

CAP Speed -- The Way Ahead

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Summary

The Cap Speed Project was a response to the identification of the need to enhance traffic camera systems. The first step was the replacement of old and non-integrated recording systems and the design of a modern fully integrated wet film and digital system, capable of manual or direct information input from other digital systems such as Automatic Number Plate Recognition (A.N.P.R.) and have the capacity for search facilities either by name, registration number make or colour of a vehicle, within a street, suburb or specified area over a set time period. The system needed to have the ability to identify target locations and grade their rankings and record equipment used for court purposes. It also was required to process a number of infringement types, to initially include all infringement offences for 'On the Spot' and traffic camera infringements, Pawn Brokers and Cannabis infringements with the ability to accept others when required. A user operating within the system would utilise computer screen/keyboard with virtually no paper handling.

1. INTRODUCTION

This paper will illustrate the restrictions placed upon WAPS (Western Australian Police Service) with the old mainframe recording systems and the benefits gained from the new CAP Speed Project as it opened up the options to enhance enforcement with new technology on in the marketplace. These factors, underpinned by a determined and dedicated Police Service, ensured that the new system would allow for expansion in enforcement types as required.

2. BACKGROUND

2.1 On the Spot and Electronic Violation recording systems

The traffic infringement recording system for on-the-spot infringements came on line in 1987 and was mainframe based. Over the years a number of enhancements were made to record names, addresses, license and infringement detail but in general the original system remained. Although large amounts of data was collected the ability to retrieve this data was limited and restricted to those with computer knowledge of mainframe systems, it could only provide numbers of those prosecuted and not a tool for area offence identification or traffic patterns. This type of system was also not compatible with digital systems and did not allow for the utilisation of imaging.

2.2 Electronic Violation Recording

In 1978 when red-light violation recorders were first introduced to Western Australia infringements were hand written utilising a paper based system in 1987 a mainframe Infringement System was developed for hand written infringements and red lights utilised this until 1988. In 1988 a Red-Light Infringement system was developed along similar lines within the mainframe but running separately and in late 1988 with the introduction of speed cameras the Red-Light system was adapted and became commonly known as the Cam System. This system had all the same issues and the Infringement system being based on mainframe technology, lots of data collected but little usable information returned. Initially because of the restricted numbers of speed and red-light cameras the system coped easily.

In late 1998 with the identification of the need to increase electronic enforcement methods it was soon established that a new system had to be acquired. Speed camera use had risen from the original 3 to 13 and red lights camera were now established at 30 in total rotating around 61 sites. Over 19,000,000 million vehicles were being monitored each year and the mainframe system was exhaustive in human resources. It was being supported with over 26 Excel based stand alone programs and statistics collated from these.

A stand alone film tracking and location system called S.A.R.C.I.S (Speed and Red Light Camera Information System) was developed as additional security for film tracking and camera enforcement performance reporting but again had no facility to store images and was not compatible with the mainframe offence recording system.

The main problem confronting WAPS for the future was that of digital recording. Current enforcement cameras were wet film based and although working exceptionally well new emerging technology was digital based. Legislative requirements were leading to photographs being placed on infringements and other enforcement types for example A.N.P.R. (Automatic Number Plate Recognition) was digital based, WAPS required a system to accommodate new technology and legislative requirements.

3. TAKING ACTION

In late 1998 Inspector Robert MOORMANN (retired) submitted a report on camera systems requesting funding to establish modern recording systems and when in place allow WAPS to enhance camera enforcement. A steering committee was formed with various heads of Government Agencies and the E.T.E.P. (Enhanced Traffic Enforcement Program) came into being.

Although lots of planning was carried out because of funding and other agencies inability to process any increase in infringement totals this program failed to gain ground and was suspended,

In late 2001 the program was reopened under the name of CAP Speed (Coordinated Action Plan- Speed) from a number of initiatives out of the Road Safety Council. drivers for this were the increased amount of vehicles detected for speeding and other offences, pending "Owner Onus" legislation that required photographs on

infringements and again the movement towards digital detection and processing, all at odds with the mainframe currently in use.

