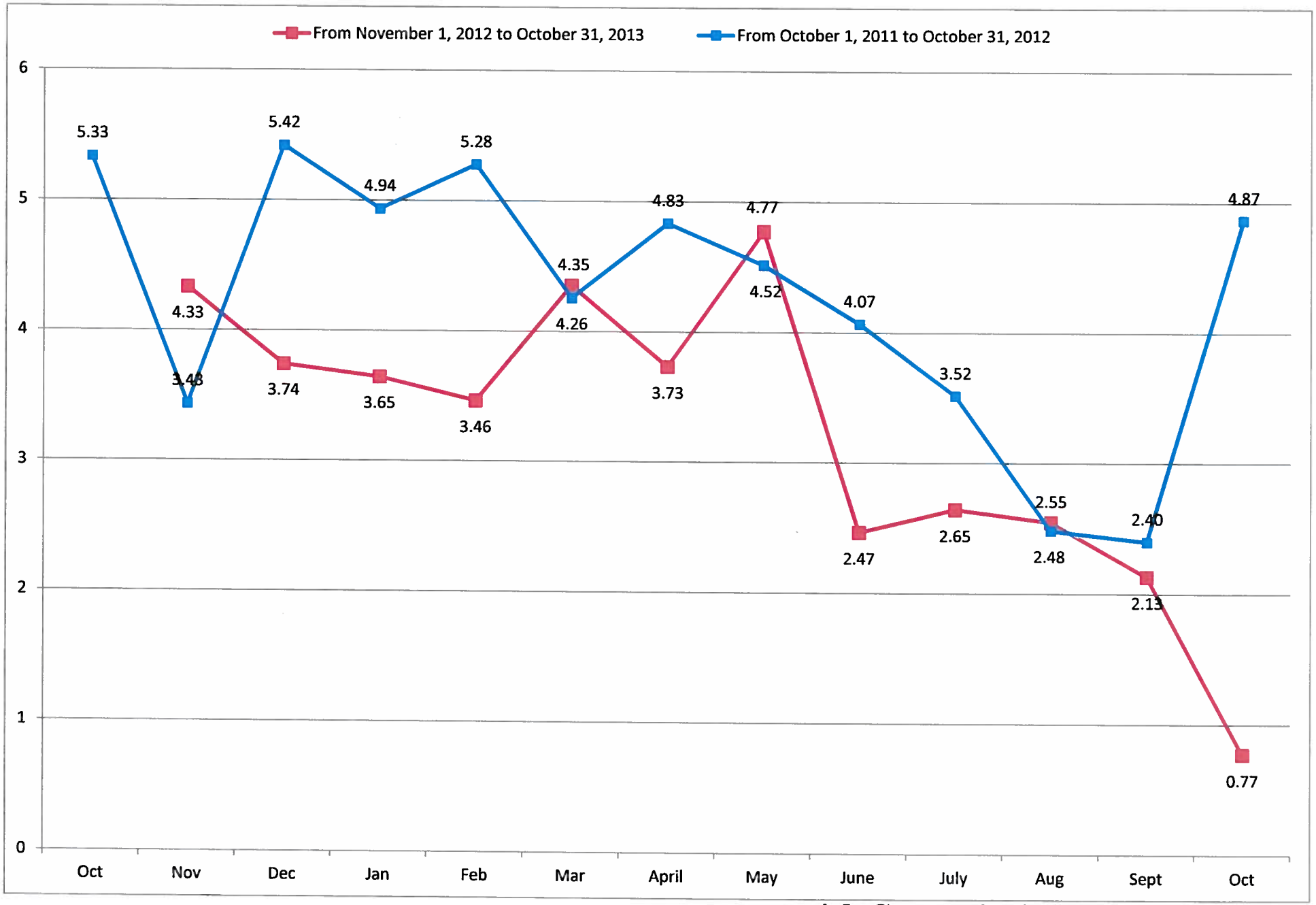


34th Street / 22nd Avenue S - S/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

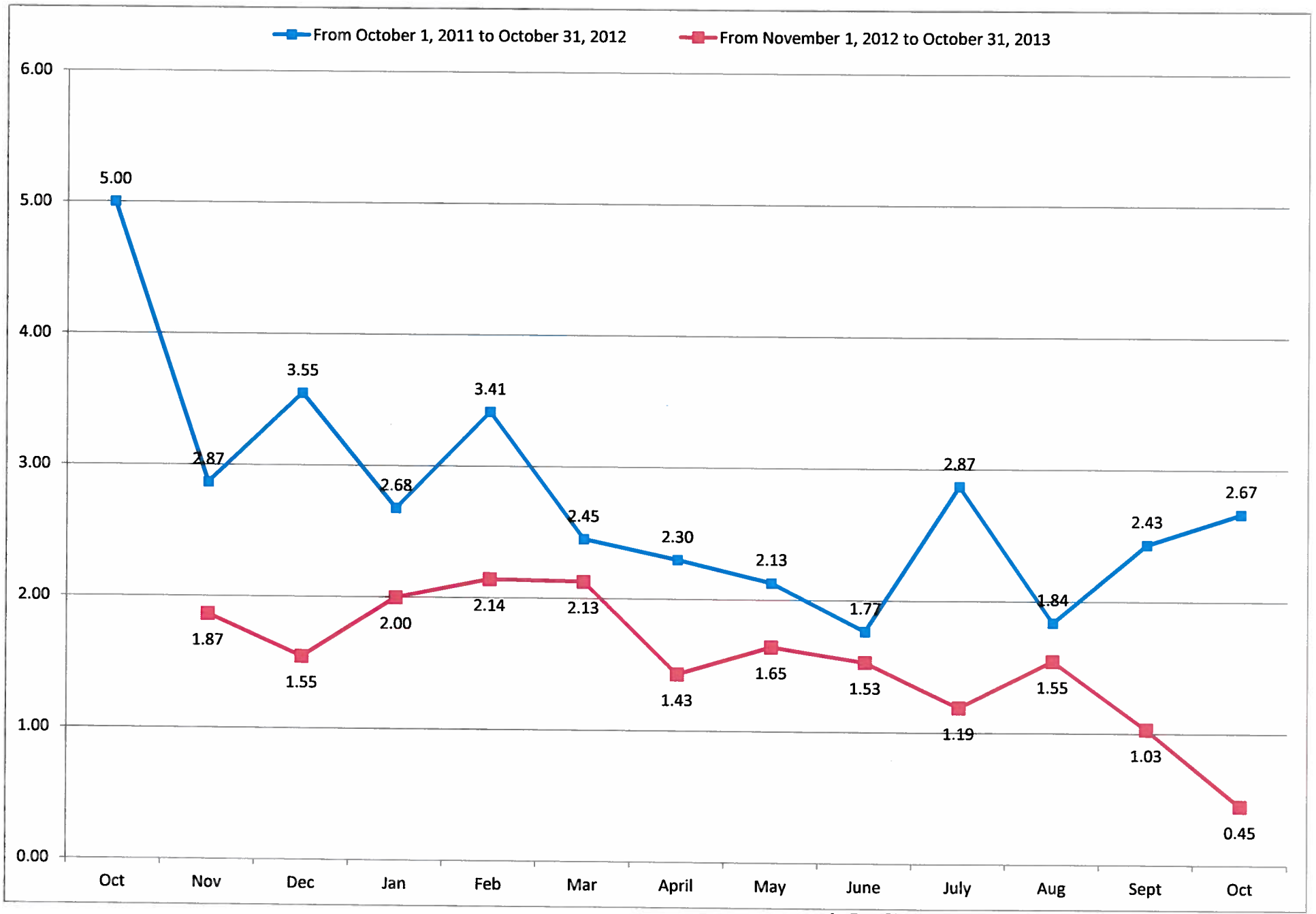


4th Street / 54th Avenue N - N/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

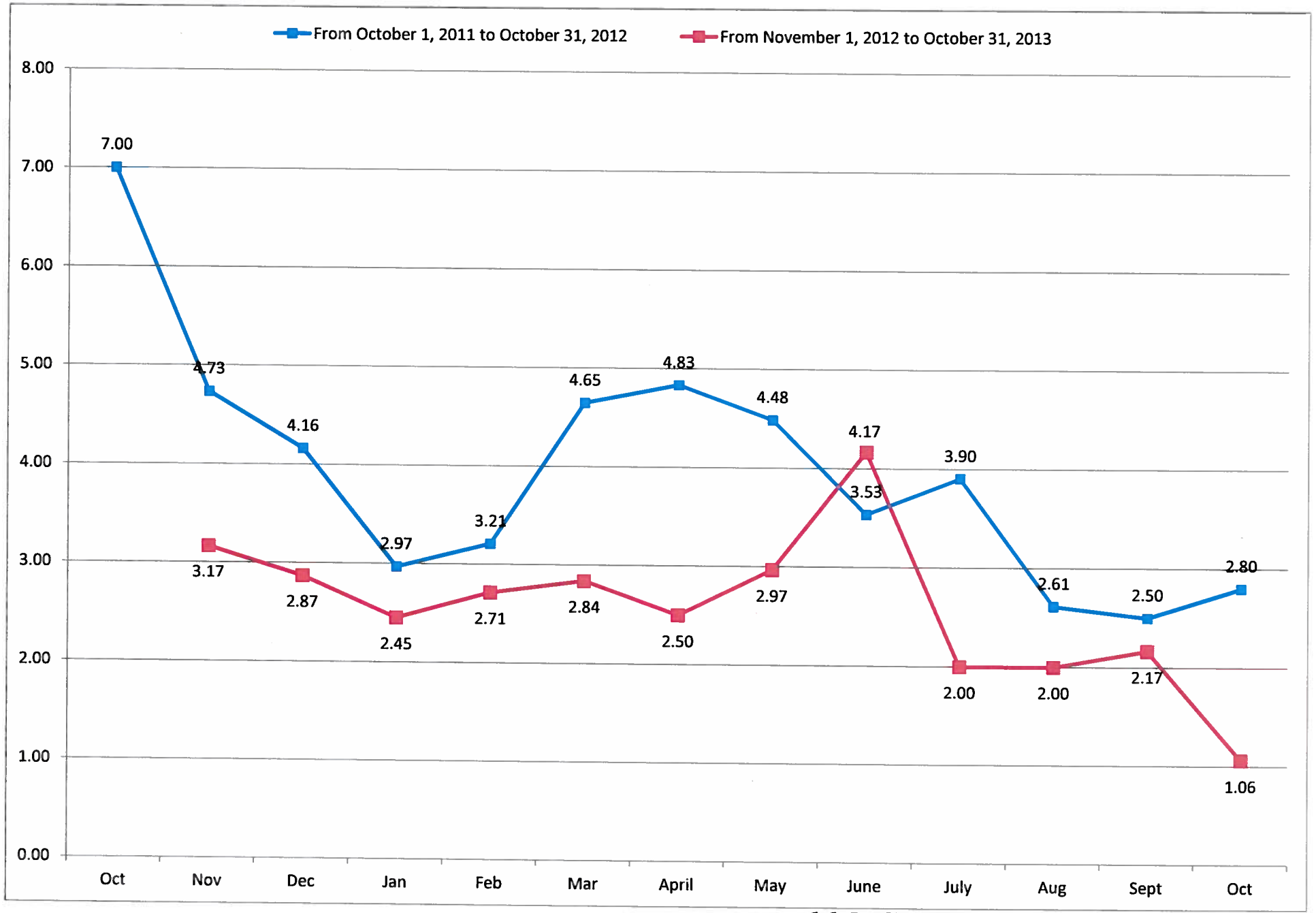


4th Street / 54th Avenue N - S/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

