



WENDY GREUEL
CONTROLLER

September 29, 2010

The Honorable Antonio Villaraigosa
The Honorable Carmen Trutanich
Honorable Members of the City Council

The City currently has 32 Photo Red Light cameras, which are designed to cite drivers who break the law by running red lights at intersections throughout Los Angeles. The program's stated primary objective is to improve public safety, by reducing accidents at the City's most dangerous intersections. The LAPD – which oversees the contract along with the City's Department of Transportation (DOT) - has reported that the cameras help to generate millions of dollars for the City, as photo red light violations cost drivers \$446 per incident.

The attached audit of the City's Photo Red Light Program (PRLP) found that the program has not been able to document conclusively an increase in public safety due to incomplete data collection. In addition, over the past two years, the City has expended \$2.6 million to support the PRLP without full cost recovery. Further, it appears that the red light cameras were not necessarily installed at the City's most dangerous intersections. In fact, the methodology used to select the intersections actually excluded some of the highest risk intersections. This included allowing for at least one red light camera per Council District, weak infrastructure at some locations and not wanting to conduct the additional analyses required for State controlled-locations.

For example the LAPD did not select two intersections – La Brea Avenue & 6th Street, and Hayvenhurst St. & Nordhoff Ave. – where there were a combined 24 accidents and 2 fatalities from 2003-2005. However, they did select Whittier Blvd. and Lorena Street where there were only 2 accidents and no fatalities. If public safety is the number one priority of the PRLP, then the LAPD should select only the most dangerous intersections.

It is important to note that, according to the LAPD, there have been some significant accomplishments of the program. Our audit found that for drivers who dispute their citation through a court trial, less than 1% of the trials end in a "not guilty" verdict. Further, there have been no fatalities at monitored intersections since the current contract was implemented in 2006.

Some of the specific audit findings include:

- The PRLP has not conclusively shown to have increased public safety.
 - According to the LAPD's own statistics, 12 of the 32 intersections actually had more accidents after the cameras were activated, 4 had no change and 16 had fewer accidents. However the number of accidents that occurred over the time frame they examined was so small the differences were nearly insignificant.
 - Other factors may have also been responsible for the collisions at the 16 intersections, such as an overall reduction in accidents throughout Los Angeles due to fewer people driving during the economic downturn.

- Rather than choosing PRLP locations based on the highest number of accidents, it appears that other factors including the decision to place at least one camera in every Council District determined where cameras were placed.
 - LAPD and DOT agreed that several political issues were considered in the program implementation. LAPD stated that the City Council "strongly recommended that each {Council} district should have at least one PRL intersection."
 - For some locations, such as City streets that are also State highways (Santa Monica Blvd.), the State requires that an engineering analysis be performed prior to applying for approval of an automated enforcement system. The LAPD believes that the additional time and expense that would be necessary to get approval from the State was not justified for the PRLP. However the California State Auditor said in a July 2002 audit that cities should not omit intersections that require State approval when public safety would benefit.

- Currently the PRLP has cost the City more than \$2.6 million to operate over the revenue received.
 - Even though the PRLP costs the City money, not having the cameras would require over 100 motor officers, with combined salaries of more than \$10 million to monitor the 32 intersections constantly.

The current PRLP contract is in its final year, and the LAPD is about to issue an RFP to execute a new contract in 2011. It is critical that lessons are learned and improvements are made so that the new contract assures the City's financial interests are protected. In addition, LAPD should ensure effective use of program resources and monitor the program results to maximize public safety.

Sincerely,



Wendy Greuel
City Controller



WENDY GREUEL
CONTROLLER

September 29, 2010

Charlie Beck, Chief of Police
Los Angeles Police Department
100 West First Street, Suite 1072
Los Angeles, CA 90012

Dear Chief Beck:

Enclosed is a report entitled "Audit of the Photo Red Light Program." A draft of this report was provided to your Department on July 2, 2010. Comments provided by your Department and by the Department of Transportation at the July 30, 2010 exit conference were evaluated and considered prior to finalizing this report.

Please review the final report and advise the Controller's Office by October 29, 2010 on planned actions you will take to implement the recommendations. If you have any questions or comments, please contact me at (213) 978-7392.

Sincerely,

FARID SAFFAR, CPA
Director of Auditing

Enclosure

cc: Reverend Jeff Carr, Chief of Staff, Office of the Mayor
Eileen Decker, Deputy Mayor, Office of the Mayor
Richard A. Roupoli, Deputy Chief & CO, Special Operations Bureau, LAPD
Rita L. Robinson, General Manager, Department of Transportation
Miguel A. Santana, City Administrative Officer
June Lagmay, City Clerk
Gerry F. Miller, Chief Legislative Analyst
Independent City Auditors



City of Los Angeles Office of the Controller

Audit of the Photo Red Light Program

September 29, 2010

**Wendy Greuel
City Controller**

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Audit of the Photo Red Light Program

EXECUTIVE SUMMARY

The Office of the City Controller has completed an Audit of the City's Photo Red Light Program. This program automates the enforcement of traffic laws that require vehicles to stop at red signal lights, and is currently in effect at 32 intersections throughout the City of Los Angeles.

Background

The Photo Red Light Program (PRLP) is an enforcement approach to increasing traffic safety, which began as a pilot program in December 2000. The Los Angeles Police Department (LAPD) is the program sponsor and contract administrator, and works in partnership with the Los Angeles Department of Transportation (LADOT) in managing the program.

LAPD works closely with the contracted vendor, which was Nestor Traffic Solutions, Inc. until September 2009, at which time the current vendor, American Traffic Solutions, Inc., stepped in to fulfill contract requirements.

LAPD's stated goal of the Photo Red Light Program is "to increase intersection safety by reducing the number of serious injury and fatality traffic collisions caused by motorists who fail to stop for red lights and to maximize red light enforcement through efficient use of police resources."

LAPD has previously reported that the PRLP has had a significant impact on public safety, measured as a reduction in traffic collisions and fatalities, and has generated significant revenue.¹ During 2009 LAPD issued approximately 45,000 citations through the PRLP, which according to LAPD represented over 22% of the moving violations citywide. A red-light violation carried a fine of \$446 as of fieldwork completion.

The overall objective of our review was to assess the efficiency and effectiveness of the City's management of the PRLP. We sought to determine how the City ensured adequate performance by the vendor, and how the City evaluates the status, problems or successes of the program. We also reviewed leading practices and those in use by other jurisdictions, and assessed whether the City achieves the program's goal of reducing traffic collisions. The audit was conducted in accordance with Generally Accepted Auditing Standards and covered the three-year period ended October 31, 2009, though we considered the conditions and some data through March 2010.

¹ Board of Police Commissioners report nos. 09-0304, 10-0067, & 10-0122, dated July 17, 2009, February 2, 2010, & March 23, 2010, respectively.

Summary of Audit Results

We found that the program cannot conclusively demonstrate that it has reduced traffic collisions, thereby increasing public safety. While the PRLP offers less expensive and less dangerous enforcement of red light violations than traditional field officer enforcement, the lack of specific metrics for reporting program success and the method by which program locations were selected, whereby some high risk intersections were eliminated, detract from its ability to clearly demonstrate a significant improvement to public safety.

In addition, we noted that the PRLP does not currently generate revenue in excess of costs for the City. Considering the actual PRLP citation revenue received compared to City resources dedicated to the program, the City actually incurred a net cost of more than \$1.5 million in 2008 and \$1 million in 2009 to operate the Photo Red Light Program. It is essential that before the City allocates additional resources to the program, it must define the specific outcomes that are expected to be achieved. Therefore, the City must clearly demonstrate how the PRLP will increase safety through enforcing drivers' compliance with traffic laws. By considering additional issues in determining when to issue a citation, and through legislative action, there may be opportunities to increase program revenue and more closely tie penalties to the relative danger of the violation.

We found that the current vendor is performing adequately and LAPD's oversight was generally appropriate. However, we noted certain shortcomings in the contract terms and program oversight that require management attention. For example, LAPD should consider additional controls to ensure completeness of all data maintained by the vendor. The City intends to release an RFP and issue a new contract, with potential for expansion to additional intersections. In selecting a vendor and negotiating a new contract, the City must ensure the City's financial interests are adequately protected.

Key Findings

- **The method used to select PRLP locations eliminated some high risk intersections.**

LAPD initially identified intersections with the highest number of collisions for consideration in the program. However, other factors also played a role in final selection which may ultimately reduce the program's effectiveness. LAPD recommended a fairly even distribution of monitored enforcement citywide, so each Council District was allocated at least one PRL location. Also, due to funding constraints, locations that lacked the stronger steel poles necessary for installation of the PRLP equipment were not considered. Finally, locations that would have required State approval were also not considered. This resulted in the City not installing automated red-light cameras at some intersections with a higher and disproportionate number of collisions than others that were selected.

- **Location decisions did not involve engineering analyses to formally document the City's consideration of other, non-enforcement solutions that may have a more direct impact on public safety.**

Although LADOT provided significant input to LAPD regarding which intersections to include in the PRLP, they did not document how other engineering solutions had been considered to support a conclusion that an enforcement solution would have the maximum impact on public safety. When considering new locations for an expanded PLRP, the City should consider utilizing a standardized engineering analysis template for this purpose.

- **As measured and reported by LAPD, the PRLP has not conclusively shown to have increased public safety.**

LAPD has reported program results based on statistics tracked by their internal databases which were incomplete and did not include information such as collision type (e.g., broadside or rear-end), the direction and speed of vehicle, and time into red, which may impact reported program results.

LAPD has focused their attention on reporting PRLP success by tracking collisions which were specifically caused by a red light violation, because those are the stated target of enforcement efforts. However, not all collisions result in a LAPD report, and the coded data within LAPD's traffic databases is insufficient to support a full analysis of all collisions that could be impacted by the program. A more comprehensive and systematic approach to evaluating the PRLP is needed. This could include tracking other information in addition to the cited violation considered as the primary collision factor, as well as measuring the change in both collision and violation rates over time.

- **The assessment of the program's effectiveness as reported by LAPD is questionable since LAPD did not consider other factors that may be responsible for a reduction in traffic collisions.**

There has been a wide fluctuation in reported collisions at PRL intersections attributed to the program, starting from the high of 107 in 2004, gradually declining to a low of 30 in 2008, then rising again to 46 in 2009. While those figures should not be considered as the sole measure of the program's success, LAPD has also not considered or reported other factors that may have had an impact on the number of collisions. For example, citywide traffic collisions have declined by 14% over the past two years. At a minimum, variations in traffic volume should be considered when reporting the ratio of traffic collisions as well as violations.

□ **The Program's operating costs exceed Program revenue.**

Our audit disclosed that the PRLP has not provided additional revenue to the City. Because the City's share of citation revenue is only about one-third of the fine amount,² and many citations are either never paid or adjudicated without a payment due, we found the City received only \$2.3 and \$3 million from the PRLP during 2008 and 2009, respectively. When compared to a conservative estimate of the costs incurred by the City to implement the program, the PRLP actually cost the City approximately \$1.5 million in 2008 and \$1 million in 2009.

□ **All PRLP violations were assessed a \$446 fine regardless of the relative danger of the violation.**

The PRLP is considered an enforcement solution to modifying risky driver behavior, thereby increasing traffic safety. However, all violations captured by the PRLP are cited under the same CVC that requires a significant monetary penalty. LAPD does not consider the relative danger of the violation, and its potential impact to safety, in assessing the citable offense. These include slower, right-turn violations and the elapsed time into red of the vehicle. Recent action by the State legislature will reduce the fine for right-turn on red violations.³

□ **State law and recent legislative changes could significantly reduce City revenue related to the PRLP.**

The State regulates traffic laws through the California Vehicle Code, and has additional limitations on the use of automated enforcement technology in assessing fines and penalties. Recent actions by the State legislature further limit cities' authority relative to PRLP. The City has no authority to cite violations under a municipal ordinance, and cannot use PRLP evidence to cite other moving/safety violations. In addition, the penalty amount for right-turn violations, which represent the majority of PRLP citations, has recently been reduced.

□ **In anticipation of a new contract for the PRLP, the City must address key contract terms and ensure diligence in vendor selection to protect the City's financial interests.**

The current contract is in its final year; LAPD just received approval to issue an RFP and execute a new PRLP contract in 2011. As the PRLP equipment is proprietary and the City intends to expand the program to additional locations, the new vendor will upgrade and replace all equipment, as well as design and install the needed infrastructure on City property. Based on lessons learned when the previous vendor (Nestor)

² \$157 of the \$446 total fine, not including a \$64 traffic school fee.

³ AB 909 passed the Senate 8/12/10 and Assembly 8/25/10.

had financial difficulties and was subsequently acquired by a third-party (ATS), and the fact that the City plans to shift new construction responsibilities to the vendor, LAPD should work closely with the CAO and City Attorney to assure the City's financial interests are protected.

These issues and related recommendations are presented in more detail in the remainder of this report.

Review of Report

We discussed audit issues with LAPD, LADOT, and ATS during fieldwork, and provided a copy of our draft report to LAPD. We held an exit conference with representatives of LAPD and LADOT on July 30, 2010, and considered their extensive comments as we finalized this report.

LAPD disagrees with our emphasis on the need for better data and analysis to measure PRLP success. They cite reports in technical studies that generally identify public safety benefits from municipal PRL systems. They were concerned that the additional costs involved in gathering and analyzing data—even data generated by the PRLP—were unnecessary because PRLP in general improves public safety.

Our audit disclosed a need for improved understanding of how well the method of intersection selection worked and which aspects of PRL enforcement produce the most public safety value for the resources invested. There is also a need to better identify which collisions relate to PRL enforcement and how to interpret trends in PRL collision data.

LAPD also disagreed with the result of our financial analysis of the program. LAPD believes that potential future collections on outstanding citations should be considered.

Though some outstanding citations may eventually be paid, under the City's current accounting practices, related receipts would be considered in that period. In addition, our review of Court data noted that only 3% of payments were for citations issued beyond the prior 12-months; therefore, future collections of long-unresolved tickets cannot be assured or quantified. Also, the City's ability to collect on these citations is questionable, since unresolved PRL citations do not result in a DMV hold being placed on the defendant's driver's license or vehicle registration, as was assumed by LAPD until this audit. Thus, there is little leverage to compel a future payment, which would improve the longer-term collection rate of these citations. Until the issue of legal leverage or improved collection procedures by the Court is resolved, the actual citation payment history should be considered indicative of the program.

We would like to thank the staff of LADOT, LAPD, and ATS for fully cooperating and providing information relative to this review.

