Queensland Parliamentary Travelsafe Committee

The following is the NSW Roads and Traffic Authority submission in relation to the Queensland Parliamentary Inquiry into Automatic Number Plate Recognition Technology (ANPR) Issues Paper No 12.

Background:

The NSW Roads and Traffic Authority (RTA) have been issuing non-reflective number plates since 1937, when black plates with white characters were first introduced. Reflective number plates were first released in 1951 when three letters and three number plates (3x3) yellow plates were first issued. Since then, a variety of number plates have been released using both reflective and non-reflective backgrounds.

NSW Police

Following a review of ANPR technology, the RTA understands that NSW Police implemented an ANPR system on 12 December 2005 at a cost of $1.6m. The ANPR project was as a consequence of the NSW Auditor General's Performance Audit of NSW Police and the RTA to address unlicensed drivers and the use of unregistered vehicles.

RTA

The RTA deploys ANPR technology in the following applications:

- Safe-T-Cam (Truck Enforcement programs) Travel Time and Registration
- Bus and transit lane enforcement (White Listed Valid vehicles)
- Point to Point Enforcement trials in two locations.

However, more recently, the RTA's Camera Enforcement Branch included ANPR as part of their recent "Expression of Interest" for new technologies used for camera enforcement applications. Part of this process included RTA conducting initial technology trials using ANPR equipment from a number of camera suppliers. During the trials issues were identified in relation to their practical operation given NSW has a mixture of non-reflective and reflective style plates. The same constraints may also apply to other registration jurisdictions where non-reflective and reflective materials are in operation.

Heavy vehicle detection systems

- ANPR technology is effective in surveillance and enforcement of driving hours, registration checks and speeding incidents in NSW. ANPR is integral to the RTA's intelligence-based approach to managing heavy vehicle compliance on the NSW road infrastructure.
- Therefore, these systems are required to detect heavy vehicles, the vast majority of which do not have special number plates but have standard style plates.
- The technology is the fundamental driver behind the success of the RTA's Safe-T-Cam (STC) system which uses ANPR to identify a vehicle and undertake compliance checks with a number of databases.
- ANPR is the driving technology at automated heavy vehicle checking stations. STC, using ANPR, identifies the registration of a vehicle and matches the details with our databases.
- Vehicles are automatically screened for offences relating to registration, outstanding defects, Safe-T-Cam driving hours, and route compliance by interrogating RTA databases such as Truckscan. DRIVES and the Heavy Vehicle Rating System.
- At checking stations, STC is able to identify potential checking station avoidance incidents by identifying the vehicle for subsequent follow up with the vehicle owner.

- The ANPR driven STC cameras are also strategically located on major freight routes to enable the identification of potential driving hour offences (fatigue), travel time incidents, incidents of a heavy vehicle attempting to avoid STC and incidents of an unregistered vehicle. This technology has been implemented at 24 locations (with 27 cameras) on major NSW freight routes, including automated heavy vehicle checking stations.
- The potential for identifying driving hour offences has increased in recent years with the use of ANPR in South Australia. South Australia's Department of Transport, Energy and Infrastructure (DTEI) has established ANPR based STC at 11 locations on the South Australian road network. This has enabled the RTA and South Australia STC networks to work in concert to identify cross-jurisdictional fatigue incidents.
- In addition, "alerts" on a vehicle of interest are also issued through STC which will identify, using ANPR, a vehicle on each occasion it is sighted, for either follow up action or for immediate interception at a checking station.
- ANPR enables the STC network in NSW to identify on average 1500 potential incidents per day. On average, 150 are confirmed incidents that require follow up action with the operator.
- An extension in the use of ANPR based technology in other jurisdictions would fit particularly well with the NTC's National Heavy Vehicle Enforcement Data Exchange project. The purpose of the project is to develop a national heavy vehicle enforcement data exchange strategy for improving road transport compliance and enforcement data sharing arrangements between jurisdictions, in order to deliver improved heavy vehicle enforcement and road safety outcomes. ANPR based technology would enable checks on vehicles with outstanding offences from other jurisdictions through the national database.
- For the period 1 January 2004 to 1 October 2007, STC identified the following confirmed heavy vehicle incidents:
  - 30,452 incidents of a heavy vehicle travelling beyond prescribed hours;
  - 27 incidents of a heavy vehicle attempting to avoid STC;
  - 5,271 heavy vehicle speeding incidents where the speed limit was exceeded by 15 or more kilometres.
- With the progressive expansion of HML and introduction of IAP in NSW, an intelligence-based approach to compliance and enforcement using ANPR and GPS will be increasingly relied upon to ensure that the right vehicles are on the right roads.

