California State Auditor

BUREAU OF STATE AUDITS

Red Light Camera Programs:

Although They Have Contributed to a Reduction in Accidents, Operational Weaknesses Exist at the Local Level

July 2002
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CALIFORNIA STATE AUDITOR

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July 23, 2002 2001-125

The Governor of California
President pro Tempore of the Senate
Speaker of the Assembly
State Capitol
Sacramento, California 95814

Dear Governor and Legislative Leaders:

As requested by the Joint Legislative Audit Committee, the Bureau of State Audits presents its audit report concerning our review of the implementation, application, and efficacy of red light camera programs statewide.

This report concludes that red light cameras have contributed to a reduction of accidents; however, our review of a sample of seven local governments found weaknesses in the way they are operating their programs that make them more vulnerable to legal challenge. Specifically, we found that the local governments we reviewed need to more rigorously supervise their respective vendors to exercise and maintain control of their programs.

Furthermore, we could not always determine if local governments followed the best practice of first addressing any needed engineering improvements to the intersections they designated before installing the red light cameras. In addition, four of the seven local governments in our sample avoided placing cameras at dangerous intersections along state-owned highways because of the delay involved in obtaining state permission. Moreover, most would use photographs as evidence in criminal proceedings even though it would appear to conflict with the law governing the program.

We also found that the local governments in our sample have generally followed the California Department of Transportation's required yellow light time interval standards. Finally, only two of the seven local governments we reviewed have generated significant revenue from their red light camera programs.

Respectfully submitted,

Elaine M. Howle

ELAINE M. HOWLE
State Auditor

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SUMMARY

Audit Highlights . . .

Red light cameras have contributed to a reduction of accidents; however, our review of seven local governments found weaknesses in the way they are operating their programs that make them vulnerable to legal challenge. Specifically, we found that the local governments:

- ☑ *Need to more rigorously supervise vendors to maintain control of their programs.*
- ☑ *Do not always follow the best practice of reviewing intersections for engineering problems before installing cameras.*
- ☑ *All but one would use photographs as evidence in criminal proceedings even though it would appear to conflict with the law governing the program.*
- ☑ *Generally follow required time intervals for yellow lights.*

Of the local governments we visited, only San Diego and Oxnard have generated significant revenue from their red light camera programs.

Our review of available data shows that red light accident rates decreased between 3 percent and 21 percent after red light cameras were installed by five of the local governments in our sample.

RESULTS IN BRIEF

Motorists running red lights are a serious traffic problem, and because it is a difficult violation for a police officer to witness and enforce at the time it is committed, the Federal Highway Administration has identified automated enforcement systems—commonly known as red light cameras—as a measure to address the problem. After the California Legislature authorized their use in 1996, several local governments implemented red light cameras at key intersections to improve traffic safety. Local governments use the resulting photographs to identify motorists who drive through red lights and send them citations. Because of the advanced technology and cost considerations involved, local governments use private vendors to provide red light camera equipment and services.

Our review found that accidents related to motorists running red lights have generally decreased where local governments have employed cameras. However, the seven local governments we reviewed need to make operational improvements to maintain effective control of their programs and comply with state law. The law mandates that only a governmental agency, in cooperation with a law enforcement agency, can operate an automated enforcement system but does not include specific requirements for carrying out this mandate. Although the law needs further clarification, we believe that to avoid the legal challenges that have affected the city of San Diego's program, local governments need to rigorously oversee the vendors that provide red light camera services. Further, we could not always determine if local governments addressed engineering improvements to the intersections they chose before installing cameras. Although the most common reason for choosing red light camera sites was traffic safety, four local governments out of the seven in our sample avoided placing cameras at some of the dangerous intersections along state-owned highways. The cities of Fremont, Long Beach, and San Diego anticipated that obtaining state permission would delay their programs and Los Angeles County indicated it did not consider state-owned highways for its program. Local governments also have differing interpretations concerning the use of photos taken. Most believe they have a legal basis for using them for purposes other than

to prosecute red light violations, which appears to conflict with the enabling legislation. These and other operational weaknesses make red light camera programs vulnerable to legal challenge.

Despite operational concerns, our review of the available data shows that accidents caused by red light violations usually decrease after the introduction of red light cameras. For five local governments we visited, the number of accidents decreased between 3 percent and 21 percent after implementation of red light cameras, but accidents increased by 5 percent for the sixth. Fremont attributed the increase in accidents to higher traffic volume. Accident statistics were not available for Long Beach as the program is still too new. Statewide collision data indicates a 10 percent drop in accidents caused by motorists running red lights in areas with red light cameras compared to no change in the number of accidents in other areas. Even more telling, after San Diego suspended use of its program in June 2001, accidents caused by red light violations increased citywide by 14 percent, based on the four months of data we were able to obtain. Finally, local governments themselves make little or no profit from their programs. Only two of the programs we reviewed made significant revenues.

RECOMMENDATIONS

We recommended that local governments take several actions to ensure that they comply with state law for using red light cameras, maintain control over their programs, and minimize the risk for legal challenges. These actions include conducting more rigorous oversight of vendors, establishing shorter periods for destroying certain confidential information, developing added controls to ensure that vendors only mail authorized and approved citations, and periodically inspecting red light camera intersections. Before installing red light cameras, local governments should consider whether engineering measures would improve traffic safety and be more effective in addressing red light violations. Finally, to avoid overlooking dangerous intersections that are state owned, local governments should diligently pursue the required state approvals, despite any resulting delays to installing their cameras.

To remove the ambiguity regarding whether a local government or a vendor is operating a red light camera system, the Legislature should clarify the law to define which tasks a local government must perform to operate a red light camera program and which

tasks can be delegated to a vendor providing red light camera services. Further, to eliminate ambiguity regarding the admissibility of evidence, the Legislature should consider clarifying the enabling legislation to state whether photographs taken by red light cameras can be used for other law enforcement purposes.

AGENCY COMMENTS

Los Angeles County, the cities of Oxnard and San Diego, and the city and county of San Francisco generally agreed with our recommendations and provided some clarifying comments in their responses. Fremont took exception to our analysis of the change in accidents before and after the installation of red light cameras. Long Beach agreed with our recommendations, but its city auditor took issue with the report for including a high-level summary of our findings and recommendations. Finally, the city of Sacramento disagreed with several of our findings, most notably that it needed added controls to ensure that the vendor does not mail unauthorized citations. ■

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INTRODUCTION

BACKGROUND

Motorists running red lights cause a significant number of accidents that are costly both in terms of human life and financial consequences. According to calendar year 2000 data we analyzed from the California Highway Patrol (CHP), 25,014 crashes resulted from red light violations throughout the State, causing 93 fatalities and 14,868 injuries. Beyond the human suffering they cause, red light accidents are also expensive due to the costs of medical, administrative, legal, and emergency services; rehabilitation for the injured; property damage; lost earnings; and reduced quality of life. Using data from the federal government, the CHP estimates that each fatality costs society $2,600,000; and other red light accidents cost between $2,000 and $183,000, depending on their severity.

According to the California Vehicle Code, a motorist violates the red light traffic law by crossing the limit line and proceeding through an intersection after the light has turned red. Police officers conducting traditional enforcement at intersections can issue citations to motorists they observe violating this law. However, enforcement of red light violations by police officers can be difficult. To catch a motorist running a red light, an officer must actually observe the violation. Even if an officer is present, pursuing the violator could entail putting other motorists and pedestrians, as well as the officer, at risk of a collision. Thus, many red light violations are not enforced.

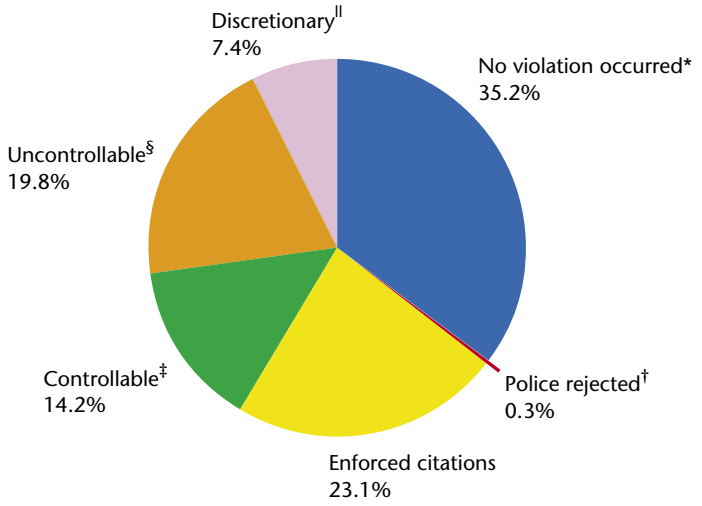
Because of the high percentage of crashes that occur at intersections and the difficulty police have in enforcing traffic laws in dense urban areas, the Federal Highway Administration (FHWA) has identified red light cameras as a measure to be considered when addressing intersection crashes in conjunction with any other needed engineering improvements. The Insurance Institute of Highway Safety (IIHS) reports that red light cameras have been in use for more than 20 years in Europe and Australia, but they are relatively new in the United States. In 2001, an IIHS survey found that 12 states, plus a few cities in Arizona, Ohio, and Tennessee, have authorized the use of red light cameras. FHWA studies in the United States show that red light

cameras reduce violations at enforced intersections and, in some instances, have the positive spillover effect of reducing red light violations at intersections without cameras.

Red light cameras are specialized cameras that take still or video photographs while the traffic signal is red. The cameras are only operational during the red light phase and take photographs of vehicles illegally entering the intersection. The local government and its vendor use the photographs to identify a motorist by reviewing records from the Department of Motor Vehicles (DMV), and if they are able to successfully identify the registered owner of the vehicle and obtain a clear photograph of the motorist, they send the registered owner a citation. The cameras operate continuously to provide constant enforcement of the traffic law. In this sense, a red light camera is more efficient than using a police officer because it potentially allows the local government to issue citations to each motorist who runs a red light at those intersections.

FIGURE 1

Local Governments Enforce Only a Small Percentage of Potential Violations Recorded by Red Light Cameras



Source: Vendor reports provided by local governments.

* Motorist activity that does not result in a violation, such as a screeching stop.

† Citations rejected by law enforcement because they are too vulnerable to court challenge.

‡ Unenforced citations that can be resolved by making improvements to the system.

§ Unenforced citations that cannot be resolved by making improvements to the system.

‖ Unenforced citations according to the respective local government's formal or informal business rules.

However, local governments are able to enforce only a small percentage of the total violations recorded by red light cameras for a number of reasons. For example, the photograph of a driver or license plate may be too poor to make a positive identification. As shown in Figure 1, the seven local governments we visited enforced about 23 percent of the total number of violations that red light cameras captured during 2001. For additional details regarding the number of citations issued, see Appendix A.

California took steps to supplement its law enforcement at signalized intersections when, in 1996, the Legislature authorized the use of red light camera systems by local governments. As shown in Figure 2 on the following page, 20 local governments have installed red light cameras. Two local governments have suspended their operations. The city of San Diego suspended its program on June 1, 2001, and has yet to restart it; and the city and county of Sacramento suspended operations on April 30, 2002, with the county restarting its operations on July 1, 2002.

Legal Requirements for Operating a Red Light Camera Program in California

- Only a governmental agency in cooperation with a law enforcement agency may operate a red light camera program.
- Signs must clearly indicate the system's presence at each intersection or at all major entrances to the city or county.
- Yellow light time intervals must meet the California Department of Transportation's minimum standards.
- Photographs must be kept confidential and made available only to governmental and law enforcement agencies to pursue red light violations.
- The registered owner or any individual identified by the registered owner as the driver of the vehicle at the time of the violation must be permitted to review the photographic evidence.
- A citation must be delivered to the driver within 15 days from the date of the violation.

To operate a red light camera program, a local government must follow certain statutory requirements; most notably, it must operate the program itself in cooperation with a law enforcement agency. The law does not specify what it means to operate a program, but one superior court reasoned that this requirement exists to ensure that the evidence obtained by a red light camera is trustworthy and reliable. California's red light camera law states that the driver is responsible for the citation, which is treated like a moving violation; in most other states, the citation, like a parking ticket, is the responsibility of the registered owner of the vehicle.

Because of the advanced technology used—high-speed traditional, digital, and video cameras—and the high cost of red light systems, local governments usually contract with vendors for use of the necessary equipment and for film and citation processing services. Also, red light camera systems require precise assembly, installation, and maintenance, which private vendors can provide. Three vendors offer red light camera services in California. Appendix B provides details on the systems and vendors used by the local governments that currently employ red light cameras in the State.

FIGURE 2

Local Governments Currently Operating Red Light Cameras

Source: Local government and vendor staff.

Note: Names in bold were selected for review. Names in italics have suspended their programs as of July 2002.

Using criteria established by the local government for issuing a citation, the vendor initially screens all photographed violations to eliminate those that are unenforceable. The vendor then accesses the DMV database to obtain the name, address, and driver's license number of the registered owner of the vehicle involved in each enforceable violation. The vendor forwards to a designated law enforcement agency, such as a police department, a citation containing (1) photographs of the vehicle entering and proceeding through the intersection, (2) a close-up of the person driving, (3) a photograph of the license plate, and (4) identifying information obtained from the DMV records. After the law enforcement agency approves it, the vendor mails the citation to the alleged violator.

Services Provided by Red Light Camera Vendors

- Installing system equipment
- Providing engineering drawings
- Collecting and developing filmed pictures
- Maintaining and servicing cameras
- Initially reviewing photographs
- Screening out unenforceable violations
- Mailing approved citations
- Preparing court evidence packages

The alleged violator may send payment to the court—$270 or more depending on the jurisdiction—or contest the violation either by appearing in court or through a trial by written declaration. An alleged violator who chooses to contest a citation by written declaration can submit a statement and other evidence to the court without the need to appear personally. Because California law states that the driver committing the violation is responsible for the citation and that the driver may or may not be the registered owner of the vehicle, the registered owner can certify that he or she was not the driver and has the option of identifying who was driving the vehicle when the violation occurred.

SCOPE AND METHODOLOGY

The Joint Legislative Audit Committee requested that the Bureau of State Audits perform a statewide review of the implementation, application, and efficacy of the use of red light cameras. We were asked to review a number of specific areas related to red light cameras in use at traffic intersections, including the following:

- The roles of local government, including law enforcement and private vendors, and whether they comply with the law, including the confidentiality requirement over photographs taken by red light cameras.

- The effectiveness of red light cameras in reducing accidents and increasing traffic safety at selected intersections.

- The existence or need for standards on site selection, installation of cameras, and calibration and accuracy of the technology. If standards did exist, we were to determine whether they were used consistently.

- To the extent possible, the percentage of red light violations that occur within one second of a light turning red.

- Whether yellow light intervals at intersections with red light cameras meet the standards suggested by the California Department of Transportation (Caltrans) and whether the intervals differ from intersections without red light cameras that have similar traffic volumes and speeds.

- The extent that local governments use revenue from red light citations for traffic safety.

In addition, we were asked to compare the differential in revenues generated from citations before and after the cameras were installed with any changes in the number of accidents. However, we were unable to perform this audit step because, before implementing their red light camera programs, the local governments we examined did not separately account for the revenues they received from red light violations. Instead, we obtained budget and accounting reports to determine the revenues and expenditures for the red light camera programs and whether revenues were used for traffic safety.

To gain an understanding of the requirements for red light cameras, we reviewed relevant state laws over their use and over related traffic issues. To understand the extent that red light cameras are used in California, we contacted local governments and vendors to develop a complete list of users of red light cameras. From this list, we selected seven local governments for review, focusing on programs that had the most cameras and/or had been in operation the longest. We chose at least one local government from each of the three main vendors that provide red light camera services. Lastly, we ensured that our selections represented different areas throughout the State.

To determine whether the local governments and their vendors complied with the laws governing the use of red light cameras, we interviewed program managers and key staff to understand the programs. In addition, we analyzed the contracts to understand

the responsibilities of each party. Further, we obtained reports from city councils and county boards of supervisors to understand why they decided to employ red light cameras and then compared the reasons with the legislative intent for authorizing red light cameras. We also determined whether the local governments properly notified the public before implementing their programs. Additionally, we asked how each local government directs and oversees its vendor's activities. Because several lawsuits have been brought concerning red light cameras, we reviewed the court decisions to determine what activities were judged not compliant with the law. Finally, we reviewed the controls that local governments have in place to ensure that motorists' photographs, names, and addresses are kept confidential.

To determine the effect that red light cameras have on increasing traffic safety, we analyzed accident data from the CHP, which maintains the Statewide Integrated Traffic Records System (SWITRS). The SWITRS is a centralized accident database containing all fatal, injury, and property damage collisions, including those caused by motorists running red lights, as reported by local police and sheriff's departments throughout the State. Our analysis focused on the change in the average number of accidents per month that were attributable to motorists running red lights beginning January 1, 1995—to provide at least one year of data before the red light camera law went into effect—and ending September 30, 2001, the most current SWITRS data available. We reviewed the change in the average number of accidents per month before and after the varying implementation dates of red light cameras at both a statewide level and for each of the seven local governments. However, we could not include Long Beach in our comparisons because it did not initiate its program until October 2001. A statistical consultant assisted us in selecting our methodology.

Although we believe that our analysis indicates how effective red light cameras are in reducing accidents, we caution that other factors not readily measurable also likely affected the accident rates. These other factors could include demographics, traffic volume, engineering improvements, citation fee increases, public information campaigns, and other police enforcement activities. However, other accident studies conducted by various entities show results similar to ours, as summarized in Appendix C.

We researched traffic practices and engineering standards to determine if standards exist for selecting intersections for enforcement, installing red light cameras, and testing the calibration and accuracy of the technology. The FHWA and several national traffic engineering organizations recommend practices that local governments should follow when implementing a red light camera program. We checked to see if the local governments in our sample followed these recommended practices.

To determine the number of violations that occur within one second of the light turning red, we requested statistics from the local governments we visited or their respective vendors.

After the audit was approved, the Legislature passed a new state law requiring that intersections with red light cameras comply with the yellow light timing standards established by Caltrans. We reviewed the signal timing sheets for intersections with red light cameras in our sample of local governments to determine if yellow light times complied with Caltrans' standards rather than looking at intersections with similar traffic volumes and speeds. Further, to ensure that yellow light time intervals were not changed either before or after intersections were equipped with red light cameras, we reviewed all the yellow light time interval changes for these intersections. ■

CHAPTER 1

Operational Weaknesses Make Red Light Camera Programs Vulnerable to Legal Challenges

CHAPTER SUMMARY

Although the seven local governments we visited generally comply with state law governing the use of red light cameras, they need to more rigorously oversee vendors to retain control of their programs and enhance public trust in this law enforcement tool. A superior court ruled that San Diego did not provide sufficient oversight of its vendor, resulting in more than 250 citations being dismissed. Other local governments risk the same rulings if they do not adequately oversee their programs.

We believe that proper oversight consists of making periodic site visits to inspect the vendor's operation for compliance with the law and contract terms, establishing criteria for screening violations, having controls in place to ensure that the vendor only mails properly authorized and approved citations, and making decisions as to how long certain confidential data should be retained. Additionally, local governments should conduct periodic inspections of red light camera intersections to ensure that the cameras are working properly and that vendors have not made unapproved changes to the equipment. Because none of the local governments we reviewed had taken all these steps at the outset of our review, all are open to potential legal challenges.

Local Governments In Our Sample

- Fremont
- Long Beach
- Los Angeles County (Los Angeles)
- Oxnard
- City of Sacramento (Sacramento)
- City of San Diego (San Diego)
- City and county of San Francisco (San Francisco)

Local governments also have differing interpretations of the confidentiality of the photographs taken by red light cameras. Six of the seven local governments in our sample acknowledged that they have used or would use the photographs for purposes other than enforcing red light violations, such as investigating unrelated crimes. According to our legal counsel, a literal reading of the statute prohibits use of the photographs for purposes other than to prosecute motorists for running red lights. However, several jurisdictions believe that other laws, as well as the California Constitution, would permit the use of red light photographs as evidence in a criminal prosecution. According

to our legal counsel, in view of these conflicting interpretations of the law, the courts will ultimately decide whether local governments are violating the red light camera law when using the photographs in criminal investigations.

Although it does not mandate such action, the Federal Highway Administration (FHWA) recommends that local governments install red light cameras at hazardous intersections to improve traffic safety most effectively. Traffic safety appeared to be a significant factor in the choice for most sites for red light cameras; however, we found that Los Angeles, Sacramento, Oxnard, and San Diego placed cameras at some intersections that did not appear to have problems with red light violations based on accident statistics. In addition, four local governments acknowledged that they avoided placing cameras at state-owned intersections with high accident rates. Fremont, Long Beach, and San Diego anticipated that obtaining permission from the State would delay their programs, while Los Angeles did not consider state-owned intersections for its program. The FHWA also suggests that, before placing cameras, local governments determine whether an intersection has engineering shortcomings that should be addressed to curb the high number of motorists running red lights. San Francisco alone performed an engineering review of intersections before installing red light cameras, and the other local governments conducted engineering reviews less formally.

