



OUTSOURCED ENFORCEMENT PROGRAMS

Lessons learned from an experienced enforcement services provider

By Redflex Traffic Systems

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Who are Redflex Traffic Systems?

Redflex Traffic Systems is part of the Redflex Holdings Group, an Australian company that is listed on the Australian Stock Exchange. From modest local beginnings in 1997, Redflex Traffic Systems has grown into the largest traffic camera operations service provider in the world. Advanced product research and development and production all occur at the Redflex head quarters in South Melbourne, Victoria. Redflex today has approximately 700+ staff worldwide, with offices and major operations in Phoenix, Los Angeles, Chicago, Saudi Arabia, Malaysia, and the United Kingdom.

Redflex is a pioneer in the usage of digital technology in enforcement camera systems, and sets itself apart from other camera manufacturers by providing services through the full traffic enforcement lifecycle. Redflex optimises its systems and processes by collecting information at each stage of the process and has a long history of data collection, providing an ongoing feedback loop for continuous improvement not only for their analysis but also for the end customers.

Redflex shares the same vision as the community: safer roads, and aims to reduce road accident frequency and severity through a change in driver behaviour.

What is automated photo enforcement? How does it work?

Automated photo enforcement captures evidence of traffic regulation violations through photographic and detection technology. The incident information is then verified and an evidence pack created for prosecution. This traditionally manual and labour intensive process has evolved into a streamlined automated process with the human touch points focusing on verification, creating a reliable integrated system. Automated enforcement systems have been developed to detect incidents such as speeding, red light, and stop sign violations, transit lane violations and rail crossing breaches. These systems are designed to operate unattended 24 hours a day, 7 day per week using flash technology to capture images of vehicles in all types of lighting and weather conditions across the globe.

Speed enforcement can occur through a variety of means. It can be through a fixed camera system that is permanently erected on a road side, bridge or gantry; or a mobile camera system that can be hand held, tripod mounted or in vehicle and deployed at a wide range of locations. Red-light enforcement is widely deployed as a fixed system and commonly incorporates speed detection and enforcement in the one system. Average speed enforcement (commonly known as point-to-point) is another form of speed enforcement. Rather than having just one point of enforcement, this method provides speed enforcement across multiple points resulting in changes in driver behaviour over long stretches of dangerous roads. The



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system works by comparing time-stamped images of a vehicle against the distance between two points and the time that it would take to travel that distance legally. Vehicle details are recorded at each point and correlated at a central server to determine the average speed. If the vehicle is speeding, an incident file is created with the collected data and images. Average speed enforcement is quickly becoming the preferred method of speed enforcement around the world, as it slows drivers down over a greater distance, rather than just at one point. This method also helps to eliminate the problem of camera surfing (speeding up then slowing down where cameras are known to be located).

The actual camera units comprise of state-of-the-art high resolution digital cameras that produce ultra sharp images whilst having the ability to capture violations across multiple lanes of traffic. To better understand the capability of these cameras, a listing of the standard features of a Redflex system can be seen below:

- Up to 24.5 total pixels (image sensor)
- 5 - 7 frames per second
- Shutter speed to 1/8000 second
- Commercial grade (SLR body style)
- Rugged magnesium alloy body
- Comprehensive protection against moisture, dust and electromagnetic interference
- Shutter unit tested to exceeded 300,000 cycles
- Designed to withstand and operate in environmental extremes

The camera systems use imaging technology to provide the best evidence packages available; software in the cameras automatically adjusts to ambient light conditions as well as time and seasonal changes using an automatic light metering system. The systems are designed to capture concurrent incidents with quality high resolution still imagery and, when combined with video capture, situational video clips act as secondary sources of highly prosecutable evidence.