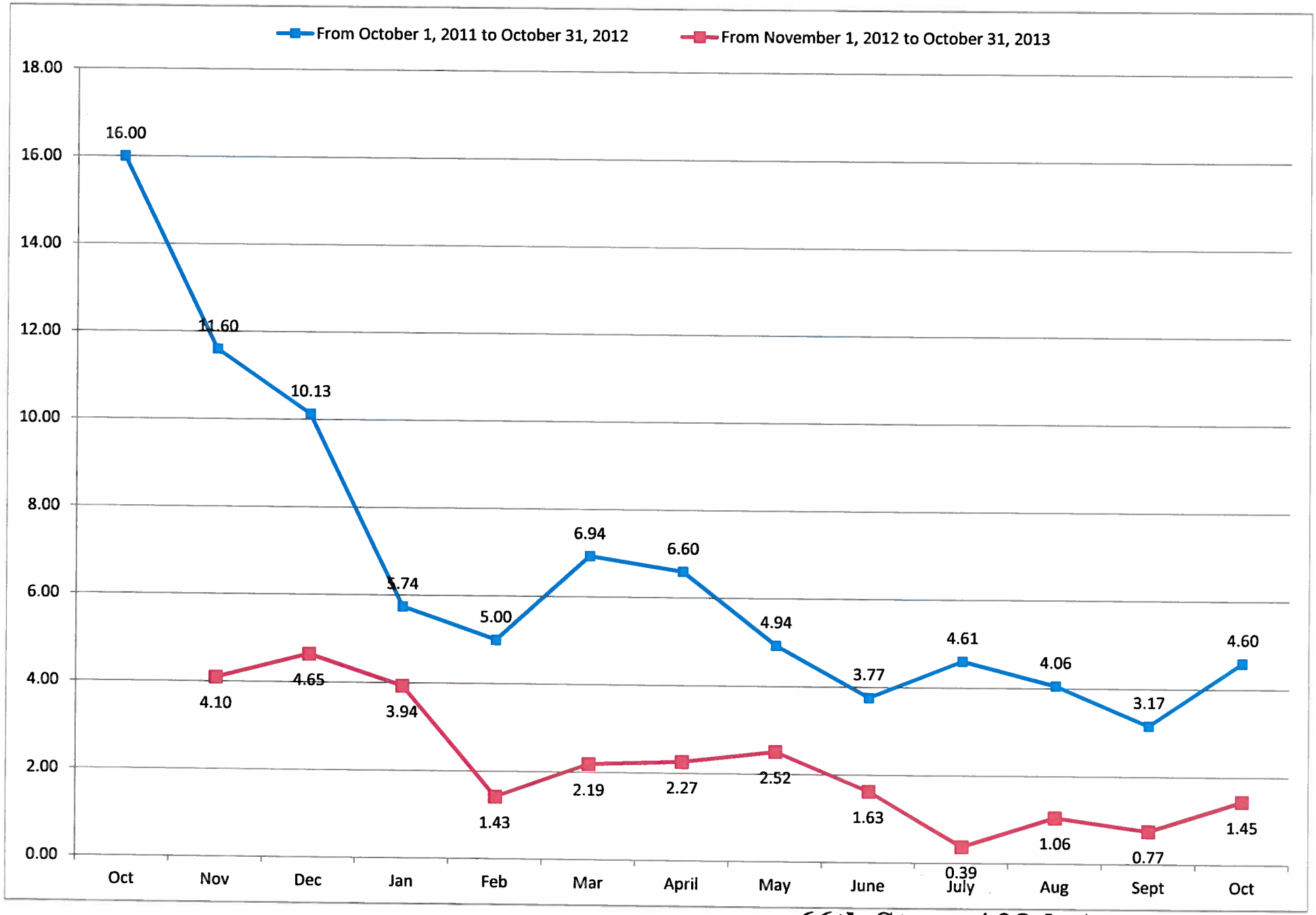


66th Street / 38th Avenue N - S/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

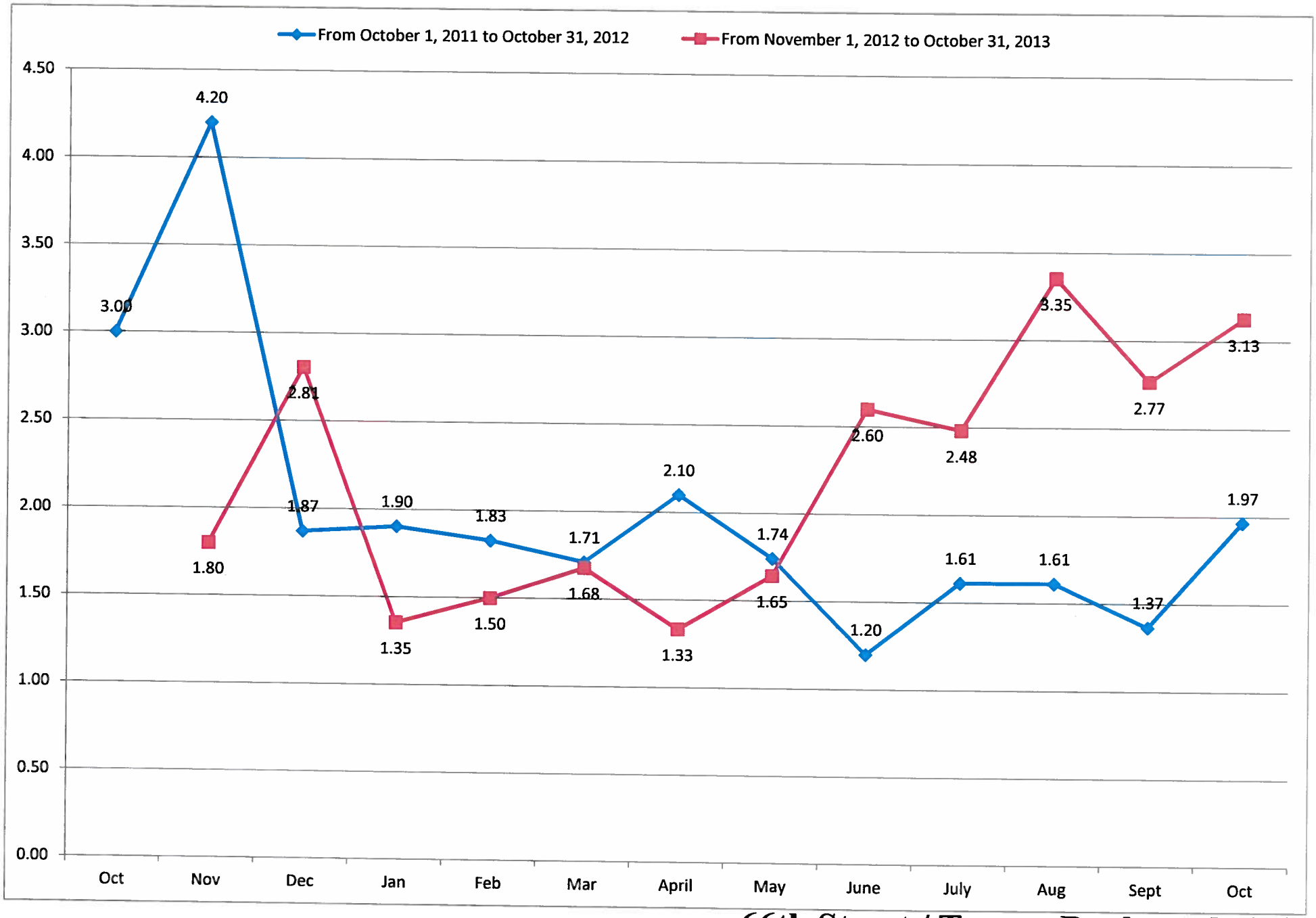


66th Street / 38th Avenue N - E/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

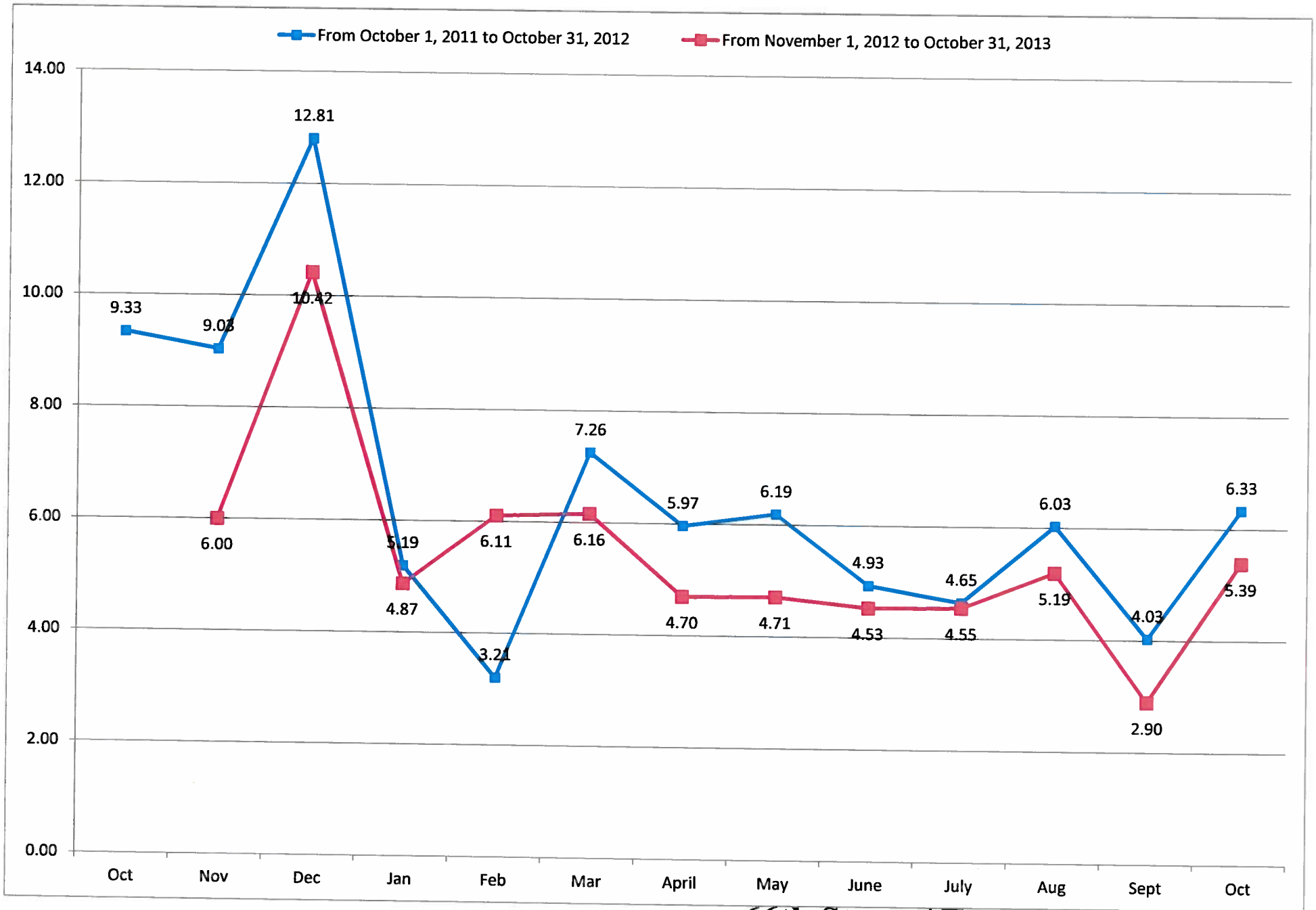


66th Street / Tyrone Boulevard - N/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