CONTROLLER'S ACCOUNTABILITY PLAN

RECOMMENDATIONS	PAGE	MAYOR ACTION REQUIRED	COUNCIL ACTION REQUIRED	DEPARTMENT ACTION REQUIRED
1. LAPD and LADOT should increase transparency for an expanded PRLP by publicizing how the location selection process will ensure that the highest risk intersections are selected for the program. In addition, LAPD and LADOT should list intersections that meet published criteria, on their websites.	21			LAPD LADOT
2. LAPD and LADOT should obtain CalTrans approval to automate enforcement of intersections that meet selection criteria.	21			LAPD LADOT
3. LAPD and LADOT should seek funding for necessary infrastructure modifications at intersections that meet selection criteria.	21			LAPD LADOT
4. For any new intersection recommended in an expanded PRLP, LADOT should complete an engineering analysis template to formally document consideration of all appropriate countermeasures, and to support the recommendation that automated enforcement would have the greatest impact to improving public safety at that location.	25			LADOT
5. LAPD should modify the method by which the PRLP is evaluated by ensuring complete and relevant data that supports the type of enforcement, i.e., right turns or straight-through violations.	30			LAPD

RECOMMENDATIONS	PAGE	MAYOR ACTION REQUIRED	COUNCIL ACTION REQUIRED	DEPARTMENT ACTION REQUIRED
6. Over the long term, LAPD should pursue the full implementation of the planned integrated system to electronically record all relevant collision information, making it more easily accessible for data analysis and program evaluation.	30			LAPD
<p>7. In the short-term, LAPD should expand their data collection from collisions at PRLP intersections. Rather than relying solely on key data fields captured by division databases, consider the information included in written collision reports and video images of the collisions that may be captured by the PRLP system, for example:</p> <ul style="list-style-type: none"> ▪ Collision type (broadside, rear-end, etc.) ▪ Time into red ▪ Speed of the vehicle ▪ Movement preceding collision ▪ Feet from the intersection 	30			LAPD
8. Because the PRLP seeks to modify risky behavior by ensuring compliance with traffic laws, LAPD should also assess the program results in terms of the rate of violations or citations issued through the PRLP by intersection approach. An expected outcome for a successful program would show that violations at a given location decrease over time.	30			LAPD

RECOMMENDATIONS	PAGE	MAYOR ACTION REQUIRED	COUNCIL ACTION REQUIRED	DEPARTMENT ACTION REQUIRED
12. LAPD should include a requirement in a new PRL contract for the vendor to serially number events so that LAPD review can easily detect any missing event numbers.	49			LAPD
13. LAPD should continually store their own log of all citations approved for issuance and periodically compare that log with the vendor's notification to the Court of citations mailed to registered owners and entered into the Court system.	49			LAPD
14. LAPD should include a requirement in the new PRL contract for the vendor to produce a comprehensive quarterly status report on each citation processed. For example, based on citation number, the status report could show the judicial and payment status of all citations previously and newly issued, broken out by month and year, and reconciled with the prior report.	49			LAPD
15. In negotiating the new contract for the PRLP, LAPD should seek competent counsel to protect the City's interests. Ensure issues regarding asset ownership, construction costs, and any related program delays due to construction, are specifically included in the contract terms.	51			LAPD

RECOMMENDATIONS	PAGE	MAYOR ACTION REQUIRED	COUNCIL ACTION REQUIRED	DEPARTMENT ACTION REQUIRED
16. LAPD should work with the City Attorney and the CAO in ensuring the selection process and contract terms fully protect the City's financial interests.	52			LAPD City Att'y CAO

INTRODUCTION AND BACKGROUND

The City of Los Angeles Photo Red Light Program (PRLP) of automated enforcement is a cooperative effort between the Los Angeles Police Department (LAPD) and the Los Angeles Department of Transportation (LADOT), who together oversee the contracted provider of the system.

The City executed a PRLP contract with Nestor Traffic Systems, Inc. (Nestor) on February 6, 2006; however, in September 2009 American Traffic Solutions, Inc. (ATS) acquired Nestor and assumed all duties under the current contract. The automated enforcement system currently operates at 32 intersections distributed throughout the City.

Automated enforcement of red signal lights is a process of systematically detecting, photographing, identifying, and citing violators using electronic equipment provided and maintained by an outside vendor. A sworn officer issues each citation by reviewing video and photographic evidence on a computer monitor, using proprietary software provided by the vendor.

Once approved by LAPD, the vendor prints and mails each citation and electronically transmits the citations to the Los Angeles Superior Court. During this adjudication phase the vendor staffs a hotline to answer questions about the citation process and to afford citation recipients the opportunity to review photographic or video evidence of the violation.

Goal of the PRL Program

According to the LAPD, the goal of the PRLP is to increase intersection safety by reducing the number of serious injury and fatality traffic collisions caused by motorists who fail to stop for red lights and to maximize red light enforcement through efficient use of police resources. Drivers may fail to stop for red signal lights for a variety of reasons, including temporary distractions and aggressive driving behavior.

Theoretically, public safety improves as drivers who are aware that red light cameras monitor an intersection modify their behavior to avoid the negative consequences of a citation and the related photographic evidence. A sentinel effect from this awareness can also result in modified driving on approaches to the same intersection that are not monitored, and even for other intersections.

PRL enforcement is one tool to reduce red light violations and related traffic collisions. Other industry established methods include appropriate intersection design, enhanced signage or pavement markings, extended yellow or red light timing and other traffic engineering solutions, as well as public information campaigns.

From Violation to Collection: How the PRLP Works

The City's PRL camera system typically monitors two opposing approaches to an intersection, primarily for straight-through or right-turn traffic.

For each monitored approach, the PRL system digitally records video and photographic evidence of red light violations or "events." The system digitally transfers and stores this evidence on remote ATS servers for processing. ATS visually reviews each event and determines whether it meets preliminary violation criteria and, if so, uses the license plate number to obtain registration and driver information from the California Department of Motor Vehicles (DMV).

For events that meet stated criteria, ATS composes a tentative citation and forwards it, along with the supporting video evidence, to a dedicated computer at LAPD. The California Vehicle Code (CVC) requires a sworn officer to approve the citation before the vendor submits it to the Court or to the registered owner of the vehicle.⁴

The LAPD officer's responsibility is to evaluate the video evidence of a violation, the legibility of the license plate, and whether the images are adequate to identify the driver. If so, and if in the officer's discretion a violation occurred, then the officer electronically approves a citation and ATS notification is automatic. If the camera does not capture a legible image of a license plate or an identifiable image of the driver's face, the officer cannot issue a citation.

ATS processes approved citations by printing and mailing them to the registered owners and responding professionally to calls received. The citation provides instructions for mailing the bail or fine to the Los Angeles Superior Court, as well as procedures for contesting the citation, including reporting the identify of the driver of the vehicle at the time of the violation if it was not the registered owner, and when to appear in court.

The Court retains a portion of the citation revenue and distributes the remainder based on various statutes, paying portions to the City, the County, and the State.

The History of the PRLP in Los Angeles

The City initiated photo red light camera enforcement as a pilot program in December 2000. LADOT and contractor Lockheed Martin—who later transferred its interest to Affiliated Computer Services (ACS)—worked together to install cameras at 16 intersections.

In April 2004, due to the impending expiration of the contract with ACS to operate the pilot program, and due to a change in the law governing automated enforcement programs, the Police Department recommended issuing an RFP for

⁴ CVC §21455.5(c)(2)(F) and §40518

a new contract. In an effort to maintain continuity of service, the contract with ACS was extended for an additional year, until June 14, 2005.

In May 2004 the Police Department issued an RFP with a July 7, 2004 deadline for receipt of proposals. Six proposals were received, and a committee consisting of personnel from LAPD and LADOT rated the proposals based on cost, past performance, technical requirements, vendor technical competence, and additional considerations. Nestor Traffic Systems was selected.

In January 2005 the Board of Police Commissioners authorized the Chief of Police to negotiate a contract with Nestor, and in August 2005 the Commission approved the contract for Mayor and Council consideration. Council approved the contract on November 18, 2005, and it was executed on February 6, 2006 for a 3-year term, with options to extend for two additional 1-year terms.

According to LAPD, on June 4, 2009, the City was notified that Nestor filed for an appointment of a receiver in Superior Court in Providence County, Rhode Island.⁵

After Nestor entered financial receivership, ATS acquired and dissolved Nestor as a separate company. ATS then stepped in to fulfill contract requirements while working closely with LAPD. On March 30, 2010, Council approved the contract's formal assignment to ATS, and extended the current term through June 30, 2010. A second action extended the term through April 2011.

LAPD received authorization to issue a new RFP in 2010, and execute a new contract in 2011. LAPD also plans to expand the program by increasing the number of PRLP intersections, and due to budgetary constraints at LADOT, the selected vendor would bid to design, construct and install all necessary infrastructure at the new intersections.

Site Readiness, Installation and Functionality of Equipment at Intersections

Installation of PRL cameras and related equipment at 32 intersections around the City required engineering design work for each location. Each selected site was unique, with differing street geometry, slopes, sub-surface objects, street and adjacent-property surface material, speed limits, and unique and active traffic control equipment and infrastructure.

LADOT worked with Nestor to modify existing engineering drawings that LADOT then used to modify each intersection. PRL camera angles and the positioning of strobe lights and the system controls required careful evaluation of the pre-existing infrastructure to ensure a successful outcome.

LADOT took responsibility to modify pre-existing infrastructure in order to provide Nestor with physical attachment points for cameras, flash units, and a control cabinet. LADOT also constructed improvements necessary to provide power for

⁵ Board of Police Commissioners 09-0304.

the system and data interconnectivity among system components. It was Nestor's responsibility to install cameras, flash units, and the control cabinet, and to test, activate, and maintain the PRL system.

Once the construction process ended, activation of the PRL camera system required testing, adjustment, and re-testing. On an ongoing basis, an LAPD officer visits each PRL intersection to visually inspect the equipment. On an annual basis LAPD, LADOT, and ATS representatives visit each intersection and certify that the operation of the equipment complies with State law.

Continual remote electronic monitoring of camera performance and outputs ensures functionality. When a technician performs any maintenance of equipment at a PRL intersection, the technician makes a manual entry in a paper log kept separately in ATS control boxes at each intersection. LAPD, LADOT, and ATS meet each week to resolve issues and ensure peak system performance.

The Finances of the Photo Red Light Program

LAPD, as administrator and process-owner of the PRLP, strongly affirms that the primary purpose of the program is to improve public safety, not to increase City revenues. However, critics of PRLP generally frame the program as driven by cities' desire to generate revenue. Revenue is the City's share of fines and penalties paid to the Superior Court by violators. As of fieldwork completion, the bail or penalty for most red light violations was set at \$446 by State law.

The citation amount is calculated first on a base fine, upon which additional fees and penalties are calculated, based on various statutes. The CVC empowers the California Judicial Council to publish a statewide penalty schedule, but allows local courts to make modifications.

NOTABLE ACCOMPLISHMENTS

LAPD reports no fatalities at monitored intersections since the implementation of the current contract in April 2006, compared to five red light related fatalities in the prior two-year period for the intersections selected for automated enforcement.

The Police and Transportation Departments have successfully worked with contracted PRLP vendor, both Nestor Traffic Solutions, Inc. and American Traffic Solutions, Inc., to meet the contractual evidence quality standard.

LAPD also reported that for drivers who chose to dispute their citation through a court trial, the high quality of photographic evidence resulted in less than 1% of court trials ending in a "not guilty" verdict.

PRLP evidence can also potentially be of assistance in solving crimes, or in determining fault when collisions occur. LAPD also uses photographic evidence to verify compliance by sworn officers with traffic policies and procedures. For example, officers who violate LAPD policy by not wearing a seat belt in their patrol car can face disciplinary action.

LAPD also reported a vibrant outreach to the community and to other agencies. This includes participation in community-police advisory board presentations, safety fairs, conducting training for sworn officers of other agencies, and publishing articles in trade journals or making presentations to trade groups.

OBJECTIVES, SCOPE AND METHODOLOGY

The primary objective of our audit was to determine the efficiency and effectiveness of the City's oversight and management of the automated Photo Red-Light Program (PRLP). Specifically:

- To determine how the City performs or otherwise ensures adequate oversight and monitoring of contractor performance.
- To assess whether the City efficiently and effectively evaluates the status, problems, failures, or success of the PRLP.
- To assess whether the City efficiently and effectively recommends necessary actions to achieve the PRLP's goal of reduction in traffic collision[s].
- To assess whether the City has implemented best practices found in other comparable governmental agencies with a PRLP.

The audit scope included the 3-year period ended October 31, 2009, but we also considered current conditions and some data through March 2010. We specifically focused on evaluating how LAPD and LADOT appropriately ensure vendor performance in accordance with the contract, and how program managers review, evaluate, and communicate the program's results; including making specific recommendations to maximize the City's goals and objectives for the program. Our fieldwork was conducted during the period November 2009 through May 2010.

This audit was conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

In conducting our audit, we reviewed and analyzed applicable policies and procedures; reviewed and analyzed documentation and studies prepared and conducted by the City and by other jurisdictions; and interviewed management and staff at the Police and Transportation Departments and at American Traffic Solutions, Inc.

SECTION I: THE PROGRAM'S IMPACT ON PUBLIC SAFETY

Finding #1: The method used to select the 32 locations for camera enforcement eliminated some high risk intersections.

LAPD's stated goal of the PRLP is "to increase intersection safety by reducing the number of serious injury and fatality traffic collisions caused by motorists who fail to stop for red lights and to maximize red light enforcement through efficient use of police resources." To achieve the goal relative to intersection safety, after considering all other solutions, automated enforcement should focus on intersections based on the number and nature of traffic collisions per vehicle transiting an intersection.

LAPD's PRL intersection selection process started by examining major-intersection collision data for the years 2003-2005. LAPD considered those collisions that were caused by red light violations, excess speed, following too closely, inappropriate left-turn, and DUI. LAPD stated that based on traffic collisions, and working in conjunction with LADOT, they first narrowed that down to approximately 200 intersections for consideration.

LAPD indicated they further narrowed the list to 88 intersections—22 in each Bureau—by talking with traffic officers and their supervisors or other experienced LAPD or LADOT personnel. For each of those 88 intersections, LAPD or LADOT personnel visited each location and completed a Proposed Intersection Field Checklist that LAPD and LADOT then used to narrow the total number of PRL intersections down to 32.

Among the factors that influenced decision-making (not in any priority order) were: 1) the Council District, 2) whether existing poles supporting signal lights were of (weaker) concrete or (stronger) steel, and 3) whether an intersection required State approval for PRL enforcement. While the location (Council District) played a significant role in prioritizing locations, the other two simply eliminated some locations from consideration. These criteria demonstrate that issues other than strictly public safety played a role in determining the program locations.

Exclusions due to Perceived "Citywide" Program

LAPD emphasized the importance that the public perceive automated Photo Red Light enforcement as a citywide program. PRL cameras were to be located in all areas of the City, with the expected result of moderation of driver behavior citywide. Stating it was important to garner maximum Council support for the PRLP, LAPD used the Council District (CD) where an intersection was located as a criterion. Therefore, of the 32 intersection locations, each CD was apportioned at least one camera, which required the exclusion of some intersections with a

higher number of collisions or fatalities. Exhibit 1⁶ presents the current PRL locations throughout the City.