LOCAL GOVERNMENTS HAVE BEEN CHALLENGED ON THEIR CONTROL OF RED LIGHT CAMERA PROGRAMS

Several local governments have been taken to court by alleged red light violators who claim that the local governments are not operating their red light camera programs as required under the law. Although the law stipulates that only a government agency, in cooperation with a law enforcement agency, can operate a program, it offers no further explanation or definition of what *operate* means, leaving the term open to interpretation. Because local governments contract out the bulk of services for these programs, private sector vendors inevitably play an important role. However, if municipalities delegate too much responsibility, they run the risk of their program being perceived as vendor controlled.

In fact, a 2001 lawsuit brought against the city of San Diego alleged that it was not operating its red light camera program as intended by law. In ruling on the allegation, the court relied

on a precedent case unrelated to red light cameras, as well as *Webster's Dictionary*, for guidance in defining what *operate* means. The court ruled that the city had no involvement with, or supervision over, the ongoing operation of the program and concluded that the city exhibited a lack of oversight. The court also found that the vendor entirely conducted the installation, calibration, and maintenance of the camera equipment and that the city did not even inspect the construction once it was completed. One of the key pieces of evidence illustrating the city's lack of control was that the vendor had moved detection loops for the camera system at three intersections without the city's knowledge or approval. Because of these concerns, the court ruled that San Diego's actions did not satisfy the plain meaning of the word *operate* and therefore the city did not comply with the law. Also, because the vendor was essentially operating the program and being paid on a contingency basis, the court found a potential conflict, which further undermined the trustworthiness of evidence used to prosecute red light violations. Because of the court's ruling, approximately 250 citations were ultimately dismissed.

One court ruled that the city of San Diego had no involvement with, or supervision over, the ongoing operation of its program and therefore it was not in compliance with the law.

San Diego has appealed the ruling, arguing that in spite of the question of who operates the program, the photographs show evidence of red light violations so the citations should not be dismissed. The appeal had not been decided as of June 2002. Because of concerns about the program, San Diego suspended its red light camera operations in June 2001 and has not restarted the program as of July 2002.

Beverly Hills was the subject of a lawsuit filed in 2000 alleging concerns over program operations similar to those in the San Diego case, but there the court ruled in favor of Beverly Hills. In the ruling, the court concluded that the city operates the program regardless of the tasks the vendor performs. After stating that contracting out does not violate the mandate of the law and that, as a practical matter, it is infeasible for a local government to implement a red light camera program on its own, the court identified specific pieces of evidence that indicated the city does operate its program. The specific items mentioned by the court included that the city determines the location of detection loops, the timing and phasing of the traffic signal lights, the delay period between the light turning red and the taking of the photograph, and the minimum speed a vehicle must be traveling to trip the system.

San Francisco is in the early stages of defending itself against a similar lawsuit over the operation of its program. The primary complaint is that San Francisco plays only a minor part in the process of issuing citations, and that the vendor's assigned functions effectively place it in control of the program. Additional complaints are that the red light camera system constitutes a speed trap, infringes on accused drivers' rights against self-incrimination, and violates the drivers' and passengers' right to privacy. As of June 2002, the lawsuit is still awaiting trial.

LOCAL GOVERNMENTS MUST MORE RIGOROUSLY SUPERVISE VENDORS TO RETAIN PROGRAM CONTROL

Because vendors providing red light camera services receive a fee for each paid citation, local government oversight is critical.

Despite the legal requirement that a government agency operate a red light camera program and the successful legal challenge against San Diego previously noted, the local governments we visited do not exercise enough oversight of their vendors. Vendors have different objectives for red light camera programs than local governments do. The local governments we visited employ red light cameras to improve traffic safety, but vendors provide the services to make a profit. There is nothing wrong with vendors making a profit from their activities; however, because most local governments pay a fee for each red light citation paid, vendors have an inherent interest in maximizing the number of citations issued by red light cameras, and the perception could exist that vendors manipulate the systems to issue more citations. In addition, red light camera programs involve reviewing confidential data about individuals—motorists' names, addresses, and photographs—another reason why local government oversight is critical.

Oversight can consist of several elements to monitor and control vendor activities. For example, the local government could make periodic site visits to review the vendor's operations to determine compliance with state law and adherence to contract terms and conditions. We also believe that oversight should include requiring the vendor to follow specific instructions—known as business rules—for screening violations, establishing controls to ensure that the vendor mails only properly authorized and approved citations, making key decisions such as how long the vendor will retain records, and making periodic inspections of red light camera intersections to ensure that they are working properly and have not been modified by the vendor without approval. Elements of this type of supervision existed

in each of the local governments we visited, but at the outset of our review none of them exhibited all the oversight elements we believe are needed to avoid legal challenge. Table 1 shows the elements of the process, along with each local government's adherence to each element.

TABLE 1

Local Governments Employ Too Few Elements of Oversight

Elements	Fremont	Long Beach	Los Angeles	Oxnard	Sacramento	San Diego	San Francisco
Conduct at least one oversight visit to vendor's facility	✓	✓			✓		
Furnish business rules to vendor	✓	✓		✓	✓		✓
Use controls to monitor whether vendors mail unauthorized or unapproved citations	✓	✓					
Include a specific contract provision making the misuse of photographs a breach of contract		✓*					✓
Include a general contract provision that ensures confidential records are kept confidential	✓	✓			✓		✓
Limit the time vendors can keep confidential records relating to unenforced violations		✓*					
Periodically conduct technical inspections of red light camera intersections		✓			✓		

Note: A check mark indicates that the local government has sufficient oversight.

* During our fieldwork, Long Beach took steps to amend the contract with its vendor to address these oversight elements.

Three Local Governments Made Oversight Visits to Their Vendors

Among the seven local governments we reviewed, three had made visits to the vendor's facilities to oversee the vendor's activities. As noted previously, vendors perform several key activities at their facilities, including screening all violations photographed, storing confidential data, and mailing citations. Periodic site visits allow the local government to observe how the vendor conducts these activities, the security features that protect access to the facilities, the handling and storage of

confidential data, and how closely the vendor follows contract terms and conditions. In addition, a visit can provide a presence to remind the vendor, and the public, that the local government is in charge of the program. To be efficient and useful, the local government should structure oversight visits to review key concerns and share the results with the vendor so that any problems can be promptly addressed.

As of June 2002, four of the seven vendors we reviewed had not conducted oversight visits and the remaining three did so only once.

The three local governments that actually conducted oversight visits at their vendors' facilities did so only once. In the first instance, two officers from the Sacramento City Police Department made an unscheduled visit in April 2002 and concluded that the vendor's employees and facilities appeared to comply with all applicable laws. However, the officers did observe that the negatives for all photographs taken in Sacramento during 1999 were stored in a cardboard box within a secured room rather than being locked in a safe as the city's contract requires. The vendor explained that the safe was full and that the negatives were temporarily being stored elsewhere. In addition, the officers noted that film development was outsourced to another company, and they were concerned that photographs could be reprinted without authorization. The vendor indicated that it was currently negotiating a confidentiality agreement with the film development company and that the contract would include economic sanctions for any violations.

In the second instance, the manager of the Fremont red light camera program and a captain from the Fremont Police Department visited the vendor's facility in April 2001 but did not document the results of the visit. After our inquiry, the program manager did document the visit, noting that the facility was very well organized and that they had observed no problems with the vendor's compliance with the law or with the city's contract. Finally in June 2002, a sergeant from the Long Beach Police Department visited its vendor's Rhode Island processing facility. The sergeant found that security procedures were appropriate and noted no problems with the vendor's compliance with the law or the city's contract. While the three cities indicate they are planning to conduct future oversight visits, they could not tell us when these visits would occur.

The other four local governments in our sample have conducted no oversight visits to their vendor's facilities. Officers from the Oxnard Police Department believe that the annual training sessions on the use of the red light camera system at the vendor's

facility provide sufficient opportunity to review and tour the vendor's facility. To ensure that they understand the vendor's operations, Oxnard's police officers indicated that they ask numerous questions of vendor staff during these training sessions. Additionally, San Francisco stated that all four of its program managers initially visited the vendor's facility when they assumed their positions, but did not document these visits or what they reviewed. Although training sessions and initial visits provide a certain amount of knowledge about how the vendor conducts its business, they are not as rigorous as a visit designed to ensure that the vendor complies with the law and the local government's contract. Oxnard states it is now considering periodic visits to its vendor.

Currently, Los Angeles, San Francisco, and San Diego have regular communications with their vendors—monthly reports, telephone calls, and periodic meetings—but these actions do not replace the oversight provided by actually inspecting the vendors' facilities. However, San Diego plans to make periodic inspections of the vendor's facilities if the city restarts its program. By failing to properly inspect the vendor's facility, these local governments are missing an opportunity to gain assurance that the vendor is properly screening citations and protecting confidential data, as well as following the terms and conditions of their respective contracts.

Not All Local Governments Provide Business Rules to Their Vendors

Business rules give vendors guidance on how to conduct the red light camera programs and provide an additional level of oversight and control.

Neither Los Angeles nor San Diego furnishes business rules—guidance and instructions on conducting a red light camera program—to its vendor. The Los Angeles vendor contract indicates that the California Highway Patrol (CHP)—with which the county contracts to review and approve red light citations through four CHP offices—and the county would jointly prepare the business rules. However, neither did so, and in fact, the vendor subsequently provided its own business rules for one of the CHP offices to follow when reviewing citations. Some of these business rules appear to be in conflict with the county's policy. For example, Los Angeles indicated that it did not use a grace period—a preset time before the system activates to differentiate between vehicles attempting to stop and vehicles that clearly are running the red light—yet the vendor's business rules instruct the CHP to allow one-tenth of a second. In this instance, the vendor's actions could be construed as having more control over the program than it should have. Although San Diego did not develop business rules for its vendor, it did

give verbal instructions for the vendor to follow when reviewing violations. However, lacking formal business rules, neither of these local governments appears to have the appropriate level of control over the vendor's participation in the red light camera program.

In contrast, the other five local governments we visited did provide business rules to direct and guide their vendors' activities. Although the content of the business rules varies, their existence gives an additional level of oversight and control over these red light camera programs, and the local governments could measure the vendors' performance against these rules during oversight visits.

Most Local Governments Lack Adequate Control Over the Mailing of Red Light Citations

Vendors not only have access to all violations captured by red light cameras but also mail approved citations and receive a fee for each citation paid. Therefore, local governments should have controls in place to ensure that vendors send only citations that have been reviewed and approved and are, therefore, enforceable. However, five local governments we visited lack such controls, and two others had controls that were not as effective as they could be. Consequently, in at least one instance, a vendor mailed motorists unauthorized or unapproved citations.

Because of the absence of a key control, San Francisco's vendor mailed 1 unauthorized citation and 21 others that were either unsigned or undated.

Specifically, San Francisco learned that its vendor had mailed at least one citation that had been previously dismissed and several unapproved citations. In March 2002, a citizen informed the police officer assigned to review citations that he had received by mail a citation the officer had previously dismissed. The police department subsequently conducted a review of citations the vendor had mailed between January 2001 and March 2002. The review found that although this was the only unauthorized citation the vendor had mailed, it had also mailed 21 other citations that were authorized but a police officer had not signed or dated them, both of which are necessary for approval, and the vendor should therefore have returned them to the police department. Because the local courts review other police-written citations for proper signature, the city has asked them to reject every red light citation without an officer's signature and date. Although court review of citations may be helpful, it is the responsibility of each local government to ensure such controls are effective. Local governments without appropriate controls over the issuance of citations run the same risk.

Two local governments—Long Beach and Fremont—use computer controls that they believe prevent their vendors from mistakenly mailing unapproved citations to motorists. These systems require the officer reviewing a citation to enter a password to electronically approve it. The Long Beach system only allows authorized police officers with unique passwords to approve citations for processing. Similarly, only citations approved by Fremont personnel are eligible for processing by the vendor. But because the vendors furnished these computer systems, the possibility exists that the vendors could manipulate the computer systems to issue citations that Fremont or Long Beach had decided not to enforce.

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.

Better Oversight of Vendor Handling of Confidential Data Is Needed

San Francisco assessed its vendor a $10,000 penalty for breaching the provisions of the contract by misusing confidential red light camera photographs.

Our review found at least two instances where vendors misused photographs taken by red light cameras. In one instance, a photograph that showed a bicyclist being struck by a vehicle in San Francisco was posted in the hallway of the San Diego Police Department. When we questioned the San Francisco program manager about this photograph, he was unaware that San Diego was displaying it. He then investigated and found that the vendor had not only released the information to the San Diego Police Department but also allowed a news reporter to see the photograph. Subsequently, San Francisco notified the vendor that it had breached the contract based on the provision in the red light camera law requiring the confidentiality of all photographs. San Francisco assessed the vendor a penalty of $10,000 for the two violations and directed the vendor to cure the breach by retrieving all photographs it or its subcontractor had similarly misused. Additionally, San Francisco indicated that it would terminate the contract if the vendor failed to deliver these photographs to the program manager within 30 days or if the vendor made public any photographs in the future. San Francisco's actions seem appropriate and were aided by having a well-written contract.

In another instance, a vendor's manual for an August 2000 training session contained both photographs and personal data of motorists running red lights taken by a red light camera in Los Angeles. Attending this session were staff from localities outside the county. Although a county engineer indicates he was not aware that the vendor had used these photographs in the training manual, he believes that the law does not prohibit their use for training because only staff from other local governments attend the training session. Nevertheless, the unauthorized use of motorists' photographs, names, and addresses could be construed as a violation of the legal requirement to keep this information confidential. In addition, none of the pages in the training manual were marked as confidential. We do not believe it is necessary to include motorists' photographs, names, and addresses on citations used to illustrate training manuals and distributed to attendees of the training. Unlike San Francisco's contract, the Los Angeles contract does not have a strongly written provision to require the vendor to keep motorists' photographs and personal data confidential.

Local Governments Allow Vendors to Keep Certain Confidential Records Longer Than Needed

Although many citations containing photographs taken by red light cameras are not enforced because the motorists cannot be identified, local governments do not require vendors to destroy these records after a reasonable period. Citations that are not approved and mailed cannot be reissued or otherwise used to prosecute red light violations. Under the law, local governments must identify the violating motorist, authorize the citation, and mail it within 15 days after the violation occurred or dismiss it. As shown in Appendix A, only about 23 percent of the total violations that occurred in 2001 were enforced by the local governments we reviewed. However, for the roughly 77 percent of violations that were not enforced, the citations contain motorists' photographs and possibly their names and addresses obtained from Department of Motor Vehicles (DMV) records. The DMV indicates that any data obtained from its records should be destroyed once their legitimate use has ended. According to the DMV, legitimate use of the records means that local governments can retain DMV data as long as their use remains consistent with the original purpose for which the information was obtained. However, the DMV noted that if the local government determines that it must retain red light camera data for contractual or legal reasons, then the local government must document why retention is necessary.

Vendors are retaining a significant number of photographs, along with motorists' names and addresses, long after the time the legitimate use of this information has ended.

Our review indicated that vendors often retain the data for an unspecified period, usually from 3 to 5 years, but do not indicate why such a long retention period is necessary. Specifically, vendors are retaining a significant number of photographs well beyond the time their legitimate use has ended. For example, San Francisco was unable to identify the motorist involved in the previously mentioned photograph of a bicyclist being struck by a vehicle, indicating the citation was not enforced. Had it been instructed to promptly destroy all data relating to unenforced violations, the vendor might not have misused this photograph. It is therefore important to destroy this data as soon as it is no longer needed. Additionally, the vendor for Long Beach retains the data until its 3-year contract expires and then returns the data to the city. However, as a result of our inquiries, Long Beach has instructed its vendor to destroy all dismissed and unenforced citations within 60 days and all enforced citations after 3 years.

Ongoing Inspection of Red Light Camera Intersections Is Needed

Although periodic inspection of red light camera systems would provide assurance that they are operating properly, only Sacramento and Long Beach apply this form of oversight. The other five local governments rely on their vendors and on informal observations of police and traffic department staff to report any problems they observe during their routine duties. Periodic inspections focusing on the engineering aspects of these intersections could ensure that the red light camera systems are properly calibrated and programmed for accuracy, along with determining if any physical conditions of the intersections might cause motorists to run red lights unintentionally. The inspections could also detect if the vendor made any unauthorized changes.

Periodic inspections could provide assurance that red light camera systems are properly calibrated and programmed for accuracy, and detect if the vendor had made any unauthorized changes.

Sacramento recently began a quarterly inspection process conducted by a private engineering firm. The engineering firm inspects the red light camera systems to determine, among other things, the accuracy of the vehicle detector loops that trigger the red light cameras. This field inspection process reviews other intersection conditions that might cause a motorist to inadvertently enter the intersection on a red light, including whether actual yellow light time intervals match the city's official settings, the visibility and placement of traffic signals and the limit line, the posting of traffic speeds and regulatory signs, the pavement condition, and traffic volume. The engineering firm delivers its report, along with any recommendations, to the city's traffic engineering department, which makes the necessary changes. The first report, completed

in October 2001, noted several minor problems and indicated that although three yellow light time intervals met California Department of Transportation (Caltrans) standards, they should be lengthened to meet driver expectations. The second report was completed in February 2002 and concluded that the city had properly addressed the first report's findings and noted several new but minor problems. Both reports found that the city's red light camera system was functioning properly. This type of ongoing inspection by an outside engineering firm provides an additional level of oversight of the vendor's activities and could enhance the public's trust in the red light camera program. A local government's traffic engineering department staff could give the same level of oversight if they followed a structured review and analyzed the same features of red light camera intersections.

Long Beach believes that it has procedures in place to provide assurance that the red light camera system it uses is operating as intended. The officer in charge of the program inspects red light camera intersections each week to ensure that the video cameras, mounting poles, and warning signs are in place and undamaged. Further, the video technology that Long Beach uses allows the officer approving citations to see motorists that approach intersections and that run the red light. If the camera system was damaged or changed by the vendor, the officer would detect the problem when reviewing potential citations.

LOCAL GOVERNMENTS GENERALLY SELECTED APPROPRIATE INTERSECTIONS FOR RED LIGHT CAMERA INSTALLATIONS BUT MAY NOT HAVE ADDRESSED ENGINEERING IMPROVEMENTS FIRST

The reasons local governments gave us for using red light cameras and selecting certain intersections for camera installation were related to traffic safety concerns, which is consistent with the Legislature's intent. However, although we could verify that a legitimate traffic safety concern existed at most intersections selected, in some circumstances the accident data alone failed to justify the selection. In addition, we could not always verify that local governments addressed engineering solutions before placing red light cameras, as recommended by the FHWA. Moreover, four local governments we visited avoided installing red light cameras at dangerous state-owned

intersections. Fremont, Long Beach, and San Diego anticipated that the Caltrans permitting process would delay their programs. Los Angeles indicated it did not consider state-owned intersections in its selection process.

Traffic Safety Concerns Controlled Most Intersection Selections

Most red light camera intersections were identified either by CHP or local accident data as being dangerous, which is consistent with the Legislature's intent to enhance traffic safety.

The local governments we visited selected most red light camera intersections because they had been identified as dangerous either by CHP data or by local accident data. This motivation is consistent with the Legislature's intent in approving the use of red light cameras—that the programs enhance traffic safety. In most cases, the local governments also cited additional factors, both quantitative and nonquantitative, as influential in the decision. In some cases, even where the statistical accident data may not have been particularly compelling, police and traffic engineers provided additional information about the decision to place a red light camera that indicated a reasonable relationship to traffic safety. Table 2 on the following page shows the various criteria local governments used—both data and judgment based—when selecting intersections for red light camera installations.

Local governments generally selected intersections using these criteria, often in combination, which is consistent with the FHWA suggestion that camera systems be placed at intersections that pose high risks for both crashes and violations resulting from running red lights. The extent of available data differed among the local governments we visited, as did the combination of criteria used to select intersections and the extent to which the local governments were influenced by particular factors.

However, we noted several instances where the final site selection may have differed from the criteria that initially guided the process. For example, in 1998, the Los Angeles County Department of Public Works Traffic and Lighting Division (traffic division), which manages the county's red light camera program, ranked the 25 most dangerous intersections based on the number of accidents caused by vehicles running red lights in combination with traffic volume and broadside accidents of all causes occurring between fiscal years 1995–96 and 1997–98. In an effort to widely distribute the camera systems across the county, the

TABLE 2

Local Governments Used Varying Criteria to Select Intersections for Red Light Camera Enforcement

Selection Criterion	Fremont	Long Beach	Los Angeles	Oxnard	Sacramento	San Diego	San Francisco
Based on data							
Accidents from motorists running red lights	✓		✓	✓	✓	✓	✓
Broadside accidents			✓				
Total accidents		✓					✓
Violations from motorists running red lights					✓	✓	✓
Traffic volume	✓		✓		✓		
Costs associated with accidents	✓						✓
Increased revenue			✓				
Based on the judgment of local government staff							
Safety of police during traffic enforcement	✓						
Technical suitability of an intersection for a red light camera system		✓		✓	✓		✓
Negative perceptions of Caltrans' permitting process	✓	✓	✓			✓	
Recent or planned intersection improvements							✓
Informal input from police, community members, and city or county representatives	✓	✓	✓	✓	✓	✓	✓
Concerns over sufficient police capacity for traffic enforcement	✓	✓			✓		
Geographic distribution		✓	✓		✓	✓	✓
Expected "spillover effects" at other intersections	✓						
Funding source							✓

Source: Internal reports and data provided by local governments that they used when selecting intersections for red light camera installations.

traffic division initially selected the most dangerous intersection from each supervisory district for the county's pilot program of five cameras. However, one intersection was considered for a different camera technology, but the traffic division decided not to use that technology. As a result, the fifth camera, slated for the most dangerous intersection in one district, was not installed at that time.