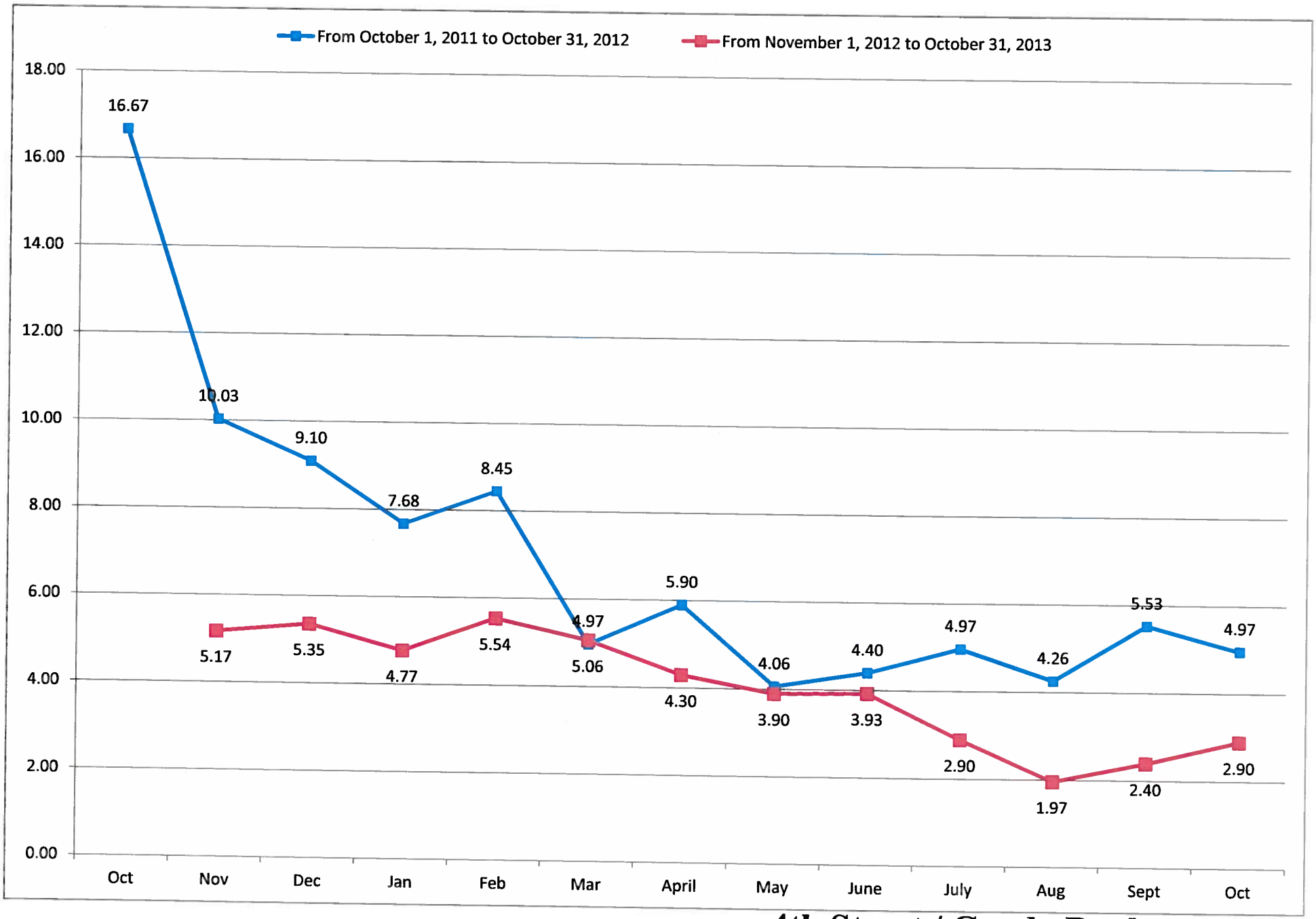


66th Street / Tyrone Boulevard - E/B

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED

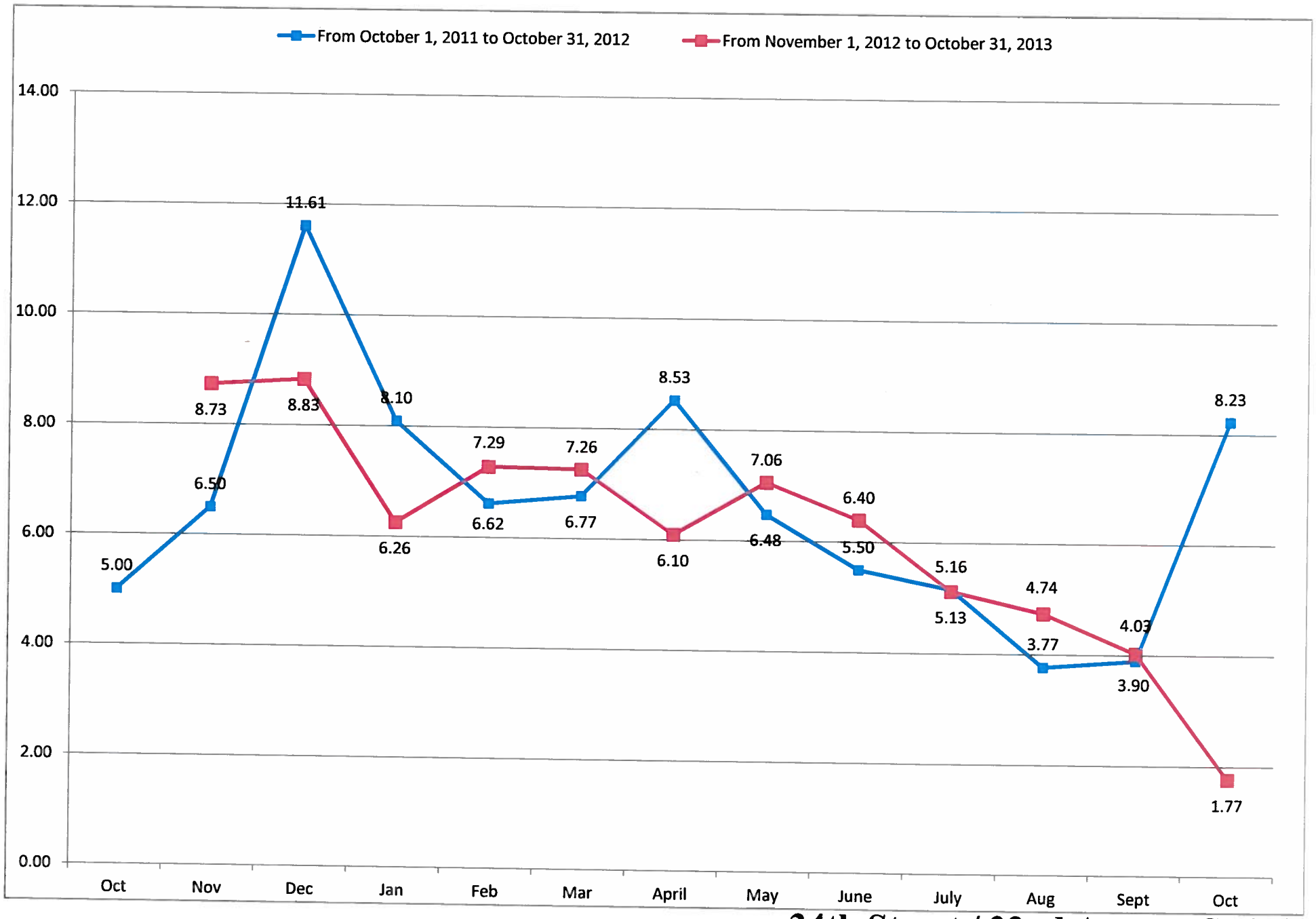


4th Street / Gandy Boulevard - S/B

City of St. Petersburg
Department ofTransportation

An Intersection Public Safety Program
Traffic Safety Camera Performance Summary
Average Daily Notices of Violation