LAPD stated that if safety alone, as measured by the number of collisions at each intersection, had been the deciding criteria, it would have resulted in an uneven distribution of PRL cameras throughout the City; which would have resulted in a very negative public perception of the program.

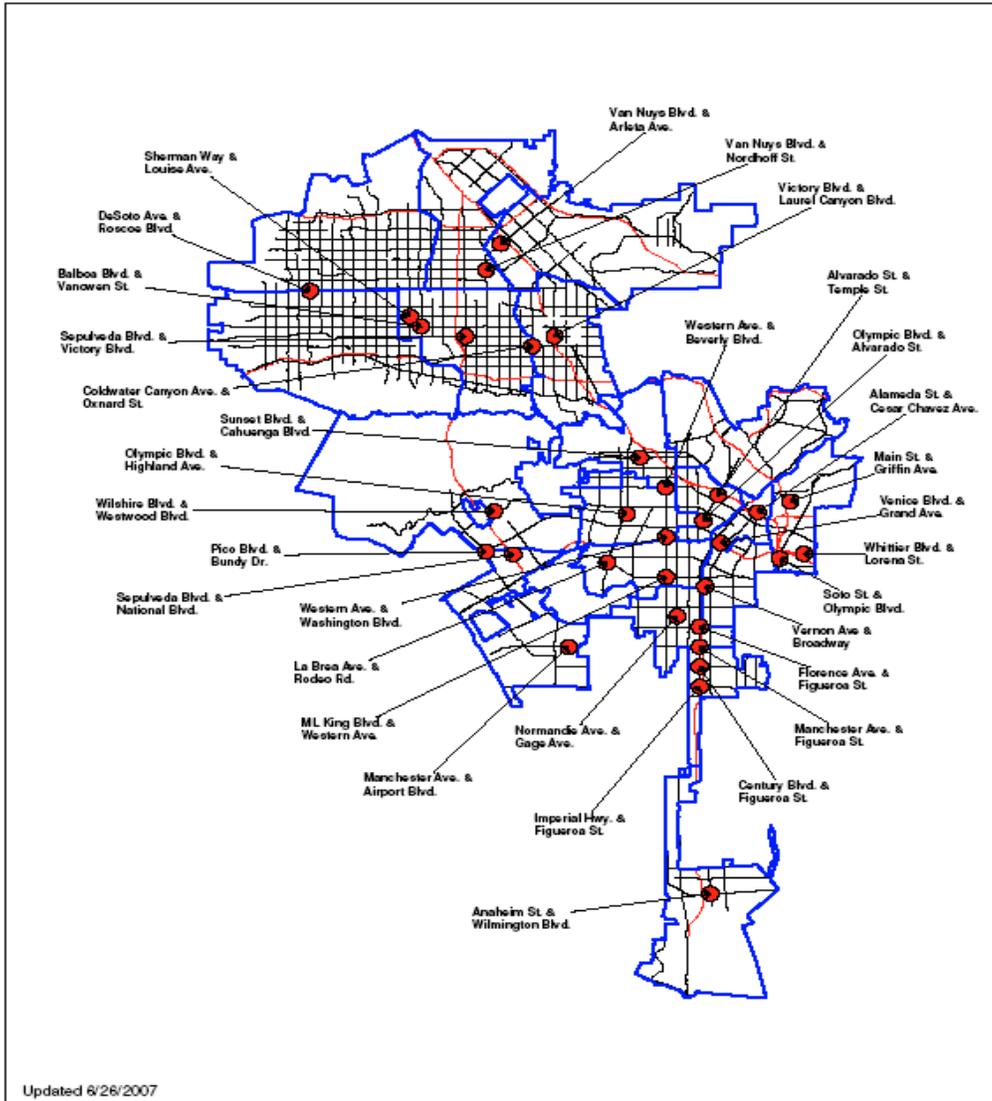
Both LAPD and LADOT agreed that several political issues were considered in the program implementation. LAPD stated the City Council “strongly recommended that each [Council] district should have at least one PRL intersection,” but went on to explain that this was not a written directive or formal motion, rather, was LAPD’s understanding of the full Council’s intent.

LADOT added that as the City considers expansion of the PRLP, new locations could be added primarily based on safety concerns.

⁶ http://www.lapdonline.org/search_results/content_basic_view/1022

Exhibit 1

City of Los Angeles Photo Red Light Locations



Exclusions based on Limitations of Existing Infrastructure

The second factor limited the inclusion of some intersections due to funding constraints. LADOT recommended against selecting intersections with weaker concrete poles, rather than stronger steel poles, because of the high cost of replacing them. While LADOT agreed to fund some infrastructure internally, i.e., improvements that were required for the installation of the PRL equipment, LAPD and LADOT stated there was no funding available for any major infrastructure upgrade, which eliminated some intersections from consideration.

Exclusions based on Required Jurisdictional Approvals

LAPD also bypassed a strict public-safety approach to the selection of locations by not considering intersections in locations that required State approval, because of potential delays. For some locations, such as those adjacent to freeway ramps or where City streets are also noted as State highways, the State requires an engineering analysis⁷ be performed prior to applying for approval of an automated enforcement system. Contradicting this approach, the California State Auditor recommended in a July 2002 audit that cities not omit intersections requiring State approval when public safety would benefit.

LAPD believes that the additional time and expense that would have been necessary to obtain an affirmative State opinion was not justified for the PRLP. Therefore, locations which would have required State approvals were eliminated from consideration.

LAPD described an example of their interaction with CalTrans relative to the PRLP, as discussions between a CalTrans Senior Engineer and the LADOT PRL Coordinator: CalTrans staff inquired about installing cameras on Santa Monica Boulevard at Gower Street to correct the existing collision history (Santa Monica Boulevard in this area is State Highway 2, subject to CalTrans authority). The LADOT representative stated they would consider this location only if the CalTrans Senior Engineer could get his supervisor, the CalTrans Deputy Director of Operations, to commit that if the City proposed PRL cameras at that location, then the proposal would be approved by CalTrans. No response was ever received from the CalTrans Senior Engineer.

This informal exchange does not reflect a determined approach to resolving issues of public safety. We would have expected to see high-level, formal correspondence between LAPD and CalTrans at this stage of a pilot program.

We discussed this issue with the Chief of the Permits section of CalTrans in Los Angeles who indicated that CalTrans is required to respond to "encroachment" requests for automated enforcement within 60 days. However, she stated that submissions routinely run into problems because applicants misjudge CalTrans requirements, leading to multiple 60-day response cycles. Nevertheless, the CalTrans Chief indicated that other municipalities have received permits for automated enforcement of State-controlled locations.

LADOT and LAPD considered a number of issues in selecting intersections for PRL enforcement. Though public safety was the primary goal of the program, LAPD stated they had to consider other logistical and practical factors, such as public perception, Council support, limited funding, and jurisdictional control. These considerations eliminated some locations from the program with higher numbers of collisions and injuries.

⁷ This "engineering analysis" of an intersection is not to be confused with an "Engineering and Traffic Survey" described in the California Vehicle Code sections 627 and 40802.

For example, we noted that LAPD considered but did not select the intersection of La Brea Avenue and 6th Street for PRL enforcement. Between 2003 and 2005, that intersection had 11 traffic collisions where a red light violation was the Primary Collision Factor (PCF), and at least one fatality.

Another intersection not selected for automated enforcement was Havenhurst & Nordhoff, where LAPD reported thirteen traffic collisions with red light violations as the PCF, as well as one fatal and one serious injury collision.

Conversely, LAPD did select the intersection of Whittier Blvd. and Lorena Street, where there had been only two traffic collisions over the same time period where a red light violation was the PCF, and no fatalities or serious injuries.

These three locations are located in separate Council Districts. The exclusion of the first two resulted directly from ensuring a “citywide” coverage and the associated priority to install at least one, but generally two PRL systems in each Council District.

Recommendation:

- 1. LAPD and LADOT should increase transparency for an expanded PRLP by publicizing how the location selection process will ensure that the highest risk intersections are selected for the program. In addition, LAPD and LADOT should list intersections that meet published criteria, on their websites.**
- 2. LAPD and LADOT should obtain CalTrans approval to automate enforcement of intersections that meet selection criteria.**
- 3. LAPD and LADOT should seek funding for necessary infrastructure modifications at intersections that meet selection criteria.**

Finding #2: Location decisions did not involve engineering analyses that formally documented the City's consideration of other solutions that could have a more direct effect on public safety than automated enforcement.

Both LAPD and LADOT seek to improve public safety, but they use different methods. LADOT works to reduce or avoid problems with better street design and traffic rules; while LAPD works to moderate driver behavior and increase driver compliance with traffic laws.

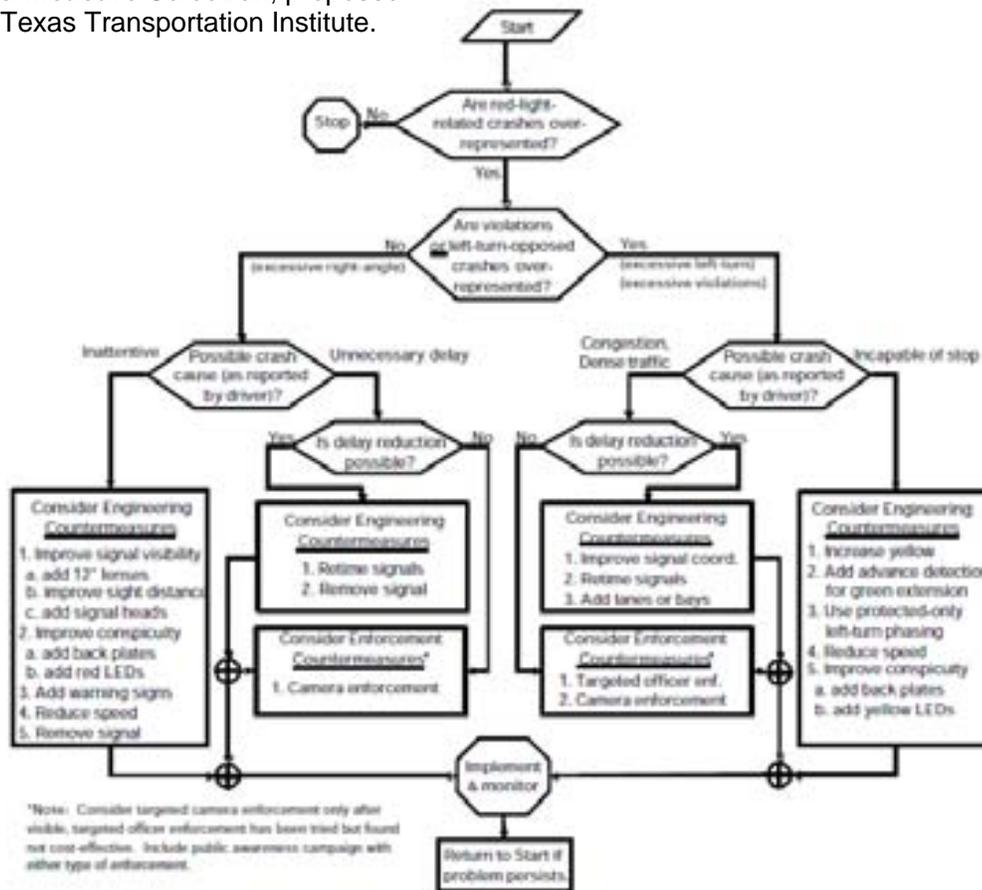
Best practices recommend that jurisdictions implementing a photo enforcement program consider first if other solutions would have a more direct impact to public safety, such as a change in approach speed, newer technology, or engineering redesign.

Traffic engineers who specialize in intersection design and signage should evaluate intersections for possible improvements and subsequently report continuing problems to law enforcement. Studies we reviewed suggest that a DOT engineering survey or evaluation should precede referring an intersection for automated enforcement. Any enforcement method should be the last resort for increasing public safety.

LAPD conducted field inspections of candidate intersections, and provided their preliminary ranking to LADOT for review. LADOT explained their role was to identify for deletion those intersections where PRL enforcement may not be appropriate, due to proposed engineering solutions and/or inherent physical site challenges. However, this process was informal and not documented. It should be noted that LADOT received no funding to participate in the intersection selection process.

A 2004 study sponsored by the Texas DOT and the Federal Highway Administration presented guidelines for identifying problem intersections and whether enforcement or engineering countermeasures are appropriate. The study stated that based on the data related to the violation's cause, either enforcement or engineering countermeasures would likely be of most benefit. The study also proposed a series of decision criteria, depicted by the flowchart in Exhibit 2, to determine when camera enforcement would be of most benefit.

Exhibit 2: Guidelines for Countermeasure Selection, proposed by the Texas Transportation Institute.



The Texas Transportation Code states that a county, municipality, or other local entity authorized to enact traffic laws under the laws of the state (local authority) that wishes to install a red light camera system must take preliminary steps before the system can be installed for use. First, an engineering analysis of the approach to the intersection must be made to determine whether in addition to or as an alternative to the system, a design change to the approach or a change in signalization may reduce the number of red light violations. A completed Texas DOT engineering analysis template is specific for each location proposed for automated enforcement, and must detail:

- Intersection and Signal data (i.e., signal visibility; pavement and markings data, diagrams)
- Signal timing and traffic data (i.e., clearance intervals, controller settings, vehicle detection data, traffic volume data)
- Crash and enforcement data (i.e., specific type and severity of collision types, violation rates, enforcement and operational issues, etc.)

Engineering Safety Analysis Guidelines prepared by the Virginia Department of Transportation also require active involvement of traffic engineers and require completion of a similar engineering analysis template.

Virginia legislation also requires that localities submit a list of intersections for photo enforcement to VDOT for final approval. VDOT has established engineering safety analysis guidelines to assist jurisdictions in preparing photo enforcement request submittals. The engineering safety analysis should include a statement explaining why photo enforcement is proposed for a specific intersection, and also requires the engineering safety analysis to be stamped and signed by a licensed professional engineer.

As stated in Finding #1, the State of California also requires a formal engineering study be performed for State-owned intersections, prior to submission to Caltrans for approval of an automated enforcement system. Though a specific template is not provided, representatives directed auditors to a 2005 Institute of Transportation Engineers Field Guide for Inspecting Signalized Intersections to Reduce Red-Light Running, sponsored by the U.S. Department of Transportation.

LAPD and LADOT stated they worked together to identify and prioritize locations; however, neither could provide documentation noting the extent of LADOT's participation, or the outcome from the field visits to each proposed location. It should also be noted that LADOT resources dedicated to the PRLP are very low, namely 10% of one employee's time, versus the six full-time and two part-time LAPD employees.