The detection method used can vary for each particular solution and site. Several determining factors such as intersection / road geometrics, intersection / road orientation, lane configurations, enforcement expectations, engineering preferences, speed thresholds, and available spatial capacities can all influence the optimal detection method for a specific site. In-ground loops and piezos are currently the most accurate way to detect vehicle length, type, and speed by accurately determining the front and rear position of vehicles in multiple lanes, simultaneously. Dual radar technology has recently been developed as a highly reliable non-intrusive alternative. Dual radar systems combine a speed and tracking radar with software to enforce multi-vehicle and multi-lane speed offences with lane discrimination that is able to classify between approaching and receding traffic. This advanced accurate lane discrimination improves incident detection and prosecution as it eliminates the problems of reflection experienced by traditional radars.



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Detection and capture is supported by advanced backend software. These software programs are designed to monitor camera networks in real time, automatically and securely transmit images back to the processing centre, securely manage the incident file through the cycle attaching all relevant information, and generate the infringement notice. The cameras encrypt the digital packet at the point of capture; ensuring the evidence cannot be manipulated or tampered with. The development of this automated software enables the processing centre to act as a paperless office with all of the required information for prosecution available at the touch of a button. Virtually all testing and maintenance of the systems can be performed remotely, using secure internet communication technologies.

As the systems are used in the local community, enforcement system enclosures are designed to be considerate to the environment and minimally obtrusive. The enclosures use minimal roadside furniture and some cases the system can use existing roadside infrastructure.

What does an outsourced enforcement model consist of?

The enforcement model may be an existing government / police program that is being transitioned to a service provider for operation, or a new enforcement program that is being set up from conception.

Outsourced enforcement models fall into one of three categories:

- Fully outsourced program all supplied by one service provider
- Fully outsourced program supplied by multiple service providers
- Partially outsourced program where the jurisdiction retains some functions and a service provider is used for selected functions.

Enforcement models consist of the following components:

- Program Design
- Installation
- Enforcement
- Verification
- Processing
- Collection

Cities and Jurisdictions across the United States of America have been operating fully outsourced Redflex enforcement programs for a number of years. The term “turn-key solution” is commonly used in the United States to describe an outsourced program. A turn-key solution describes a type of program that is constructed by a provider and sold or turned over to a buyer in a ready-to-use condition. Redflex turnkey safety programs typically include all hardware, installation, maintenance, software, citation processing, mailing, adjudication services, payment processing, collections, process serving, public outreach, and training.



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Redflex has a major presence in the US, with close to 2500 cameras installed across 300 cities, and the world's largest enforcement processing centre located in Phoenix, Arizona. The following case study looks at how fully outsourced enforcement programs are operating in the US from Redflex's experience. These programs are primarily based around red light enforcement; one of the most dangerous infringements to society.

Outsourced enforcement programs in the US – The Redflex Experience.

Program Design

Before programs are launched Redflex works closely with police departments and cities, sharing industry expertise in the following crucial areas to ensure program sustainability:

Legislation: For the automatic enforcement of traffic violations to occur, the correct legislation needs to be in place. If this legislation is not in place and well supported, the program will be challenged and fall down in court. Not all states in America have existing legislation to allow photo enforcement, and states that have the legislation are constantly challenged by bills to ban photo enforcement programs. To ensure program success, Redflex conducts substantial legislative and public outreach campaigns. Lobbyists are used collectively with partner cities to ensure that photo enforcement agendas are effectively addressed.

Lesson learned: effective legislation is crucial for program success. Getting service providers involved early in the process gives legislators access to expert enforcement knowledge.

Approach Strategy: A city may request a particular enforcement solution because that's what a neighbouring city is using, but this may not be the most effective solution for that particular intersection or stretch of road. A justified approach strategy is needed to ensure that the most effective camera systems are installed in the most appropriate location, and that the selection is clear and transparent to the public.

Creating the best solution begins with location selection analysis. Working with the city, a traffic survey and site analysis of the identified location is conducted to determine if the location warrants camera installation. Crash data, engineering and environmental factors for the site are all collated. In addition a detailed video analysis is taken of the site to create a baseline of violation data. A minimum of 8 hours of consecutive footage is taken across peak times to get a visual representation of what is really happening at the site. The collected data provides the city with clear information on location selection and provides a base for a comprehensive approach strategy.