STOP ON RED



34th Street / 22nd Avenue S - N/B

An Intersection Public Safety Program

Annual Average Red Light Running Crashes

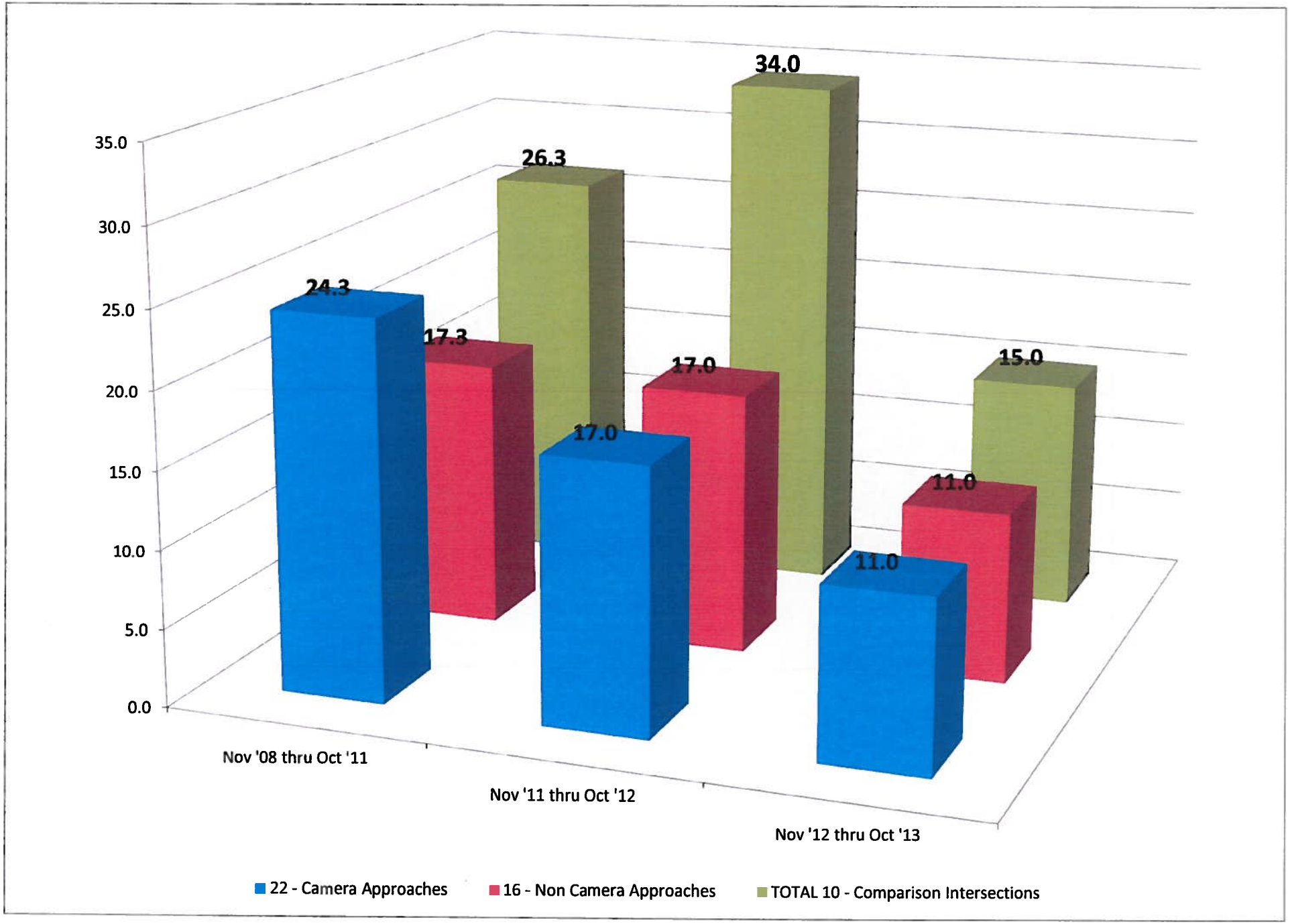


Chart No. 26

City Of St. Petersburg
Department of Transportation

An Intersection Public Safety Program

Annual Average Red Light Running Injury Crashes

Stop On Red

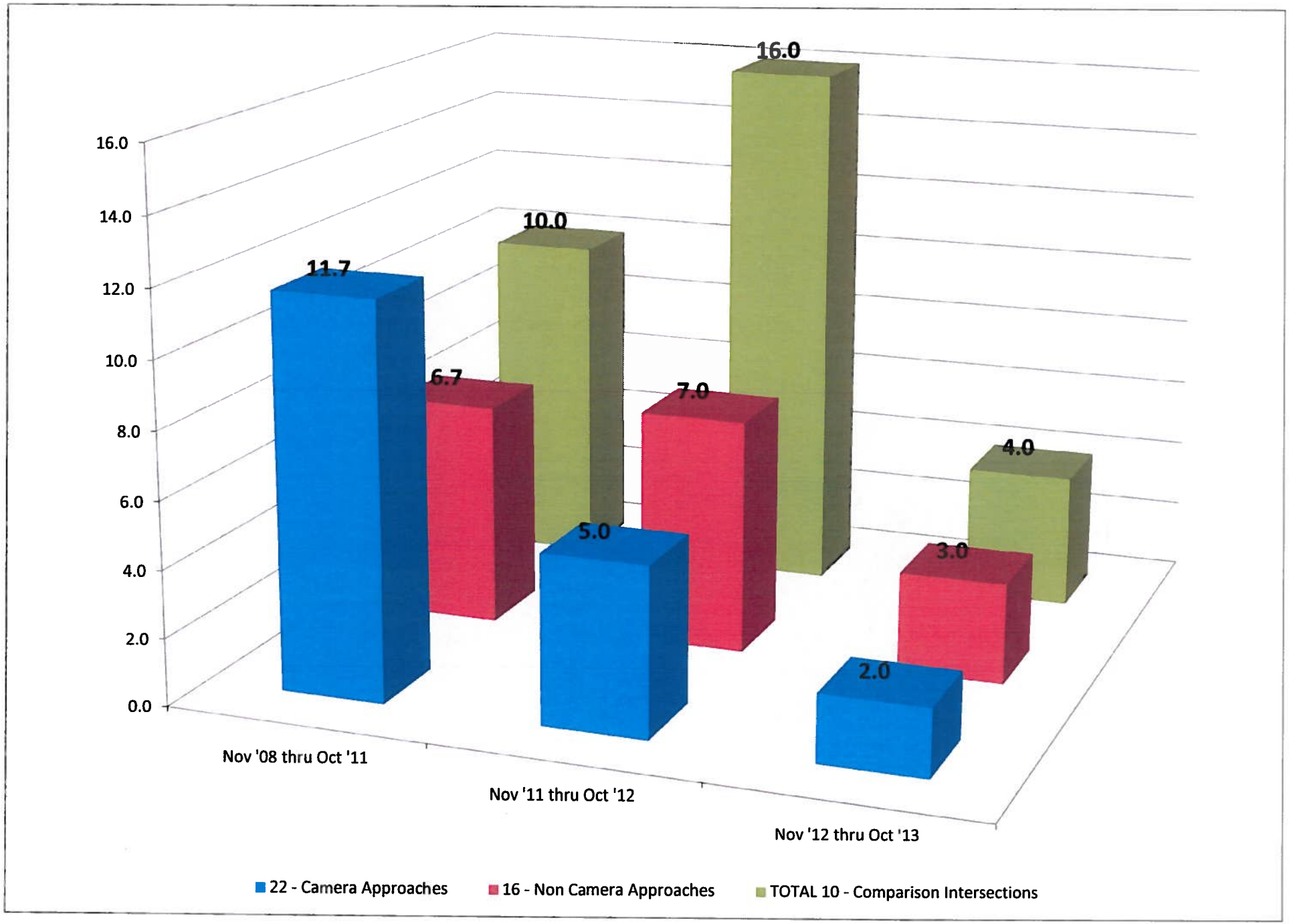


Chart No. 27

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program

Annual Average Red Light Runing - Rear End Crashes