A year later, the traffic division decided to install red light cameras at a fifth intersection, citing several reasons for selecting the site in its April 2000 staff status report. It reported that it based this decision on the number of accidents caused by vehicles running red lights, the number of broadside accidents, and the potential for increased revenue. However, the traffic division has been unable to provide us with any data to support these reasons other than a potential annual increase in revenue of $300,000. Further, data we obtained from the CHP covering calendar years 1995 through 1999 show that only 6 accidents attributable to vehicles running red lights occurred at this intersection compared with a range of 16 to 30 accidents occurring at the county's other red light camera intersections during the same period. Thus, in terms of accidents, this intersection does not appear to be as dangerous.

San Diego, Sacramento, and Oxnard placed cameras at some intersections that did not appear to have traffic safety problems based strictly on accident data.

Although San Diego, Sacramento, and Oxnard used traffic safety data—accidents, violations, or traffic volume—to select intersections for placing red light cameras, for several intersections selected, we found that both their criteria and accident data from the CHP did not establish that a traffic safety problem existed. For example, 5 of the 19 intersections that San Diego selected were not among the most dangerous based on the accident data we analyzed. Similarly, we found that 3 of the 11 intersections in Sacramento and 1 of the 11 intersections in Oxnard did not appear overly dangerous based on accident data. According to a sergeant that helped set up the San Diego program, the police department used police officer and community input along with older accident data to select that city's intersections, even though the number of accidents were minimal in the period immediately before the start of the red light camera program. A one-day video survey conducted by Sacramento's vendor showed that all 3 intersections had a high number of red light violations. Finally, Oxnard did not provide additional data to document their selection process but indicated that the city approached site selection with a desire to place camera systems in locations that would provide coverage to the entire city, thereby discouraging motorists from running red lights at all intersections.

Although Some Changes Were Ongoing, Local Governments Did Not Always Address Recommended Engineering Improvements Immediately Before Installing Red Light Cameras

Our review of the site selection processes used by the local governments we visited found evidence of ongoing engineering improvements at problem intersections, but we could not always determine whether local governments addressed these shortcomings before installing the cameras. The FHWA recommends that before installing a red light camera system, traffic engineers review the engineering aspects of the potential sites to determine whether the problem of vehicles running red lights could be mitigated by engineering changes or improvements. In addition, Caltrans recommends a number of engineering measures when upgrading an intersection.

Possible Engineering Measures to Reduce Red Light Violations

- Use or increase an all-red interval to clear the intersection.
- Increase the yellow light time interval to allow for adequate stop time.
- Improve signal visibility by installing mast arms or additional signal lights.
- Improve the visibility of signal lights by using larger lamps or replacing incandescent lamps with light-emitting diodes.
- Use warning signs to alert motorists of an upcoming traffic signal.
- Adjust the posted speed limit to reflect prevailing speeds.
- Install vehicle detector devices further from the intersection to improve traffic flow.
- Repaint or add stripes or pavement markings.

Sources: The Federal Highway Administration, California Department of Transportation, and Transportation Research Board.

To varying degrees, all the local governments we visited showed evidence of conducting some type of traffic safety analysis, usually on an ongoing basis, and implementing some level of engineering improvements at dangerous intersections. For example, at all red light camera intersections, five of the local governments we visited employed an all-red clearance interval—a period in which the signal lights are red in every direction for up to two seconds to allow traffic to clear. Los Angeles and Sacramento used all-red clearance intervals on some but not all their red light camera intersections.

San Francisco best demonstrated that it made engineering improvements before installing red light cameras. Early in its pilot program in late 1996, San Francisco's traffic department, which manages the red light program, considered different options to mitigate red light violations. Convinced that some engineering measures were promising and others could actually exacerbate the problem, the traffic department recommended pursuing a camera program as another tool to address red light violations. We were able to determine that San Francisco made engineering improvements before installing red light cameras at intersections. For example, San Francisco added an all-red clearance interval, installed larger signal lights or mast arms, redesigned the intersection, or suggested additional engineering analysis of the problem. Documents provided by San Francisco

not only revealed the engineering efforts taken to address the problem but also illustrated that engineering improvements need not be applied with a one-size-fits-all approach but can be done incrementally based on the characteristics of a particular intersection.

San Diego's process of implementing engineering solutions is similar to San Francisco's, except it is not explicitly linked with red light camera deployment. San Diego's annual accident review process identifies intersections with high accident rates resulting from all causes. Where a high accident rate is indicated, the intersection becomes the focus of further analysis that ultimately leads to proposals to address the problem. The recommended engineering measures vary, depending on the specific characteristics of the intersection, accident patterns and rates, and what measures may have been previously implemented.

Except for San Francisco, we could not tell if other local governments' intersections received engineering improvements before the installation of red light cameras.

Similarly, the other local governments conducted their engineering improvements on a more informal and ongoing basis and, as in San Diego, we could not always tell if intersections chosen for red light cameras received engineering improvements before cameras were installed. For example, according to city representatives, Fremont and Oxnard conduct informal engineering analyses of intersections that come to the attention of police or traffic engineers. The extent to which engineering improvements were considered before placing red light cameras was described by traffic engineers from both cities as an ongoing process not linked to red light camera placement. With the exception of Oxnard adding an all-red clearance interval to two intersections with high accident rates, we could not determine the extent to which those local governments had formally analyzed the intersections with high accident rates to make specific engineering changes before installing red light cameras.

Traffic engineers from some of the local governments indicated to us that although the engineering improvements may reduce accidents, they might not necessarily deter motorists from running red lights, particularly motorists who do so deliberately. Some traffic engineers we spoke with believe that motorists will simply adjust their driving behavior to longer yellow light time intervals or all-red clearance intervals, thereby possibly perpetuating the problem. Some engineers also contend that engineering tools alone have a limited effect on reducing accidents and red light violations, particularly when motorists are deliberately running red lights, and that enhanced enforcement combined with improvements to intersections is probably a more effective approach.

To Avoid Installation Delays, Some Local Governments Bypassed State-Owned Intersections With High Accident Rates

Local governments face the likelihood that some intersections with high incidences of red light accidents and violations are state owned. Caltrans allows red light cameras at state-owned intersections but requires an encroachment permit for construction. The time it takes to obtain an encroachment permit—which grants the local government access to a state right-of-way for construction—was viewed differently among the local governments we visited.

Fremont and Long Beach avoided including state-owned intersections in their red light camera programs because they anticipated that the Caltrans permitting process would be too cumbersome and would unnecessarily delay the start of their programs. In addition, San Diego stated that Caltrans was unwilling to allow red light cameras on state-owned intersections, but the city could not provide evidence of Caltrans' refusal. Also, Los Angeles did not consider state-owned intersections for its program. By avoiding state-owned intersections, these local governments failed to place cameras at some of the most dangerous intersections within their jurisdictions. Long Beach, for example, excluded several high-accident intersections from its initial site selection process. In its 1998 accident analysis, which the city used as the basis for its site selection process, three of the top ten high-accident intersections are state owned, yet the city chose not to place any of its camera systems at those locations. Despite avoiding state-owned intersections, however, Long Beach ultimately chose three other intersections from among the top ten intersections in terms of collisions for its red light camera program. Because the program was a pilot in Long Beach, the city chose to only consider city intersections in its selection process.

The Fremont Police Department's 1999 report that recommended the intersections to receive red light cameras identified three of the top five intersections in terms of collisions as state-owned. However, the city's traffic-engineering department recommended against selecting these sites because of the additional permits and other steps involved. Fremont thus excluded these intersections from consideration for site selection despite their high accident numbers. The Fremont Police Department indicated that it plans to include the state-owned intersections when and if its program expands beyond its current size.

Other local governments we visited did not necessarily view the Caltrans permitting process as a hurdle. For example, it took Sacramento nine months to obtain a Caltrans encroachment permit for installing the camera at one intersection, but Sacramento felt that this time delay was acceptable. Currently, three of the city's red light cameras are installed at state-owned intersections, and four additional installations at state-owned intersections are in the design or construction phase. At the outset of its program in 1997, Oxnard identified several state-owned intersections with high accident rates and obtained a Caltrans encroachment permit to install camera systems at four of these locations. Although San Francisco does not currently have red light cameras at any state-owned intersections, its traffic engineers indicate that it has a good working relationship with Caltrans. In fact, Caltrans is embarking on its own red light camera effort targeting five intersections near the Golden Gate Bridge that will eventually be turned over to San Francisco. Caltrans will finance the construction, and San Francisco will assume the operation and maintenance responsibility.

According to a Caltrans official, the encroachment permit process and related inspections can take five months or longer, but generally the turnaround time is about 60 days. However, the official acknowledged that each Caltrans district office may experience a learning curve due to the additional technology involved in the red light camera systems. Caltrans is working with the district offices to expedite the process.

Local Governments Generally Required Vendors to Follow Municipal Permit and Engineering Standards When Installing Red Light Cameras

Local governments use local standards to ensure that changes to traffic infrastructure achieve an expected level of quality and do not conflict with existing traffic control systems.

Six of the seven local governments we visited required vendors to follow local permit and engineering standards to ensure proper construction and inspection of red light camera systems; San Diego used a different and less rigorous approach. Local standards may include issuing the proper permits to perform the work, reviewing engineering drawings and plans for the suitability of the work proposed, and inspecting the finished work for accuracy and adherence to the plans and local construction requirements. Local governments use these standards to ensure that any changes to their traffic infrastructure achieve an expected level of quality and do not conflict with existing traffic control systems.

Of the governments we visited, San Diego was the only one that chose not to apply its local permitting and engineering standards to red light camera intersections. The San Diego Police Department hired a consulting firm specializing in transportation planning and traffic engineering to conduct an audit of the city's program three months after the program was suspended. The consulting firm found that the plans for adding red light cameras to intersections were not prepared by a registered civil or electrical engineer and that the construction was not subject to the city's formal plan check, permitting, and inspection procedures. According to a senior traffic engineer, the city believed that the nature of the red light camera system construction work did not necessitate the more formal review process the city normally used for development projects. Consequently, the city gave only verbal approval of the plans to the vendor. In addition, the vendor obtained only traffic control permits rather than the city's standard construction permits. Once construction was complete, the city did not conduct detailed inspections of the intersections for adherence to the engineering plans, nor did it prepare as-built plans to illustrate the actual construction work. According to the senior traffic engineer, city inspectors viewed the red light camera infrastructure as too technical and essentially relied on the vendor to properly perform the construction. The consulting firm found that at all red light camera intersections, the placement of the camera systems did not correspond with the intersection improvement plans, especially the vehicle detection loops, which are used to measure a vehicle's speed and time into the red light. However, the consulting firm concluded that the possible errors resulting from the misplacement of the detection loops would not be significant enough to cause the system to issue citations in error.

San Francisco exhibited the most rigorous permitting and engineering standards in installing its red light cameras.

We found the most rigorous permitting and engineering standards and processes in San Francisco. Registered engineers developed and reviewed construction plans, two different city departments reviewed and signed the plans, the city conducted an inspection during the site construction process, and the vendor prepared as-built drawings reflecting the actual construction of the intersections. San Francisco maintains files for each of its red light camera intersections to allow for ready access to the engineering records. Although the level of documentation varied, the remaining cities we visited generally followed similar practices to ensure that the vendors properly constructed the red light camera systems.

MOST LOCAL GOVERNMENTS BELIEVE PHOTOGRAPHS CAN BE USED FOR OTHER LAW ENFORCEMENT PURPOSES

Most of the local governments we visited believe they can use photographs captured by red light cameras for purposes other than to prosecute red light violations, though only four have done so. According to state law, such photographs are to be used only for enforcing compliance with traffic signals. Our legal counsel has advised that a literal read of the statute would limit the use of photographs for those purposes. Nonetheless, several local law enforcement jurisdictions have asserted that other legal principles permit the use of the photographs in other criminal investigations.

Of the seven local governments we visited, only San Francisco specifically disallows the use of photographs for purposes other than to prosecute red light violations. According to a deputy city attorney, San Francisco believes that the law prohibits the use of the photographs for any purpose beyond prosecuting motorists for running red lights. She indicated that the city has refused requests for the release of photographs. Of the six remaining local governments, four have used the photographs for other law enforcement purposes, and two others believe it would be appropriate to do so. For example, the Sacramento Police Department acknowledged that when a red light camera violation occurs in concert with a more serious crime—such as a carjacking with a homicide, a hit-and-run accident, armed robbery, or suspects fleeing a burglary—it used the photographs to investigate those crimes. According to the lieutenant in charge of the program, law enforcement officers believe they have an obligation under the law to provide the best evidence when other crimes are incidental to red light camera violations, and they would be derelict in their duties to withhold evidence that might either identify or exclude the identity of a suspect involved in another crime. The San Diego Police Department also used a photograph of a motorist caught running a red light to determine whether the same motorist was involved in a hit-and-run accident at an intersection not equipped with a red light camera. The police failed to identify the motorist to determine if he caused the accident, but they used the photograph to verify the extent of vehicle damage. Finally, Los Angeles used a photograph as evidence to convict a motorist of a hit-and-run felony, and Oxnard used a photograph to identify a suspect in a stolen car case.

Although the remaining local governments, Fremont and Long Beach, have not used their photographs for reasons other than to issue traffic violations, they do not see a problem in releasing them for other law enforcement purposes. A police captain in Fremont whom we spoke to believes that the photographs are available for other law enforcement uses. Additionally, the Long Beach city prosecutor's office believes that another section of the law supercedes the confidentiality provision in the red light camera law and that red light video clips can be used for other law enforcement purposes.

As noted previously, the six local governments that have or would use the photographs for other purposes indicated that they would only do so in criminal investigations. For example, in response to our inquiry, Oxnard obtained a legal opinion from the Ventura County district attorney (district attorney). The district attorney concluded that the Vehicle Code limits the use of the photographs for purposes other than enforcement of traffic signal laws. It based this conclusion on the legislative history of the law, which showed that the Legislature added the confidentiality requirement for the photographs to protect the privacy of motorists. Nonetheless, the district attorney advised that the California Constitution—which provides that relevant evidence shall not be excluded in any criminal proceeding—would permit the admission of the photographs as evidence in criminal proceedings. Other jurisdictions also believe that the courts would permit prosecutors to use traffic enforcement photographs that provide material evidence that an accused person has committed a crime. Our legal counsel advised that, if district attorneys believe that these photographs are admissible in criminal proceedings as evidence, criminal defense lawyers might similarly assert that photographs, which provide evidence that an accused person did not commit a crime, are also relevant and admissible evidence.

The Ventura County district attorney concluded that the Vehicle Code limits the use of the photographs to traffic signal enforcement, but believes that the California Constitution would permit their admission as evidence in criminal proceedings.

According to our legal counsel, the use of red light camera photographs in criminal investigations and proceedings conflicts with a literal reading of the law, which expressly makes the photographs confidential, expressly limits their use to red light traffic violations, and expressly states that the photographs may not be used for any other purpose. In view of that language, it is clear that the Legislature intended local governments would not use the photographs for other purposes. In addition, the

According to our legal counsel, the final decision over whether the red light camera photographs are admissible as evidence in criminal cases will likely be decided in court.

use of those photographs in criminal investigations might raise additional legal issues, such as whether that use infringes on individual privacy rights. Nonetheless, our legal counsel advised that in view of the strongly held belief by some jurisdictions that competing provisions in the law and the California Constitution permit the use of the photographs in criminal proceedings, the final decision regarding whether the photographs are admissible as evidence will likely be decided in a legal challenge. The local governments we interviewed, however, had not yet reached a point where the issue could be brought before a judge.

The provision of the California Constitution cited by the district attorney as permitting the introduction of all relevant evidence in a criminal proceeding also provides that, with a two-thirds vote of its members, the Legislature can specifically exclude certain evidence from criminal proceedings, and according to our legal counsel, this would likely include photographs related to traffic signal enforcement. If the Legislature is concerned that the district attorney's view of the California Constitution is inconsistent with the Legislature's intended use of the photographs, it should consider obtaining further legal advice on the likelihood of that view prevailing in court. Moreover, the Legislature may wish to consider amending the law by a two-thirds vote to expressly state that the photographs cannot be used as evidence in criminal proceedings.

LOCAL GOVERNMENTS GENERALLY COMPLIED WITH OTHER LEGAL REQUIREMENTS

The local governments we visited comply with the other legal requirements related to red light camera programs. The law requires that local governments follow certain steps when implementing their programs. Although we found some differences in how the requirements were met, all seven programs we observed comply with the California Vehicle Code, as shown in Table 3 on the following page.

Several cities decided to place the red light camera warning signs at major entrance points rather than at intersections. They did so in the belief that this approach would enhance the deterrent effect of red light cameras across the entire jurisdiction rather

TABLE 3

Red Light Camera Programs Comply With All Legal Requirements

Legal Requirement	Fremont	Long Beach	Los Angeles	Oxnard	Sacramento	San Diego	San Francisco
Place warning signs at one of these sites:							
• Intersections		✓	✓		✓		
• Major city or county entrances	✓			✓	✓	✓	✓
Issue public notice before start of program	✓	✓	✓	✓	✓	✓	✓
Issue warning citations for the first 30 days of the program	✓	✓	✓	✓	✓	✓	✓
Sworn officers or qualified personnel approve all citations	✓	✓	✓	✓	✓	✓	✓
City council or county board of supervisors conduct a public hearing before entering a contract	✓	✓	✓	✓	✓	✓	✓

Note: A check mark indicates the local government complied with the legal requirement.

than just at specific intersections. Although California law gives local governments the option of placing warning signs only at major entrances, the language of the law defines major entrances as, at a minimum, freeways, bridges, and state highway routes, leaving some discretion to the local government.

The decision to place warning signs at major entrances, therefore, carries with it a potential risk that a local government may not adequately identify all its major entrances and might not inspect the locations on a routine basis to ensure that the signs remain in place as required by law. In fact, an appeal of a red light citation regarding Sacramento's placement of warning signs at major entrances resulted in a December 1999 ruling by a traffic court commissioner that the city had failed to install warning signs in full compliance with the law. The city decided to dismiss approximately 700 citations as a result of the ruling. In response, Sacramento added warning signs at each of its red light camera intersections. Fremont places warning signs at city entrances but indicates that its risk of a similar legal challenge is minimal because it has only 38 entrances and it placed signs at each one.

By placing warning signs only at major entrances to their cities, San Francisco, Fremont, and Oxnard run the risk that their citations could be challenged because they failed to identify all major entrances.

San Francisco also chose to place warning signs at its entrance points but only recently inspected the locations to ensure that the signs were still in place. This inspection, which took place in July 2001, determined that signs at 5 of 49 locations were missing, prompting an immediate effort to replace them. The other local governments that placed warning signs at entrance points—Fremont and Oxnard—indicated that they do not have a policy to inspect them on a regular basis but do inspect them as they would any other traffic signs within their jurisdiction. However, these practices range from an occasional police officer driving by a sign location to routine checks performed by city personnel who may notice signs are missing. Such inspections create the potential that signs are missing for extended periods and leave the local governments open for legal challenges over inadequate warning.

Although all the local governments we visited complied with the public notice requirements of the California Vehicle Code, we noted that only San Francisco's red light camera program is fully integrated into a jurisdiction-wide traffic safety improvement program. The San Francisco Department of Parking and Traffic's Livable Streets program consists of traffic calming, pedestrian safety, school area safety, and red light camera enforcement. The program is designed to increase motorists' awareness and change their behavior through a combination of engineering, education, and enforcement. The Livable Streets program itself is tied to the San Francisco Department of Public Health's Stop Red Light Running program, which began in 1995. Public notice regarding the use of red light cameras is an ongoing process in San Francisco and focuses on a multitude of traffic safety issues and programs.

NO STANDARD EXISTS FOR CONTRACTS BETWEEN VENDORS AND LOCAL GOVERNMENTS

Despite contracting for relatively the same services, the local governments we visited have varying provisions in their contracts with red light camera vendors. Table 4 on the following page shows the variations in certain key provisions. Most notably, only two local governments have strong provisions in their contracts with vendors to protect the confidentiality of motorists' personal data. According to their agreements with the DMV, for vendors to access motorists' personal data, they must be authorized by the local governments to apply for access through the DMV. The DMV requires the vendor to take steps necessary to ensure the

confidentiality of the DMV information they receive. However, it is the local governments' responsibility to ensure that vendors maintain the confidentiality of the information they have access to. Long Beach has confidentiality provisions to protect an alleged violator's personal DMV information, and San Francisco has a provision securing the confidentiality of the photographs its vendor collects. As previously discussed, San Francisco was able to impose penalties against its vendor for breaching the contract regarding this provision. The other five local governments have either a general provision or none to ensure confidentiality of DMV information or photographs taken by their respective vendors.