The CAP Speed teamed was formed in 2002 that included the Traffic Camera Section and consultants from Fujitsu (known then as DMR) who were WAPS partners in technology.

Tenders were called for in December 2002 and in early 2003 Redflex Traffic Systems of Melbourne were selected as the successful applicants

4. PROJECT REQUIREMENTS

After numerous planning meetings with consultants a lengthy tender document, successfully won by Redflex Traffic Systems, was produced that would be exhaustive to cover in this document however some of the general requirements for the one system are as follows:

- Design, purchase and implementation of a fully digital processing system capable of manual or direct line input.
- System to be able to convert wet-film through a scanned image process and store in digital format.
- System to be able to issue a traffic infringement for every infringeable offence under the Road Traffic Act 1974 or Code 2000, and the Vehicle Standards Regulations and Rules.
- Ability to print the photograph of the “Offence” obtained by a camera on an infringement notice.
- Ability to collate data on crash and speed locations and electronically allocate camera site rostering as per selected criteria and weightings.
- Track the location of all enforcement equipment for evidentiary and equipment management purposes.
- Ability to digitally record and process all On-the spot infringements through document scanning and archiving with all other processes being computer based.
- Initial ‘go-live’ ability to process Pawn brokers and cannabis infringements with facility to increase infringement types as required.
- Search facilities against any fields within the database including name, vehicle registration, colour or make in a given area at a time by use of an ad-hoc inquiry facility.
- Monitoring and reporting of all activities within the system by action or person, allowing real time or reported performance management.
- Ability to create statistical reports for KPI’s or office processes as required, with standard or ad-hoc run schedules built into system.
- Ability for Quality Control staff to randomly select on line in real time any system incidents, infringements or investigations by operator ID, location, user ID, type or status and request these on a percentage basis.
- Investigation recording and management facilities including allocation, resolution and emailing of links into the IIPS application with limited update ability.

- Flexible workflow management functionality to allow changes to process flows within the system.
- Up-gradable storage capacity to enable expansion of enforcement.

The system will allow a user, depending on security access to search across all fields of information, with the various types of data collected search across these fields increases intelligence information available and becomes a valuable tool for traffic and criminal inquiries. Because all traffic data from speed cameras or A.N.P.R. could be recorded and retrieved then traffic flows, contact rates and offence types can be identified. The ability to write our own ad-hoc inquiries provides the ability to search across a range of issues that might have only part information available for the initial search. A name has been selected for the new system and it is commonly known as I.I.P.S. (infringement and Image Processing System).

5. SYSTEM REPORTING - CURRENT

Numerous stand-alone reports are now produced from the S.A.R.C.I.S. system and the numerous excel support systems, all rely on human resources with little integrated feed of data.

Current reports obtained from the S.A.R.C.I.S. system can be built on, an example of current reporting is:



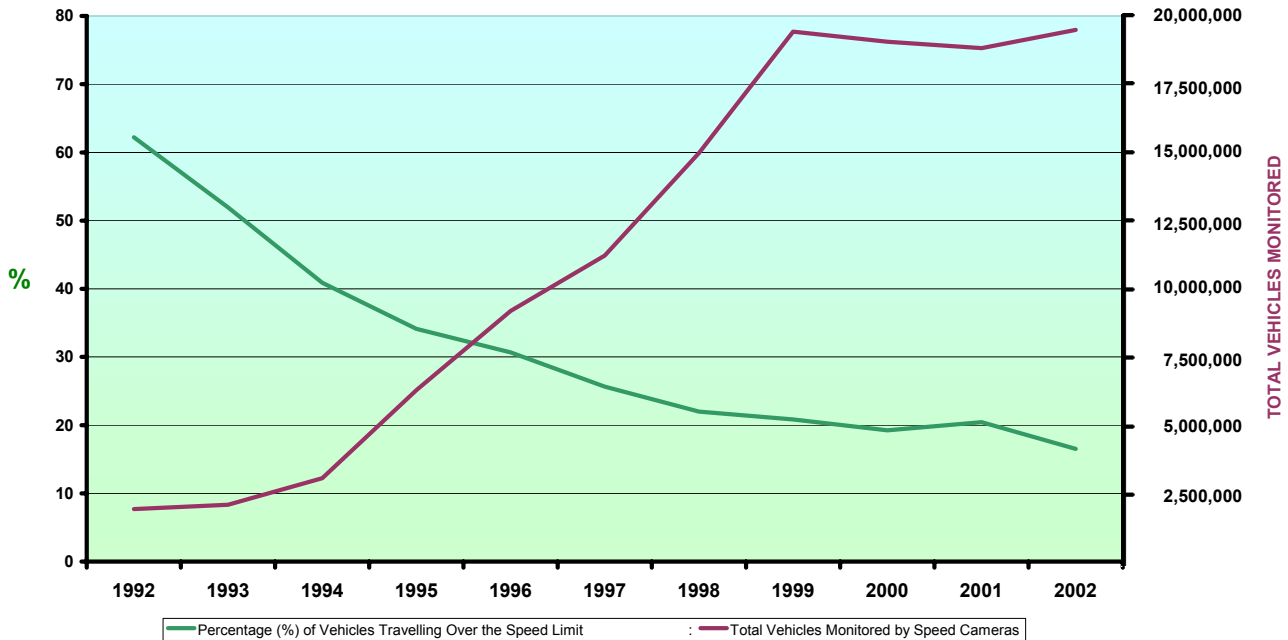
Western Australia Police Service Speed Camera Statistical Information RAW DATA (Prior to Film Evaluation) for 3 years to 31/03/2004 for the whole State

2002	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTALS
Locations	1,120	1,018	1,262	1,159	1,130	1,194	1,201	1,145	1,148	1,076	1,167	1,260	13,880
Hours	3,084	2,796	3,460	3,252	3,179	3,393	3,382	3,239	3,281	3,119	3,376	3,663	39,224
Total Vehicles	1,473,072	1,378,460	1,620,351	1,645,800	1,737,902	1,788,430	1,777,630	1,692,675	1,622,311	1,441,178	1,510,986	1,800,967	19,489,762
Over Speed Limit	18.00%	17.40%	16.60%	18.60%	19.90%	19.40%	18.90%	16.20%	11.30%	11.30%	14.00%	15.60%	16.53%
Over Enforcement Limit	49,141 3.30%	43,764 3.20%	48,267 3.00%	54,066 3.30%	63,340 3.60%	61,300 3.40%	61,057 3.40%	46,642 2.80%	27,917 1.70%	24,128 1.70%	36,838 2.40%	48,540 2.70%	565,000 2.90%
2003	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTALS
Locations	1,237	1,062	1,167	1,101	1,118	1,054	1,081	1,106	940	870	958	1,125	12,819
Hours	3,319	2,921	3,168	3,012	3,269	2,977	3,012	2,992	2,691	2,380	2,541	3,017	35,299
Total Vehicles	1,857,354	1,724,262	1,774,692	1,793,250	2,047,211	1,723,760	1,772,368	1,774,721	1,593,786	1,366,089	1,421,332	1,576,679	20,425,504
Over Speed Limit	16.50%	15.40%	16.10%	16.30%	15.80%	15.40%	15.60%	16.60%	14.90%	14.80%	17.50%	16.80%	15.98%
Over Enforcement Limit	52,157 2.80%	45,626 2.60%	47,319 2.70%	47,517 2.60%	51,110 2.50%	40,053 2.30%	45,558 2.60%	50,803 2.90%	38,933 2.40%	33,480 2.50%	43,419 3.10%	46,416 2.90%	542,391 2.66%
2004	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTALS
Locations	1,108	1,049	1,136										3,293
Hours	2,967	2,848	3,150										8,965
Total Vehicles	1,553,039	1,619,215	1,828,673										5,000,927
Over Speed Limit	239,588 15.40%	271,826 16.80%	321,627 17.60%										833,041 16.66%
Over Enforcement Limit	40,542 2.60%	48,265 3.00%	56,053 3.10%										144,860 2.90%

An example of the excel spreadsheets supporting the current mainframe indicating vehicles monitored to vehicles infringed during camera operations is:



Total Vehicles Monitored by Speed Cameras V's the Percentage of those Vehicles Speeding



Future reporting including on-the-spot infringements and other traffic enforcement tools (A.N.P.R.) would provide a larger picture of traffic enforcement and assist in the targeting of offences or areas and possible the allocation of police resources.