Stop On Red

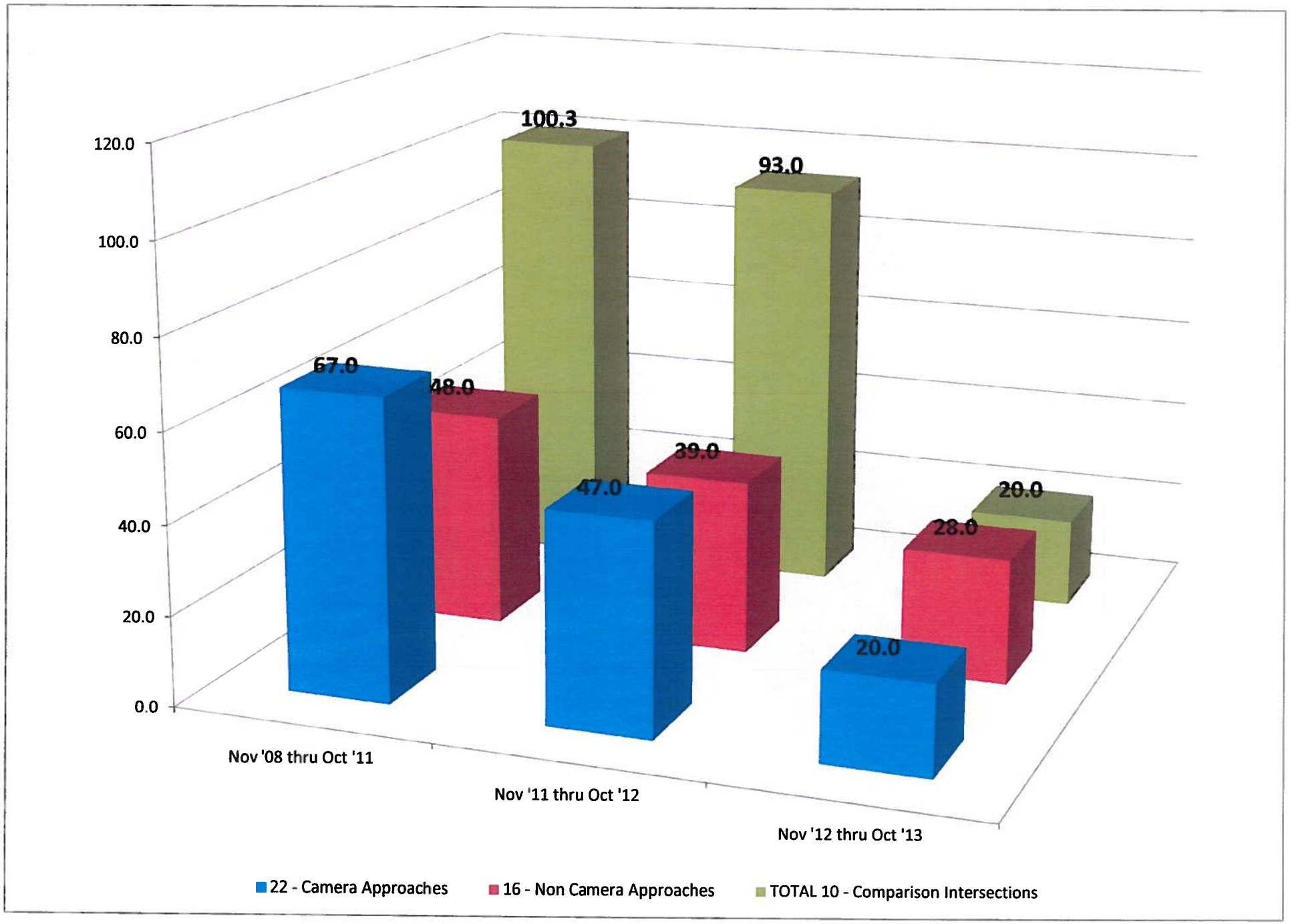


Chart No. 28

City of St. Petersburg
Department of Transportation

An Intersection Public Safety Program

Stop On Red

Annual Average Total Intersection Crashes

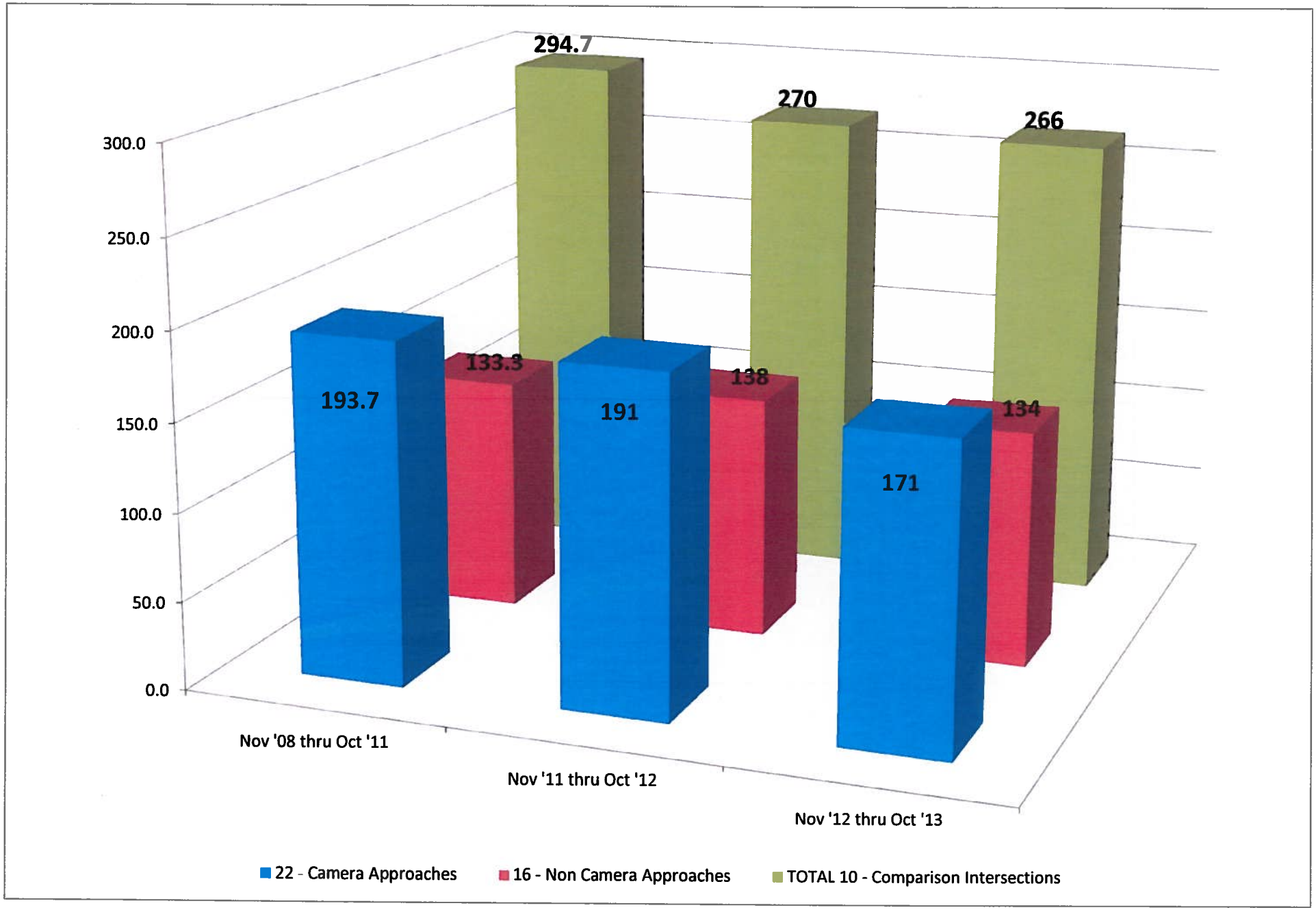


Chart No. 29

City of St. Petersburg
Department of Transportation

Red Light Running Crashes
10 Camera Intersections

STOP ON RED

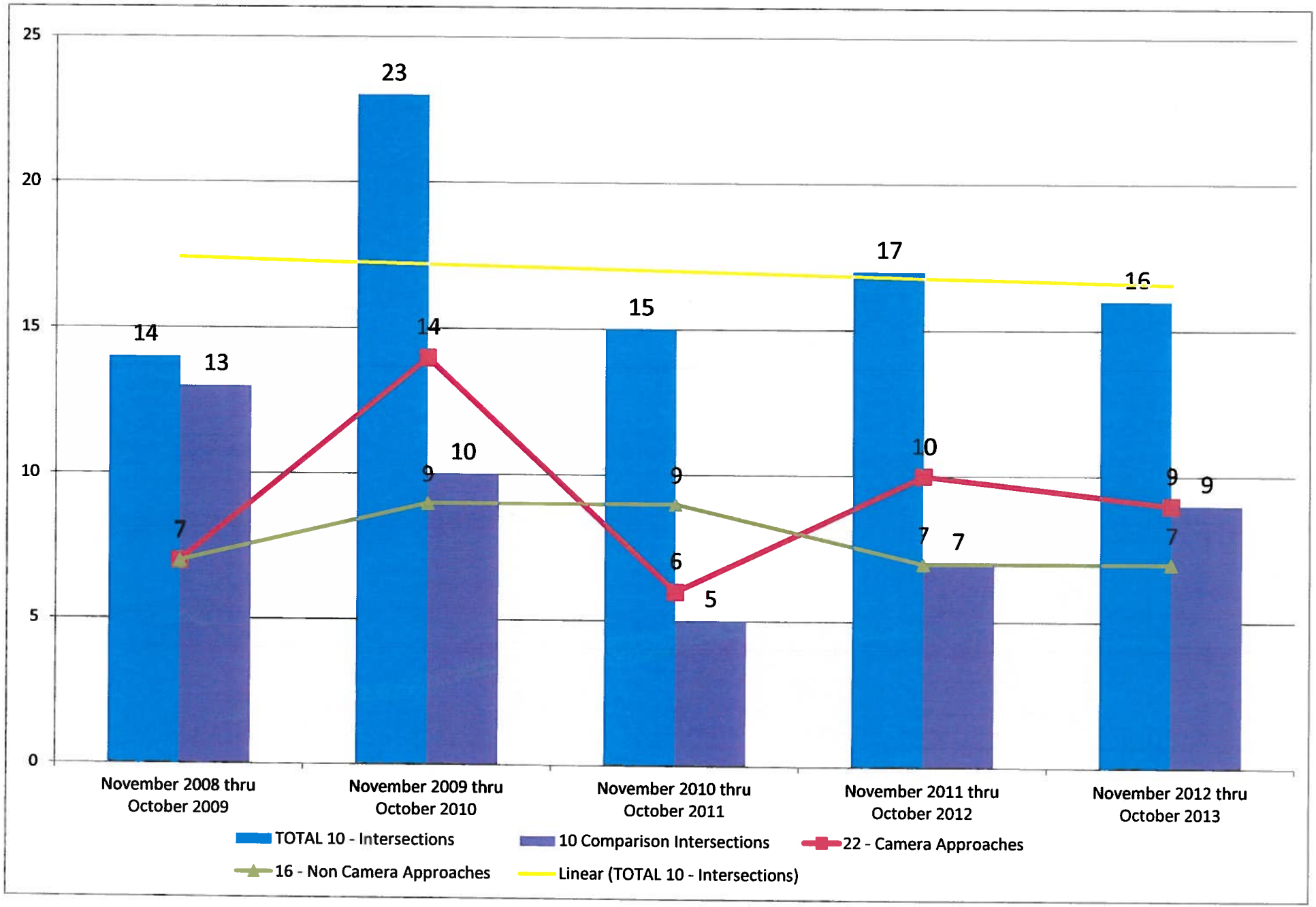


Chart No. 30

City of St. Petersburg
Department of Transportation