A completed engineering analysis template provides a formal record that countermeasures have already been considered, and the jurisdiction has determined that there would be no additional benefit from implementing engineering solutions, and therefore concludes that an enforcement solution would have the maximum increase to traffic safety. Such potential countermeasures could include:

- Adding 'signal ahead' signs, with or without flashers; adding additional signal heads, e.g., one head over each lane; use LED lighting; 12-inch signal lamps and backplates, all designed to improve signal visibility
- Improving pavement markings and/ or pavement condition, including grade of approach.
- Ensuring appropriate clearance intervals (e.g., extended yellow light timing and all red intervals), evaluation of timing, phasing, and coordination with other intersections, an evaluation of loop detector locations, and intersection volume count for both the number of passenger cars and heavy vehicles.

LADOT representatives stated that they had not documented their meetings with LAPD or their internal processes during the intersection selection process, nor did they complete a written engineering safety analysis for each proposed intersection, citing a lack of funding for this endeavor.

LADOT asserts that they routinely incorporate proactive traffic engineering measures to maximize safety at intersections. LADOT stated that Los Angeles is at the forefront in implementing traffic signal upgrade programs and in responding to concerns at individual locations. In addition, LADOT stated their internally established rigorous traffic signal design guidelines meet or exceed requirements set forth in both the State and federal Manual on Uniform Traffic Control Devices, and therefore, many of the countermeasures recommended by the FHWA noted in Exhibit 2 have been the design standards used for years by LADOT.

Though LAPD led the process of selecting intersections for automated enforcement, LADOT's suggestions regarding which intersections to include (or exclude) were considered. For example, we noted that based on LADOT's recommendation, the intersection of Sunset Blvd. & Crescent Heights Blvd. was not included in the PRLP, despite a high number of collisions, because an engineering solution was being pursued. We observed the specific engineering drawings for that location dated October 2007 that showed signal improvements consistent with engineering countermeasures designed to improve intersection safety.

LADOT believes their current citywide procedures and their review of the proposed PRLP locations generally considered the applicability of possible countermeasures. Though LADOT's participation in the program is limited in terms of time and funding, a formal engineering analysis, or simply the completion of a standard recommended template for each location, would definitively document how engineering solutions were considered, and determined not to be more effective than photo enforcement in increasing safety at those locations. However, in considering new locations for an expanded PRLP, LAPD and LADOT should consider utilizing the template developed by Virginia and Texas for this purpose (sample template provided as Appendix D).

Recommendation:

- 4. For any new intersection recommended in an expanded PRLP, LADOT should complete an engineering analysis template to formally document consideration of all appropriate countermeasures, and to support the recommendation that automated enforcement would have the greatest impact to improving public safety at that location.**

Finding #3: The data presented by LAPD in their evaluation of the Photo Red Light Program, is inadequate to show a significant increase in public safety.

LAPD has reported PRLP success by noting that no fatalities have occurred at intersections monitored in the PRLP since April 2006. LAPD also cites declining numbers of traffic collisions where a red light violation was the Primary Collision Factor (PCF) at PRLP intersections.

However, without a formal engineering survey, attributing these results solely to automated enforcement is questionable. For example, we learned that LADOT instituted an all-red phase at PRL intersections, along with the camera installation. That change alone could have made the intersection safer.

We noted other concerns regarding the completeness and type of data that is collected. Other factors that affect reported program results are not considered. Taken together, these issues cloud the value of reported outcomes.

Counting the number of traffic collisions (TC), fatalities, or severe injuries to measure progress towards LAPD's goal of increasing safety requires data. The information underlying collision data is gathered manually on paper forms, and the quality and comprehensiveness of information varies.

Officers record available details of traffic collisions on written collision reports. Information is obtained either at the scene of the collision, through later interviews, or by examination of written or physical evidence. The process is labor intensive, and includes multiple levels of review to help minimize errors.

The forms LAPD officers use for this purpose are primarily California Highway Patrol forms that provide a standardized way to record extensive information, when that data is available. After manual completion, LAPD enters some of the data into an LAPD database accessible citywide. LAPD also scans the hardcopy forms into a separate image database.

In addition, personnel at each of the four traffic divisions enter some of the data into different databases designed and maintained separately at each of the four traffic divisions. Although some divisions enter additional fields, the data collected is not standardized beyond the mandatory information required by the State. LAPD has historically reported PRLP results by summarizing collision data from these four separate ad hoc databases.

LAPD does not copy the Type of Collision from these forms into their databases. Collision types include head-on, broadside, and rear end, among others. Broadside collisions, also known as angle or t-bone collisions, are considered the most dangerous result of a red light violation, because of a side impact occurring between vehicles traveling at high speed. Ready access to this information would improve reporting on the outcomes of the PRLP.

Risk of Incomplete Data - Unreported Collisions

LAPD officers are unlikely to witness a traffic collision, though they will respond when or if they are called to the scene. However, even when responding they may not file a collision report.

Collisions are only included in the LAPD databases if a report is completed. Collisions where there is property damage only, and there is no crime involved (i.e., hit and run), do not meet LAPD reporting criteria. Although LAPD may be dispatched to such an incident, a report will generally not be taken. Also, motorists, passengers, or bystanders who are witnesses may not immediately inform LAPD of a collision, and therefore, no officer would be dispatched. Some individuals may instead report the collision to the California Department of Motor Vehicles or to the California Highway Patrol.

Even for those collisions reported to LAPD, patrol officers who do not specialize in traffic enforcement may arrive at the scene after parties to the collision or other witnesses have left or were transported for treatment of injuries. Therefore, an officer may lack adequate information for a complete report.

Risk of Not Measuring the Right Data

Historically, LAPD considers the following data, when assessing PRLP results:

- Location, i.e., if the collision occurred at an intersection with automated red light enforcement (*Note: all traffic collisions are assigned to the nearest intersection, regardless of the specific location along the block, on public street or private property, or the cause*).
- Primary Collision Factor. This is the California Vehicle Code (CVC) section a driver violated that was considered by the officer as the primary cause of the collision. Typically, in reporting program results, LAPD has reported collisions where the PCF is either 1) CVC 21453(a), running a red light; 2) 21801(a) Unsafe Left Turn; 3) 22350 Unsafe Speed; 4) 22107 Unsafe Turning Movement; 5) 21658(a) Unsafe Lane Change; 6) 23152(a) Driving Under the Influence; or 7) Following Too Close.

However, this method is also limited, since other PCFs that may have been relevant to the program, and the type and severity of the collision are not considered.

We noted that LAPD does not currently measure or report the number of right-angle or “broadside” collisions. Generally, studies we reviewed indicated that the prevention of right-angle collisions is regarded as the prime target in photo red-light programs, as other crashes (i.e. rear-end collisions) carry a lower risk of causing serious injury.

Another consideration is the ratio of late straight-through violations compared to violations that occur within the first second after the change from yellow to red.

PRL cameras measure violations to the thirtieth of a second, and make it possible to consider this criterion in evaluating intersections in the PRLP.

A newer, automated system for documenting traffic collisions has been in development for more than a year and is currently piloted in the Central Traffic Division. When fully implemented, this system could facilitate more precise analysis of collisions that involve red light violations at PRLP intersections. However, full implementation of that system is not assured.

The State of Texas noted similar data difficulties in a report on automated enforcement: *Development of Guidelines For Identifying And Treating Locations With A Red-Light-Running Problem*. That report states:

There are several challenges to the accurate identification of red-light-related crashes. Such crashes are not explicitly identified on the crash report forms used by most states. As a result, the identification of red-light-related crashes requires a thorough review of the crash report with consideration given to the following crash attributes: contributing cause, crash type, traffic control, and offense charged. The officer narrative and crash diagram also provide important clues to the cause of the crash.

Unfortunately, the narrative and diagram are rarely available in a coded crash database. This sole use of a coded database can lead to errors.

This accurately describes LAPD's coded traffic collision databases. Because much of the raw data is not available in a searchable format, obtaining comprehensive and quality information on traffic collisions at PRLP sites is difficult to produce.

We reviewed information provided by LAPD on traffic collisions at PRLP intersections over calendar years 2004 to 2009. We compared the summary results by intersection to the detailed collision data that we independently obtained from the four traffic divisions' databases. Exhibit 3 presents a summary of that data. Though we found no significant discrepancies in what LAPD had reported, based on concerns regarding the completeness and relevance of the data collected, the success of the PRLP cannot be judged solely on these reported statistics.

Exhibit 3

LAPD Traffic Collision Statistics related to the Automated Photo Red Light Program Citywide Totals, based on the 32 Program Intersections

LAPD Primary Collision Factor, considered "cause" of the Collision										
Year	Total T/C	% Change	Red Light 21453A	% Change	Left Turn 21801A	% Change	Speed 22350	% Change	FTC 21703	% Change
2004	376	N/A	107	N/A	122	N/A	107	N/A	40	N/A
2005	351	-6.6%	99	-7.5%	113	-7.4%	112	4.7%	27	-32.5%
2006	297	-15.4%	69	-30.3%	98	-13.3%	110	-1.8%	20	-25.9%
2007	302	1.7%	50	-27.5%	104	6.1%	111	0.9%	37	85.0%
2008	338	11.9%	30	-40.0%	130	25.0%	135	21.6%	43	16.2%
2009	322	-4.7%	46	53.3%	116	-10.8%	119	-11.9%	41	-4.7%
Total	1,986	-9.2%	401	-63.1%	683	4.7%	694	16.0%	208	25.4%

Note: % Change by year compares T/C counts to those in the prior year. The Total % Change over the five year period was calculated as the sum of T/Cs in 2004 and 2005, compared to sum of T/Cs in 2008 and 2009.

Media Report Prompted a More Detailed Analysis

In November 2009, an investigative reporter challenged LAPD statistics on PRLP results. LAPD disputed the reporter's findings and invested significant time and effort to conduct a more comprehensive analysis of traffic collisions than they had ever done before.

Specifically, an experienced traffic officer reviewed in detail images of the paper forms for all collisions of record that were classified at or near every PRLP intersection over the specified period. This new LAPD analysis showed mixed results: 12 out of 32 intersections had worse collision results in the six months after activation of PRL equipment compared to the six months before activation. Four had no change, and the remaining 16 noted a reduction in collisions. Exhibit 4 provides a summary of LAPD's more detailed analysis.

We reviewed the process and methodology LAPD used in their analysis, and found it would provide more comprehensive program information than had previously been reported.

However, it should be noted that since the total number of collisions was so small at most intersections, the results may be rendered meaningless. Most intersections had fewer than five collisions before or after activation of PRL equipment. Therefore, a difference of one collision either way could make an intersection look much better or much worse. Also, since some locations included in the program were not those with the greatest potential impact for improved public safety (as noted in Finding #1), the reduction in total collisions would not have been maximized.

LAPD intentionally limited this more comprehensive review of collisions at the 32 locations to a six-month before and after timeframe, in order to produce comparative results to the media report. Both LAPD and LADOT agreed with the auditors that these outcome results may not be reflective of the program as a whole. LAPD stated they would like to perform a full 2-year study; however, the additional efforts involved in that analysis would be significant.

Recommendations:

- 5. LAPD should modify the method by which the PRLP is evaluated by ensuring complete and relevant data that supports the type of enforcement, i.e., right turns or straight-through violations.**
- 6. Over the long term, LAPD should pursue the full implementation of the planned integrated system to electronically record all relevant collision information, making it more easily accessible for data analysis and program evaluation.**
- 7. In the short-term, LAPD should expand their data collection from collisions at PRLP intersections. Rather than relying solely on key data fields captured by division databases, consider the information included in written collision reports and video images of the collisions that may be captured by the PRLP system, for example:**
 - Collision type (broadside, rear-end, etc.)**
 - Time into red**
 - Speed of the vehicle**
 - Movement preceding collision**
 - Feet from the intersection**
- 8. Because the PRLP seeks to modify risky behavior by ensuring compliance with traffic laws, LAPD should also assess the program results in terms of the rate of violations or citations issued through the PRLP by intersection approach. An expected outcome for a successful program would show that violations at a given location decrease over time.**

Exhibit 4

**Los Angeles Police Department
Photo Red Light Collision Data
(+/-) 6 months from Activation Date**

Source: Summarized results of LAPD detailed analysis, included in report to LAPD Commission dated March 9, 2010.

Intersection	Activation Date			Diff	% Change
		Prior	After		
La Brea / Rodeo	2006 Apr 04	6	4	-2	-33%
Victory / Laurel Canyon	2006 Jun 08	9	8	-1	-11%
DeSoto / Roscoe	2006 Aug 07	4	2	-2	-50%
Sepulveda / National	2006 Aug 15	0	2	2	200%
Van Nuys / Nordhoff	2006 Sep 28	5	6	1	20%
Main / Griffin	2006 Nov 20	1	1	0	0%
Vernon / Broadway	2007 Feb 07	9	4	-5	-56%
Balboa / Vanowen	2007 Mar 08	5	5	0	0%
Western / Washington	2007 Mar 29	3	7	4	133%
Pico / Bundy	2007 May 02	4	3	-1	-25%
Sepulveda / Victory	2007 May 10	4	4	0	0%
Sherman Way / Louise	2007 May 14	5	6	1	20%
Whittier / Lorena	2007 May 23	0	2	2	200%
Coldwater Cyn / Oxnard	2007 Jun 25	4	6	2	50%
Manchester / Airport	2007 Aug 09	2	4	2	100%
Sunset / Cahuenga	2007 Aug 09	4	3	-1	-25%
Van Nuys / Arleta	2007 Aug 17	2	1	-1	-50%
Normandie / Gage	2007 Sep 26	1	6	5	500%
Manchester / Figueroa	2007 Dec 05	5	4	-1	-20%
Wilshire / Westwood	2007 Dec 12	2	0	-2	-100%
Western / Beverly	2006 Oct 10	4	6	2	50%
Grand / Venice	2007 Jun 07	1	2	1	100%
Alvarado / Temple	2007 Nov 29	5	3	-2	-40%
Soto / Olympic	2006 Sep 01	8	4	-4	-50%
Imperial / Figueroa	2006 Oct 19	6	5	-1	-17%
Florence / Figueroa	2006 Nov 20	2	4	2	100%
Olympic / Highland	2007 Jun 18	5	1	-4	-80%
M.L. King / Western Ave	2007 Jul 05	10	8	-2	-20%
Olympic / Alvarado	2007 Jul 19	1	1	0	0%
Century / Figueroa	2007 Oct 16	11	5	-6	-55%
Alameda / Cesar Chavez	2007 Nov 02	4	1	-3	-75%
Anaheim / Wilmington	2007 Nov 19	1	3	2	200%
TOTAL:		133	121	-12	-9%

Finding #4: Other factors that may be responsible for a reduction in Traffic Collisions have not been considered in reporting program results.