7. BENEFITS REALISATION

Part of the project included a benefits realisation exercise being carried out an a document listing these benefits produced so that WAPS could measure results, some of the benefits identified were:

- Improved incident response and management.
- Modify Road user behaviour.
- Efficiency gains.
- Traffic Services staff development.
- Mainframe replacement.
- Transfer of core functions, and
- Traffic management linked to wider police responsibilities.

7.1. Improved Incident Response and Management

I.I.P.S. will provide the ability to track infringement and quality assess images, documents or incidents on-line. As all information recorded against an incident can be shown to the user as one document file the system allows for faster access to information and therefore decreasing processing time. Data is improved and a decrease in errors leading to improved reporting facilities and less complaints.

7.2 Modify Road User Behaviour

The ability to automatically process and generate deployment rosters against weighted criteria leads to better targeting. Because every offence an infringement can be issued for is recorded in the system secondary offences detected by speed or red-light cameras can be prosecuted. Producing photographs on infringements enables "Owner onus" legislation and offenders can sight the offence on infringements or attend the office and look at the digital images. This should lead to decreased investigation times and a quicker processing system allows for increased enforcement.

7.3. Efficiency Gains

One system is used instead of three previously with the support of many excel spreadsheets. All types of infringements are processed by the one system and delivered to the user in the same format leading to less confusion and less errors. It will automatically generate returns to external agencies and internally be able to generate infringements details for on-the spot issues to officers in the field via email, for them to update or correct infringement errors thereby decreasing handling times. Because I.I.P.S. is designed to take differing infringement types WAPS will be in the position to process these in the one system and decommission old programs. Less processing time leads to greater efficiency and faster processing cycle.

7.4 Traffic Service Staff Development

The I.I.P.S. system eliminates the current need for shift work due to the increased work flow ability. It provides supervisors with the facility to manage staff and quality assess work on-line and has built in performance management indicators. Because of the restructuring of processes it provides for a variety of new tasks and the opportunity to multi-skill staff leading to staff satisfaction, increased career opportunities, empowerment and motivation.

7.5 Mainframe Replacement

The "INF", "CAM", and SARCIS systems will be decommissioned along with numerous spreadsheets. The digital I.I.P.S. system is a better base platform for future development.

7.6. None Core Functions

Current demerit point suspension and payment inquiry roles for infringements have been identified as non WAPS functions and I.I.P.S. now allows for these functions to be transferred to the Department of Planning and Infrastructure.

7.7 Traffic Management Linked with Wider Police Responsibilities

All infringement data will pass onto the Incident Management System (I.M.S.) increasing the level of intelligence for crime investigations. Images and personal inquiry details will still have to be obtained from I.I.P.S. provided on request. Currently over 800,000 photographs are taken each year with no picture stored and wet based film storage utilised making retrieval difficult. No search facility is available on mainframe apart from a registration number. I.I.P.S. ability to search by vehicle type or colour by ad-hoc inquiry greatly assists investigations.

8.CONCLUSION

The secret to the success of this system lies with the ability of the user to interpret data from the system. Like all information if the user is not familiar with the data collected or is not familiar with practices for on road enforcement then the interpretation can be at fault.

The system will provide for search by ad-hoc report, over a range of infringement and other enforcement information, a powerful tool in the combating of traffic and criminal investigations. Targetting of enforcement locations especially for camera enforcements will be automatically produced with the capability to override manually if desired. It will be produce these against specific and weighted criteria, for example crash sights and enable WAPS better manage traffic enforcement.

Most importantly being a fully digital system it opens WAPS to the window of the future, as technology becomes more digital or image based this system is waiting to take advantage.