TABLE 4

Contracts Between Local Governments and Vendors Seldom Contain All Critical Provisions

Provision	Fremont	Long Beach	Los Angeles	Oxnard	Sacramento	San Diego	San Francisco
Requires that the vendor protect the confidentiality of photographs		✓*					✓
Requires that the vendor protect the confidentiality of DMV information		✓					
Stipulates how long the vendor should retain information related to unenforced citations		✓*					
Requires that the vendor seek permission before making any modifications to the red light camera intersections	✓	✓					✓

Note: A check mark indicates that the provision exists in the contract.

* During our fieldwork, Long Beach took steps to amend the contract with its vendor to include these provisions.

Moreover, local governments pay their vendors different amounts despite contracting for similar services. Generally, the vendor's scope of services includes installing the camera system, providing red light camera system training to local government staff, maintaining and servicing the system, and performing the initial review and processing of citations. However, although different local governments might receive the same vendor services, the differences in the sizes of their programs and their abilities to negotiate contracts could explain the differences in compensation amounts that we observed. Of

the jurisdictions we visited, San Francisco and Los Angeles pay a flat fee along with a fee based on each citation paid. To remove any perception that vendors might be tempted to increase the volume of citations to increase their compensation, Sacramento hopes to negotiate a flat fee with its vendor. When we inquired about how the local governments had negotiated the amount their respective vendor receives as compensation, most indicated that their main concern was simply to negotiate the best deal possible for the program.

ALTHOUGH CALTRANS GUIDANCE RELATED TO YELLOW LIGHT TIME INTERVALS COULD BE MORE SPECIFIC, WE FOUND NO EVIDENCE OF LOCAL GOVERNMENTS SHORTENING THE INTERVAL TO INCREASE VIOLATIONS

With few exceptions, the local governments we visited complied with a new law requiring that the minimum yellow light time interval at intersections with red light cameras meet the standards established by Caltrans. The change was effective January 1, 2002, and was prompted by the Legislature's concern that yellow light time intervals at such intersections may be shorter than Caltrans' standards, thereby creating the need for a uniform minimum standard at red light camera intersections.

Caltrans Standards for Yellow Light Time Intervals

Approach speed (miles per hour)	Yellow light time interval (seconds)
25 or less	3.0
30	3.2
35	3.6
40	3.9
45	4.3
50	4.7
55	5.0

Source: Caltrans traffic manual.

Caltrans Guidance to Local Governments Related to Yellow Light Time Intervals Could Be More Specific

Caltrans standards use the speed of the approaching traffic to determine the appropriate time interval for a yellow light. The faster a vehicle travels, the longer the distance it takes to stop, making it necessary to increase yellow light time intervals for higher speeds. However, the Caltrans traffic manual does not specify how traffic engineers are to determine the speed of the approaching traffic. Two primary methods can be used to establish traffic speed: using the posted speed limit or surveying the traffic speed.

The chief of the Caltrans Office of Electrical Systems acknowledges that the traffic manual does not specify the method to use for determining yellow light time intervals. The chief indicated that it is very common to determine the yellow light time

interval using the posted speed limit, but cautions that traffic engineers should exercise judgment to accommodate the traffic and intersection needs. The chief further stated that traffic engineers can request a survey of traffic speed if they are concerned that a considerable difference exists between the posted speed limit and the prevailing speed of traffic, or if an intersection has a history of accidents or characteristics in the roadway that cause changes in traffic speed before or after the intersection. From the survey, traffic engineers determine the maximum speed that 85 percent of the motorists are traveling—commonly referred to as the 85th percentile—and compare it to the posted speed. Often a speed survey shows that most traffic is driving faster than the posted speed. In these circumstances, the chief stated, traffic engineers should use the higher speed for determining the minimum yellow light time interval. If necessary, traffic engineers should then use engineering judgment to determine whether to increase minimum time intervals to account for other factors—such as the slope of the road—that might affect a motorist's ability to stop safely at an intersection. Although the chief's explanations are not published in the Caltrans traffic manual, she has provided this guidance to at least one local government that asked for clarification of how to comply with the new yellow light time interval law.

While there are two methods for establishing the traffic speed to use in determining yellow light time intervals, a Caltrans official acknowledged that its traffic manual does not specify when either must be used.

Most Local Governments Comply With the New Yellow Light Time Interval Law

We determined whether local governments in our sample complied with the law using either posted speeds or speed survey results. Specifically, we evaluated whether each approach equipped with a red light camera complied with Caltrans' standards. As shown in Table 5, the yellow light time intervals for most approaches at intersections equipped with red light cameras meet or exceed Caltrans' standards using posted speeds. However, when using the actual traffic speed, some of the yellow light time intervals were too short.

As the table shows, using either the posted speed or speed survey method, Los Angeles and Fremont did not comply with the new law as of January 1, 2002. The city of Los Angeles, which has the responsibility for maintaining the intersection of Wilshire and Sepulveda on behalf of Los Angeles County, reported that as of June 2002, the yellow light time intervals for the

TABLE 5

Most Approaches Equipped With Red Light Cameras Met Caltrans Minimum Standards for Yellow Light Time Intervals

Local Government	Approaches Complying With the Standard/Total Approaches	
	Using the Posted Speed	Using the 85th Percentile per the Speed Survey
Fremont	6/7	4/7
Long Beach	12/12	4/12
Los Angeles	12/14	12/14
Oxnard	11/11	5/11
Sacramento*	15/15	12/15
San Diego	19/19	18/19
San Francisco	31/31	3/3†

Source: Signal timing sheets provided by the traffic engineers of the local governments we visited, as of January 2002.

* We did not test the time interval for one approach because the red light camera was only operational for one month during our fieldwork due to road construction.

† Most of San Francisco's intersections had posted speeds of 25 miles per hour and its policy is to not obtain speed surveys for these intersections.

two approaches at this intersection that did not meet Caltrans' standards have been extended to comply with the law based on speed survey results. Similarly, in March 2002, Fremont lowered the posted speed at the intersection of Fremont and Paseo Padre to conform to a speed survey. According to the speed survey, most of the traffic was traveling more slowly than the original posted speed; thus, lowering the posted speed was justified. By lowering the posted speed, the interval time met Caltrans' standards. However, Los Angeles and Fremont both risk legal challenges to the red light citations issued at these intersections during the period when yellow light time intervals did not conform to Caltrans' standards. In addition, because the Caltrans traffic manual does not specify which of the two methods to follow, local governments that do not meet Caltrans standards using both posted speeds and speed survey results run the risk that their yellow light time intervals may be legally challenged.

No Evidence Exists That Local Governments Have Manipulated Yellow Light Time Intervals to Increase Red Light Violations

We found that in most instances, local governments kept yellow light intervals the same or increased them before and after installing red light cameras.

We reviewed the history of yellow light time interval changes for the period immediately before red light cameras were installed in the respective jurisdictions through April 2002 and found that in most instances, local governments kept yellow light time intervals the same or increased them. Some critics of red light cameras believe that local governments reduce yellow light time intervals at intersections after installing red light cameras to cause motorists to unintentionally run red lights and create a situation similar to a speed trap. Consequently, local governments—and the vendors—benefit financially by issuing more citations, the critics claim. However, our analysis found no evidence of any manipulation of yellow light time intervals by the local governments we visited. Six of the local governments were able to provide us with signal change documents evidencing changes in yellow light time intervals. Oxnard retained only a copy of the most recent signal change documents and did not retain evidence of past time interval changes. However, a traffic engineer from Oxnard stated that yellow light time intervals have not decreased since the installation of red light cameras.

According to a senior traffic engineer, San Diego shortened the yellow light time intervals for two intersections several months before installing red light cameras for reasons unrelated to the program. For the intersection of Mission Bay Drive and Grand Avenue—which is an unusual gradual left turn rather than the more common 90-degree left turn—the city traffic engineers set the yellow light time interval for the turn at 4 seconds in April 1998, recognizing that a longer interval was necessary to accommodate the higher speed driven through this gradual left turn. However, in September 1999, after completing construction unrelated to the red light camera program, the engineers mistakenly shortened the time interval to the standard 3 seconds the city uses for its 90-degree left turns. Red light camera enforcement at this particular intersection began in May 2000, and according to the traffic engineer, almost immediately the yellow light time interval became the subject of controversy. In response to the public's concerns, the city lengthened the time interval in July 2000 to the current time of 4.7 seconds, and the number of red light violations dropped by nearly 88 percent. In its ruling on a lawsuit against the city, the court reviewed the evidence supporting this timing change and recognized that the shortening of the time interval

was apparently attributable to a mistake the city made before automated enforcement began at this intersection and it was subsequently corrected. We found no evidence to the contrary.

San Diego also shortened the yellow light time interval at the intersection of Mira Mesa and Scranton. In March 1999, as part of a citywide timing adjustment to a national engineering group's standard for setting yellow light time intervals, the city lowered the time interval at this intersection from 5 seconds to 3.9 seconds. The new time interval was based on a February 1995 speed survey, which showed the 85th percentile speed was 40 miles per hour. However, in adjusting the yellow interval time, city traffic engineers did not observe that the posted speed was 45 miles per hour, which would suggest a time interval of 4.3 seconds. In retrospect, a senior traffic engineer believes that the city should have either based the new interval on the posted speed or not lowered the yellow light time interval. Red light camera enforcement began in April 2000. In November 2000, after receiving complaints from motorists, the interval was increased to correspond to the posted speed.

Long Beach shortened the yellow light time intervals from 4 seconds to 3.9 seconds for two approaches at one intersection because the posted speed was 40 miles per hour and the city's traffic engineering department believed the law change required it to exactly match the Caltrans intervals. Long Beach shortened the time intervals at the two approaches in November 2001, the month the city began issuing red light camera citations. After our inquiry about the changes, the city reset the interval times at the two approaches to their original time of 4 seconds because it wanted to remove any concern of impropriety about the red light camera program.

Percentage of Citations Occurring Within One Second of the Red Light

Fremont*	88%
Long Beach	84
Los Angeles	86
Oxnard	73
Sacramento	82
San Diego	57
San Francisco	72

Source: Vendor data since the inception of each program. However, San Francisco is 2001 data only.

* Fremont data are for violations captured by red light cameras rather than citations issued.

A SIGNIFICANT NUMBER OF RED LIGHT VIOLATIONS OCCUR WITHIN ONE SECOND OF THE LIGHT TURNING RED

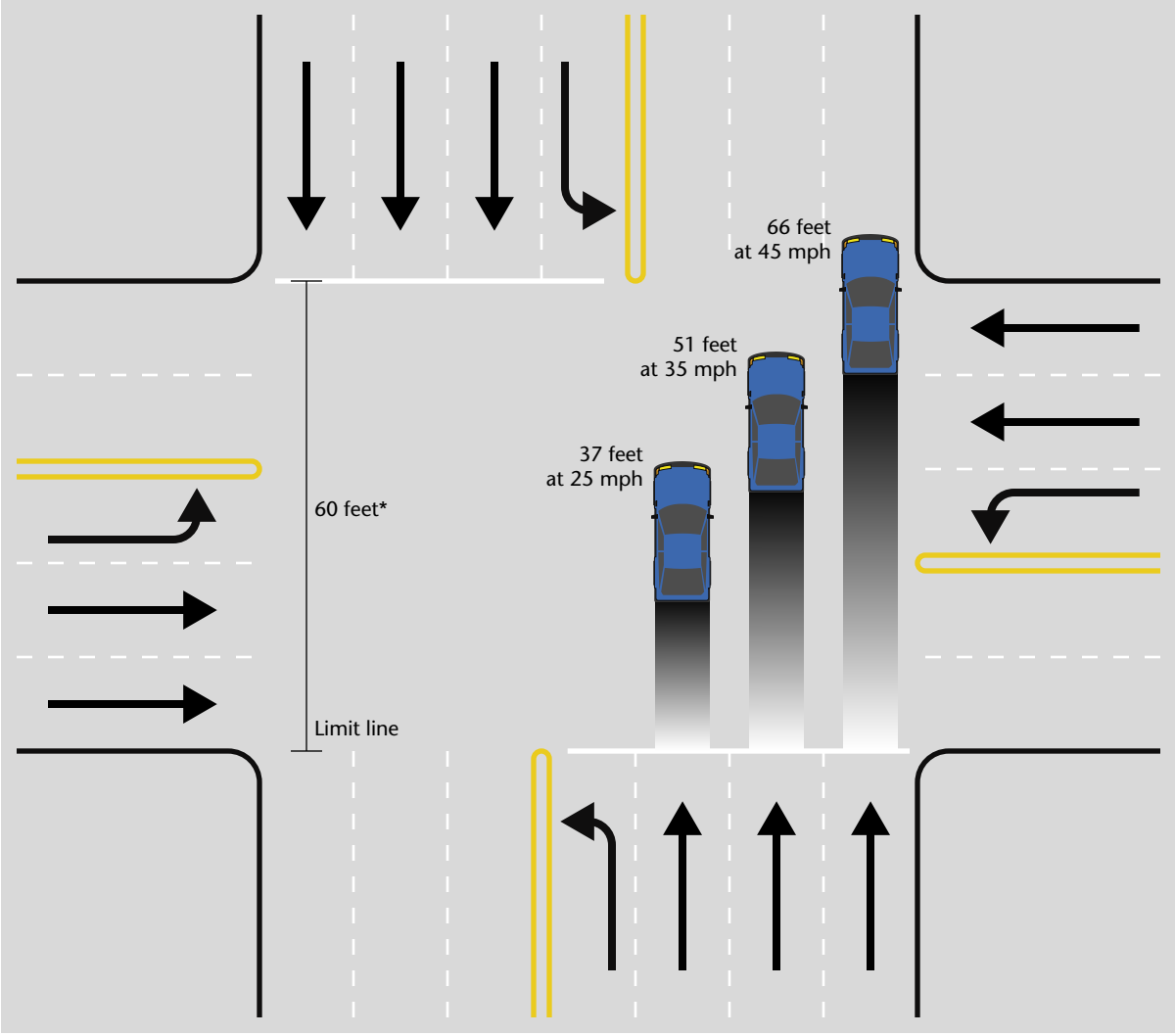
We were asked to obtain information to determine the percentage of violations occurring within one second of a light turning red. Because this is specific information the vendors collect, we obtained it directly from the three vendors that contract with the seven local governments we visited. The vendors' information shows that

a significant percentage of the issued citations are for red light violations that occur within one second of the light turning red.

As shown in Figure 3, vehicles can travel significant distances within a second of the light turning red. Depending on their speed, all the vehicles depicted in the figure would be in or through the intersection when the signal changed to green for the other direction of traffic.

FIGURE 3

Vehicles Can Travel Significant Distances in One Second



* Based on Caltrans minimum lane width of 12 feet.

It is important to keep in mind that the yellow light phase is meant to warn motorists that the light will soon be turning red and that standards exist to ensure that local governments establish yellow light time intervals that provide an adequate time for motorists to react. Although the law does not mandate them to do so, five of the seven local governments we visited employ grace periods of up to five-tenths of a second before their red light cameras will begin taking photographs. A grace period is a preset time interval after a light turns red that is used to differentiate between vehicles attempting to stop or turn right on a red light and vehicles that are clearly running the light. The FHWA indicates that a grace period of three-tenths of a second is commonly used and that five-tenths of a second is the international standard. During the grace period, red light cameras do not take photographs of vehicles that enter the intersection. Thus, a motorist illegally entering the intersection after the light has turned red will not receive a citation during the grace period, although a police officer, if present, could still choose to give chase and issue a citation, because the motorist has broken the law.

RECOMMENDATIONS

Local governments should take the following actions to ensure that they comply with state laws for the use of red light cameras, maintain control over their programs, and minimize the risk of legal challenges:

- Conduct more rigorous oversight of vendors by making periodic visits to review their operations and develop business rules for vendors to follow when screening violations.

- Specify periods for destroying confidential information relating to unenforced red light citations.

- Reconcile citations authorized and approved for enforcement with citations the vendor mails, and promptly follow up on any differences so that only authorized and approved citations are mailed.

To ensure that local governments maintain control and operate their red light camera programs, the Legislature should consider clarifying the law to define the tasks that a local government must perform to operate a red light camera program and the tasks that can be delegated to a vendor.

Because a potential conflict exists between the confidentiality provision in the Vehicle Code and the California Constitution regarding the admissibility of evidence, the Legislature should consider clarifying the Vehicle Code to state whether photographs taken by red light cameras can be used for other law enforcement purposes.

To respect the privacy of motorists whose photographs are taken by red light cameras, local governments should strengthen the language within their contracts with vendors to include explicit wording to protect the confidentiality of photographs and information obtained from the DMV database.

Before installing red light cameras, local governments should first consider whether engineering measures, such as improving signal light visibility or using warning signs to alert motorists of an upcoming traffic signal, would improve traffic safety and be more effective in addressing red light violations.

To focus on traffic safety and avoid overlooking high-accident locations that are state owned when considering where to place red light cameras, local governments should diligently pursue the required Caltrans permitting process, even though it may cause some delays to their programs.

To ensure that intersections are constructed and cameras are installed as planned, local governments should follow their own permit processes by reviewing the as-built plans and inspecting the intersection after construction. Also, to help maintain the integrity and accuracy of their systems, local governments should conduct periodic inspections of red light camera intersections and consider contracting with independent engineering firms to conduct technical reviews of the camera settings and system calibrations.

To avoid the risk of legal challenges, local governments should petition Caltrans to clarify its traffic manual to explain when local governments should use either posted speeds or the results from speed surveys to establish yellow light time intervals at intersections equipped with red light cameras. ■

CHAPTER 2

Red Light Cameras Improve Traffic Safety While Generating Little Additional Revenues for Most Local Governments

CHAPTER SUMMARY

Despite operational concerns about red light camera programs, our review of available data on accidents caused by vehicles running red lights shows that after the introduction of cameras, the number of accidents related to this type of violation usually declined. Based on our analysis of accident data from January 1995 through September 2001, the average number of accidents per month caused by motorists running red lights declined by 10 percent statewide for all local governments combined that use red light cameras compared to no change in the number of accidents in those communities without red light camera programs.

Throughout their jurisdictions, the number of red light accidents decreased between 3 percent and 21 percent after implementation of red light cameras for five of the local governments we visited but increased by 5 percent in a sixth; accident data for the seventh local government was not available for the period that it used red light cameras. Additionally, based on the four months of data that we were able to obtain, after San Diego suspended the use of red light cameras in June 2001, accidents caused by red light violations increased citywide by 14 percent and by 30 percent at the intersections where red light cameras had been operating.

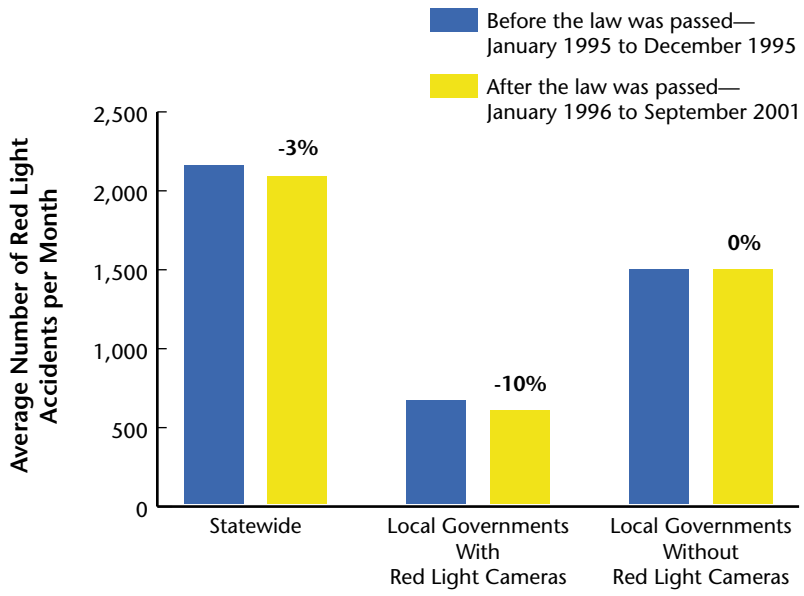
Finally, we found that the red light camera programs are not revenue enhancing for most of the local governments we visited and that most programs operate on a break-even basis or at a slight deficit. Only San Diego and Oxnard have generated significant revenues in excess of expenditures. For those two programs, Oxnard has dedicated its net revenue to support the costs of school crossing guards, and San Diego's revenue remains in the city's general fund.

AFTER INTRODUCING RED LIGHT CAMERAS, FIVE LOCAL GOVERNMENTS SAW THE NUMBER OF RELATED ACCIDENTS FALL

Although other factors can influence monthly accident rates, red light camera technology seems to be effective in reducing accidents. As one measure of the effectiveness of these programs, we considered the effect red light cameras had on reducing accidents caused by motorists running red lights. We took a three-level approach in our analysis, considering statewide red light accident rates, red light accident rates in cities or counties that use cameras, and red light accident rates at intersections equipped with cameras. Our analysis, which produced similar results to other accident studies, focused on the change in the average number of accidents per month. It showed that the number of accidents related to motorists running red lights decreased after local governments implemented red light camera programs.