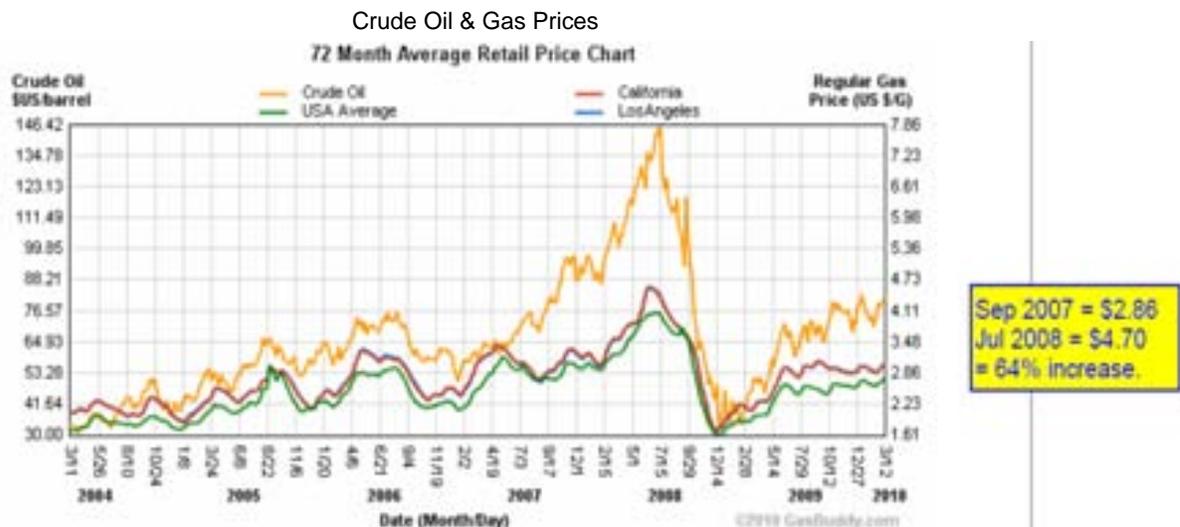
LAPD reported that traffic collisions at PRL intersections declined from 107 in 2004 to 30 in 2008—a 72% decline—but then increased 53% to 46 collisions between 2008 and 2009 (as previously noted in Exhibit 3). Our review disclosed that LAPD does not consider all factors in reporting the program’s results. For example, LAPD does not include the relative changes in overall number of citywide collisions.

Citywide Traffic Collisions Have Declined

LAPD reported that citywide traffic collisions of all types declined from 48,958 collisions in 2008 to 44,307 collisions in 2009.⁸ While trends in citywide collisions cannot be directly adjusted to those related to the PRLP, such trends should be considered in any comparative analysis.

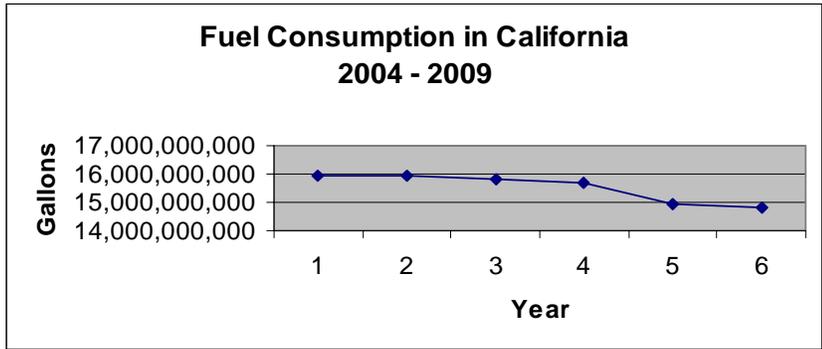
A general reduction in collisions could have been the result of there being fewer cars on the road, due to a significant increase in fuel prices. We noted over a ten-month period, average gas prices rose by 64% (Exhibit 5). We also noted there was a 4.6% decline in statewide fuel consumption that year (Exhibit 6), as well as a 2.6% decline in traffic volume on State highways in LA County.

Exhibit 5



⁸ COMPSTAT Report for the week ending December 19, 2009.

Exhibit 6



LAPD has not historically reported fluctuations in traffic collisions at photo red light intersections in the context of trends in citywide traffic collisions. For example, an LAPD CompStat Report issued in late December 2009 shows a 9% decline in 2009 traffic collisions from the prior year, and a 14% decline in traffic collisions over the prior two years. Failure to report PRL results in context with broader citywide results could be misleading.

Weather patterns also affect collision trends over time. Precipitation affects visibility and traction, increasing hazardous driving conditions. Therefore, fluctuations in the number of rainy days in a given year can also affect the number of collisions. LAPD and LADOT stated that due to the moderate and mostly dry climate in Los Angeles, they do not believe weather should be considered a cause for any fluctuations in the number or severity of traffic collisions.

Without considering the context of citywide traffic collisions (including citywide collisions involving a red light violation), or other factors such as changes in traffic volume or weather conditions, the reported program results measured as the change in the number of traffic collisions at PRL intersections may not be adequately attributed to the program. At a minimum, traffic volume should be considered as a common denominator when comparing relative numbers of violations and collisions.

Variations in Traffic Volume Should be Considered

LAPD does not measure traffic collisions in relation to traffic volume, i.e., collisions per 10,000 vehicles. Fluctuations in traffic volume can directly influence the number of citywide traffic collisions, but LAPD indicated they were not monitoring traffic volume—either citywide or at PRL intersections.

A Texas study emphasized that traffic volume data are needed to represent exposure. The study noted that annual average daily traffic (AADT) and the volume-to-capacity ratio (level of congestion) are important considerations in analyzing intersection safety. Again, up until now, LAPD has not incorporated traffic volume or relative congestion data in reporting the program's results.

A study reported in a 2007 Status Report of the Insurance Institute of Highway Safety (IIHS) also refers to collisions per 10,000 vehicles as a key metric.

The Center for Transportation Research and Education at the Iowa DOT reports on violations per 1,000 vehicles entering an intersection, the number of violations per hour, and the seconds into the red for violations.

According to the Virginia DOT, the primary measures for assessing the automated enforcement program are the number of red light violations per 1,000 vehicles on an approach, and the collision rates measured per million vehicles entering at an intersection, with an additional measure that considers a reduction in broadside collisions.

In another report the Virginia DOT further stated:

Traffic count data are also important to highway safety personnel, as they are frequently used in conjunction with accident statistics to produce traffic accident rates. These rates are important indicators of accident probabilities and are frequently used to identify hazardous locations. It is, therefore, imperative that the traffic counts be accurate indications of traffic volumes and VMT [Vehicle Miles of Travel].⁹

LADOT provided some historical data on traffic volume at PRL intersections, but the data could not be used for comparative or trending purposes, since it was not gathered in a statistically useful manner. That is, traffic volume counts were noted on single dates ranging from November 2003 through November 2009, with no more than two days counted for each location. Although LADOT monitors citywide traffic volume to adjust signal timing each day, that data is not permanently stored.

Current technology used by LADOT for congestion management allows the measurement of lane-by-lane traffic counts almost continuously, though the data is retained only for a brief time. Traffic volume can be estimated based on a systematic method of automated counts for a given period. The PRLP equipment itself could also be used to measure traffic volume at program intersections. Therefore, the City may have more extensive traffic volume information available, though it is not considered in evaluating the PRLP.

Recommendation:

9. In coordination with LADOT, LAPD should consider, at a minimum, the effect of traffic volume in the comparative metric in reporting and measuring program results. Specifically:

a.) The number or ratio of traffic collisions at monitored intersections (considered through implementation of recommendations 6 and 7) compared to the number of

⁹ Garber, N.J., Bayat-Mokhtari, Faramarz. "Optimizing Traffic Counting Procedures."

vehicles transiting a single approach. A successful program outcome would note a decline in the adjusted ratio.

- b.) The number or ratio of violations at monitored intersections (considered through implementation of recommendation 8) compared to the number of vehicles transiting a single approach. A successful program outcome would also note a decline in the ratio.**

SECTION II: THE PROGRAM'S IMPACT ON CITY FINANCES

Finding #5: The Program has not covered its operational costs nor generated additional revenue for the City.

LAPD has reported that the PRLP generates millions of dollars of net revenue for the City. In addition, there is a public perception that the program brings in additional funds for the City, and critics have alleged that this revenue aspect of the program, rather than public safety, is the primary objective of automated enforcement. LAPD expressly rejected this allegation, stating that traffic safety is the ultimate goal and highest priority of the PRLP.

Our audit found that previous reports by LAPD on the revenue impact of the program were overstated. In some reports, LAPD considered actual citations paid by violators (as reported by the Court) as revenue. However, these figures were misleading, since the majority of fines paid to the Court for red light violations are not received by the City. In fact, of the \$446 fine amount, the City was entitled to receive only \$157, or 35% of that amount. Exhibit 7 below presents the fine amounts for a red light violation over a four year period, and the proportionate allocation of the fee.

Exhibit 7

Los Angeles Police Department
Automated Photo Red Light Enforcement Program

City Share of Citation Fine Revenue

Citation Info	2006		2007		2008		2009		
	21453(a)CVC	21453(b)CVC	21453(a)CVC	21453(b)CVC	21453(a)CVC	21453(b)CVC	21453(a)CVC		
Total Cost Fine	\$361.00	\$151.00	\$381.00	\$159.00	\$381.00	\$159.00	\$436.00	\$446.00	\$446.00
City Share	\$151.31	\$55.90	\$157.19	\$58.25	\$157.19	\$58.25	\$148.37	\$148.37	\$157.19
County Share	\$54.51	\$22.13	\$66.23	\$27.62	\$66.23	\$27.62	\$66.23	\$67.23	\$74.11
State Share	\$155.18	\$72.97	\$155.58	\$73.13	\$155.58	\$73.13	\$219.40	\$229.40	\$214.70
Traffic School Fee	\$39.00		\$39.00		\$39.00		\$64.00		

NOTE 1: During the years 2006 to 2008, LAPD cited straight-through red light violations under section 21453(a) of the California Vehicle Code (CVC), and right-turn red light violations under CVC section 21453(b). Starting 1 Aug 2008, LAPD cited all red light violations under CVC section 21453(a).

NOTE 2: Changes to State law resulted in changing amounts and allocations of fines in 2009.

LAPD has also reported the City's PRLP fine revenue by multiplying the total number of citations issued by the City's share of fine revenue. However, this method would also overstate revenue because it ignores Court records of dismissing or otherwise receiving no payment for 24% of citations adjudicated in 2009. In addition, many citations are sent for collection by the Court, but may never be paid. The Court may also adjust fine amounts or assign community service, based on a defendant's economic circumstances.

Fine Revenue

The Superior Court collects bail or fines from traffic citations issued by cities within the Court's jurisdiction. The Court distributes this revenue to the State, the County, the cities, the Court, and any other recipients designated by statute.

Every month, the Los Angeles Superior Court deposits the City's portion of Court fines into a City account. In 2009, the Controller's Office conducted an assessment of the procedures used by the Court to allocate fine revenue to the City. Our review noted no exceptions. However, documentation the Court provides does not break out photo red light citation fines from the total traffic fine revenue paid to the City.

In lieu of a deposit breakdown, the Court provides the City with a monthly report titled "Estimated & Unadjusted Red Light Camera Revenue & Payment Transaction Counts." The Court labels this report "Estimated & Unadjusted" because of timing issues in assigning revenue to a specific period. However, this report provides the most accurate information available relative to payments made for PRLP citations issued, and is considered a reliable source for the total PRLP amounts due to the City, after one final adjustment.

Per Government Code §72712, for the three jurisdictions that formerly comprised the Los Angeles Judicial District,¹⁰ the Superior Court deducts an additional proportionate amount for the Reporters' Salary Fund, which is maintained by the Court. This final adjustment reduced the City's receipts from the Court by an average of 18% during both 2008 and 2009.

Our revenue calculations are derived from the payments to the Court, and the Court's subsequent transfer to the City. LAPD believes this understates program results because they learned during the course of our audit that a significant number of citations from prior years are not yet resolved or "adjudicated" by the Court. LAPD stated that those unresolved citations could eventually bring in additional revenue.

For example, LAPD stated that 39% of citations issued in 2008 had not yet been resolved over one year later; and 52% of citations issued in 2009 remain unresolved in early 2010. However, we noted that based on 2009 data provided by the Superior Court, only \$307,000 (2.7%) and \$21,000 (0.2%) of Court revenue were from violations more than one and two years prior to the adjudication date, respectively.

During the course of our audit, LAPD also became aware that the Court does not ask DMV to place a hold on the vehicle registration or the driver's license of PRL citation recipients who do not respond to a PRL Notice to Appear. Instead, the Court sends these citations to a collection agency. Therefore, future collectability

¹⁰ City of Los Angeles; City of San Fernando and the County of Los Angeles.

of delinquent PRL citations is even less certain, which may explain the large number of outstanding citations.

We do not agree that unresolved or unpaid citations issued in prior years should be considered as collectible revenue in the year they were issued. Any significant timing delays between when a citation is issued and when it is paid would be reflected during the year it was paid, and the timing difference would smooth out over time. Also, the number of citations that will never be paid, and are therefore “uncollectible,” is unknown.

From a cash-basis accounting perspective, which is consistent with the method by which the City recognizes revenue, the Court’s monthly revenue reports, adjusted by an 18% deduction for the Reporters’ Salary Fund, are considered a reliable source for recognizing the amount of actual cash received by the City.

Exhibits 8 and 9 present a summary of the City’s allocated share of Court revenue for 2008 and 2009. These amounts do not include a further 18% deduction for the Reporters’ Salary Fund as required by GC §72712.