Red Light Running Injury Crashes
10 Camera Intersections

STOP ON RED

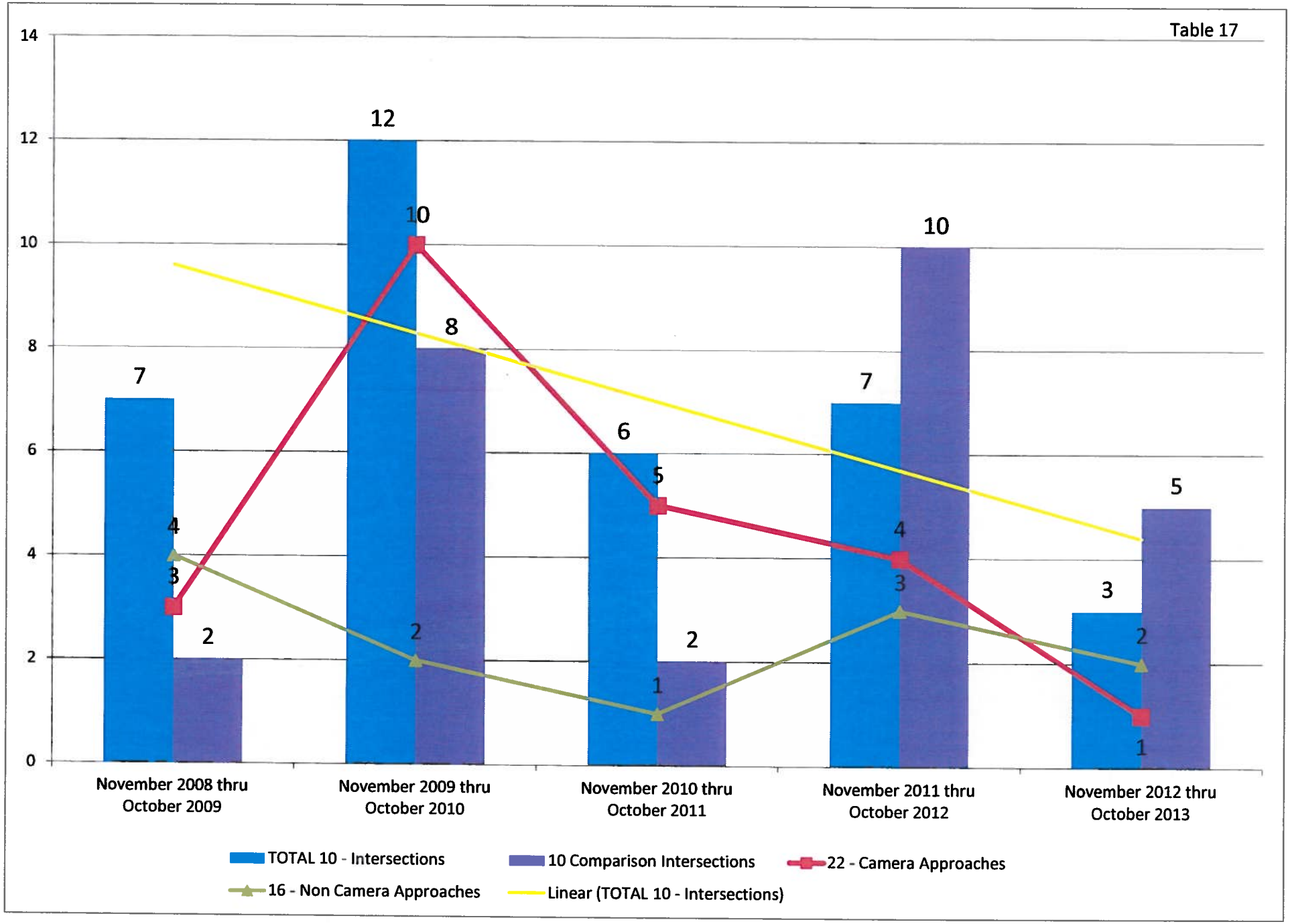


Chart No. 31

City of St. Petersburg
Department of Transportation

Red Light Running Related Crashes
10 Camera Intersections

STOP ON RED

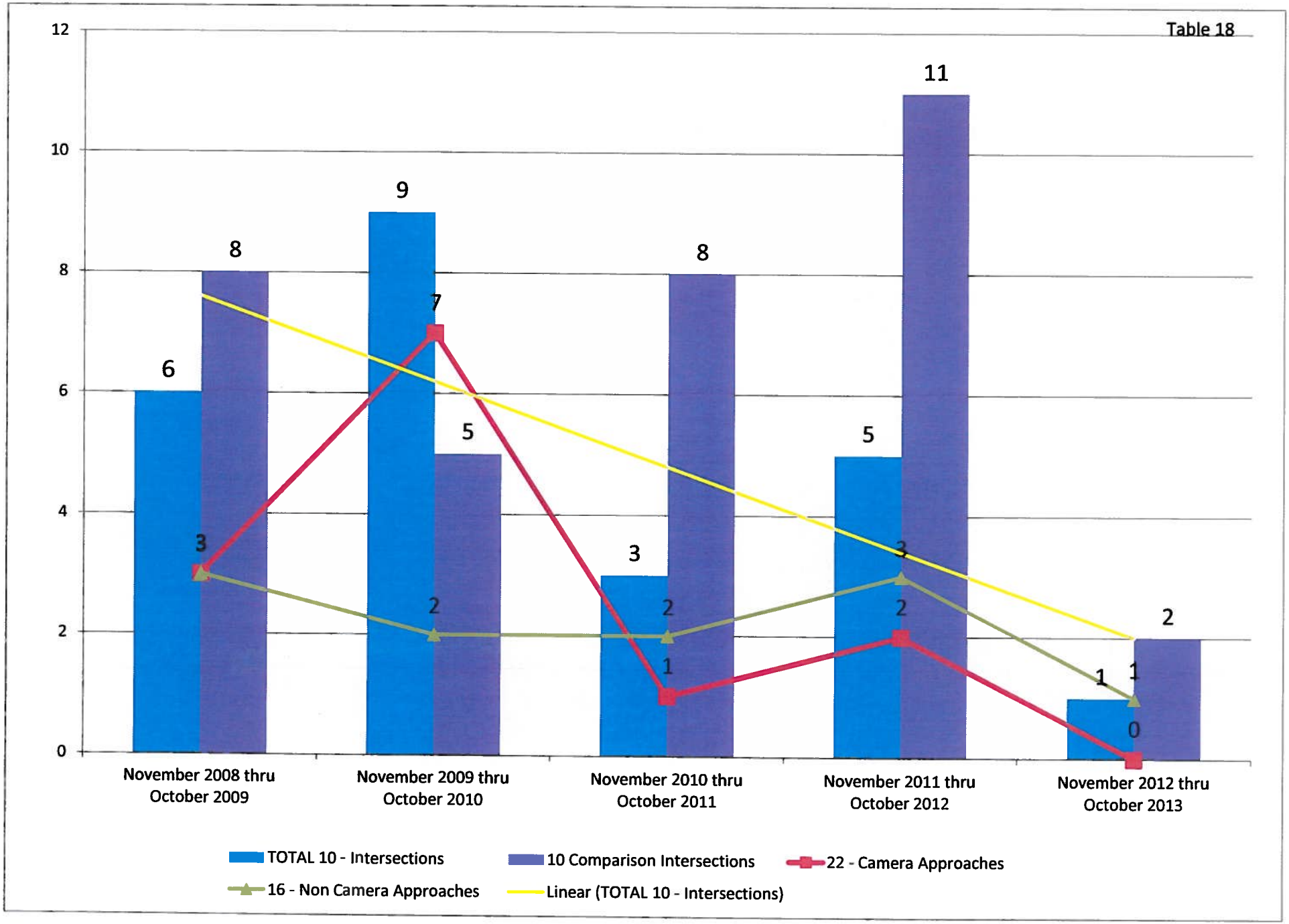


Chart No 32

City of St. Petersburg
Department of Transportation

Red Light Running Crashes

STOP ON RED

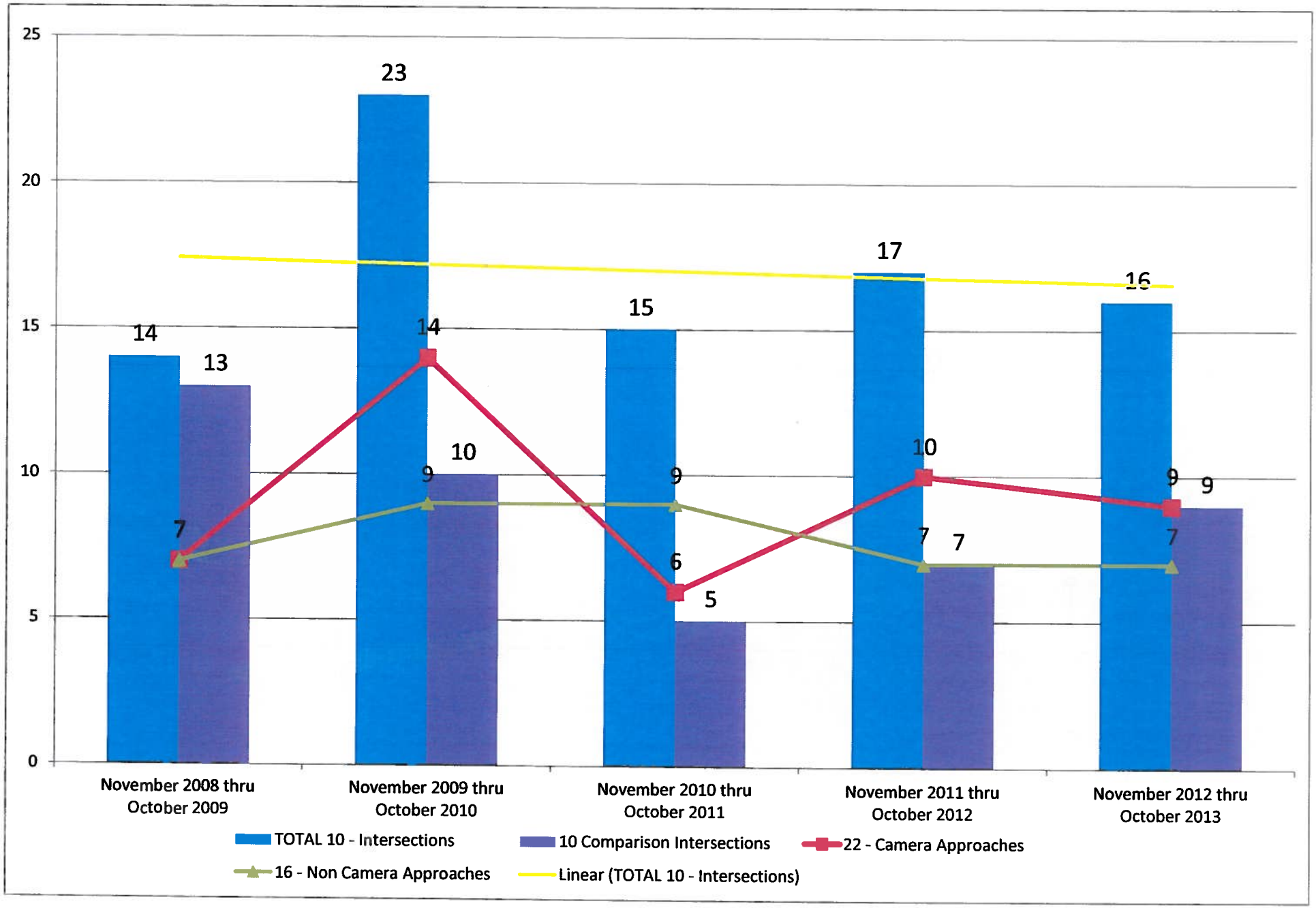


Chart No. 30

City of St. Petersburg
Department of Transportation