FIGURE 4

Red Light Cameras Reduced the Number of Accidents Statewide and Locally



Source: Bureau of State Audits analysis of data from the Statewide Integrated Traffic Records System maintained by the California Highway Patrol.

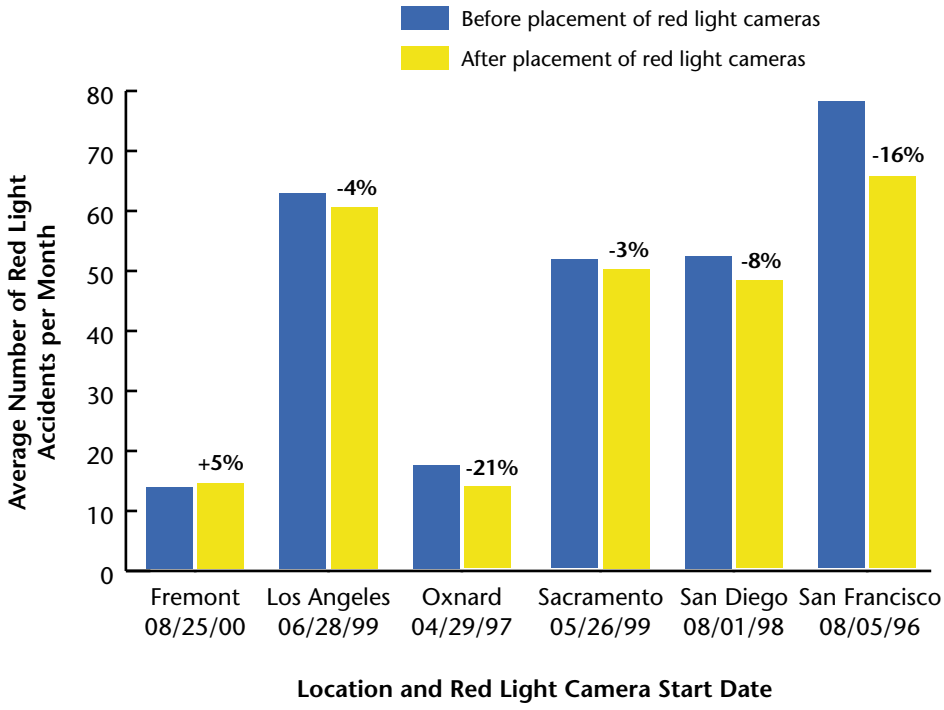
The Number of Accidents Dropped for Local Governments That Introduced Red Light Cameras

Our analysis indicates that for local governments that use red light cameras, the technology seems to be effective in reducing accidents caused by motorists who run red lights. For example, red light accident rates decreased statewide after January 1, 1996, the effective date of the red light camera law. As indicated in Figure 4, after the law was passed, related accidents decreased 3 percent statewide, attributable at least in part to those local governments that currently use red light cameras.

We also analyzed the specific red light accident rates of the local governments in our sample and found that accidents throughout those jurisdictions had generally decreased. As shown in Figure 5, five of the local governments experienced a decline in their monthly average number of red light accidents, ranging from 3 percent to more than 21 percent. Reductions appeared greatest for local governments that have had red light cameras in place the longest.

FIGURE 5

Local Governments Experienced Significant Reductions in Accidents After Implementing Red Light Camera Programs



Source: Bureau of State Audits analysis of data from the Statewide Integrated Traffic Records System, maintained by the California Highway Patrol. The analysis covers the period from January 1995 through September 2001, except for San Diego, which suspended its program on June 1, 2001.

We noted factors other than the length of time San Francisco has operated its red light camera program that probably contributed to the decline in the number of its red light accidents. Part of San Francisco's approach to this problem is to also have its police aggressively issue citations to motorists who run red lights. In 1997, the first full year for automated traffic enforcement, we observed that the San Francisco Police Department also issued a large number of officer-generated red light citations in addition to the citations issued by the camera program. San Francisco has also employed an ongoing awareness program to educate the public about the dangers of running red lights.

Fremont, which began its red light camera program in late August 2000, actually experienced almost a 5 percent increase in the average number of red light accidents per month. Fremont explained that a disproportionate increase in the volume of traffic occurred in the same year the red light cameras became operational, but did not provide us with an analysis of traffic volume data to substantiate the claim that this caused the higher accident rate. Long Beach began its program in October 2001, one month after the September 2001 cutoff of the accident data we obtained for our analysis.

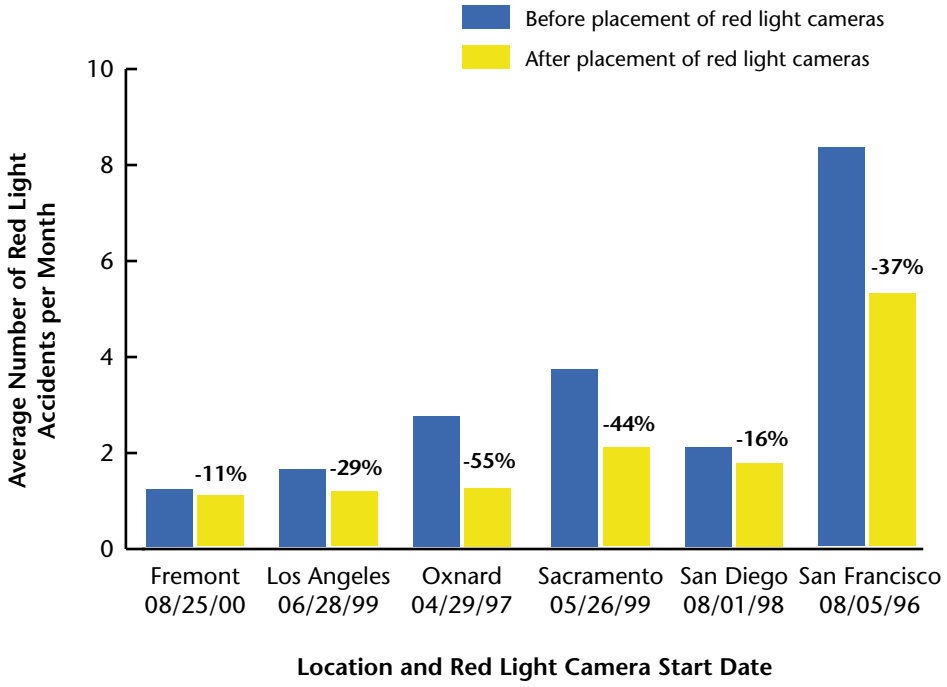
In Most Instances, Accidents Decreased Substantially at Intersections With Red Light Cameras

For local governments we visited, we analyzed the combined average number of red light accidents that occurred before and after the start of the program at all intersections with red light cameras. Many of the decreases were much more dramatic than the community-wide or statewide decreases already discussed. As shown in Figure 6, reductions in red light accidents at the relevant intersections ranged from almost 11 percent in Fremont to more than 55 percent in Oxnard.

We also looked at San Diego's rate of accidents caused by motorists running red lights after it suspended its program in June 2001 (not shown in Figure 6). Based on the four months of available data, red light accidents increased by 14 percent citywide and by 30 percent for intersections where the city had been using red light cameras.

FIGURE 6

Red Light Accident Rates Fell More Dramatically at Intersections With Cameras



Source: Bureau of State Audits analysis of data from the Statewide Integrated Traffic Records System maintained by the California Highway Patrol. The analysis covers the period from January 1995 through September 2001, except for San Diego, which suspended its program on June 1, 2001.

The implementation of the red light camera program may have had a spillover benefit in most of the local government jurisdictions we reviewed. Accidents attributable to red light violations also decreased at intersections without red light cameras in four of the six communities whose data we analyzed. Specifically, red light accident rates at intersections without cameras fell by 3 percent in Los Angeles, 8 percent in San Diego, and 14 percent in Oxnard and San Francisco. In contrast, at intersections without cameras, the red light accident rate for Sacramento was unchanged and for Fremont it increased 7 percent.

In Appendix D we display the average number of accidents per month before and after the installation of red light cameras at specific intersections of the local governments in our sample. The appendix shows that red light accident rates at individual intersections both decreased and increased during the time studied.

Other Accident Studies Show Similar Results

Similar to our analysis, two national studies found that red light accidents and violations decreased after the introduction of red light camera programs.

We reviewed two national studies from the Federal Highway Administration (FHWA), and similar to our analysis, they showed that red light accidents and violations decreased after the initiation of red light camera programs. One of the studies, published in September 1999, evaluated the accident data of five local governments across the country.[1] Two participants in the study—Howard County, Maryland, and Polk County, Florida—experienced a reduction in the overall number of red light accidents in the year after red light cameras were deployed compared to the statistics for the year before deployment. In Polk County, accidents decreased countywide by 7 percent from 1995 to 1996, but statewide accidents increased 4 percent during the same period. One year after the program began in Howard County, red light accidents had decreased 10 percent at one of its intersections and 46 percent at the other.

The other study, published in August 2001, gathered statistics from numerous sources, such as interviews with local transportation agencies and periodicals, and concluded that violations for running red lights decreased after the placement of red light cameras.[2] Reductions in violations ranged from 20 percent to 87 percent, with half the jurisdictions represented in the study reporting reductions of between 40 percent and 62 percent. These studies indicate that both red light violations and accidents decrease after red light cameras are installed.

Most of the local governments we visited also conducted their own studies to determine whether red light accidents decreased since beginning their programs. Because different local governments used different data or applied different analyses, we conducted our own analysis to provide a more consistent comparison. Although their methodologies and data varied, these local governments' studies reached similar conclusions to ours—that red light accidents decrease when red light cameras are employed. See Appendix C for a discussion of these studies.

[1] *Synthesis and Evaluation of Red Light Running Automated Enforcement in the United States*, Federal Highway Administration, September 1999.

[2] *Automated Enforcement of Traffic Signals: A Literature Review*, Federal Highway Administration, August 2001.

MOST LOCAL GOVERNMENT RED LIGHT CAMERA PROGRAMS OPERATE AT THE BREAK-EVEN POINT OR AT A SLIGHT LOSS

Most of the local governments we visited did not receive significant net revenues from their red light camera programs. According to their cost accounting records or other cost data they provided, some of which were based on estimates, three of the seven local governments we visited are operating with a cumulative deficit, as shown in Table 6. Only San Diego and Oxnard have generated significant cumulative net revenues from their red light camera programs. Long Beach has only been operating its red light camera program since October 2001 and has not accumulated enough data for us to determine the relationship between costs and revenue. Regardless, all seven local governments maintain that whether or not their programs provide any net revenue, they are achieving their main goal, which is to promote traffic safety.

TABLE 6

Few Red Light Camera Programs Make Money

	Fremont August 2000	Los Angeles June 1999	Oxnard April 1997	Sacramento May 1999	San Diego August 1998	San Francisco August 1996
Cumulative revenue	$360,000	$1,963,000	$578,000	$1,822,000	$8,205,000	$2,947,000
Cumulative vendor payments	(275,000)	(2,157,000)	(97,000)	(1,709,000)	(3,834,000)	(2,747,000)
Cumulative program expenditures	(80,000)	(102,000)	(73,000)	(266,000)	(3,246,000)	(1,183,000)
Cumulative net revenue (deficit)	**$ 5,000**	**$ (296,000)**	**$408,000**	**$ (153,000)**	**$1,125,000**	**$ (983,000)**

Source: Accounting reports and other financial data provided by the local governments we visited.

Note: In Appendix E, we show the same information broken down by fiscal year. The amounts in this table are totals for each local government from their respective program start dates through December 31, 2001, rounded to the nearest thousand. The red light camera program for Long Beach started in October 2001; therefore, revenue and expenditure data were limited. As a result, we did not include Long Beach in this analysis.

Accounting for Program Revenues and Expenditures Is Weak

Although good internal control practices dictate proper accounting for revenues and expenditures, only Fremont can fully account for the revenue and expenditures of its red light camera program. Because each local government pays their respective vendor based on the number of red light citations that motorists' pay, it would be prudent for them to properly

account for program revenues. Additionally, we found that only Fremont and Long Beach conduct monthly reconciliations of their vendors' invoices with the courts' payment records (where traffic citations are paid) to ensure that they are paying their vendors the appropriate amount.

Only Fremont and Long Beach reconcile vendors' invoices to ensure that they are paying the correct amount.

The remaining five local governments rely solely on vendors' invoices and are unable to conduct reconciliations with the citations the courts show have been paid. For example, according to a city auditor report, the San Diego Police Department (police department) was unable to substantiate the amount that the vendor billed the city because the local courts were not differentiating between information on the revenue from its red light camera program and the revenue received from other types of traffic citations. San Diego asked its city auditors to review the vendor payments made from the start of the red light camera program through May 2001 to determine if the city had paid the vendor the correct amount. The auditors found that the vendor had overbilled the city by more than $78,000, and the police department reduced subsequent payments to the vendor to correct for the overpayment. To provide better control over future payments to the vendor, the police department persuaded the local courts to separately account for revenues from red light camera citations.

In addition to being unable to accurately account for revenues, three of the local governments we visited do not properly account for the expenditures of their red light camera programs. San Diego, San Francisco, and Oxnard could only provide us with estimates for some of their program costs. For example, they calculated personnel costs by estimating the percentage of time that staff spent on the program. San Diego's expenditures—which were the highest of all local governments we visited—included estimated costs of nearly $1.4 million. These estimates included the budgeted cost of six officers on light duty and a sergeant who were dedicated to the program for fiscal years 1997–98 and 1998–99, the daily overtime for two officers who attended court hearings, one full-time city attorney who prosecuted contested citations, and an estimated direct cost amount representing between 10 percent and 20 percent of the time of specific management employees—a lieutenant, captain, assistant police chief, and three fiscal employees—for every fiscal year of the program. These estimated costs also included overhead rates for the police department, city attorney's office, and citywide administration. Because these costs were not based on a cost accounting system that required employees to charge their time to separate cost codes, we could not verify their accuracy.

San Francisco estimated some of its program's personnel time and does not track the cost related to the police department's staff that review and approve citations. Expenditure estimating is less of a problem in Oxnard because less than the equivalent of one full-time officer's cost is dedicated to the red light camera program. Without an accurate method of accounting for program expenditures, these local governments cannot accurately determine the cost-effectiveness of their programs and ensure that local resources are used appropriately.

As indicated in Table 6, four of the six local governments now break even or operate at a deficit. Only Oxnard and San Diego have generated significant revenues from their respective programs. Oxnard dedicates its net revenues to support the costs of school crossing guards, and San Diego's revenues go to its general fund.

Vendor Fees and Administrative Costs Differ Significantly

The fees and fee structures that local governments pay their vendors differ significantly, even though the vendors provide basically the same services. As shown in Table 7 on the following page, Oxnard pays the lowest fee, with the vendor receiving $25 per citation, while Fremont pays its vendor $106. San Francisco and Los Angeles also pay their vendors a flat fee to cover certain costs. Sacramento intends to switch to a flat fee to pay its vendor. These variances may be due to the relative size differences among the programs and each local government's negotiating ability.

The variances in the amounts local governments pay their vendors may be due to the size of the program and the local government's negotiating ability.

The advantage of paying a fee for each paid citation is that the local government does not have to pay a large amount all at once. The downside of this method is that increasing profits by maximizing the number of citations issued might become an incentive for vendors—and create a poor perception of the red light camera program by the public. Conversely, paying the vendor a flat fee removes any incentive to maximize the number of citations issued to bolster profits but makes the local government susceptible to the risk that, should the number of citations issued decrease, it would not receive enough revenue to pay the vendor.

To determine how cost-effective each local government is in administering its red light camera program, we calculated the administrative cost to issue each citation based on the number of citations issued from the start of the program. Local governments incur administrative costs, for items such as police officers'

and traffic engineers' time, to operate their programs. Table 7 also shows how administrative costs varied substantially among the local governments. San Diego had the highest administrative cost at about $39 per citation, and Los Angeles had the lowest at about $5 per citation. As previously mentioned, San Diego included more administrative costs in its red light camera program than did any other local government we visited. We did not attempt to analyze why the administrative costs varied.

TABLE 7

Red Light Camera Fees and Costs for Calendar Year 2001 Varied Substantially

	Fremont	Long Beach	Los Angeles	Oxnard	Sacramento	San Diego	San Francisco
Fee structure for vendor compensation:							
• Fixed monthly fee	N/A	N/A	$56,000	N/A	N/A	N/A	$79,000*
• Per citation paid fee	$106	$97	35	$25	$87	$70	48.50
Total fee paid per citation	106	97	113	25	87	70	106
Administrative cost per citation†	20	N/A	5	7	8	39	31

Source: Accounting reports and other financial data provided by the local governments we visited.

N/A: Not applicable.

* San Francisco's fixed monthly fee increased to approximately $79,000 in August 2001 from $61,000 because it began leasing six additional red light cameras.

† The administrative cost per citation is equal to the local government's cumulative program expenditures divided by the total number of citations issued since the start of each respective program. The red light camera program for Long Beach started in October 2001 and has not accumulated enough data for us to determine the relationship between costs and revenues.

RECOMMENDATION

To allow for better accountability over red light camera programs and to ensure that vendors are paid appropriately, local governments should improve their methods of tracking revenues and expenditures related to their programs.

We conducted this review under the authority vested in the California State Auditor by Section 8543 et seq. of the California Government Code and according to generally accepted government auditing standards. We limited our review to those areas specified in the audit scope section of this report.

Respectfully submitted,

ELAINE M. HOWLE
State Auditor

Date: July 23, 2002

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APPENDIX A

Reasons Local Governments Do Not Enforce Many Red Light Violations

Local governments enforce only a small percentage of the total violations recorded at red light camera intersections for several reasons. For example, if a driver or license plate cannot be positively identified, the violation is considered unenforceable. Of the total number of violations that red light cameras capture, the seven local governments we visited eventually enforced only 23 percent in 2001, as shown in Table A.1. State law requires that for local governments to enforce a red light camera violation, the photograph must clearly show the license plate and the driver of the vehicle. Local governments have found that obtaining clear photographs is difficult at times and that this difficulty has prevented them from enforcing a large percentage of red light camera violations.

Before a local government issues any citations, its vendor initially screens out unenforceable violations based on several criteria. A vendor might reject violations due to controllable factors, such as a malfunctioning camera that produces photographs that are out of frame or images that are too dark to identify. The vendor can control these factors by later making the necessary adjustments to the equipment. Other factors that might cause a vendor to screen out violations are uncontrollable, such as a vehicle without a front license plate, making the identification of the violator impossible. For economic reasons, many local governments have chosen a red light camera system that can only photograph a front plate, and the absence of the front license plate prevents the processing of many potential citations. Some factors that vendors use in screening violations are determined at the discretion of each local government. Termed business rules, these discretionary factors include instances when the gender or age of the person photographed does not appear to match that of the registered owner. The vendor also screens out photographs when it is clear that no violation occurred. This might happen if a vehicle makes a sudden stop, triggers the camera, but does not proceed across the intersection.

TABLE A.1

Vendors and Local Governments Did Not Enforce Violations for Various Reasons

Calendar Year 2001	Fremont	Long Beach	Los Angeles	Oxnard	Sacramento	San Diego*	San Francisco	Totals	Percentage of Total Potential Violations
Total potential violations	9,275	514	38,251	2,800	55,544	44,918	84,006	235,308	
Less: Photographs showing no violation			19,827	318	25,121	8,644	28,873	82,783	35.2%
Total violations captured	9,275	514	18,424	2,482	30,423	36,274	55,133	152,525	
Citations not issued due to discretionary factors:									
Emergency vehicle		2	710		421		2,244		
Moratorium on program in San Diego						565			
Out-of-state or country plate	35	4	344	27	270	190	1,898		
Vendor unable to match the DMV records to vehicle photographed	326	9	1,454	45	246	1,179	3,624		
U-turn or multiple vehicles					6		1		
Gender match failure	3	22			60	1,404	2,115		
Vehicle match failure			43		38		12		
Total not issued due to discretionary factors	364	37	2,551	72	1,041	3,338	9,894	17,297	7.4%
Citations not issued for uncontrollable factors:									
Car, driver, or front plate obstructed	1,089	211	893	94	2,518	5,372	4,709		
Glare on plate or plate damaged		16	48	9	106	133	178		
No front plate or temporary plate	257	12	3,267	279	3,736	5,891	8,388		
Weather or nature	12								
Windshield glare	1,058		244	15	409	672	3,717		
Yellow with red light[†]	459								
Other		104	631		51	379	1,639		
Total not issued due to uncontrollable factors	2,875	343	5,083	397	6,820	12,447	18,631	46,596	19.8%
Citations not issued due to controllable factors:									
Vehicle cabin too dark to identify driver			197	28	1,067	1,112	6,244		
Camera malfunction and exposure	1,885		127	46	340	112	323		

TABLE A.1 CONTINUED

Calendar Year 2001	Fremont	Long Beach	Los Angeles	Oxnard	Sacramento	San Diego*	San Francisco	Totals	Percentage of Total Potential Violations
Poor clarity of driver or plate			1,274	153	2,291	4,230	4,063		
Data error			139	11	379	543	229		
Vendor did not mail citation within required 15-day period	177		27	65	27	5			
Poor framing of driver, plate, or vehicle		2	346	31	2,268	4,728	1,123		
Total not issued due to controllable factors	2,062	2	2,110	334	6,372	10,730	11,982	33,592	14.2%
Violations rejected by the police	23		43	31	117	41	400	655	0.3%
Total citations issued	3,951	132	8,637	1,648	16,073	9,718	14,226	54,385	23.1%
Total citations issued as a percentage of total potential violations	42.6%	25.7%	22.6%	58.9%	28.9%	21.6%	16.9%		

Source: Vendors' citation processing reports provided by the local governments we reviewed.