Exhibit 8

Superior Court Payments to the City of Los Angeles
Allocated Share of Photo Red Light Revenue
2008

Date	Revenue	% Avg	Transx	% Avg
Jan-08	\$ 187,753	79%	2,496	89%
Feb-08	189,085	80%	2,311	83%
Mar-08	204,424	87%	2,488	89%
Apr-08	243,494	103%	2,834	101%
May-08	215,956	91%	3,004	107%
Jun-08	255,853	108%	3,212	115%
Jul-08	243,933	103%	3,207	115%
Aug-08	222,076	94%	2,899	104%
Sep-08	292,248	124%	3,405	122%
Oct-08	303,394	128%	3,109	111%
Nov-08	217,690	92%	2,188	78%
Dec-08	259,370	110%	2,442	87%
Total	\$ 2,835,276		33,585	
Average	\$ 236,273	100%	2,800	100%
Max	\$ 303,394		3,405	
Min	\$ 187,753		2,188	

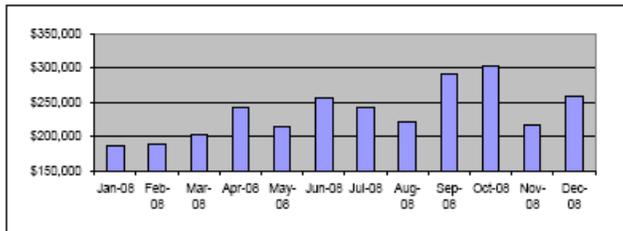
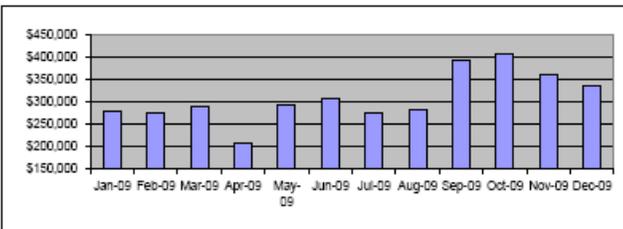


Exhibit 9

Superior Court Payments to the City of Los Angeles
Allocated Share of Photo Red Light Revenue
2009

Date	Revenue	% Avg	Transx	% Avg
Jan-09	\$ 277,995	90%	2,517	96%
Feb-09	275,503	89%	2,375	90%
Mar-09	290,875	94%	2,593	98%
Apr-09	208,589	68%	2,012	76%
May-09	292,058	95%	2,481	94%
Jun-09	306,290	99%	2,613	99%
Jul-09	275,535	89%	2,381	90%
Aug-09	283,760	92%	2,380	90%
Sep-09	392,173	127%	3,152	120%
Oct-09	405,848	131%	3,281	125%
Nov-09	361,575	117%	2,971	113%
Dec-09	334,347	108%	2,856	108%
Total	\$ 3,704,548		31,612	
Average	\$ 308,712	100%	2,634	100%
Max	\$ 405,848		3,281	
Min	\$ 208,589		2,012	



City Costs for the Photo Red Light Program

As part of our overall program evaluation, we also assessed the City resources dedicated to the program. Those include payments to the vendor and the costs of dedicated LAPD and LADOT staff who install, monitor, and manage the program. The table below presents the estimated annual costs incurred by the City to implement the current PRL program:

Contract Costs	Based on current maximum payments to the vendor to monitor 32 intersections (63 approaches at \$4,062.50 each, assuming a 80% CIR)	\$3,071,250
Labor Costs	Salaries and fringe benefits for six full-time LAPD sworn employees assigned to program.	\$791,335
	Salaries and fringe benefits for two LAPD employees assigned part-time to the program.	\$32,180
	Salaries and fringe benefits for one LADOT employee who indicated he spends about 10% of his time on the program.	\$17,865
Infrastructure	Amortized amount of LADOT costs related to required infrastructure improvements at 32 locations (\$1.57 million, based on 4 year schedule)	\$392,500
TOTAL: City's Annual Cost of PRLP		\$4,305,130

The cost figures used in this analysis are approximate. However, we consider the total amount of \$4.3 million to be a conservative estimate of total annual City costs of the PRLP.

While the actual contract payments in prior years were reduced from the maximum allowable due to performance issues¹¹, the labor costs are based on salary ordinance amounts for the positions indicated, overtime was not considered. In addition, we did not consider the effect of LAPD management supervision or Division-, Departmental- or citywide overhead. These costs are generally included for the purpose of full cost recovery.

By comparing the City's share of citation fine revenue received to a conservative estimate of the City resources dedicated to the program, our review found that for the first two full years of PRL operations at all 32 intersections, the financial result for the City was a net loss.

¹¹ Some PRL intersections do not currently achieve an 80% Citation Issuance Rate (CIR) required for full compensation to the contractor for a given intersection. For 2008 this issue resulted in reduced vendor payments of \$393,255, and for 2009 the reduction was \$212,631. LAPD and ATS have achieved an 80% CIR if they average all 32 PRL intersections together; however, some intersections exceed that rate and some do not. LAPD and ATS continue to work towards achieving that rate for every intersection.

	2008	2009
Fine Revenue Received		
Receipts due from Superior Court	\$2,835,275	\$3,704,548
Adjustment for 18% deducted, per GC 72712	<u>(510,350)</u>	<u>(666,819)</u>
<i>Estimated Revenue Received from PRLP</i>	<u>\$2,324,925</u>	<u>\$3,037,729</u>
City Costs Incurred		
Vendor Cost ¹²	\$2,627,219	\$2,857,806
Labor (LADOT & LAPD Direct)	841,380	841,380
LADOT Infrastructure Cost (4-year amortization)	<u>392,500</u>	<u>392,500</u>
<i>Estimated Costs Incurred for the PRLP</i>	<u>\$3,861,099</u>	<u>\$4,091,686</u>
Net Result (Loss):	(\$1,536,174)	(\$1,053,957)

Our analysis shows that the PRLP has not been a “money maker” for the City. It should also be noted that this issue had not been acknowledged by management or policymakers until audit fieldwork noted the significantly lower revenue figures received by the City. Our audit conclusions are also supported by other recent analyses by the CAO and CLA using the same source data.

LAPD has argued that the fine revenue reported above is understated, since there may be a significant lag between citation issuance and collection, and that most receipts in 2008 may be attributed to citations issued during 2007, when the program was not yet fully implemented. However, it should be noted that the Court’s revenue figures relate to roughly the same number of transactions, as noted in Exhibits 8 and 9. Therefore, the significant increase in receipts in 2009 may be due to the higher fines imposed for “rolling right-turns,” which began in 2008, and is discussed in Finding #6.

Even at a net City cost, automated enforcement could be considered a viable alternative to fielding more traffic police. PRLP is a round-the-clock enforcement effort. Comparable enforcement efforts by traffic officers posted at those intersections would be far more expensive. LAPD reports that the citations issued through the PRLP equate to over 22% of the moving violations citywide, and that it would require over 100 motor officers, with salaries alone over \$10 million, to monitor the 32 PRLP intersections.

However, the decision to allocate resources to any program, either through technology or staff, should be based on an expectation that it will achieve a specific outcome. Both automated and officer enforcement efforts seek to modify driver behavior by increasing compliance with traffic laws. Such enforcement actions (or threat of enforcement) are considered most effective in cases where drivers violate the red light within one second of the change from yellow to red.

¹² Maximum vendor contract cost of \$3,071,250 contractually reduced because of the low Citation Issuance Rate (CIR).

In addition, as presented in section I, the PRLP cannot conclusively show a significant impact to safety, as measured by a reduction in collisions.

Recommendation:

10. LAPD and LADOT should consider departmental priorities along with the expected outcomes of the PRLP in allocating resources to the program.

Finding #6: All PRLP violations are cited under the same CVC were assessed a \$446 fine, regardless of the relative danger of the violation.

Straight-Through versus Right-Turn Violations

A California driver who fails to stop for a red light violates CVC 21453. Although that section of the code has several subsections with different penalty amounts that are set by State law, the City issues all PRL citations under subdivision (a), whether for a straight-through violation, or a right-turn violation.

The PRLP resulted in 41,224 and 44,542 citations issued in 2008 and 2009, with approximately two-thirds of the citations issued for red light violations during right turns. In August 2008, based on advice from the City Attorney, LAPD began citing all red light violations under CVC 21453(a). Previously, right turn violations at PRLP locations were cited under CVC 21453(b), which requires a driver to yield "after stopping as required by subdivision (a)." Violations that were cited under subdivision (b) had a maximum fine amount of \$159, which was significantly lower than the fine amount under subdivision (a), which was \$381 in 2008 but has risen to \$446 as of the end of 2009 (refer to Exhibit 7).

This action nearly tripled the City's share of potential payments for two-thirds of citations issued. Several media reports and advocacy groups have called this practice of using cameras to issue citations for right-turn violations, which carries the same penalty as the more dangerous straight-through violation, as driven solely by the opportunity for increasing revenue.

Subsequent to our audit fieldwork, on September 3, 2010, the State Legislature sent AB 909 to the Governor for his signature. This bill would amend section 21453 of the Vehicle Code to re-assign turning violations to a lower fine amount.

Due to the slower speed of the vehicle during right-turns, drivers generally have control of their vehicle and if they see another vehicle or pedestrian, they are able to react and stop in time. Therefore, right-turn red light violations are generally considered less dangerous than straight-through violations. LAPD points out that collisions occurring from a rolling right-turn violation could have a greater risk of involving a pedestrian, which would be very serious.

Several California cities that cite right-turn violators say that these infractions increase hazards, especially for pedestrians. A 2006 LADOT report that analyzed traffic collisions in Los Angeles over a seven-year period reported 22,350 pedestrian collisions (or about 3,000 annually), which accounted for 7% of all traffic collisions citywide. About one-fourth of the pedestrian collisions occurred at signalized intersections, but just 4% occurred when there was a “circular red or red arrow” noted as the cited violation. There was no distinction, however, of what proportion of those collisions were caused by a right-turning vehicle. LADOT has previously stated that improper right turns had not caused a major [collision] problem, rather they reflect bad driver habits. Therefore, while PRLP right-turning violators could hit a pedestrian, Los Angeles has been “lucky in this respect.”

Though enforcement against drivers who do not stop at all has the potential to make intersections safer, some jurisdictions opt not to target right turns, or record the illegal right turn only when a vehicle is going 15 mph or faster.

Timing of the Violation, and Speed of the Vehicle

Advances in video technology now make it routine to determine to the thirtieth of a second when a violation occurred and how fast a vehicle was travelling. We reviewed studies showing that 75% of straight-through red light violations occur within the first second after a signal light changes from yellow to red.

An Iowa study found that vehicles entering the intersection a second or less after the onset of the red phase may pose less of a hazard to serious crashes because of the perception, reaction, and start-up time of possible conflicting vehicles that are currently stopped at the intersection. The most dangerous violations are generally those that occur several seconds after the signal light changes to red, when deadly broadside collisions are more likely.¹³

As an enforcement tool that seeks to change risky driver behavior, the City of Los Angeles makes no distinction between straight-through or right-turn violations, nor considers the speed of the vehicle or “time into red,” when issuing citations. LAPD stated the City intentionally lengthened the time for the yellow signal phase from the legally required 3.6 seconds to 3.9 seconds or higher in deference to potential violators. They estimate this effectively reduced by one-third the number of citations that would have otherwise been issued.

Furthermore, LAPD does not summarize collisions and injuries by straight-through or right-turn red light violations (previously noted in Finding #3). Without this data, the difference between the high-speed, straight-through violation and the slower, right-turn violation tends to indicate that the former are more dangerous and deserve more enforcement attention, and a more severe penalty.

¹³ However, right-turn violations with a longer time into red may not be as dangerous, as these could be “rolling” right turns, as drivers slow down to view and prepare to yield the right of way.

PRLP Does Not Generally Cite Left-Turn Violations

The existing PRLP equipment installed at 32 City intersections does not adequately detect or record left-turn violations; therefore, the City does not generally issue citations for red light violations by left-turning vehicles.

Significant attention to camera placement and adjustment is typically necessary to record images of left-turning vehicles; and the design will vary based on the specific intersection's layout. LAPD stated that in some instances, when a driver crosses the limit line on red and then negotiates a left turn, the event is captured by the cameras. They also stated that if an unobstructed photograph of the drivers' face is obtained, those violations are cited.

The City chose not to install the equipment necessary to detect all left-turn red light violations, as it was decided that illegal left turns were not a significant enough problem to justify the expense.

Recommendation:

- 11. Council should direct LAPD and the CLA to promote legislative action at the State to amend the CVC so that fines for red light violations reflect current technology and are proportional to the level of danger (e.g., graduated fines, etc.).**

Finding #7: Existing Law and Recent Legislative Changes Could Significantly Decrease Program Revenue.

The PRLP has not covered its operational costs nor generated additional revenue for the City. Recent legislative changes at the state level could also significantly decrease the amounts received by the City.

PRLP Violations Cannot Be Cited as Municipal Code Violations

An inquiry by the City Council proposed that automated enforcement of red light violations be cited as Los Angeles Municipal Code (LAMC) violations, which would lead to civil fines, similar to parking tickets.

This change would significantly increase the City's share of the paid citations, while reducing the fine amount for the violator and eliminating most of the payroll costs for sworn officers dedicated to the program.

The City sets the penalty amounts related to LAMC violations. Civil citations, unlike those assessed through the California Vehicle Code, do not require that a sworn officer review video evidence of the violation prior to ATS issuing the citation.

LAPD stated they have researched this issue, and that the City Attorney concurred with their analysis that this practice is "of questionable legality," citing

the State constitution that forbids municipalities from enacting legislation that duplicates or conflicts with State law. Although questionable, some localities have reportedly enacted local ordinances for traffic violations. As a result, recent legislation (SB 949), if signed by the Governor, prohibits a local authority from enacting an ordinance that establishes a violation or related penalty fee for matters covered by the State vehicle code, unless expressly authorized.

Amended Vehicle Code Reduces the Penalty for Right-Turn Violations

As stated in the previous section, since August of 2008 LAPD has cited all red light violations, both straight-through and right-turn, under the same section of the California Vehicle Code, which carried a \$446 fine as of the end of 2009. During our audit, a proposal was introduced in the State Assembly (AB 909) to significantly reduce the fine for “rolling right turns.” The League of California Cities strongly opposed the bill on monetary grounds, stating that it would negatively affect cities’ ability to use automated traffic enforcement tools and potentially cost the state millions of dollars in lost revenue. The California Police Chiefs Association also opposed the bill. Nevertheless, both houses of the legislature passed AB 909 by substantial majorities in late August 2010, and it will become law with the Governor’s signature.

Our audit noted that approximately 67% of PRLP citations issued during 2008 and 2009 were issued for right-turns on red. Therefore, this recent legislation would have a significant effect on PRLP costs recovered by the City.

State Law Limits Photo Enforcement Safety Impact and Financial Results

Reports during our audit fieldwork indicated the Governor may work to change the State law that currently prohibits speed cameras in California. Though PRLP video cameras already detect vehicle speed, it is not with the precision required by the Court. Speed enforcement, as a supplement to the PRLP, would require additional equipment at an added cost.

It appears the State would receive the majority of additional fee revenue from citations issued by speed cameras, though the City would also retain a portion. However, it is unknown if a projected increase in City revenue related to speed cameras would be sufficient to offset additional vendor costs. The City has also not taken a position to support this proposal.

The use of speed cameras is highly unpopular among some citizen groups. Though the State of Arizona has used camera enforcement to ticket speeding motorists on highways, it plans to end the practice soon.