Red Light Running Injury Crashes

STOP ON RED

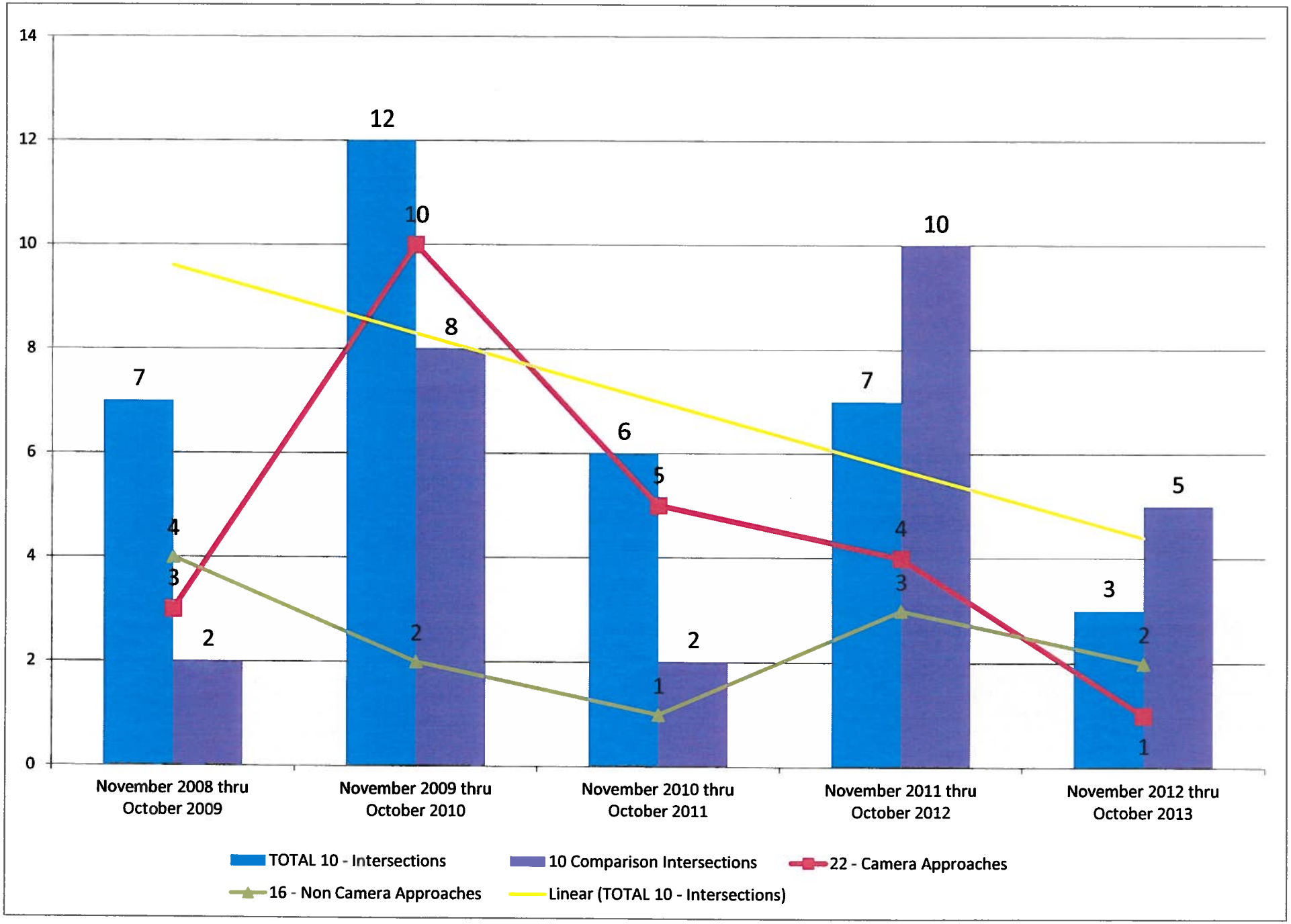


Chart No. 31

City of St. Petersburg
Department of Transportation

Red Light Running Related Crashes

STOP ON RED

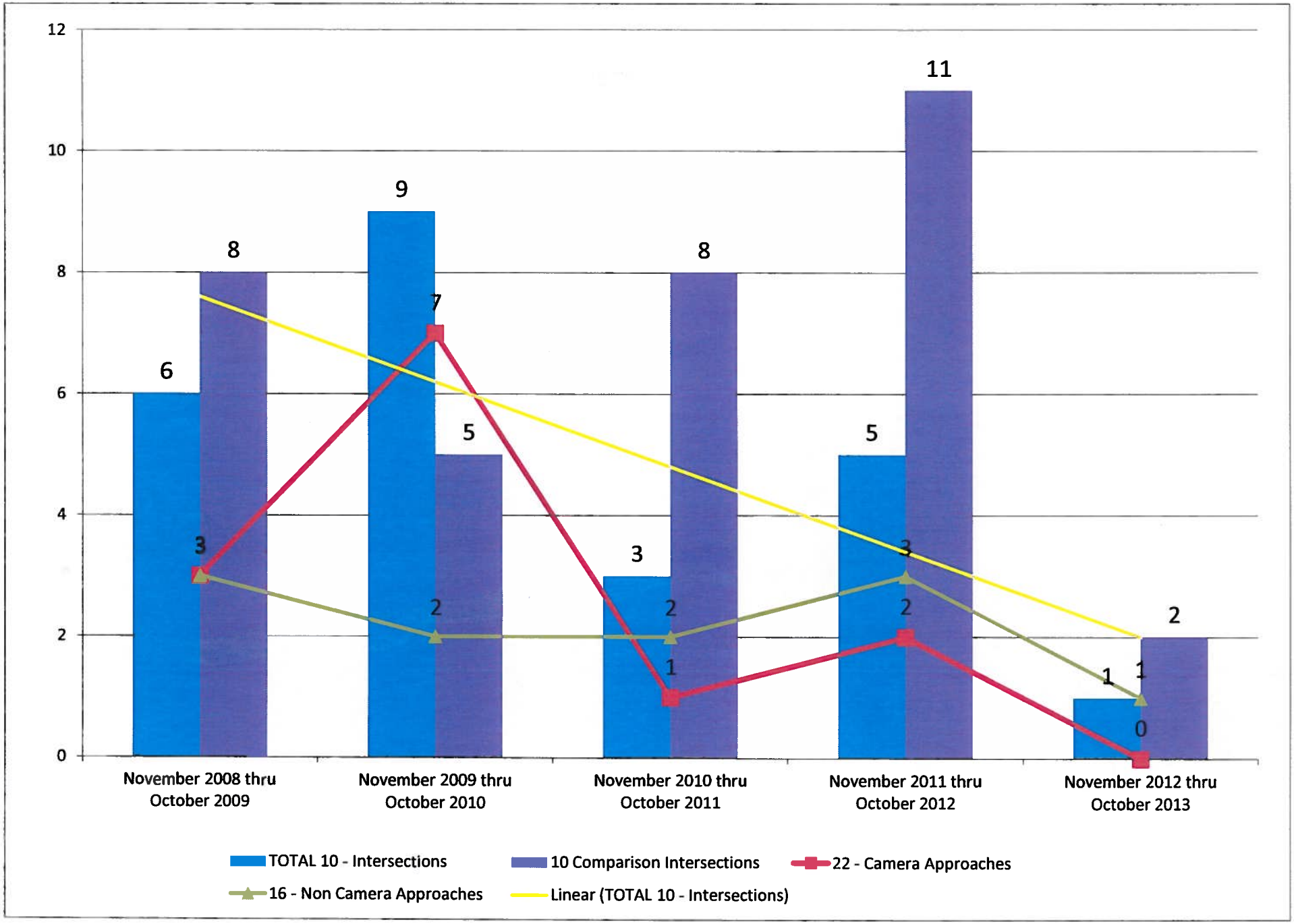


Chart No 32

City of St. Petersburg
Department of Transportation

Red Light Running Related Injury Crashes

STOP ON RED

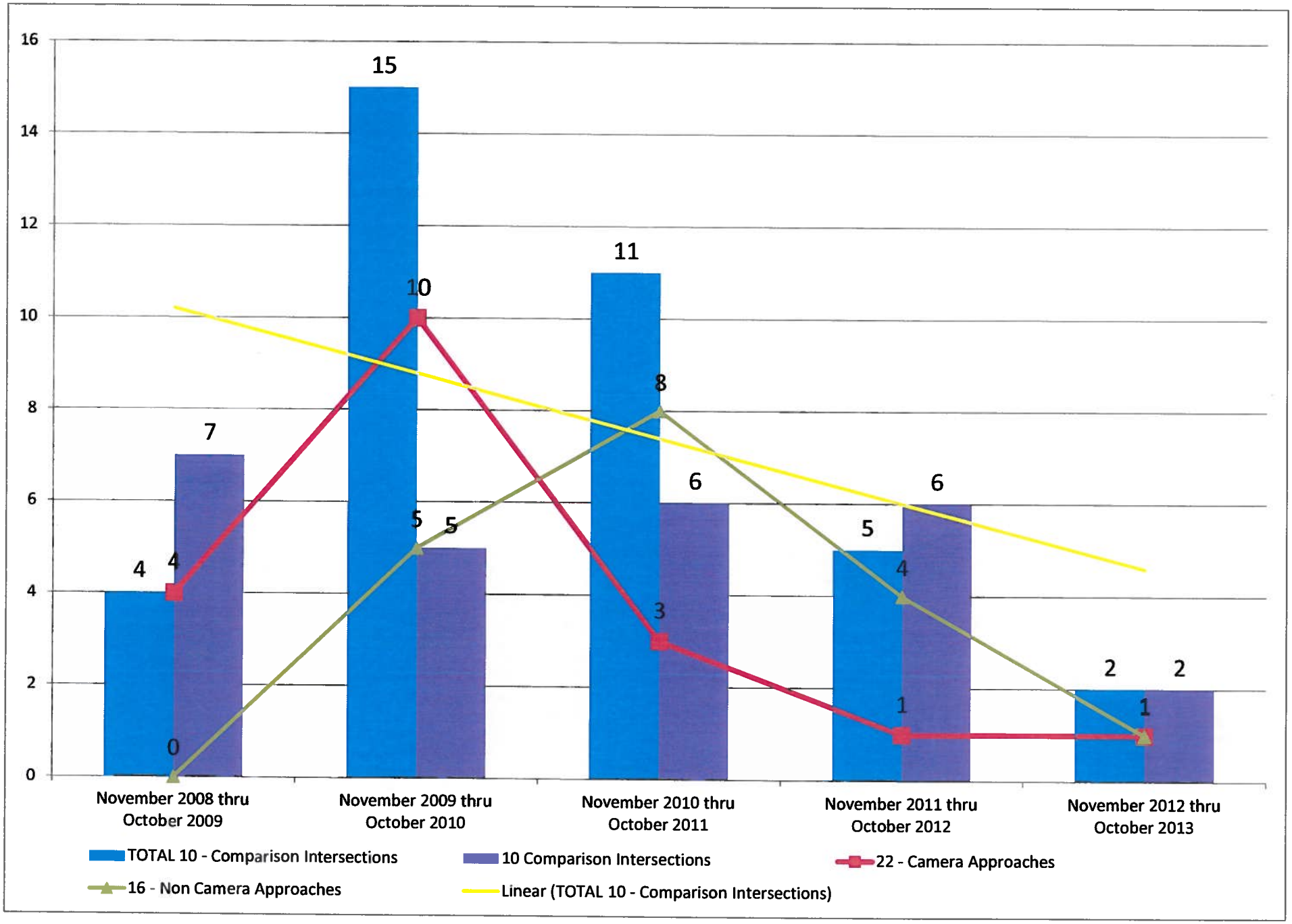


Chart No.33

City of St. Petersburg
Department of Transportation

Rear-End Crashes
(Not Related to Red Light Running)