* The amounts shown for the city of San Diego includes data only through May 2001. The city suspended its program in June 2001.

† According to the Fremont program manager, the non-light-emitting diode signal lights previously used by the city resulted in a burning-out phase, during which both the yellow and red lights were displayed on some photographs.

After the initial screening, the vendor fills out citations and forwards them to the appropriate law enforcement agency for review and approval. At this point, the law enforcement agency may still not enforce some violations because it does not believe the photograph is clear enough to identify the driver of the vehicle if challenged in court. Table A.1 presents in more detail the key reasons violations are rejected by both vendors and law enforcement agencies and the difference between the potential violations and the number of citations issued in 2001 for the local governments we reviewed.

APPENDIX B

Local Governments That Employ Red Light Cameras as of April 2002

Local governments scattered throughout California employ red light cameras. These programs vary depending on the vendor used, the type of photographic device employed, and the number of intersections included. Table B.1 on the following page lists the local governments that currently have red light cameras installed.

Currently in California, three vendors contract with local governments to implement red light camera devices: Affiliated Computer Services, Inc. (ACS); Redflex Traffic Systems, Inc. (Redflex); and Nestor Traffic Systems, Inc. (Nestor). Each vendor uses a different type of technology that produces a different type of product: wet film, digital print, and video. ACS uses the most traditional technology, wet film. It produces a negative that must be retrieved at the intersection and then developed using conventional film development methods. In contrast, Redflex employs a digital print technology and Nestor a digital video technology; both allow the vendors to electronically download and transmit the violation data for processing.

As Table B.1 shows, the number of intersections, approaches, and cameras each local government uses varies. An intersection usually consists of two streets that cross or intersect and can therefore be approached in four different directions. Because of the traffic dynamics at any given intersection, a local government could decide to enforce one or more approaches. For example, Fremont has cameras at seven intersections but is enforcing only one approach per intersection. Conversely, Long Beach has cameras operating at three intersections and enforces all four approaches at each of those intersections.

Additionally, the local governments must decide whether the cameras installed at the intersections will remain stationary or rotate among various intersections. A camera might remain stationary because the intersection is considered hazardous. In contrast, a local government might choose to rotate its cameras for wider coverage. For example, Fremont has determined that its red light cameras should be stationary and operate continuously, but Oxnard rotates its four cameras among its 11 intersections.

TABLE B.1

Local Governments Scattered Throughout the State Employ Red Light Cameras

Local Government	Vendor*	Type of Technology Used	Date Program Went Into Operation	Number of Intersections	Number of Approaches	Number of Camera Systems†	Do Cameras Rotate?
Beverly Hills	ACS	Wet film	May 1997	3	8	8	No
Culver City	Redflex	Digital photo	February 1999	7	15	15	No
Cupertino	ACS	Wet film	July 2001	2	3	5	No
El Cajon	ACS	Wet film	August 1996	6	6	2	Yes
Fremont	Redflex	Digital photo	August 2000	7	7	7	No
City of Fresno	Nestor	Video	April 2002	2	8	8	No
Garden Grove	Redflex	Digital photo	January 2001	1	2	2	No
Indian Wells	ACS	Wet film	February 2000	3	4	4	No
Long Beach	Nestor	Video	October 2001	3	12	12	No
City of Los Angeles	ACS	Wet film	December 2000	9	18	18	No
Los Angeles County	ACS	Wet film	June 1999	5	14	10	Yes
Oxnard	ACS	Wet film	April 1997	11	11	4	Yes
Rancho Cucamonga	Nestor	Video	April 2002	1	4	4	No
City of Sacramento‡	ACS	Wet film	May 1999	11	16	10	Yes
Sacramento County‡	ACS	Wet film	April 2001	5	6	7§	No
City of San Diego¶	ACS	Wet film	August 1998	19	19	19	No
City and county of San Francisco	PRWT**	Wet film	August 1996	17	31	18	Yes
San Juan Capistrano	Redflex	Digital photo	March 2000	3	6	6	No
City of Ventura	Redflex	Digital photo	April 2001	15	16	16	No
West Hollywood	ACS	Wet film	June 1999	8	24	24	No

Source: Staff of the red light camera programs from each local government listed and also the staff from the vendors listed. These programs were in place as of April 2002.

* Affiliated Computer Services, Inc. (ACS); Redflex Traffic Systems, Inc. (Redflex); Nestor Traffic Systems, Inc. (Nestor); and PRWT, Inc. (PRWT).

† The Redflex technology uses a two-camera system per approach, and Nestor uses a three-camera system.

‡ Both the city and county of Sacramento suspended operations on April 30, 2002, to resolve certain concerns with their programs. The county restarted its program on July 1, 2002.

§ Sacramento County uses two cameras to enforce a multi-lane left turn intersection.

¶ San Diego suspended use of red light cameras in June 2001 to evaluate the program. It is included in the table because we reviewed its program during the audit.

** San Francisco contracts for services with PRWT, which in turn subcontracts with ACS to perform the majority of the citation review and processing. It chose to contract with PRWT instead of directly with ACS because U.S. Public Technologies, the original contractor, assigned the contract to PRWT.

APPENDIX C

Local Government Accident Studies

As shown in Table C.1, the results of other studies on accident reduction trends are similar to our analysis. We did not attempt to validate these studies because we were conducting our own analysis.

The Oxnard study was conducted by the Insurance Institute for Highway Safety (IIHS) in April 2001 and concluded that red light accidents decreased substantially after the placement of cameras. Using the Statewide Integrated Traffic Records System (SWITRS), the IIHS analyzed 29 months of data before and after the initiation of the red light camera operation. At intersections with traffic signals, the overall accident rate decreased in Oxnard by 7 percent, but broadside accidents, the type most associated with motorists running red lights, decreased by 32 percent. We focused on red light accidents, and our analysis shows more pronounced decreases of 21 percent for red light accidents at all intersections combined and a 55 percent decrease for only the intersections with red light cameras, which may be explained by the additional two years of data we included after the program began in Oxnard. Although the magnitude of our results may differ from the other studies, we came to the same conclusion—the number of red light collisions decreased after red light cameras were implemented.

A recent study by a consulting firm hired by the San Diego Police Department also showed a significant reduction in accidents in that city. Using more than six years of data, from April 1995 to October 2001, from San Diego's traffic engineering department, the consulting firm computed the average monthly accident rates for each year for each intersection with a red light camera. Its analysis showed a 30 percent decrease in red light accidents compared with the 16 percent reduction we found. The consulting firm conducted additional analyses of violations and rear-end accident rates and found that red light violations decreased by 20 percent to 24 percent and rear-end collisions increased 37 percent. The consulting firm hypothesized that motorists would eventually adjust to red light cameras and pay more attention to vehicles stopping in front of them. The limited data available to the consulting firm suggested that

rear-end collisions would decrease over time, but it felt more data was needed to confirm that the increased rate of rear-end collisions will not be sustained.

Sacramento, San Francisco, and Los Angeles conducted less formal internal accident studies that yielded similar reductions in red light accidents to those found in our analysis. As we did for our analysis, Sacramento and San Francisco used SWITRS data.

TABLE C.1

Our Analysis Compares Favorably With Other Local Government Accident Studies

Local Government	Name of Study	Data Used	Methodology	Period Reviewed	Results	Comparison With Bureau of State Audits Study
Oxnard	Crash Reductions Associated With Red Light Camera Enforcement in Oxnard, CA., by the Insurance Institute for Highway Safety	Statewide Integrated Traffic Records System	Regression analysis	29 months before and after the red light camera program for a total of 58 months	At signalized intersections, 7 percent decrease in all accidents and 32 percent decrease in broadside collisions.	No analysis was conducted for all types of accidents. Decreases of 21 percent for red light accidents at all intersections and 55 percent at intersections with red light cameras.
San Diego	City of San Diego Photo Enforcement System Review, by PB Farradyne, Inc.	City data	Calculated right-angle accident rates at red light camera intersections. Also analyzed violation trends and rear-end collisions.	April 1995 to October 2001	Decrease in violations of 20 percent to 24 percent. Increase in rear-end collisions of 37 percent. Decrease in red light collisions at intersections of 30 percent.	Violation and rear-end collision analysis was not conducted. Decrease of 16 percent in red light accidents at intersections with red light cameras.
Sacramento	Red Light Camera Traffic Safety Evaluation, by Sacramento City Police Department's Traffic Division	Statewide Integrated Traffic Records System and city data	Compiled yearly accident totals and found percentage change.	July 1998 to September 2001	At all red light camera intersections, 33 percent decrease in broadside collisions in the first year of the program.	Decrease of 44 percent in red light accidents at intersections with red light cameras.
San Francisco	Can We Make Red Light Runners Stop? by San Francisco Department of Parking and Traffic	Statewide Integrated Traffic Records System	Yearly red light accident totals compared to the five-year average before red light cameras.	Calendar years 1992 to 1997	Injury collisions attributable to red light running decreased 9 percent citywide in the first year.	All red light accidents decreased 16 percent citywide since the program began.
Los Angeles	Current Status and Cost Analysis Report	CHP offices	Found an accident rate by dividing the number of accidents caused by the running of red lights by intersection volume and the number of days. Computed the rates before and after deployment of red light cameras.	May 1997 to September 2001	Red light accidents decreased at three of five intersections.	Red light accidents decreased at four of five intersections.

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APPENDIX D

Accident Rates at Selected Red Light Camera Intersections

As discussed in Chapter 2, we used data from the Statewide Integrated Traffic Records System (SWITRS), produced by the California Highway Patrol (CHP), to analyze the change in average monthly accident rates throughout the State and for the local governments we visited. This appendix uses the same red light accident data but takes the analysis a step further by reviewing accident rates at each intersection with a red light camera within six of the seven local governments we reviewed. The accident data presented in this appendix represents the period from January 1, 1995, through September 30, 2001. Because red light cameras were installed on various dates for each of the local governments' respective intersections, Table D.1 on page 71 uses the operation date as the initial point when red light camera enforcement began. Finally, as noted previously, we could not perform this analysis for Long Beach because its red light camera program was implemented in October 2001, and the most recent data available from the SWITRS covers the period through September 2001.

Although the SWITRS provides a consistent source of data for making comparisons, local governments may have made errors or reported inconsistently to the CHP. When compiling accident statistics for individual intersections, we noted that different spellings and abbreviations were sometimes used for the same intersection. For example, in San Diego, one intersection that houses a red light camera is at Euclid and Imperial Avenues. However, officers sometimes wrote "North Euclid" or "South Euclid" rather than "Euclid," and at other times they wrote "Emperial" rather than "Imperial." To correctly count all the accidents that occurred at this intersection, it would be necessary to identify and correct all possible spelling errors or variations of intersection names. Although we made an effort to detect them, some of these errors might remain.

Also, the SWITRS includes all reported fatal, injury, and property damage collisions from local police and sheriff departments. However, the Vehicle Code requires local governments to report only fatal and injury accidents to the CHP; they are not required to report accidents involving just property damage.

Thus, the number of property damage accidents included in the SWITRS may be understated. However, the local governments in our sample did report accidents involving property damage. Lastly, although the CHP verifies the completeness of the data reported, it does not verify its accuracy. Thus, other data errors or inconsistencies may exist in the figures submitted by local governments.

In most cases, the average monthly rate of accidents decreased at intersections after red light cameras were installed. However, accident rates actually increased at several intersections. When interpreting this data, it is important to note that when the number of accidents at a given intersection are few, a small average monthly increase or decrease in the number of red light accidents can cause a substantial percentage change. Further, as noted previously, the SWITRS data may contain errors or be incomplete. Nonetheless, the following tables show that the accident rates generally fell after the installation of red light cameras at intersections; therefore, these cameras appear to be effective in improving traffic safety.

TABLE D.1

Change in the Average Number of Accidents per Month Before and After the Red Light Camera Program

Fremont

Location	Date Operational	Number of Accidents Before the Red Light Camera Program Began	Average Number of Accidents per Month Before the Red Light Camera Program Began*	Number of Accidents During the Red Light Camera Program	Average Number of Accidents per Month After the Red Light Camera Program Began*	Percent Difference Between Monthly Averages Before and After the Red Light Camera Program Began
Mowry Avenue at Fremont Boulevard	August 25, 2000	21	0.31	3	0.23	-27%
Mowry Avenue at Blacow Road	November 4, 2000	8	0.11	2	0.18	62
Stevenson Boulevard at Fremont Boulevard	November 4, 2000	13	0.19	2	0.18	-1
Paseo Padre Parkway at Fremont Boulevard	January 10, 2001	20	0.28	2	0.23	-16
Fremont Boulevard at Decoto Road	February 28, 2001	9	0.12	0	0.00	-100
Auto Mall Parkway at Grimmer Boulevard	March 6, 2001	4	0.05	0	0.00	-100
Fremont Boulevard at Auto Mall Parkway	May 7, 2001	9	0.12	2	0.42	253
Total of red light camera intersections	August 25, 2000	81	1.19	14	1.06	-11
Total of non-red light camera intersections	August 25, 2000	835	12.31	173	13.12	7
Total of all intersections	August 25, 2000	916	13.51	187	14.18	5%

Source: Bureau of State Audits analysis of accident data from the Statewide Integrated Traffic Records System, maintained by the California Highway Patrol covering the period from January 1, 1995, through September 30, 2001. We used the date each local government started its program to compute the total of intersections. For individual intersections, we used the date cameras began operating at each intersection.

* The numbers displayed are rounded to two decimal points, however, the calculations used the unrounded amounts.

Los Angeles County

Location	Date Operational	Number of Accidents Before the Red Light Camera Program Began	Average Number of Accidents per Month Before the Red Light Camera Program Began*	Number of Accidents During the Red Light Camera Program	Average Number of Accidents per Month After the Red Light Camera Program Began*	Percent Difference Between Monthly Averages Before and After the Red Light Camera Program Began
Arrow Highway at Glendora Avenue	June 28, 1999	16	0.30	4	0.15	-50%
Colima Road at Batson Avenue	July 28, 1999	30	0.55	8	0.31	-44
Hacienda Boulevard at La Monde Street	July 28, 1999	21	0.38	5	0.19	-50
Wilshire Boulevard at Sepulveda Boulevard	October 12, 1999	16	0.28	9	0.38	37
Whittier Boulevard at Atlantic Boulevard	August 1, 2000	8	0.12	1	0.07	-40
Total of red light camera intersections	June 28, 1999	87	1.61	31	1.14	-29
Total of non-red light camera intersections	June 28, 1999	3,282	60.91	1,602	59.06	-3
Total of all intersections	June 28, 1999	3,369	62.52	1,633	60.21	-4%

Source: Bureau of State Audits analysis of accident data from the Statewide Integrated Traffic Records System, maintained by the California Highway Patrol covering the period from January 1, 1995, through September 30, 2001. We used the date each local government started its program to compute the total of intersections. For individual intersections, we used the date cameras began operating at each intersection.

* The numbers displayed are rounded to two decimal points, however, the calculations used the unrounded amounts.

Oxnard

Location	Date Operational	Number of Accidents Before the Red Light Camera Program Began	Average Number of Accidents per Month Before the Red Light Camera Program Began*	Number of Accidents During the Red Light Camera Program	Average Number of Accidents per Month After the Red Light Camera Program Began*	Percent Difference Between Monthly Averages Before and After the Red Light Camera Program Began
Channel Island Boulevard at C Street	April 29, 1997	12	0.43	12	0.23	-47%
Gonzales Road at H Street	April 29, 1997	13	0.47	8	0.15	-68
Harbor Boulevard at Wooley Road	April 29, 1997	5	0.18	5	0.09	-47
Rice Avenue at Sturgis Road	April 29, 1997	2	0.07	5	0.09	31
Rose Avenue at Camino Del Sol	April 29, 1997	8	0.29	9	0.17	-41
Rose Avenue at Wooley Road	April 29, 1997	3	0.11	5	0.09	-12
Saviers Road at Pleasant Valley Road	April 29, 1997	5	0.18	9	0.17	-5
Ventura Boulevard at Vineyard Avenue	April 29, 1997	3	0.11	1	0.02	-82
Ventura Road at Bay Boulevard	April 29, 1997	4	0.14	4	0.08	-47
Ventura Road at Doris Avenue	April 29, 1997	12	0.43	4	0.08	-82
Channel Island Boulevard at Rose Avenue	September 17, 1997	10	0.31	2	0.04	-87
Total of red light camera intersections	April 29, 1997	76	2.72	65	1.22	-55
Total of non-red light camera intersections	April 29, 1997	405	14.51	659	12.41	-14
Total of all intersections	April 29, 1997	481	17.23	724	13.64	-21%

Source: Bureau of State Audits analysis of accident data from the Statewide Integrated Traffic Records System, maintained by the California Highway Patrol covering the period from January 1, 1995, through September 30, 2001. We used the date each local government started its program to compute the total of intersections. For individual intersections, we used the date cameras began operating at each intersection.

* The numbers displayed are rounded to two decimal points, however, the calculations used the unrounded amounts.

City of Sacramento

Location	Date Operational	Number of Accidents Before the Red Light Camera Program Began	Average Number of Accidents per Month Before the Red Light Camera Program Began*	Number of Accidents During the Red Light Camera Program	Average Number of Accidents per Month After the Red Light Camera Program Began*	Percent Difference Between Monthly Averages Before and After the Red Light Camera Program Began
Valley Hi Drive at La Mancha Way and Mack Road	May 26, 1999	33	0.63	7	0.25	-60%
El Camino Avenue at Evergreen Street	June 4, 1999	12	0.23	7	0.25	11
Howe Avenue at Fair Oaks Boulevard	June 9, 1999	27	0.51	5	0.18	-64
Mack Road at Center Parkway	December 2, 1999	7	0.12	1	0.05	-62
Exposition Boulevard at Ethan Way	December 17, 1999	15	0.25	2	0.09	-63
30th Street at Capitol Avenue	February 28, 2000	26	0.42	4	0.21	-50
Alhambra Boulevard at J Street	March 2, 2000	9	0.15	0	0.00	-100
Broadway at 21st Street	March 13, 2000	15	0.24	2	0.11	-55
W Street/US 50 at 16th Street	June 29, 2000	6	0.09	0	0.00	-100
College Town Drive at Howe Avenue	July 13, 2000	67	1.01	8	0.55	-46
Total of red light camera intersections	May 26, 1999	195	3.69	58	2.06	-44
Total of non-red light camera intersections	May 26, 1999	2,524	47.80	1,349	47.82	0
Total of all intersections	May 26, 1999	2,719	51.50	1,407	49.88	-3%

Source: Bureau of State Audits analysis of accident data from the Statewide Integrated Traffic Records System, maintained by the California Highway Patrol covering the period from January 1, 1995, through September 30, 2001. We used the date each local government started its program to compute the total of intersections. For individual intersections, we used the date cameras began operating at each intersection.

* The numbers displayed are rounded to two decimal points, however, the calculations used the unrounded amounts.

City of San Diego*

Location	Date Operational	Number of Accidents Before the Red Light Camera Program Began	Average Number of Accidents per Month Before the Red Light Camera Program Began†	Number of Accidents During the Red Light Camera Program	Average Number of Accidents per Month After the Red Light Camera Program Began†	Percent Difference Between Monthly Averages Before and After the Red Light Camera Program Began
Aero Drive at Murphy Canyon Drive	August 1, 1998	6	0.14	11	0.32	132%
Bernardo Center Drive at Rancho Bernardo Road	August 1, 1998	1	0.02	1	0.03	26
El Cajon Boulevard at 43rd Street	August 5, 1998	7	0.16	4	0.12	-27
College Avenue at Montezuma Avenue	December 7, 1998	5	0.11	2	0.07	-37
Garnet Avenue at Ingraham Street	December 7, 1998	3	0.06	2	0.07	6
Harbor Drive at 32nd Street	December 7, 1998	3	0.06	1	0.03	-47
La Jolla Village Drive at Towne Centre Drive	December 7, 1998	9	0.19	1	0.03	-82
16th Street at F Street	April 2, 1999	4	0.08	2	0.08	-2
Imperial Avenue at Euclid Avenue	April 2, 1999	6	0.12	4	0.15	31
Mira Mesa Boulevard at Black Mountain Road	April 2, 1999	5	0.10	0	0.00	-100
Harbor Drive at Grape Street	October 7, 1999	0	0.00	0	0.00	0
10th Avenue at A Street	February 24, 2000	15	0.24	4	0.26	9
Carmel Mountain Road at Rancho Carmel Drive	February 24, 2000	7	0.11	1	0.07	-42
Miramar Road at Camino Ruiz	February 24, 2000	6	0.10	1	0.07	-32
Black Mountain Road at Gemini Avenue	April 20, 2000	11	0.17	1	0.07	-57
Mira Mesa Boulevard at Scranton Road	April 20, 2000	8	0.13	0	0.00	-100
Mission Bay Drive at Garnet Avenue	May 19, 2000	10	0.15	1	0.08	-48
Mission Bay Drive at Grand Avenue	May 19, 2000	3	0.05	1	0.08	74
Mission Boulevard at Garnet Avenue	May 19, 2000	2	0.03	0	0.00	-100
Total of red light camera intersections	August 1, 1998	89	2.07	59	1.74	-16
Total of non-red light camera intersections	August 1, 1998	2,149	49.97	1,571	46.21	-8
Total of all intersections	August 1, 1998	2,238	52.04	1,630	47.95	-8%

Source: Bureau of State Audits analysis of accident data from the Statewide Integrated Traffic Records System, maintained by the California Highway Patrol covering the period from January 1, 1995, through September 30, 2001. We used the date each local government started its program to compute the total of intersections. For individual intersections, we used the date cameras began operating at each intersection.