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Site Design: Once the system configurations and customizations are determined, local state licensed engineers and traffic signal construction contractors are engaged as a part of the project team to assist with the site design documentation. Redflex takes the responsibility for gaining all necessary approvals, permits, certifications, and clearances; as required by city, state and federal law. Comprehensive design drawings and installation plans are then presented to the city for a final review.

Lesson Learned: Get it right from the very start - aligning the most applicable technology and systems to each individual site, rather than a blanket approach, will ensure maximum program success. Additionally, ensuring that the location selection is justified through data will assist with gaining public acceptance of the program.

Public Outreach: Nowhere in the world is the support of the public more crucial for photo enforcement success than the United States. Vocal anti-enforcement minorities have driven agendas to have photo enforcement legislation overturned in cities and states. Therefore public awareness and community education is crucial for program success. Redflex provides each city with a complete public awareness campaign solution that includes a media kit full of templates to launch the enforcement program. Redflex also supports the city through targeted media releases, public information activities and kick off press conferences. Online support is also provided through set up assistance for websites providing enforcement program information as well as social media campaigns.

Lesson Learned: A strategic public education campaign is a key driver for program success. Public resistance can be problematic in many ways, with systems being vandalised and in some cases destroyed by anti camera campaigners. In mobile programs where civilian staff operate equipment rather than uniformed police, public resistance to the outsourced program can be higher than fixed systems. This public resistance needs to be managed and acted upon early so that it doesn't reach extremes. It is important to communicate to the public the safety aspects of site selection so the need for enforcement is driven by safety, *rather than* a perception of revenue-raising.

Installation

Regardless of the system configuration, there are commonalities that occur within the installation process. These commonalities include things such as; on site meetings, drafting, establishment of communications at the site, departmental notifications, equipment and conductor installation, power and phasing supply, enforcement equipment installation, restoration of install area, signage placement, testing, and finally activation.

As a part of the overall turn-key implementation approach, Redflex also provides the city with the following:



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Customer Integration: A dedicated customer integration team works with police departments and courts to implement accurate and secure data transfer between Redflex and the customer.

Court Involvement: The integration team works directly with court personnel to comply with the jurisdiction requirements and court protocols.

Citation design: Based on the requirements of the jurisdiction, a citation notice is created for the city.

Lessons Learned: Once the program is installed, ongoing enforcement program training for city staff is still important. Ensuring that city personnel understand the program and that this knowledge base remains consistent for the duration of program (even with the turnover of key positional staff within the city) will add to the success of the program.

Enforcement

The type of enforcement required is dependent on the needs of the jurisdiction, with red light enforcement being the most prevalent in America. The majority of states have a 'right turn on red' road rule that allows drivers to turn right on a red arrow or light, only after coming to a complete stop and ensuring that the intersection is clear. Images are captured of vehicles that enter the intersection after the light has turned red, along with vehicles that do not come to a complete stop for the right turn on red.

For red light enforcement in the US Redflex predominately uses a multiple camera system with three activated cameras detecting violations. In conjunction with image sharing technology these cameras are capable of capturing multiple simultaneous violators; up to 12 violations per second. Full motion digital video footage is also captured to provide crucial situational evidence. The software package used also allows for 24/7 live intersection monitoring and viewing. This functionality has been utilised by a number of cities to assist in crime investigation; from hit and runs right through to bank robberies.

When recommending the most suitable detection method, Redflex works with the city to determine a system that will minimize false triggers, missed violations, and maximise the capture of genuine violations. Due to their increased reliability and validity, inductive loop systems are used in the majority of cases. This setup allows for the provision of additional data to the city, such as vehicle types & volumes by time of day, day of week, or lane of activity.