LAPD also stated that the existing PRLP equipment currently detects numerous other violations that impact driver safety and if cited, would result in additional penalties or fines. For example:

Moving/Safety Violations:

23123 Cell Phone (extremely common)
27315 Seatbelt not worn (very common)
22100 Turning from improper lane / position (fairly common)
22108 Turning without signaling (last 100 feet) (extremely common)
27360 Child Restraints
14601 Driving on a suspended license
23103 Reckless Driving
27400 Headset in both ears
21658 Lane straddling
21700 Obstructed View by passengers or load
21950 Failure to yield to pedestrian in crosswalk
12500 Unlicensed Driver
23109 Speed contest

Equipment Violations:

5200 License plate not attached (either front or rear)
4000a Expired Registration

Others:

21712 Unlawful riding (e.g., passenger in pickup bed)
21806 Failure to Yield to Emergency Vehicle

Current State law¹⁴ prohibits the use of photographic records made by an automated enforcement system for any purpose other than as evidence supporting a red-light violation. Therefore, a change to State law would be required to allow automated enforcement of these violations.

¹⁴ CVC 21455.5 (e)

SECTION III: CONTRACT OVERSIGHT AND MONITORING

Finding # 8: The City relies on the vendor to ensure a complete reporting of all photo red light events, potential and LAPD approved violations, and actual citations mailed to violators, without ensuring completeness of the data.

For each vehicle entering a monitored approach, the PRL system detects vehicle speed and position and compares that information to the signal light timing to predict whether the vehicle will likely enter the intersection on a red light. When the system predicts such a violation, it triggers an “event.” Video cameras feed video recorders for several seconds, and still cameras and flash units activate in sequence to record the event, which may indicate a violation and ultimately result in a citation.

There is a low risk that potential violations are not captured by PRL system. While our audit did not assess the functionality of the PRL equipment, we assessed controls in place to ensure that the installed systems did work as intended. Though the vendor provided no formal study to support the ability of the system to comprehensively capture all violations, we noted that LAPD did some “ground-truthing” upon system installation, and we reviewed evidence that the City complies with required periodic certification that PRL equipment functionality conforms to State requirements.

LAPD is of the opinion that the equipment does not miss violations. However, there remains a risk that some events captured by the system may not be reported to the City, or that officer-approved citations are not timely mailed to violators.

The City lacks assurance that events, once captured by PRLP cameras, are transferred and remain in the vendor’s database, and that all such events are reported to LAPD.

An impending red light violation activates the equipment monitoring a particular approach to record a date- and time-stamped “event,” which is unique for that approach. Events are then digitally transferred and stored on remote ATS servers for initial review by ATS. ATS reviews each event to determine whether the photographic evidence meets preliminary violation criteria and, if so, uses the license plate number to obtain registration information from the California Department of Motor Vehicles (DMV).

If ATS determines the event would not support a citation, they note the exemption reason and store these events as “discards,” which are not sent to LAPD for review, but remain available for an LAPD quarterly audit.

While LAPD maintains overall control and supervision of the process, the PRLP data is stored on ATS computers. ATS personnel have system-level access to event data from the moment of capture by the cameras through inclusion of the images in the ATS database and submission of the images to LAPD for approval.

If all events captured by the cameras are not included in ATS' database, there is a risk that some valid violations would never result in citations, or, conversely, invalid violations would not be counted appropriately as discards, which would misstate the Citation Issuance Rate (CIR), and affect the payment to the vendor.

For example, ATS reported that event numbering occurs after their system transfers event data to a central server. Without traceable event numbering in the roadside equipment, a roadside computer failure could result in the loss of un-numbered event data.

Without a verifiable reconciliation that all events captured by cameras are in the database, LAPD lacks assurance that all events are considered for either potential citation or as a discard. Since the vendor suffers a financial penalty when data cannot support citations, there is a reasonable expectation that the vendor should provide information to support this type of reconciliation.

The City lacks assurance that all LAPD-approved violations result in citations mailed to registered owners.

For events that meet stated criteria, ATS uploads the images onto a dedicated computer at LAPD on a daily basis. There, an officer reviews each event and determines whether to cite the driver. State law requires a sworn officer to sign off on a citation before submission to the Court.

The officer's responsibility is to evaluate the video evidence of the violation, the legibility of the license plate, and whether the images are adequate to identify the driver. If so, and if in the officer's discretion a violation occurred, the officer electronically approves the citation and ATS notification is automatic. Events disapproved for citations are categorized for monthly reporting purposes.

For efficiency, ATS determines the mailing address of the alleged violator before submitting data to the LAPD for review and approval. ATS does this by accessing DMV databases and matching the registered owner of the vehicle with a driver by the same name that lives at the same address.

ATS processes officer-approved citations by generating citation numbers and printing citations in a specified format (see example at Exhibit 10). That format includes four color images:

- *A close up of the driver.*
- *The front or rear of the vehicle and license plate.*
- *The vehicle behind the limit line with the signal light in red phase.*
- *The vehicle within the intersection with the signal in red phase.*



Exhibit 10

CITY OF LOS ANGELES
NOTICE OF VIOLATION

Automated Red Light Enforcement System



Citation Number SA12345

Citation Information
PAYMENT DUE: 01/19/2010
AMOUNT DUE >>> \$446.00
Payable to: Los Angeles Superior Court
P.O. Box 77366
Los Angeles, CA 90007

FIRST NAME LAST NAME
123 MAIN STREET
HUNTINGTON BH, CA 92648

https://www.yourcityofcal.com/Ticket/ownerCA_LA

	VIOLATION Red light CODE AND SECTION CVC 21453(a) Fail to Stop on Red LOCATION OF VIOLATION Imperial WB @ Figueroa CITY OF OCCURRENCE Los Angeles, CA DATE OF VIOLATION 01/14/2010 TIME OF VIOLATION 09:58:08 AM YELLOW TIME 4.0 RED TIME 0.83 VEHICLE LICENSE 4XXX123 VEHICLE STATE CA	

If you are filing an Affidavit of Non-Liability, complete the affidavit, separate here and mail using the enclosed envelope

Citation Number SA12345	Respond By: 06/29/2001
TO FILE AN AFFIDAVIT OF NON-LIABILITY, please complete the information requested on the reverse side of this notice, and mail the affidavit portion of this notice in the envelope that has been provided.	
Driver filing Affidavit of Non-Liability	
AUTOMATED RED LIGHT ENFORCEMENT P O BOX 3997 BURBANK, CA 91508-3997	FIRST NAME LAST NAME 123 MAIN STREET HUNTINGTON BH, CA 92648

LOS ANGELES POLICE DEPARTMENT NOTICE TO APPEAR		Arrested/Booked/Arrested/Booked	
Date: 01/14/2010	Time: 09:58:08	Day of Week: Friday	Cases No: SA12345
Name/First Middle Last: FIRST NAME LAST NAME			
Address: 123 MAIN STREET			
City: HUNTINGTON BH		State ZIP Code: CA 92648	
Driver's License No: 8349192	Class: COMMERICAL	Exp: 28	Ren Date: 9/05/1973
Sex: M	Eyes: Brown	Hair: B-2	Race: W
Vehicle No: 4EKK123	State: CA	Registration: <input type="checkbox"/> Commercial Vehicle	Registration: <input type="checkbox"/> Other Vehicle
Year: 1998	Make: Mercedes	Body Style: Sedan	Color: Dark Green
Registered Owner or Lessee: FIRST NAME LAST NAME			
Address: 123 MAIN STREET		City ZIP Code: HUNTINGTON BH CA 92771	
Class and Section: 21453(a) CVC			
Location of Violation: IMPERIAL WB @ FIGUEROA - LOS ANGELES			
<input checked="" type="checkbox"/> I am the driver of this vehicle. No other vehicle is involved in this violation. <input type="checkbox"/> I am not the driver of this vehicle. No other vehicle is involved in this violation.			
Date Issued:	Delivered:	CD No:	
YOU MUST RESPOND TO THE COURT ON OR BEFORE			
WHEN: Date: 06/16/2008	BY: 09:00 AM		
WHERE: Superior Court of California County of Los Angeles Main Justice Center 1441 S. 1st Street Los Angeles, CA 90007 Telephone: (213) 182-1888			

The citation also includes the fine or bail amount and court instructions. ATS makes a final check of content and image quality, then mails these citations to the alleged violator.

When ATS mails the citations, they take a list of the individual envelopes to the post office, where postal clerks check and hand date-stamp the list, creating a Certificate of Mailing. The Certificate of Mailing is required by law and provides evidence of compliance with the legal requirement to mail citations within 15 days of the alleged violation. Periodically, ATS electronically transfers a batch of issued citations to the Los Angeles Superior Court.

LAPD does not reconcile the total number of citations they approve with the total number of citations that ATS both mails to registered owners, and electronically submits to the Court. Currently, LAPD relies on ATS and its software to consistently print, mail and submit to the Court only those events approved by LAPD as citations.

In July 2002 the California State Auditor recommended tighter control of this issue. The report states: "A periodic reconciliation of the number of citations the local government authorized and approved with those the vendor mailed during the same period would detect any unauthorized or unapproved citations. This reconciliation would allow the local government to promptly follow up with the vendor on any differences."

When ATS electronically submits citations to the Court, ATS also emails the Court a list of the citations submitted. The Court does not immediately respond electronically with a report or even a tally of citations submitted. Rather, the Court provides ATS with a CD each month that lists all the citations paid or dismissed during the prior month. ATS loads this data into their system.

However, the data provided by the Court is a record of payments received and citations dismissed, regardless of when the citation was issued. Therefore, this information is not comparable to citations issued and approved by LAPD or mailed by ATS during that month.

Recommendations:

12. LAPD should include a requirement in a new PRL contract for the vendor to serially number all events within their database so that LAPD review can easily detect any missing event numbers.

13. LAPD should continually store their own log of all citations approved for issuance and periodically compare that log with the vendor's notification to the Court of citations mailed to registered owners and entered into the Court system.

14. LAPD should include a requirement in the new PRL contract for the vendor to produce a comprehensive quarterly status report on

each citation processed. For example, based on citation number, the status report could show the judicial and payment status of all citations previously and newly issued, broken out by month and year, and reconciled with the prior report.

Finding # 9: Anticipated expansion of the program will shift responsibility for infrastructure construction to the Vendor. To preserve the City's financial interests, LAPD must consider payment alternatives and asset ownership in negotiating a future contract.

LAPD indicated its plans to expand the number of PRL intersections beyond the current 32. LAPD stated that under the terms of a new RFP, the City also plans to shift the burden of all site preparation costs to the contractor. Under the previous contract, LADOT constructed the infrastructure improvements with design assistance from Nestor. This new approach, of making the vendor responsible for all necessary construction, requires consideration of increased monthly payments for each intersection, or a separate method of compensating the vendor for the construction component of the contract.

We also noted that the current draft RFP is silent on the subject of who would own the infrastructure after construction—or even after termination of the contract. There is also no mention of whether construction deadlines would apply or how to allocate costs arising from unforeseen construction delays.

Installation of Nestor's PRL cameras and related equipment at 32 City locations required engineering design work for each intersection. Each selected site was unique, with differing street geometry, slopes, sub-surface objects, surface material issues for the street and adjacent property, speed limits, and unique and active traffic control equipment and related supporting infrastructure.

LADOT worked with Nestor to modify existing engineering drawings that LADOT then used to construct necessary improvements at each intersection. PRL camera angles, the positioning of strobe lights, and the system controls required careful evaluation of the pre-existing infrastructure to ensure a successful outcome.

LADOT modified pre-existing infrastructure and provided Nestor with physical attachment points for cameras, flash units, and a control cabinet. LADOT also constructed the improvements that were necessary to provide adequate power for the automated system, as well as data interconnectivity among system components. It was Nestor's responsibility to install cameras, flash units, and the control cabinet, and to test, activate, and maintain the PRL system. The CAO reported LADOT costs of \$1.6 million for their part of this process, or about \$50,000 per intersection.

Given the City's budget constraints and the specific pre-installation infrastructure requirements demanded by an upgraded replacement system, it appears appropriate to assign these requirements to the vendor. However, LAPD should

seek competent counsel to price the additional construction responsibilities competitively, and to structure the payment process accordingly in order to avoid overpayment. For example, if the necessary capital costs are amortized over a stated contract term, they may effectively raise the monthly payment amount per intersection. In that case, once the infrastructure costs are fully amortized, the monthly payment should be reduced. In addition, as the City compensates the vendor for infrastructure improvements, those improvements could incrementally become the property of the City.

LAPD can avoid paying an unnecessary premium by anticipating additional up-front costs the vendor will incur, by considering the payback period for capital costs, by clearly specifying who owns what at each stage of the process, and by anticipating the problems that frequently arise in construction projects.

Recommendation:

15. In negotiating the new contract for the PRLP, LAPD should seek competent counsel to protect the City's interests. Ensure issues regarding asset ownership, construction costs, and any related program delays due to construction, are specifically included in the contract terms.

Finding #10: The Program is highly dependent on vendor viability; therefore, the City must ensure appropriate due diligence in contractor selection and clarity of contract terms.

The PRLP demands a strong partnership between the City and a well-performing contracted vendor. Without a viable private partner, the program cannot function.

From 2000 to 2004, the City piloted automated enforcement of traffic signal lights. When the pilot concluded PRL enforcement ended and was dark for more than a year.

After a year-long selection process, the City selected Nestor Traffic Systems, Inc. to provide PRL services, starting in 2006. The contract included provisions for two one-year extensions that could feasibly extend the contract until April 2011.

During the third year of the contract, Nestor failed financially and entered into receivership. Since the cameras and related equipment are proprietary and were owned by the failed company, the City risked program interruption a second time.

In addition, the City had initially invested \$1.6 million in public (LADOT) resources to design and build out the infrastructure to accommodate Nestor's proprietary equipment. With the failure of the vendor and the program at risk of shutting down, the opportunity to benefit from this investment for the remaining two-year option period appeared lost.

In September 2009, ATS, a Nestor competitor, stepped in to purchase Nestor out of receivership, which resulted in the continued operation of the PRLP for the City. This was despite concerns that LAPD had no contractual authority to pay ATS for ongoing services, since LAPD's contract was with Nestor, and ATS dissolved Nestor during the acquisition process, essentially voiding the contract.

The agreement was eventually amended in April 2010 to formally assign the contract to ATS, which gave LAPD the authority to pay ATS for services incurred since September 2009. The contract has also been extended through April, 2011, to provide for continued service while the City seeks proposals for a new contract.

The current language of the RFP requires the vendor to provide "documentation on the organizational and financial status of the proposer," but does not specifically address the effects of a possible interruption or cessation of business by the contractor.

A common imperative in selection decisions is that the vendor must demonstrate current and long-term financial viability. In addition, the City must include provisions in its contract to reduce its financial risk.

The situation with Nestor could have been mitigated with additional contract provisions. Based on LADOT's \$1.6 million investment in PRLP infrastructure, the contract could have specified that complete failure of the vendor to fulfill contract terms would have defaulted the vendor's equipment to the City. That would have put the City in a better negotiating position to seek an interim solution.

The current contract allows only for LAPD to terminate the contract. To avoid a system shutdown or an interruption in payments, the contract could have included a provision for temporary substitution of a cooperating competitor.