* The information for city of San Diego is up to June 1, 2001, which is the date the city suspended its program.

† The numbers displayed are rounded to two decimal points, however, the calculations used the unrounded amounts.

City and County of San Francisco

Location	Date Operational	Number of Accidents Before the Red Light Camera Program Began	Average Number of Accidents per Month Before the Red Light Camera Program Began*	Number of Accidents During the Red Light Camera Program	Average Number of Accidents per Month After the Red Light Camera Program Began*	Percent Difference Between Monthly Averages Before and After the Red Light Camera Program Began
7th Street at Mission Street	August 5, 1996	7	0.37	34	0.55	50%
5th Street at Howard Street	October 30, 1996	12	0.55	17	0.29	-47
19th Avenue at Sloat Boulevard	January 10, 1997	12	0.49	10	0.18	-64
9th Street at Howard Street	September 18, 1997	15	0.46	5	0.10	-78
Pine Street at Presidio Avenue	September 20, 1997	16	0.49	8	0.17	-66
6th Street at Bryant Street	December 6, 1999	32	0.54	0	0.00	-100
1st Street at Folsom Street	March 14, 2000	16	0.26	1	0.05	-79
14th Street at South Van Ness Avenue	June 21, 2000	23	0.35	8	0.52	49
Geary Street at Franklin Street	June 21, 2000	44	0.67	6	0.39	-42
15th Street at Mission Street	August 4, 2000	22	0.33	4	0.29	-12
Pine Street at Polk Street	October 4, 2000	21	0.30	2	0.17	-45
Hayes Street at Polk Street	November 1, 2000	22	0.31	2	0.18	-42
5th Street at Mission Street	November 13, 2000	34	0.48	2	0.19	-61
8th Street at Harrison Street	February 1, 2001	38	0.52	1	0.13	-76
3rd Street at Harrison Street	April 2, 2001	30	0.40	0	0.00	-100
Bush Street at Van Ness Avenue	April 2, 2001	24	0.32	0	0.00	-100
5th Street at Harrison Street	April 3, 2001	17	0.23	0	0.00	-100
Total red light camera intersections	August 5, 1996	159	8.31	326	5.27	-37
Total non-red light camera intersections	August 5, 1996	1,330	69.51	3,715	60.04	-14
Total of all intersections	August 5, 1996	1,489	77.82	4,041	65.31	-16%

Source: Bureau of State Audits analysis of accident data from the Statewide Integrated Traffic Records System, maintained by the California Highway Patrol covering the period from January 1, 1995, through September 30, 2001. We used the date each local government started its program to compute the total of intersections. For individual intersections, we used the date cameras began operating at each intersection.

* The numbers displayed are rounded to two decimal points, however, the calculations used the unrounded amounts.

APPENDIX E

Red Light Camera Revenues and Expenditures

In Chapter 2, we included the cumulative red light camera revenue and expenditure amounts or estimates for the six local governments we visited. Each local government with available data reported its revenues and expenditures, and we matched the figures to supporting accounting records to determine the reasonableness of the reported amounts, where possible. However, as described in Chapter 2, some local governments—San Diego, San Francisco, and Oxnard—could only provide us with estimates of certain costs. Table E.1 on the following page shows the breakdown by fiscal year of revenues and expenditures. Most of the local governments used weak accounting practices for recording revenues and expenditures for their red light camera programs. Therefore, the amounts in the table may contain some errors.

TABLE E.1

Only Two Local Governments Made Significant Revenue From Their Programs

	1995–96	1996–97	1997–98	1998–99	1999–2000	2000–01	2001–02	Totals
Fremont								
Revenue	—	—	—	—	—	$ 140,515	$ 219,358	$ 359,873
Vendor payments	—	—	—	—	—	(104,060)	(171,364)	(275,424)
Program expenditures	—	—	—	—	—	(47,719)	(32,460)	(80,179)
Net totals*	—	—	—	—	—	(11,264)	15,534	4,270
Los Angeles								
Revenue	—	—	—	—	$ 499,543	1,015,433	448,383	1,963,359
Vendor payments	—	—	—	—	(753,247)	(946,980)	(457,204)	(2,157,431)
Program expenditures	—	—	—	—	(20,803)	(62,158)	(19,291)	(102,252)
Net totals*	—	—	—	—	(274,507)	6,295	(28,112)	(296,324)
Oxnard								
Revenue	—	—	—	$ 149,421	190,898	183,259	54,727	578,306
Vendor payments	—	—	—	(16,543)	(40,565)	(25,840)	(13,875)	(96,823)
Program expenditures	—	—	—	(20,883)	(20,883)	(20,883)	(10,442)	(73,091)
Net totals*	—	—	—	111,996	129,450	136,536	30,410	408,392
Sacramento								
Revenue	—	—	—	—	197,187	1,126,538	497,924	1,821,649
Vendor payments	—	—	—	—	(254,040)	(1,004,850)	(449,790)	(1,708,680)
Program expenditures	—	—	—	—	(123,922)	(120,068)	(21,877)	(265,867)
Net totals*	—	—	—	—	(180,775)	1,620	26,257	(152,898)
San Diego								
Revenue	—	—	—	1,074,106	3,149,871	3,817,295	163,579	8,204,851
Vendor payments	—	—	—	(372,203)	(1,600,677)	(1,708,430)	(152,345)	(3,833,655)
Program expenditures	—	$ (3,802)	$ (244,104)	(592,097)	(720,533)	(1,123,121)	(562,278)	(3,245,935)
Net totals*	—	(3,802)	(244,104)	109,806	828,661	985,744	(551,044)	1,125,261
San Francisco								
Revenue	—	—	50,645	423,696	389,753	1,357,951	724,844	2,946,889
Vendor payments	—	(119,253)	(160,758)	(295,089)	(591,958)	(881,352)	(698,891)	(2,747,301)
Program expenditures	$(19,473)	(50,497)	(186,744)	(265,250)	(269,803)	(265,249)	(126,254)	(1,183,270)
Net totals*	(19,473)	(169,750)	(296,857)	(136,643)	(472,008)	211,351	(100,301)	(983,682)

Source: Accounting reports and other financial data provided by the local governments we visited. The amounts for fiscal year 2001–02 are through December 31, 2001.

Note: The red light camera program for Long Beach started in October 2001 and has not accumulated enough data for us to determine the relationship between costs and revenues.

* Differences may exist due to rounding.

Agency's comments provided as text only.

City of Fremont Police Department
2000 Stevenson Boulevard
Fremont, CA 94537-5007

July 10th, 2002

The State Auditor*
Bureau of State Audits
555 Capitol Mall, Suite 300
Sacramento, Ca 95814

Attention: John Baier

Re: "Red-light Camera Program Audit Report" – July 2002

A draft copy of the Audit Report was provided to the City of Fremont on 07/02/02 and the State Auditor requested our review and comments be submitted to their office by 07/09/02. A request was made for an extension to 07/23/02 however we were allowed an extra half a day to submit our comments. Please note that due to the time constraints a detailed review of the audit report was not completed.

Following our exit meeting on 07/09/02 and upon review of the report both by the Police Department and City Engineering Department the following items and comments have been noted.

1. We noted that some of the terminology appears to be used incorrectly e.g. dangerous (what is the basis/measure used to call an intersection "dangerous".), CalTrans "standards" – CalTrans does not establish a "standard" for the yellow change interval, however provides recommended "values" to be used…etc.

2. Page 58 - We have included a Speed/Distance calculation worksheet that shows the minimum distance traveled feet per tenth of a second at a given rate of speed. Recommend that this be added to the report as an appendix.

3. Page 68 – Accident rates may have increased at other intersections without the cameras, however, Statistical data should be obtained on individual intersections installed with Red-light cameras one year prior and one year after camera installation to show a true analysis of the decrease in accident rates (enclosed are our internal statistical information relating to three intersections that were in operation for approximately a year and that is within the time frame of your audit report which shows a total decrease of 41.66%.) However this is based on absolute data and has not been normalized. Traffic Accident data should be normalized with respect to Traffic Volume. In traffic engineering, collision rates can be determined in several ways depending on the context of the analysis. There are two types of collision rates (1) roadway segment and (2) intersection rates.
   For intersection collision rate analysis, such rates can be based on the # of vehicles, vehicles miles traveled, per 10,000 registered or per 10,000 population, per one million entering vehicles, etc.

* California State Auditor's comments appear on page 81.

By this method, one can compare one intersection from another. No two intersections are ever the same (i.e. different geometries, different trip attractions, different characteristics), which may attribute to different collision rates.

To better analyze any given intersection, we typically analyze on a per million entering vehicles.

Rate per million entering vehicles = (accident * 1,000,000) /(24-hour volume*365)

With this method, we can generally normalize each intersection and be able to compare one intersection to another.

4. Page 72 – "Fremont pays its vendor $106 – the reason being that there are no upfront equipment costs for the City of Fremont when the cameras are installed.

Sincerely,

(Signed by: Craig T. Steckler)

_____
CRAIG T. STECKLER
Chief of Police

Note: Fremont also provided us copies of internal statistical information relating to accidents at three intersections and a speed/distance calculation worksheet. Because we could not reproduce legible copies of these documents, we have not included them with Fremont's response. These documents are available for inspection at our office during business hours upon request.

COMMENTS

California State Auditor's Comments on the Response From the City of Fremont

To provide clarity and perspective, we are commenting on the City of Fremont's (Fremont) response to our audit report. The numbers below correspond to the numbers we placed in the margins of Fremont's response.

1. We stand by our description of certain intersections as being "dangerous" based on accident data that Fremont provided to us when selecting intersections for red light cameras.

2. In the context of this report, the term "standard" is used when describing the yellow light time intervals contained in the California Department of Transportation's (Caltrans) traffic manual. The law, which took effect as of January 1, 2002, requires that the minimum yellow light time intervals at intersections equipped with red light cameras conform to those contained in Caltrans' traffic manual. Thus, we feel it is appropriate to use the term standard when referring to these required time intervals.

3. We recognize that there are a variety of methods to analyze accident statistics. In fact, we describe several of these methods in Appendix C on page 65. The method we chose to employ was very similar to the one used in a study performed at one of the local governments we visited. The method we used was also recommended by our statistical consultant.

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Agency's comments provided as text only.

City of Long Beach
Office of the City Manager
333 West Ocean Boulevard
Long Beach, California 90802

July 10, 2002

John Baier, CPA*
Bureau of State Audits
555 Capitol Mall, Suite 300
Sacramento CA 95814

Subject: Exit Response

Dear Mr. Baier:

In response to the City's review of the draft audit report submitted to the City on Tuesday, July 2, 2002, the City has the following comments/responses:

Recommendation No. 1: "Before installing red light cameras, local governments should first consider whether the engineering measures, such as improving signal light visibility or using warning signs to alert motorists of an upcoming traffic signal, would improve traffic safety and be more effective in addressing red light violations."

Response: The City of Long Beach will, prior to all future automated photo red light enforcement installations, conduct a specific engineering review at each of the locations identified for potential photo red light enforcement to specifically determine if there are any engineering measures not previously noted during our ongoing evaluations which can be applied to the respective locations to potentially reduce red light violations.

Recommendation No. 2: "To focus on traffic safety and avoid overlooking high-accident locations that are state-owned when considering where to place red light cameras, local governments should diligently pursue the required Caltrans permitting process, even though it may cause some delays to their programs."

Response: For purposes of the City's photo red light enforcement pilot program, the inclusion of state-owned intersections were not considered due to the possibility that equipping these locations would unnecessarily delay our pilot program for implementation. However, state-owned intersections will be considered if the program is adopted permanently.

* California State Auditor's comments appear on page 87.

Recommendation 3: "To avoid the risk of legal challenges local governments should petition Caltrans to clarify its traffic manual to explain when local governments should use either posted speeds or the results from a speed survey to establish yellow light time intervals at intersections equipped with red light cameras."

Response: The City of Long Beach's practice of setting yellow intervals based on posted speed limits is in compliance with Caltrans traffic signal timing guidelines. However, in order to resolve the ambiguity of the term "approaching speed of traffic" as worded in the Caltrans Traffic Manual, the City of Long Beach will request that Caltrans revise the Traffic Manual language to clarify the term's intended meaning. It is anticipated that this issue will need to be reviewed by the California Traffic Control Devices Committee prior to any changes taking place. If the language in the Traffic Manual is revised to specify that yellow intervals shall be set according to the measured prevailing speed of traffic, the City of Long Beach will ensure that all yellow intervals are set according to the prevailing speed of traffic, as measured through a speed survey.

Recommendation 4: "A periodic reconciliation of the number of citations the local government authorized and approved with those the vendor mailed during the same period of time."

Response: The City plans to implement within 60 days a reconciliation between the number of citations approved by the Long Beach Police Department and the number of citations issued by our contractor.

Recommendation 5: "A provision requiring the confidentiality of all photographs."

Response: The City has amended the contract inserting specific language regarding the confidentiality of photographic evidence.

In addition, attached is a memorandum from the City Auditor, Mr. Gary Burroughs, noting concerns with this report. If you need further information, please advise me accordingly.

Thank you for the opportunity to respond to the draft audit.

Sincerely,

(Signed by: Gerald R. Miller for)

HENRY TABOADA
CITY MANAGER

Attachment

City of Long Beach Memorandum

Office of the City Auditor

Date: July 10, 2002

To: Henry Taboada, City Manager

From: Gary Burroughs, City Auditor

Subject: Red Light Camera Program Audit

At your request I have reviewed the draft report of the Red Light Camera Programs audit issued by the California State Auditor. I have reviewed the report from both a professional and practical perspective, and have several comments.

First, a program audit is conducted to evaluate the performance of a program against stated goals and outcomes. Because programs from multiple jurisdictions were included in the scope of this report, I would consider the results to be more in line with a "study" rather than an "audit". This report combines exceptions that apply to one or more jurisdictions utilizing one or more technologies and includes global conclusions about Red Light Camera systems without acknowledging the programs' differences. It appears that in an attempt to summarize results that apply to different jurisdictions and different programs, the auditor has risked misinterpretation by the reader.

Government Auditing Standards (Section 7.18) require that, in reporting findings, auditors "…should include sufficient, competent and relevant information to promote adequate understanding of the matters reported and to provide convincing but fair representations in proper perspective." I believe the auditors have deviated in this case. For example, the Summary section of the report implies that jurisdictions did not place cameras at dangerous intersections. The argument states "…although the most common reason for choosing red light camera sites was traffic safety….local governments…avoided placing cameras at some of the dangerous state-owned intersections. Long Beach anticipated that obtaining State permission would delay their program."

As you know, Long Beach selected 4 of the top 10 most dangerous intersections for the red light program. Because the program is a pilot program and State permitting can take several months or more, we did avoid state-owned intersections. However, these pertinent facts do not appear until page 38 of the report.

Another example of “insufficient relevant information” appears on page 4, where the auditor states, “Further, we could not always determine if local governments addressed engineering improvements to the intersections before installing cameras.”

In fact, Long Beach provided the auditors with evidence that the City performs ongoing evaluations of high-accident intersections for engineering improvements; however, this is not acknowledged until page 35 of the report. Again, the reader could misinterpret the statements in the Summary section to mean that there was no evidence that the City considered engineering improvements at the sites.

My office contacted the auditor in charge to relate our concerns illustrated above and the auditor indicated that, because of the need to summarize the differing results at multiple jurisdictions, they were unwilling to provide pertinent detail that would more accurately reflect the conditions at Long Beach.

Additionally, recommendations in the report are not always directed to the appropriate entity. For example, the report recommends that Long Beach and other jurisdications, “…petition Caltrans to clarify its traffic manual to explain when local governments should use either posted speeds or the results from a speed survey to establish yellow light time intervals ...” Currently, the manual only dictates the required yellow light duration based on the approach speed and local governments use one of two generally accepted methods for determining approach speed, either the posted speed or a speed survey. In addition, it could be considered inappropriate for Long Beach to utilize one method for just those intersections equipped with red light cameras and another method for all other intersections. Regardless, the auditor in charge was queried as to why this recommendation is not being made directly to the Legislature so that they can direct Caltrans to make such a change, being that the State Auditors feel strongly that it is required. However, they responded that they will not make such recommendations.

In summary, it is disappointing that readers or the media might draw conclusions about the Long Beach Red Light Program from generalized commentary that does not accurately depict the conditions in Long Beach. I would be happy to discuss these observations with you in more detail.

COMMENTS

California State Auditor's Comments on the Response From the City of Long Beach

To provide clarity and perspective, we are commenting on the City of Long Beach's (Long Beach) response to our audit report. The numbers below correspond to the numbers we placed in the margins of Long Beach's response.

1. The city auditor of Long Beach takes issue with the way that we structure our reports, implying that it does not meet with government auditing standards. We disagree. Our reports include a "Results in Brief" section that presents a high-level summary of our findings and recommendations. This summary section is not meant to include every aspect of the issues more fully discussed in the report as doing so would defeat the purpose of including a summary. Furthermore, Long Beach acknowledges in its response that we discuss the pertinent facts in the body of the audit report. Finally, as noted on page 57 of the report, we conducted this audit in accordance with generally accepted government auditing standards.

2. We chose to address this recommendation to the auditees of the report, which in this case were the local governments. As the local governments are the entities that bear the risk of legal challenges should they fail to comply with the law when setting yellow light time intervals at intersections equipped with red light cameras, they should seek clarification from the California Department of Transportation for the method to use so as to mitigate that risk.

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Agency's comments provided as text only.

County of Los Angeles
Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

July 9, 2002

Ms. Elaine M. Howle
California State Auditor
555 Capitol Mall, Suite 300
Sacramento, CA 95814

Dear Ms. Howle:

RED LIGHT CAMERA PROGRAM AUDIT

Enclosed is our response to the recommendations pertaining to Los Angeles County that are contained in your audit report. Also, as requested, a copy of this cover letter and our response has been saved on the enclosed diskette. Overall, we generally agree to the findings in the report and will initiate actions to improve this program.

If you have any questions or require further assistance, please call me or you may call Raymond Low at (626) 458-6950.

Very truly yours,

(Signed by: James A. Noyes)

JAMES A. NOYES
Director of Public Works

Enc.

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
STATE AUDIT REPORT - PHOTO RED LIGHT PROGRAM
JULY 2002

CHAPTER 1 RECOMMENDATIONS

1. **Conduct more rigorous oversight of vendors by making periodic visits to review their operations and develop business rules for vendors to follow when screening violations.**

   Response: We agree. The County of Los Angeles Department of Public Works will conduct oversight visits periodically to ensure adequate oversight of vendor operations. Additionally, Public Works will formalize the existing business rules for screening and processing violations in writing.

2. **Establish specific time periods for the destruction of confidential information relating to unenforced red light violations.**

   Response: We agree. Public Works will incorporate appropriate time periods for the destruction of confidential information relating to photo red light violations as part of the formal business rules for screening and processing violations.

3. **Reconcile citations authorized and approved for enforcement are mailed out as citations.**

   Response: We agree with the intent of this recommendation. We will evaluate whether additional controls are needed to ensure only authorized and approved violations are mailed. Public Works will work with the California Highway Patrol for any necessary changes.

4. **To respect the privacy of motorists whose photographs are taken by red light cameras, local governments should strengthen the language within their contracts with vendors to include explicit wording to protect the confidentiality of photographs and information obtained from the DMV database.**

   Response: We agree. Public Works will incorporate language to strengthen the contract on confidentiality of photographs and information obtained from the DMV. We anticipate completing a competitive solicitation and entering into a new agreement for red light camera services in Fiscal Year 2003. In the interim, we will incorporate confidentiality requirements as part of our formal business rules.

5. **Before installing red light cameras, local governments should first consider whether the engineering measures, such as improving signal light visibility or using warning signs to alert motorists of an upcoming traffic signal, would improve traffic safety in addressing red light violations.**

   Response: We agree. In fact, as part of the current photo red light program implementation, Public Works considered these measures prior to installing red light cameras.