STO{P ON RED

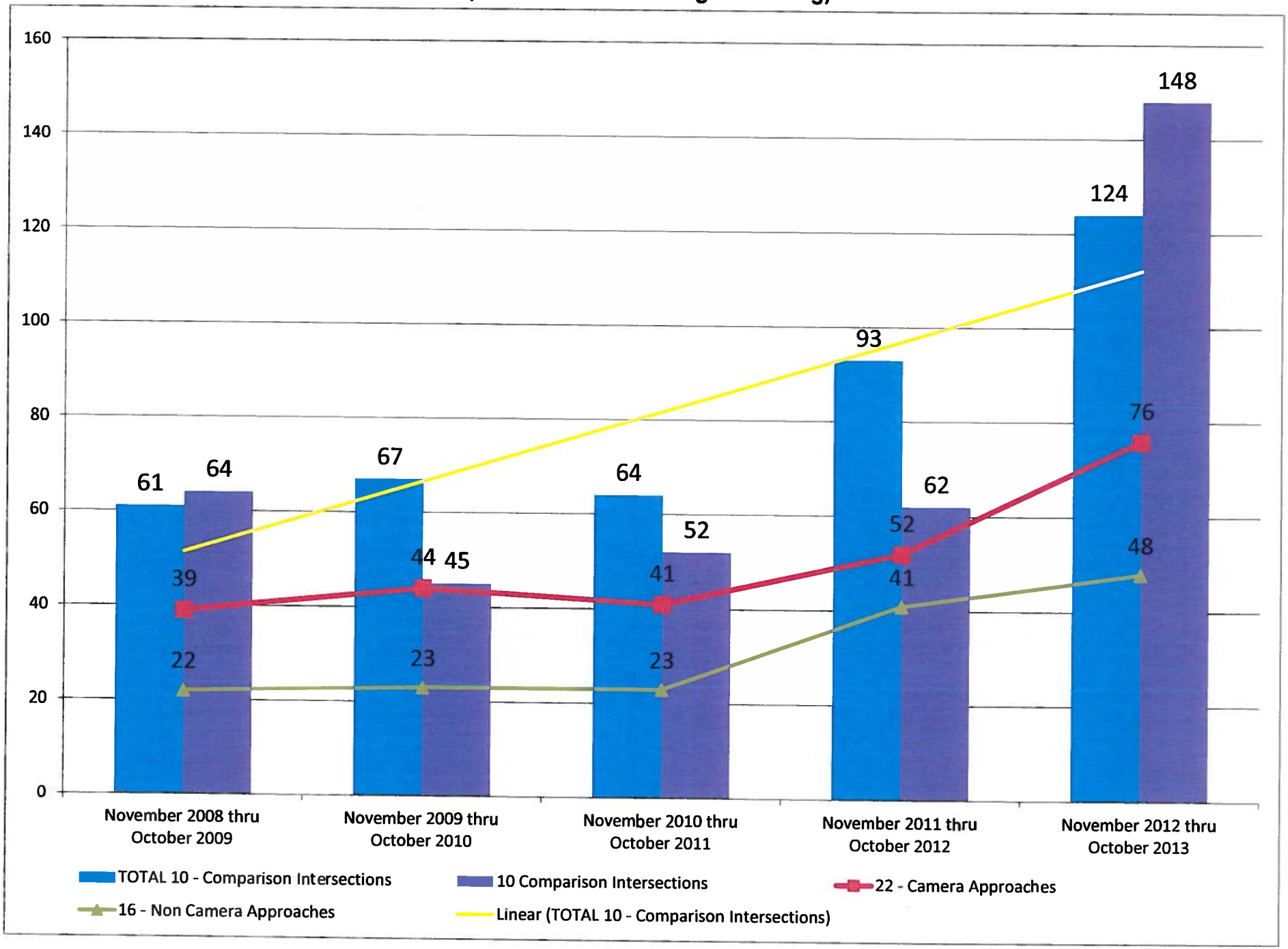


Chart No. 34

City of St. Petersburg
Department of Transportation

Red Light Running Related Rear-End Crashes

STOP ON RED

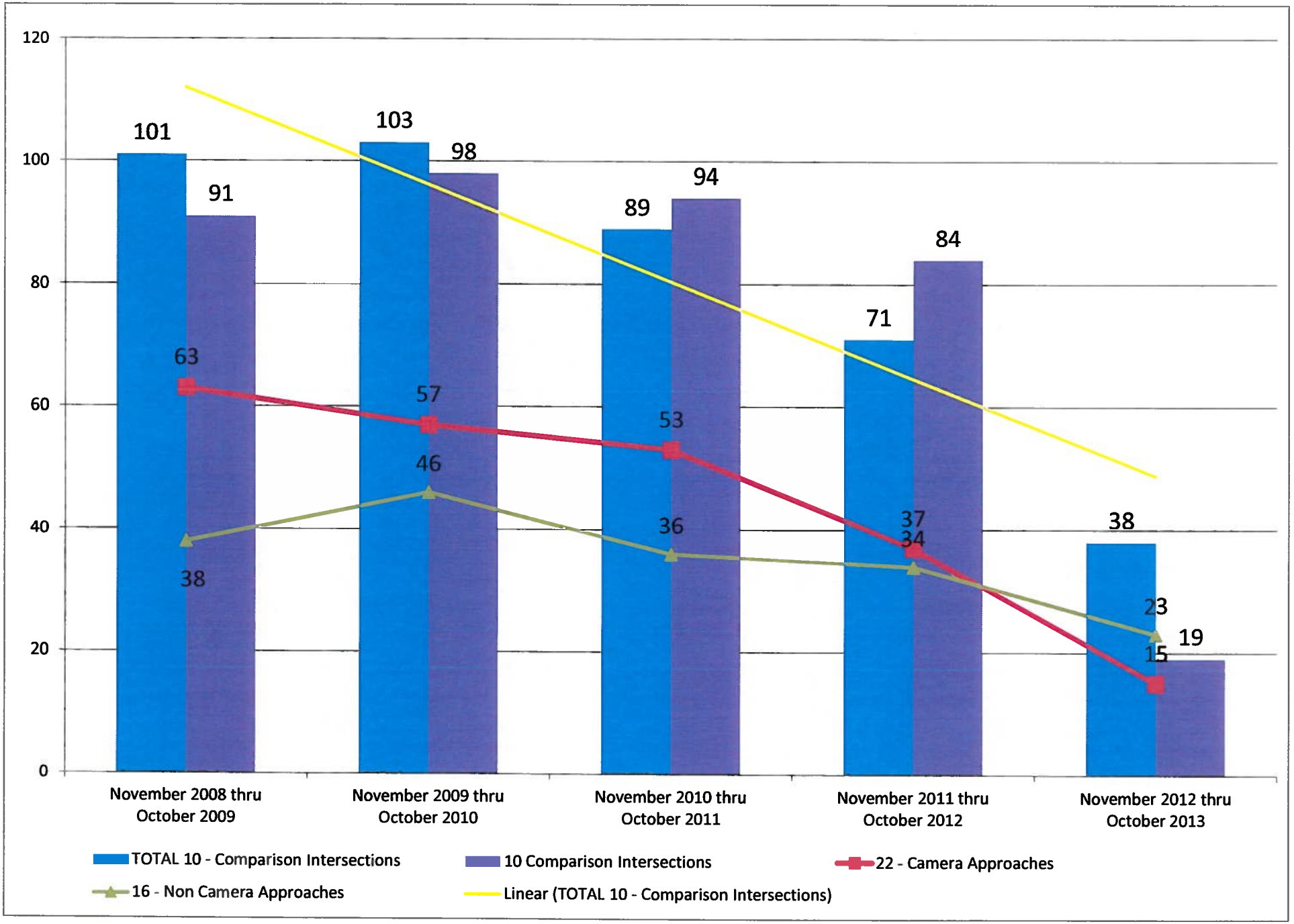


Chart No. 35

City of St. Petersburg
Department of Transportation

Red Light Running Rear-End Injury Crashes

STOP ON RED

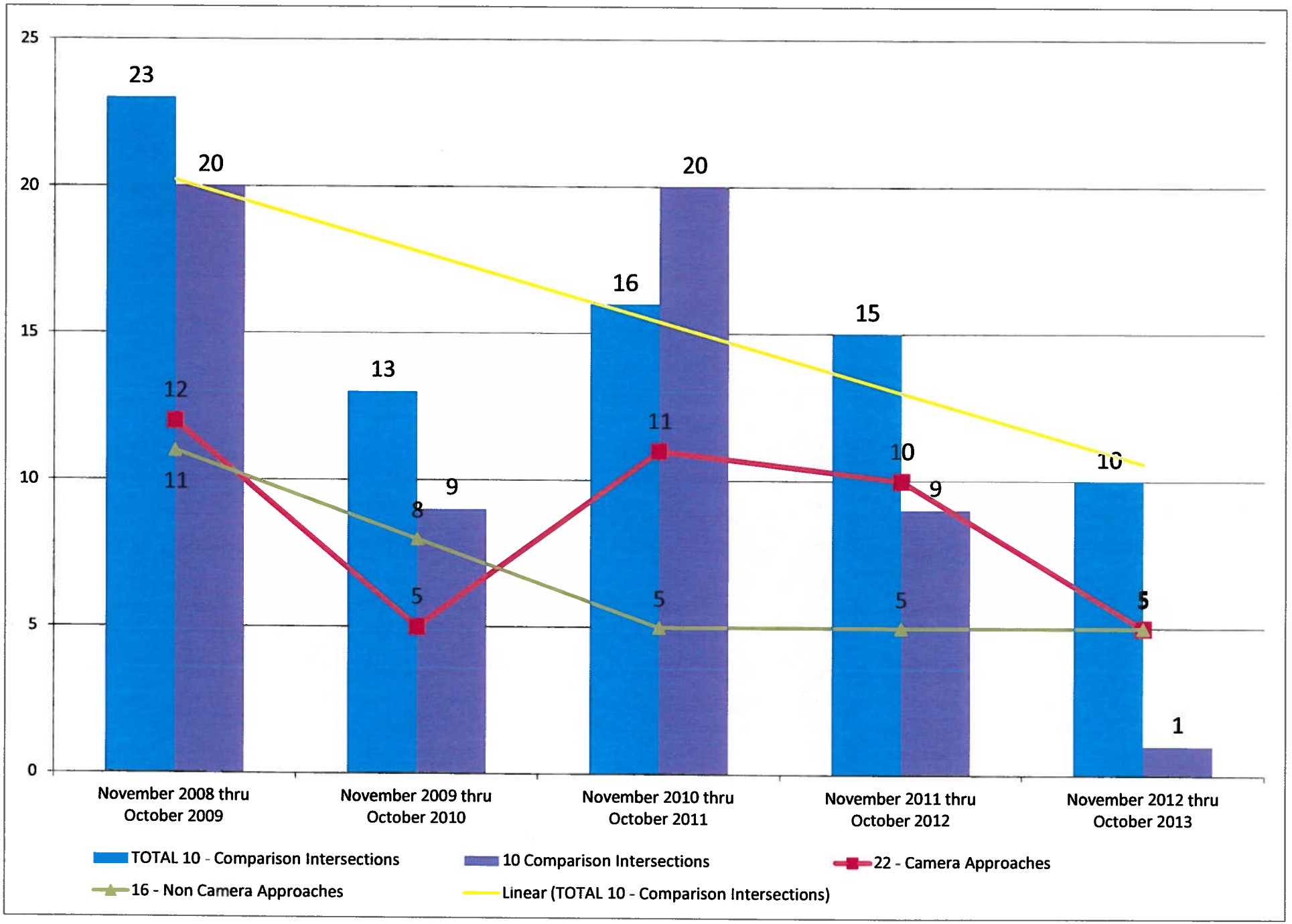


Chart No. 36

City of St. Petersburg
Transportation Department

Angle Crashes
(Not Related to Red Light Running)

STOP ON RED

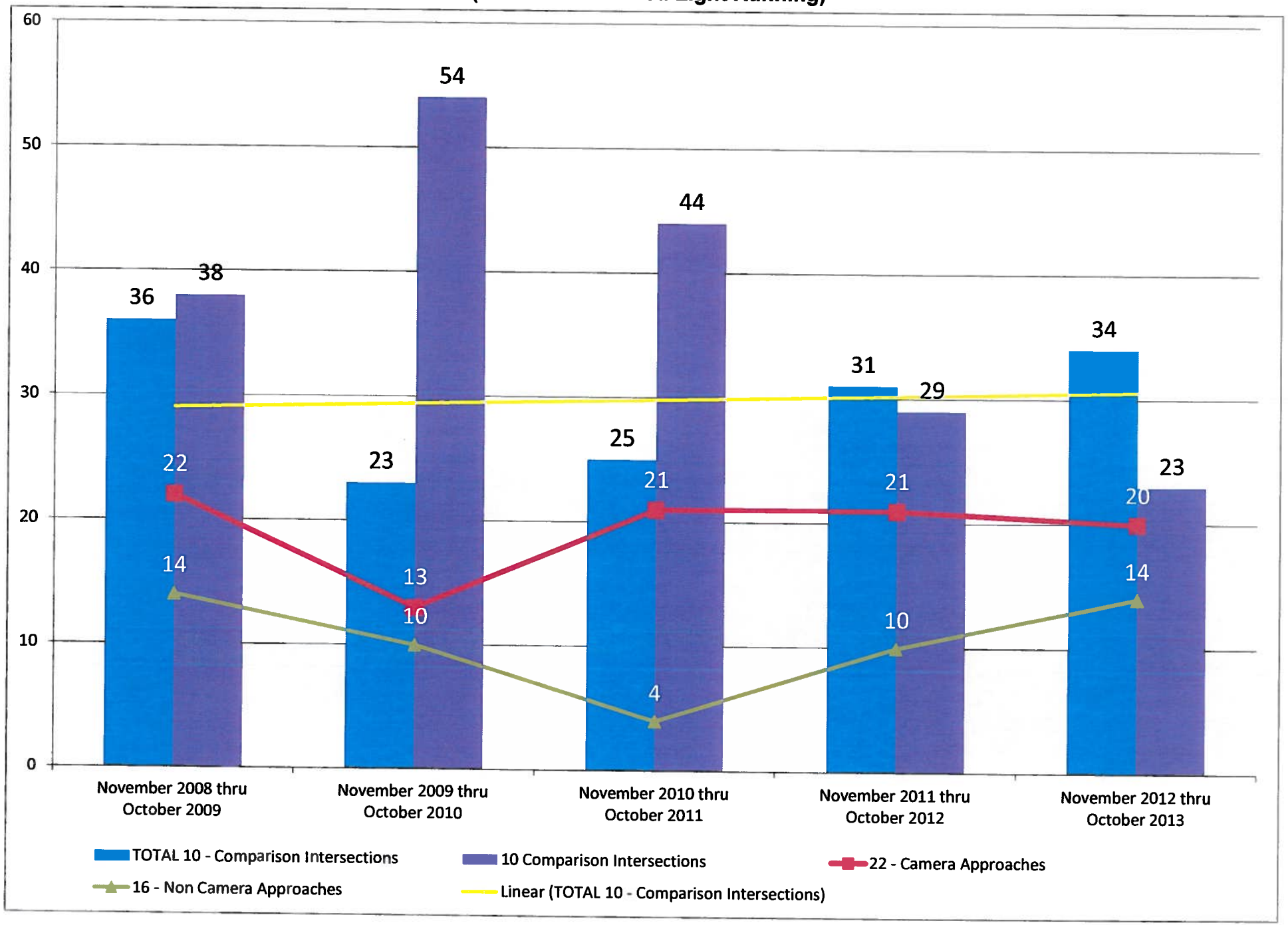


Chart No. 37

City of St. Petersburg
Department of Transportation

Total Intersection Related Crashes

STOP ON RED

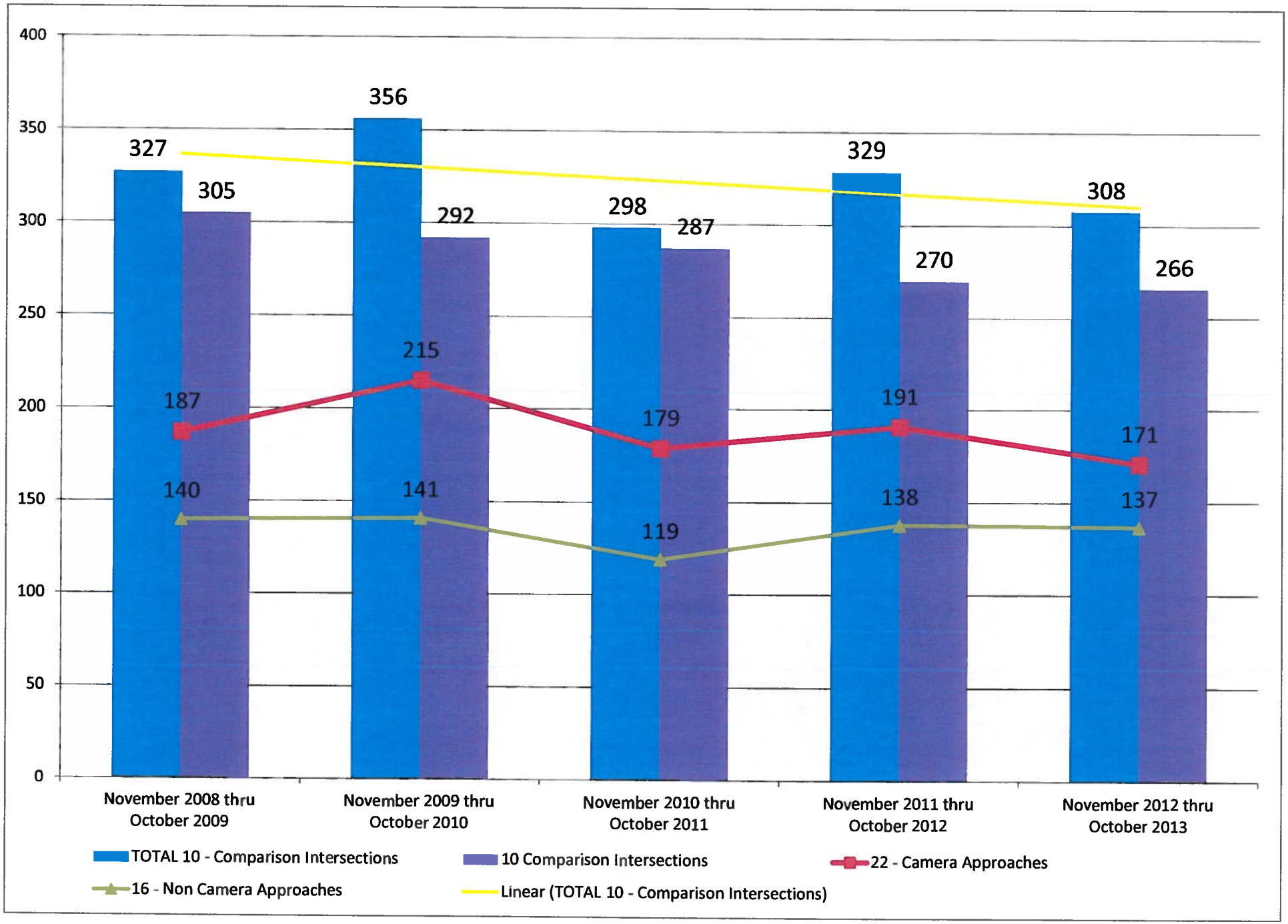


Chart No. 38