Pre-emptive maintenance ensures minimal system downtime. The systems are designed to automatically alert with any system failure or malfunction. The maintenance plan is designed to detect any malfunction, with an initial response occurring within the first 24 hours. Redflex Smartcam technology allows a download of system diagnostics for remote monitoring and scheduling of preventative maintenance on a daily basis. Daily quality and operational checks are automatically installed into the camera system



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Lesson Learned: enforcement systems are continually capturing data for enforcement purposes, but this data can have other applications. As an outsourcing organisation, don't be afraid to use the resources of your service provider and investigate the very relevant data collected for the program such as a total vehicle comparison of driver behaviour over time.

Verification / Processing / Collection

All administrative services, from back office and violation processing to citation, printing, and call centre duties are conducted in house on a secure network without leaving the protective redflex umbrella. Acting as the single point of contact for all support requirements for internal and external customers, the Redflex Network Operations Centre is located in Phoenix, Arizona and process more violations than all other American vendors combined. A fully internet enabled violation processing system is provided by for the city. The preliminary viewing is conducted by Redflex, with the police department having the ultimate responsibility for reviewing and authorising the issuance of all violations. When a violation is detected, the following process occurs;

- Digital image and video are uploaded to the processing centre
- Redflex processes the incident and submits an electronic file to the Department of Motor Vehicles (DMV) for registered owner inquiry
- Incident becomes available for police verification (police authorise incident within 3 business days)
- Redflex prints and mails the infringement notification (within 3 days from police authorisation)
- Redflex hosts web site to allow violators to view their incident online
- Registered Owner receives notice, has four options; pay, nominate, request hearing, or no response
- Payment options include cheque or money order directly to the court, or online through the photo notice website. Once payment is entered, the court notifies DMV of the conviction
- If another driver is nominated, this information is entered into the system and a revised infringement notification is reissued and mailed to the nominated driver
- If the violator requests a hearing, the court is notified and Redflex prepares a court evidence package. The court will notify Redflex of the hearing outcome
- If there is no response from the violator, a processing service agency performs 2 to 3 contact attempts.

Redflex provides a multilingual call centre for violator and public enquiries. A secure internet site also provides violators with flexibility when requesting further information regarding their infringement notification. Rather than waiting for images to be posted or having to book an appointment to review images with a police officer, www.photonotice.com allows violators 24/7 access to view their violation images and video footage online. Information on fine payment options and how to contest the



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fine is also provided, along with general program information and answers to frequently asked questions.

Lesson Learned: Providing services online has streamlined the traffic infringement collection process, dramatically reducing processing timelines. Allowing violators direct access to their infringement photographs and video files has decreased dissatisfaction with the process by making it more 'user friendly'.

What are the benefits of an outsourced enforcement program?

Photo enforcement involves advanced technology that needs to provide sufficient evidence that will hold up in court. Jurisdictions acknowledge that this technology is not something that they are able to produce and elect to buy systems outright. But why should they consider outsourcing as an option? The benefits include:

Cost Savings: Outsourcing is a financially viable option, and provides for cost savings in a number of areas. When operating under the American Build Own Operate Maintain (BOOM) Model for example, Redflex offers processes to address much of the city's overheads associated with programs, in addition to contractually ensuring an all-inclusive "no risk, no capital required" solution.

Increased Efficiency: The jurisdiction saves time and resources on the tasks that are completed by the service provider, which increases efficiency and allows them to perform other jurisdictional duties.

Minimisation of Risk: The costs are far greater for a jurisdiction that implements an enforcement program and gets it wrong, compared to the costs of outsourcing the program to service providers who specialise in program delivery. By employing the services of an experienced provider and getting it right the first time, finger pointing and politics can be avoided.

Experience: Engaging a service provider will ensure that you have industry experts with a superior knowledge base working for you.

Public Safety: Photo enforcement can reduce accident frequency and severity, improving road safety through a change in driver behaviour.