6. **To focus on traffic safety and avoid overlooking high-accident locations that are State-owned when considering where to place red light cameras, local governments should diligently pursue the required Caltrans permitting process, even though it may cause some delays to their programs.**

   Response: We agree. Public Works internally established criteria to select locations suitable for placing photo red light cameras. These criteria included red light running accidents, law enforcement input, and other factors. The Caltrans permitting process was not considered in the selection process.

7. **To help maintain the integrity and accuracy of their systems, local governments should conduct periodic inspections of red light camera intersections and consider contracting with an independent engineering firm to conduct the more technical reviews of the camera settings and calibration of the system.**

   Response: We agree. Public Works performs routine inspections of all intersections within our purview including all of the photo red light enforcement intersections. Public Works will consider contracting with an independent engineering firm to review camera settings and calibration of the system.

8. **To avoid the risk of legal challenges local governments should petition Caltrans to clarify its traffic manual to explain when local governments should use their posted speeds or the results from speed survey to establish yellow light time intervals at the intersections equipped with the red light cameras.**

   Response: Public Works is committed to adhering to all criteria established in Caltrans' Traffic Manual, which clearly stipulate requirements for setting yellow cycle intervals for signalized intersections.

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Agency's comments provided as text only.

City of Oxnard
Police Department
Art Lopez, Police Chief

July 3, 2002

Elaine M. Howle, State Auditor
Bureau of State Audits
555 Capitol Mall, Suite 300
Sacramento, California 95814

Dear Ms. Howle,

The City of Oxnard has been utilizing "Photo Red Light" cameras since 1996. We have experienced an overall reduction in accidents as a result of the camera enforcement at the identified locations. The reduction of accidents at these intersections is the primary goal of this program. This is just one tool that we at the Oxnard Police Department use to enforce traffic laws and improve traffic conditions within the City.

We appreciate the input provided to us as a result of this audit process and have had numerous discussions with your audit team. Some of the recommendations in this document have been implemented already. We will be looking to improve our administrative controls of the photo red light program. This will insure that the operation of the entire photo red light program is under our control.

Sincerely,

(Signed by: Art Lopez)

Art Lopez
Chief of Police

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Agency's comments provided as text only.

City of Sacramento
Department of Police
900 8th Street
Sacramento, Ca 95814-2506

July 8, 2002

Elaine M. Howle*
State Auditor
Bureau of State Audits
555 Capitol Mall Suite 300
Sacramento, California 95814

Dear State Auditor Howle:

In response to draft audit report, entitled "Red Light Camera Programs: Although They Have Contributed to a Reduction in Accidents, Operational Weaknesses Exist at the Local Level," the following requested revisions are forwarded from the Sacramento Police Department and the City of Sacramento Traffic Engineering Department c/o Mr. Marty Hanneman. Please consider these materials for inclusion or review in your final report on this matter.

Sincerely,

(Signed by: Arturo Venegas Jr.)

Arturo Venegas Jr.
Chief of Police

* California State Auditor's comments begin on page 99.

The requested revisions from the Sacramento Police Department are as follows:

1.) Page 21 "Elements of Oversight" The table reflects that Sacramento has no controls to prevent vendor from sending out unauthorized citations. We dispute this assertion and offer the following controls as proof:

- **All citations require an officers signature for acceptance and date entry by the court. Without a visible signature and badge number, the citation is immediately rejected and returned to agency.**

- **Officers assigned to the Red Light Camera program log by citation number, every approved citation and maintain records of approved citations.**

- **Vendor is notified by mail of all rejected citations and certificate of mailing for rejected citations is retained by police department.**

- **Preparation for court trials requires officers to review original acceptance records. Unauthorized citations would be detected and addressed when contested by violator.**

2.) On page 28, paragraph #2, the auditors take issue with our vendor keeping data for unenforced citations for three years, "without indicating why such a long retention period is necessary."

- **We have previously advised the auditor's staff that pursuant to page #8 of our contract, our vendor is required to archive such materials. This was done at the recommendation of our City Attorney to ensure compliance with Government Code sections 34090 and Sacramento City Council Resolution #76-181.**

3.) On page #32 on the table row #10 "Safety of Police During Traffic Enforcement" was not checked for the City of Sacramento.

- **On at least one interview, Sgt. Poerio advised auditor's staff that this criteria was considered when determining locations for camera placement.**

The requested revisions from the City of Sacramento Traffic Engineering Department c/o Mr. Marty Hanneman are as follows:

Existing
* Page 16- second paragraph: "Traffic safety appeared to be a significant factor in the choice for most sites for red light cameras. However, we found that Sacramento placed cameras at some intersections that did not appear to have a problem with running of red lights based on accident statistics."

Revised:
*** Page 16- second paragraph: "Traffic safety was the primary factor in the choice for most sites for red light cameras. Additionally, Sacramento placed some cameras based on video surveys of recorded red light violations."**

Existing
* Page 34- second paragraph: "According to a one-day video survey conducted by Sacramento's vendor, these two intersections had a high number of red light violations."

Proposed
*** Page 34- second paragraph: "According to a one-day video survey conducted by Sacramento's vendor, all three intersections had a high number of red light violations."**

Existing
* Page 36- first paragraph: " Sacramento used all-red clearance intervals on some but not all of their red light camera locations."

Proposed
*** Page 36- first paragraph: " Based on engineering judgement, Sacramento used all-red clearance intervals on some of their red light camera locations."**

Existing
* Page 47-second paragraph: " In fact, an appeal of a red light citation regarding Sacramento's placement of warning signs at major entrances resulted in a December 1999 ruling by a traffic court commissioner that the city failed to install warning signs in full compliance with the law."

Proposed
*** Page 47- second paragraph: " In fact, an appeal of a red light camera citation regarding Sacramento's placement of warning signs at major entrances resulted in a December 1999 ruling by a pro-tem traffic court commissioner that the city had failed to install warning signs in full compliance with the law."**

Existing
*Page 54- Table 5: "Using the 85th percentile per the speed survey" Sacramento- 12/15."

Proposed
<u>*Page 54- Table 5:</u> " Using the 85th percentile per the speed survey" Sacramento- 12/15."

Footnote: Two locations did not have cameras, the other was for nine days.

Existing
<u>*Page 60- first paragraph:</u> " Before installing red light cameras, local governments should first consider whether the engineering measures, such as improving signal visibility or using warning signs to alert motorists of an upcoming traffic signal, would improve traffic safety and be more effective in addressing red light violations."

Proposed
<u>* Page 60- first paragraph:</u> " Before installing red light cameras, local governments should first consider whether the engineering measures, such as improving signal visibility, signal timing or using warning signs to alert motorists of an upcoming traffic signal, would improve traffic safety and be more effective in addressing red light violations."

COMMENTS

California State Auditor's Comments on the Response From the City of Sacramento

To provide clarity and perspective, we are commenting on the City of Sacramento's (Sacramento) response to our audit report. The numbers below correspond to the numbers we placed in the margins of Sacramento's response.

1. Although Sacramento believes it has controls in place, the controls it describes rely on other entities to perform its responsibilities or fall short of those controls needed to detect if the vendor issues unauthorized citations. For example, Sacramento indicates that the courts will reject any citation without a badge number and signature. Sacramento is relying on the courts to properly perform this verification, but it cannot force the courts to do so or dictate the quality of this verification. Instead, Sacramento should independently verify that its vendor does not issue unauthorized citations by reconciling its log of authorized citations with those citations that the vendor issues. Until such a reconciliation is put in place, Sacramento cannot be certain that its vendor only issues authorized citations.

2. We disagree with the city's interpretation of the Government Code. Our legal counsel advises that unenforced citations do not appear to rise to the level of official city records because the vendor has deemed them as unusable and they have never become enforceable citations. Therefore, our legal counsel concludes that it is unlikely that a court would find unenforced citations are official city records within the meaning of Section 34090 of the Government Code. As noted on page 22 of the report, these unenforced citations constitute approximately 77 percent of all photographs taken by red light cameras. Thus, under Sacramento's current philosophy, it is allowing the vendor to retain a significant amount of confidential information about motorists—including their photographs and possibly their names and addresses obtained from the Department of Motor Vehicles' database—without having a legitimate business use for this confidential information. When this type of information is retained by the vendor without a legitimate reason, there is a heightened risk it could be misused.

- We need to clarify a point regarding Table 2 shown on page 26 of the report. The purpose of this table is to show the factors that the local governments considered in selecting intersections for red light camera enforcement. As noted in the "Source," we prepared this table relying solely on internal reports and data provided to us by the local governments. None of the planning documents that Sacramento provided to us indicated that the safety of police during traffic enforcement was one of the criteria it used during the selection process.

- We considered the city's suggested change but chose not to make it because we believe our report is accurate as written.

- We modified a sentence on page 27 of the report to reflect that the one-day video survey conducted by Sacramento's vendor showed that all three intersections had a high number of red light violations.

- Sacramento is attempting to obscure the fact that the three intersections in question are part of its red light camera program—which rotates 10 cameras among 16 camera housings—and that cameras could have been rotated to those intersections at any time. It is irrelevant whether or not the intersections held cameras on the date that Sacramento was required to comply with the California Department of Transportation time intervals for yellow lights. What is relevant is whether the yellow light intervals at all intersections in Sacramento's red light camera program complied with the new yellow light timing law as of January 1, 2002.

Agency's comments provided as text only.

The City of San Diego
Office of the Chief of Police
1401 Broadway
San Diego, CA 92101-5729

July 9, 2002

Elaine M. Howle*
State Auditor
Bureau of State Audits
555 Capitol Mall, Suite 300
Sacramento, CA 95814

Dear Ms. Howle:

In 1998, the City of San Diego implemented a pilot Red Light Photo Enforcement Program to address the problem of red light violators and the resulting collisions. The goal of the program has always been and remains public safety. The system in place has proven to be reliable and effective in reducing both red light violations as well as collisions.

I have reviewed a copy of your audit and applaud the significant efforts taken by the state. I agree with almost all of the recommendations put forward. In fact, most of the recommendations identified by your audit have already been identified by our department and are ready to be implemented should the program be reinstated. However, with respect to the audit, there is one area that I feel needs clarification. Your audit indicated that the contract between the City of San Diego and its vendor does not have any specific provisions protecting the confidentiality of the records, giving the impression that no safeguards exist. Although not specifically covered within the provisions of the contract, the confidentiality of all records is specifically protected through additional written agreements between the vendor and the Department of Motor Vehicles. State law also protects the information gathered and forbids the dissemination of such information for any purpose other than that authorized by statute.

As Chief of Police, traffic safety remains one of my top priorities for the City of San Diego. I continue to believe that a properly operated photo enforcement program will greatly benefit the citizens of San Diego by making its streets and intersections considerably safer.

Sincerely,

(Signed by: John Welter for)

David Bejarano
Chief of Police

* California State Auditor's comment appears on page 103.

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COMMENT

California State Auditor's Comment on the Response From the City of San Diego

To provide clarity and perspective, we are commenting on the City of San Diego's (San Diego) response to our audit report. The number below corresponds to the number we placed in the margin of San Diego's response.

1 In response to another local government's concern, we clarified pages 37 to 38 of the report to add the following wording regarding vendors' access to the Department of Motor Vehicles' (DMV) database: According to their agreements with the DMV, for vendors to access motorists' personal data, they must be authorized by the local governments to apply for access through the DMV. The DMV requires the vendor to take steps necessary to ensure the confidentiality of the DMV information they receive. However, it is the local governments' responsibility to ensure that their vendors maintain the confidentiality of the information they have access to.

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Agency's comments provided as text only.

Department of Parking & Traffic
Traffic Engineering Division
City and County of San Francisco
25 Van Ness Ave., Suite 345
San Francisco, CA 94102

July 9, 2002

Response to State Auditor's Report on
Red Light Photo Enforcement Programs

Ms. Elaine M. Howle
Bureau of State Audits
555 Capitol Mall, Suite 300
Sacramento, CA 95814

Dear Ms. Howle:

Please find attached our response to the recommendations made in the State Auditor's draft report on Red Light Camera Programs. We thank you for the opportunity to respond. Please call Britt Thesen at 415-252-3291 if you have any further questions.

Very Truly Yours,

(Signed by: Bond M. Yee)

Bond M. Yee
Deputy Director and City Traffic Engineer

INTRODUCTION

On behalf of the City and County of San Francisco, we appreciate this opportunity to respond to statements made in the State Auditor's Report on Red Light Camera Programs. Thank you for highlighting the many positive components of San Francisco's Program, and also bringing increased attention to areas where we may be able to improve our Program.

As the first Red Light Photo Enforcement Program in California, we have striven to create a positive reputation for photo enforcement and are always looking for possible improvements to our program. We believe we are not only in compliance with state laws, but that we have reduced injuries and saved lives through our Program. The City takes red light running seriously and works in many ways to address this issue. For example, the Department of Parking and Traffic (DPT) and the Police Department have worked together to heavily enforce "No Front Plate" violations to promote the effectiveness of the Red Light Photo Enforcement Program.

COMMENTS:

Below is our response to the draft report's recommendations at the end of Chapters 1 and 2.

"CONDUCT MORE RIGOROUS OVERSIGHT OF VENDORS BY MAKING PERIODIC VISITS TO REVIEW THEIR OPERATIONS"

Each project manager, and other key DPT staff working on the San Francisco Red Light Photo Enforcement Program, have made visits to the offices of the contractor to oversee their work. Our inspections addressed all of the concerns mentioned in the draft report, such as their procedure for processing violations, security facilities, the handling of confidential data and compliance with the contract. These visits were typically documented in internal weekly reports, which we do not retain. If we had found any problems in our visits, we would have documented them in correspondence to our vendor and retained those records, per our record retention policy. We never found any problems, however. In addition, we have held the monthly team meetings at the vendor's facility. The team, with representatives from the Police Department, City Attorney's Office, the Court, Public Works and the Health Department, has also visited the vendor's facilities to review their process.

As you have pointed out in the draft report, DPT has maintained regular communications, including monthly meetings and nearly daily phone calls and e-mails with the vendor. We do this in order to stress the contractual obligations, remain abreast of problems that might arise and provide guidance and oversight in this unique program.

We believe that our current procedures address your concerns, but to provide even more rigorous oversight, we will conduct all future monthly team meetings at the vendor's facilities to increase the opportunity for inspection.

"ESTABLISH SPECIFIC TIME PERIODS FOR THE DESTRUCTION OF CONFIDENTIAL INFORMATION RELATING TO UNENFORCED RED LIGHT VIOLATIONS"

Our contract specifies that at the end of the contract, the vendor is to return all products of the contract (such as confidential records) to the City and County of San Francisco. This complies with our departmental record retention policy.

For those records not resulting in issued notices to appear, it is the vendor's current practice to retain only the film and destroy all other data related to non-issued violations. The film for non-issued violations is retained because the negatives for issued violations are interlaced on the same roll of film as the non-issued violations, and it would be difficult to splice the film to separate the issued from the non-issued violations. The vendor does not save any other information specific to non-issued violations. Per your recommendations, DPT will formalize this practice by instructing the vendor to follow this procedure through a memorandum and through contract amendment. DPT will also begin work to modify the department's record retention policy to create special categories for all red light photo enforcement documents and records.

"RECONCILE CITATIONS AUTHORIZED AND APPROVED WITH THOSE THE VENDOR MAILS AND PROMPTLY FOLLOW UP ON ANY DIFFERENCES SO THAT ONLY VIOLATIONS AUTHORIZED AND APPROVED FOR ENFORCEMENT ARE MAILED OUT AS CITATIONS"

From the beginning of our program, we have had a system in place to ensure that only authorized citations were mailed out. The process initially was that the issuing officer rejected notices to appear by marking a diagonal line through the entire length of the notice to appear with the same pen used to sign approved violations. The mailed unauthorized notice mentioned in the draft report was sent out due to human error, when the rejection line was overlooked in the mailing process. As stated in the draft report, the Police Department reviewed fifteen months of records and determined that this was the only unauthorized or unapproved notice that had been issued during that period. We have already begun to work toward an improved system where the Police Department more emphatically indicates which violations are to be issued or not. To ensure that unauthorized notices to appear are not mailed, the Police immediately substituted a large rubber "void" stamp for the pen line rejection process.

Additionally, we are working with the Court to provide an additional layer of citation inspection as you mentioned in the draft report. In the interim, the Police will perform a manual audit to reconcile the authorized citations with those mailed out every two months, similar to that done on the fifteen months of records recently.

"TO RESPECT PRIVACY OF MOTORISTS WHOSE PHOTOS ARE TAKEN BY RED LIGHT CAMERAS, LOCAL GOVERNMENTS SHOULD STRENGTHEN THE LANGUAGE WITHIN THEIR CONTRACTS TO INCLUDE EXPLICIT WORDING TO PROTECT THE CONFIDENTIAL INFORMATION OBTAINED FROM THE DMV DATABASE"

While San Francisco has specific contract provisions with respect to confidentiality, the City did not explicitly tell the vendor that DMV records are confidential because we felt that would have been redundant. DMV, in its agreement with users, already requires this. However, based on your recommendation, we will remind the contractor of the confidentiality of DMV records through both a memorandum and contract amendment.

"TO HELP MAINTAIN THE INTEGRITY AND ACCURACY OF THEIR SYSTEMS, LOCAL GOVERNMENTS SHOULD CONDUCT PERIODIC INSPECTIONS OF RED LIGHT CAMERA INTERSECTIONS AND CONSIDER CONTRACTING WITH AN INDEPENDENT ENGINEERING FIRM TO CONDUCT THE MORE TECHNICAL REVIEWS OF THE CAMERA SETTINGS AND CALIBRATION OF THE SYSTEM"

We understand that your comment regarding site inspection relates to (1) equipment not working properly and (2) the vendor's willful manipulation of the equipment.

With our current practice, we are confident a camera will be used for enforcement only when the camera is working properly. The intersection equipment was installed per city-approved plans and was installed under city supervision with an engineer on site fully documenting the work preformed. We have done additional inspections at selected sites and found no discrepancies. City crews maintain the equipment (except cameras) at these locations. If any part of the system fails, the camera will not take photos. To ensure camera systems are functioning properly, diagnostic tests are performed and documented each time film is collected, at least three times a week, which becomes part of the evidence package for contested cases and is reviewed by the Police Department on a case by case basis. In January 2002, DPT verified the loop locations at all intersections to ensure that the locations of the loops matched the drawings, and also verified the pitch inputs at several locations and found no problems. We will consider additional measures to review the camera installations in light of our financial and staffing resources.

We are comfortable that the vendor could not change key system elements that would result in falsified violations at an intersection without our knowledge. The vendor is only able to modify one camera setting to generate increased violations, the pitch setting. The pitch setting tells the computer the distance between the loops in order to computer the speed of a vehicle. Any modification to this setting would change the apparent speed of a vehicle. Our program, unlike some other cities, does not use the speed of the vehicle to determine if there was a violation or not. Our system takes two photos of each violator, one showing the violator behind the stop bar when the light is red and one showing the violator in the intersection. The first photo verifies that the violator was behind the stop bar when the light turned red, and the second photo verifies that the violator ran the red light. Thus, the speed of the vehicle is inconsequential to determining if a violation occurs. The only reason that speed is considered is to set a threshold speed, a speed below which we do not enforce violations. Although we verified the pitch inputs at several intersections as recently as January 2002, we will check the pitch settings at all sites based on your recommendations.

“TO ALLOW FOR BETTER ACCOUNABILITY OVER RED LIGHT CAMERA PROGRAMS AND TO ENSURE THAT VENDORS ARE PAID APPROPRIATELY, LOCAL GOVERNMENTS SHOULD BETTER TRACK THEIR REVENUES AND EXPENDITURES RELATED TO THEIR PROGRAMS.”

We provided the best information available for tracking our expenditures. The Police Department bases its expenditures on the salary paid to employees working on the Red Light Photo Enforcement Program and the percent of their time spent on the Program. Based on your recommendations, the Police Department will look into setting up an accounting procedure that tracks specifically how much time is spent on the Program.

“TO AVOID THE RISK OF LEGAL CHALLENGES LOCAL GOVERNMENTS SHOULD PETITION CALTRANS TO CLARIFY ITS TRAFFIC MANUAL TO EXPLAIN WHEN LOCAL GOVERNMENTS SHOULD USE EITHER POSTED SPEEDS OR THE RESULTS FROM A SPEED SURVEY TO ESTABLISH YELLOW LIGHT TIME INTERVALS AT INTERSECTIONS EQUIPPED WITH RED LIGHT CAMERAS”

The City is in compliance with state law, and would consider modifying its signal timing upon guidance from Caltrans. We will seek confirmation from Caltrans regarding our current practice to satisfy your recommendation.

CONCLUSION

Again, we believe that we are not only in compliance with state laws, but that we have reduced injuries and saved lives through our Program. We thank you for the opportunity to respond to your comments.

cc: Members of the Legislature
Office of the Lieutenant Governor
Milton Marks Commission on California State Government Organization and Economy
Department of Finance
Attorney General
State Controller
State Treasurer
Legislative Analyst
Senate Office of Research
California Research Bureau
Capitol Press