Considering the potential loss of infrastructure investment and the detrimental impact to enforcement efforts by interrupting the PRLP, the total City cost of Nestor's failure could have been substantial. LAPD's contract could have better anticipated downside risks.

Recommendation:

16.LAPD should work with the City Attorney and the CAO in ensuring the selection process and contract terms fully protect the City's financial interests.

Respectfully Submitted,



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Internal Auditor III



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May 26, 2010

OFFICE OF THE CONTROLLER

Review of the Photo Red Light Program

Ranking of Recommendations

Description of Finding	Ranking Code	Recommendations
Section I: The Program's Impact on Public Safety		
<i>Finding #1: The method used to select the 32 locations for camera enforcement eliminated some high risk intersections.</i>	N	1. LAPD and LADOT should increase transparency for an expanded PRLP by publicizing how the location selection process will ensure that the highest risk intersections are selected for the program. In addition, LAPD and LADOT should list intersections that meet published criteria, on their websites.
	N	2. LAPD and LADOT should obtain CalTrans approval to automate enforcement of intersections that meet selection criteria.
	N	3. LAPD and LADOT should seek funding for necessary infrastructure modifications at intersections that meet selection criteria.
<i>Finding #2: Location decisions did not involve engineering analyses that formally documented the City's consideration of other solutions that could have a more direct effect on public safety than automated enforcement.</i>	N	4. For any new intersection recommended in an expanded PRLP, LADOT should complete an engineering analysis template to formally document consideration of all appropriate countermeasures, and to support the recommendation that automated enforcement would have the greatest impact to improving public safety at that location.

Description of Finding	Ranking Code	Recommendations
<p><i><u>Finding #3:</u> The data presented by LAPD in their evaluation of the Photo Red Light Program, is inadequate to show a significant increase in public safety.</i></p>	U	<p>5. LAPD should modify the method by which the PRLP is evaluated by ensuring complete and relevant data that supports the type of enforcement, i.e., right turns or straight-through violations.</p>
	D	<p>6. Over the long term, LAPD should pursue the full implementation of the planned integrated system to electronically record all relevant collision information, making it more easily accessible for data analysis and program evaluation.</p>
	N	<p>7. In the short-term, LAPD should expand their data collection from collisions at PRLP intersections. Rather than relying solely on key data fields captured by division databases, consider the information included in written collision reports and video images of the collisions that may be captured by the PRLP system, for example:</p> <ul style="list-style-type: none"> ▪ Collision type (broadside, rear-end, etc.) ▪ Time into red ▪ Speed of the vehicle ▪ Movement preceding collision ▪ Feet from the intersection

Description of Finding	Ranking Code	Recommendations
	N	<p>8. Because the PRLP seeks to modify risky behavior by ensuring compliance with traffic laws, LAPD should also assess the program results in terms of the rate of violations or citations issued through the PRLP by intersection approach. An expected outcome for a successful program would show that violations at a given location decrease over time.</p>
<p><i>Finding #4: Other factors that may be responsible for a reduction in Traffic Collisions have not been considered in reporting program results.</i></p>	N	<p>9. In coordination with LADOT, LAPD should consider, at a minimum, the effect of traffic volume in the comparative metric in reporting and measuring program results. Specifically:</p> <ul style="list-style-type: none"> a. The number or ratio of traffic collisions at monitored intersections (considered through implementation of recommendations 6 and 7) compared to the number of vehicles transiting a single approach. A successful program outcome would note a decline in the adjusted ratio. b. The number or ratio of violations at monitored intersections (considered through implementation of recommendation 8) compared to the number of vehicles transiting a single approach. A successful program outcome would also note a decline in the ratio.

Section II: The Program's Impact on City Finances

<p><i>Finding #5: The Program has not covered its operational costs nor generated additional revenue for the City.</i></p>	<p>U</p>	<p>10.LAPD and LADOT should consider departmental priorities along with the expected outcomes of the PRLP in allocating resources to the program.</p>
<p><i>Finding #6: All PRLP violations are cited under the same CVC and were assessed a \$446 fine, regardless of the relative danger of the violation.</i></p>	<p>N</p>	<p>11.Council should direct LAPD and the CLA to promote legislative action at the State to amend the CVC so that fines for red light violations reflect current technology and are proportional the to the level of danger (e.g., graduated fines, etc.).</p>
<p><i>Finding #7: Existing law and recent Legislative Changes Could Significantly Decrease Program Revenue.</i></p>		

Section III: Contract Oversight and Monitoring

<p><i>Finding # 8: The City relies on the vendor to ensure a complete reporting of all photo red light events, potential and LAPD approved violations, and actual citations mailed to violators, without ensuring completeness of the data.</i></p>	<p>N</p>	<p>12.LAPD should include a requirement in a new PRL contract for the vendor to serially number events so that LAPD review can easily detect any missing event numbers.</p>
	<p>N</p>	<p>13.LAPD should continually store their own log of all citations approved for issuance and periodically compare that log with the vendor’s notification to the Court of citations mailed to registered owners and entered into the Court system.</p>
	<p>D</p>	<p>14.LAPD should include a requirement in the new PRL contract for the vendor to produce a comprehensive quarterly status report on each citation processed. For example, based on citation number, the status report could show the judicial and payment status of all citations previously and newly issued, broken out by month and year, and reconciled with the prior report.</p>

<p><i>Finding # 9: Anticipated expansion of the program will shift responsibility for infrastructure construction to the Vendor. To preserve the City's financial interests, LAPD must consider payment alternatives and asset ownership in negotiating a future contract.</i></p>	<p>N</p>	<p>15. In negotiating the new contract for the PRLP, LAPD should seek competent counsel to protect the City's interests. Ensure issues regarding asset ownership, construction costs, and any related program delays due to construction, are specifically included in the contract terms.</p>
<p><i>Finding #10: The Program is highly dependent on vendor viability; therefore, the City must ensure appropriate due diligence in contractor selection and clarity of contract terms</i></p>	<p>N</p>	<p>16. LAPD should work with the City Attorney and the CAO in ensuring the selection process and contract terms fully protect the City's financial interests.</p>

Description of Recommendation Ranking Codes

U- Urgent-The recommendation pertains to a serious or materially significant audit finding or control weakness. Due to the seriousness or significance of the matter, immediate management attention and appropriate corrective action is warranted.

N- Necessary- The recommendation pertains to a moderately significant or potentially serious audit finding or control weakness. Reasonably prompt corrective action should be taken by management to address the matter. The recommendation should be implemented within six months.

D- Desirable- The recommendation pertains to an audit finding or control weakness of relatively minor significance or concern. The timing of any corrective action is left to management's discretion.

N/A- Not Applicable

Appendix B

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Red Light Running Camera (Photo Enforcement) Engineering Safety Analysis Template



Highway Operations Section
Traffic Engineering Division
Virginia Department of Transportation
1401 East Broad Street
Richmond, Virginia 23219

February 19, 2008

VDOT Traffic Signal Photo Enforcement Engineering Analysis Template

Local Jurisdiction: _____ VDOT District: _____
(County/City/Town)

Intersection: _____
Street Name (Route #) at Street Name (Route #)

This Study performed under the direction of _____
(licensed professional engineer)

A. INTERSECTION & SIGNAL DATA

1. Signal Visibility

a. Minimum Sight Distance to Signal

Approach	Grade	Speed Limit (mph)	Measure (ft)	Required (ft)*

*See attached table of minimum sight distance requirements from the MUTCD.

- b. Are "SIGNAL AHEAD" signs present? Yes No
 Are "SIGNAL AHEAD" signs needed? Yes No
 Are other warning signs present in the vicinity of the intersection? Yes No
 Explain: _____

c. Information on Signal Heads

Approach	Lens Size	Lens Type (LED or Bulb)	Back Plates (Yes or No)

2. Pavement and Markings Data

- a. Stop bars in "good" condition? Yes No
 Explain: _____

- b. Lane lines "clearly" visible? Yes No
 Explain: _____

- c. Crosswalks "clearly" marked? Yes No
 Explain: _____

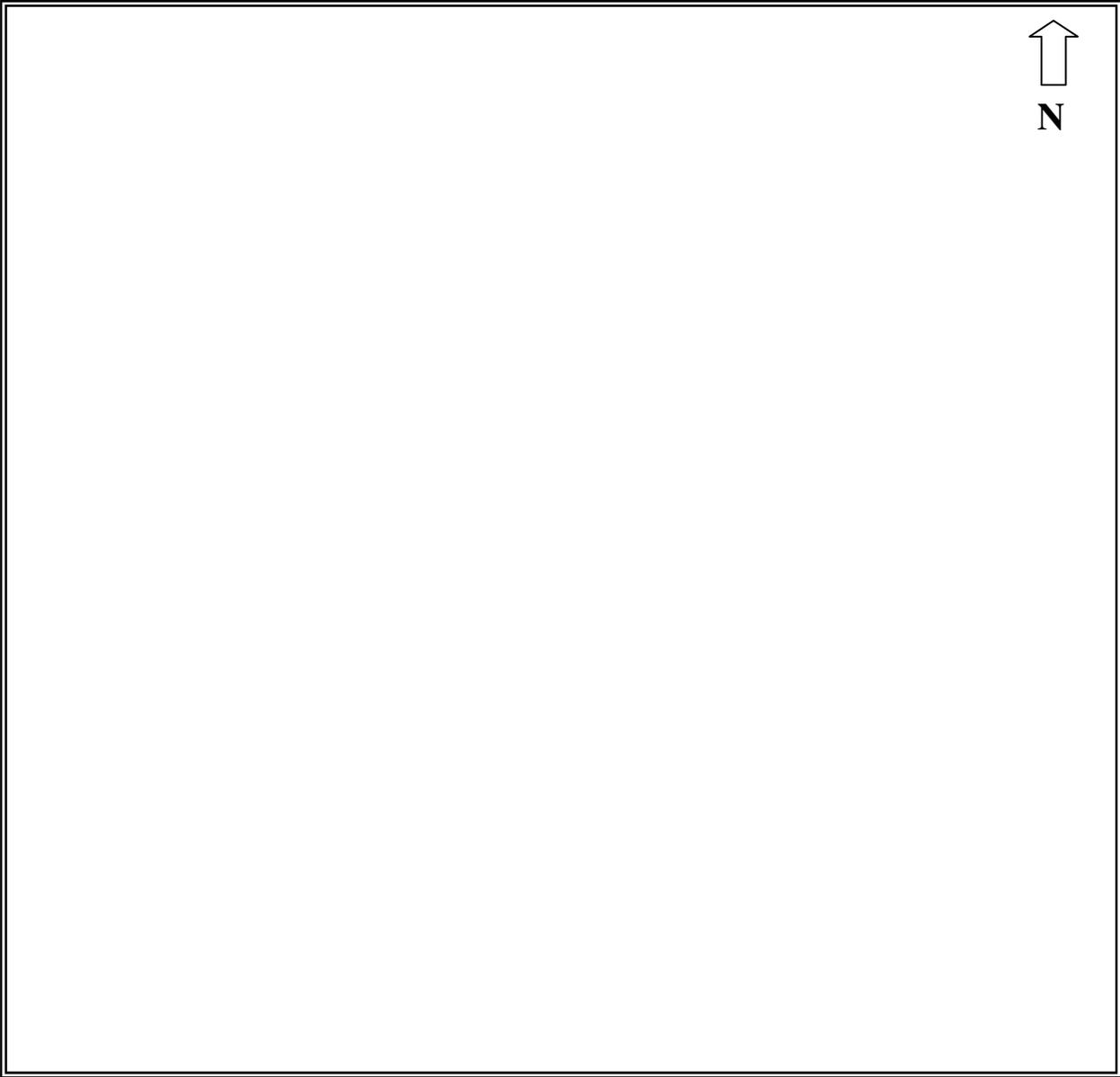
d. Pavement conditions (ruts, potholes, cracking, etc.)?

- Good Explain: _____
- Fair Explain: _____
- Poor Explain: _____

e. Pavement surface treatments exist? (rumble strips, texturing, pavers, etc.)

- Yes Explain: _____
- No _____

3. Provide diagram of intersection including: pavement markings, width of lanes and medians, location of signal heads and signs, locations of loops/detectors, and grades.



B. SIGNAL TIMING & TRAFFIC DATA

1. Clearance Intervals

Approach	Posted Speed Limit	Grade	Width of Intersection	Yellow Interval		All Red Interval	
				Existing	Calculated*	Existing	Calculated*

*Reference TE Memo 306 provided in Appendix E for calculation of Clearance Intervals

2. Include existing controller settings for each phase and each time-of-day. Information should include applicable settings such as minimum green, max 1 & 2, passage, minimum gap/ext, protected-permissive, lead-lag, yellow and all red, walk and ped clearance time, recall settings, offsets, cycle length, etc. Include analysis of peak hour conditions and a determination of whether signal timings are contributing to red-light running problem.

a. Does signal timing or phasing factor in as a possible contributor to RLR at this intersection?

- Yes Explain: _____

 No

b. List comments or recommendations on potential signal timing or phasing changes:

3. Vehicle Detection Data

Approach	Detection Type (loop, video, etc.)	Detector Location (measured from stop bar)

4. Traffic Volume Data

Approach	Daily Volumes		Peak Hour Volumes	
	Total	Heavy Vehicles	Total	Heavy Vehicles

C. CRASH & ENFORCEMENT DATA

1. Three-Year Crash Data

Collision Type	3-year Total	Number of Injury Crashes	Number of Fatal Crashes	Crashes Associated With Red-Light-Running
Angle				
Rear End				
Head On				
Sidewsipe				
Pedestrian				
Bicyclist				
TOTAL				

2. Crash Rate

- a. Number of crashes per million entering vehicles: _____
- b. Locality rate for comparison (if available): _____

3. Violation Rate

- a. Number of red light running citations per year issued by law enforcement at the evaluated intersection, if available.
 Number: _____ Year: _____

b. Observed Violations

Date: _____
 Time Period: _____

Approach	Traffic Volume	Number of Violations

4. Enforcement and Operational Issues

- a. Describe the difficulty experienced by law enforcement officers in patrol cars or on foot in apprehending violators.

- b. Describe the ability of law enforcement officers to apprehend violators safely within a reasonable distance from the violation.

- c. Are pedestrians at risk due to violations? Yes No
 Explain: _____

 Number of pedestrians per hour? _____
 Pedestrian crosswalk provided? Yes No
- d. Have there been any changes to the operations of the intersection (signal timing, restriping, or increased enforcement) within the past three years? Yes No
 Explain: _____

Minimum Sight Distance

85th Percentile Speed (mph)	Minimum Sight Distance (ft)
20	175
25	215
30	270
35	325
40	390
45	460
50	540
55	625
60	715

Table 4D-1 *Manual on Uniform Traffic Control Devices*, (Revision 1, Nov 2004) Transportation Research Board (TRB), Washington, DC, 2003