Public Security: By outsourcing processing aspects that don't require police attention, police resources can be refocused in other important areas, and in turn increasing public security.



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Further lessons learned: Taken from our experiences in Australia, Saudi Arabia and Ireland, along with the USA.

Programs need to be driven by creating safer roads; Photo enforcement has a greater level of public support when it is evident that the systems are in place for public safety, at sites that have a need for photo enforcement. An effective photo enforcement program will see a decline in initial fine revenue as driver behaviour is modified and fewer incidents are detected. Greater savings are to be gained through a reduction in accidents rates and severity which lead to reduced road trauma costs. Road safety needs to be the main driver of the program.

Be transparent about the enforcement program you are implementing; Educating the public about the program from the outset, and keeping them informed throughout the program lifecycle will help establish and maintain public confidence in the program. Where public information campaigns have been ignored and neglected, the vocal anti-enforcement minority becomes the only voice on the issue and this creates misinformation and public doubt. The rise of social media multiplies this effect, meaning the days of keeping quiet and hoping the noise stops are now gone. Social media and smart phones also mean that choosing not to disclose program information is no longer a guarantee that this information won't reach the public domain. A quick web search brings up multiple pages advising of camera locations, with photos of unmarked mobile units uploaded in real time. Jurisdictions also need to consider what their public appeals and enquiry process will be and ensure this is effectively communicated to the wider community.

Understand the tender/program you are creating; Create a tender specification/program that is going to give you what you require from the start. If you are not quite sure what you may need by way of enforcement technology, employ a consulting service to investigate this for you, or allow potential service providers to tailor a solution for your situation, incentivize them based on maximized prosecutability. Consideration should also be given to system calibration; how can it be done in a practical, timely, legal, and safe way?

Choose your service providers well; There are pros and cons associated with employing the services of just one service provider, or multiple service providers for the one program. The major advantage of having a complete end-to-end service provider is that you get a fully integrated system from day one, meaning there are no issues with multiple service providers (who are usually competitors, creating intellectual property issues) attempting to integrate their programs. The data feedback from camera to back office will be richer and quicker if it's all driven through the one provider. Each jurisdiction is different in terms of its legal requirements, having an experienced provider who understands the legislative environment is an important factor in program success. Operational procedures and evidence handling technology need to be robust and secure enough to stand various court and public challenges. The service provider must have the experience to protect the technical and procedural integrity of the program, with safeguards in



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place. Your service provider should be able to bring more to the table than just the basics of what you are asking; they should be able to provide best practice in addition to the latest technology.

Keep the communication chains open with your service provider throughout the entire program lifecycle; Continued feedback is important to both parties. Make sure the outsourced agreement that you set up is measurable, and that a review and improvement process is implemented for each area.

Buy-in from police stakeholders from the beginning of the program is a must; Police support of the program is integral for positive public perception, and as such, police should play a part in community education. The service provider will need operational support from the police to counter avoidance measures such as radar detectors and tampered plates. In return, the service provider can assist police with using the infrastructure and resources that are provided through photo enforcement for public safety and investigations.

To reduce risk, start small and build on your program rather than going too big too soon; Mobile enforcement vehicles are a quick way to get a program up and running, in Saudi Arabia, Redflex established a medium sized mobile speed enforcement program and are now scaling up to a large scale fixed red light and speed program.

We are in it together; For the program to be as successful as possible, both the jurisdiction and the service provider need to protect the integrity of the program and work together on public outreach and community education.

Integration with the vehicle registration database requires more thought than it may seem; Consideration needs to be given to the handling of number plates and registration details from other jurisdictions. In Australia, this is limited to dealing with plates from other states, but in other regions it becomes necessary to recognise plates from other countries.

Allow your program to adapt to advances in technology advances; In Saudi Arabia, SMS notifications are used to advise registered drivers of incidents. By utilising mobile technology it speeds up the notification process and is more in line with the way that the community communications.