ANPR Technology - system constraints

The ANPR works within the infra-red spectrum, requiring a reflective surface for optimal character recognition. The main issues identified with equipment supplied to date are:

- The inconsistency in reflectivity of plates due to age and design.
- The reflectivity characteristics of plates in the infra red spectrum required for all vehicle detections.
- The location and application of rules regarding obscuration of plates.
- The duplication of plate numbers between states.
- The ability of ANPR engines to deal with the wide variety of plates shapes and sizes between states.
- The need to consider the issues of data collection and privacy with this technology.

As part of the technology trials, versatility of ANPR for use in multi application enforcement has been confirmed, but a number of technical challenges remain to maximise its effectiveness. ANPR systems require a lane based approach which has substantial infrastructure implications.

Key issues and comments:

The Enhanced Enforcement Program (EEP) is a funding agreement between the Roads and Traffic Authority (RTA) and NSW Police and represents a major component of road safety activity designed to extend the effectiveness of Police enforcement operations. The aim of EEP is to enhance the level of visible Police enforcement activity over and above normal operating requirements. The enhanced profile seeks to deter drivers and other road users from unsafe road user behaviour and is supported with targeted public education campaigns.

The NSW Police commenced operational deployment of ANPR technology in December 2005 and applied for EEP funding to conduct operations using this technology. The system is comprised of a stationary camera linked to a computer that analyses live video to identify and read vehicle number plates. Having read the number plate the system then checks the vehicle against the RTA database. Vehicles are intercepted further along the road and checked more rigorously using mobile data terminals and police radio.

1. Assessment against EEP principles

All EEP funded operations are assessed against five key criteria, an assessment against the key principles concluded that the use of ANPR technology is not appropriate for funding under the EEP. The basic premise of the EEP is that operations are highly visible and effectively targeted. Unlike the development of EEP funded speed and drink drive operations which use crash data and/or local Police intelligence to develop effectively targeted operations, the identification of locations for unregistered vehicle offences is almost impossible. In addition, EEP operations are to be integrated with coordinated public education. The RTA does not have any state-wide or regional public education campaigns that focus on unregistered or unlicensed drivers.

2. Lack of quantitative research

There is a lack of quantitative research both in Australia and overseas that demonstrates the effectiveness of ANPR technology in reducing crash rates. There are currently a relatively small number of operations conducted in NSW using ANPR technology and therefore a lack of operational evidence of its effectiveness.

In addition to a lack of qualitative research there are also limitations in determining a correlation between unregistered and unlicensed drivers due to discrepancies in both the recording and reporting of the licence status of motor vehicle controllers involved in crashes in NSW.

The RTA and NSW Police have conducted road safety research on a range of topics including road spike technology, road-side drug testing trials and best-practice police enforcement. The RTA has expressed its support both financially and with the allocation of expert personnel to conduct research that investigates the road safety benefits of ANPR technology, in partnership with the NSW Police.

3. ANPR as a deterrent

The deterrence theory of enforcement is a key principle of the EEP. This theory has been shown to be ineffective deterring unlicensed drivers from the perceived risk and fear of legal punishment. Research concludes there is an identified correlation between unregistered vehicles and unlicensed drivers which suggests that there would similarly be little impact on unregistered vehicle owners. Therefore the effectiveness in deterring unlawful behaviours, such as driving unregistered or stolen vehicles, is unknown.

Recently, NSW Police wrote to the RTA's Chief Executive seeking to prevent the issue of National Rugby League (NRL) plates, as they were non-reflective and therefore not compatible with revised ANPR technology they were testing/implementing.

NSW Police advised the RTA that Police in all jurisdictions through out Australia are seeking to implement ANPR technology and that the equipment cannot adequately capture number plates with non-reflective backgrounds. Therefore, NSW Police have advised that they require all NSW number plates that are to be issued in future have reflective backgrounds and non-reflective characters for optimal capture on their ANPR systems. This requirement has created an issue for both the RTA and the number plate manufacturer, who must now source new reflective materials and special ink colours for number plates. The new products will also need to be field tested to allow the manufacturer to determine warranty periods for such new materials.

The number plate manufacturer Licensys Pty Ltd based in Queensland manufactures both reflective and non-reflective number plates. Licensys is also contracted to the RTA to provide number plates. Their work in resolving the reflective plate issues in NSW will also Queensland and other jurisdictions. Changes to manufacturing processes will also mean the associated costs to jurisdictions will increase to some extent. This issue should be considered before the introduction of any ANPR system that is limited to reading number plates with reflective backgrounds. There may be opportunities to improve the detection rates of these systems with non-reflective plates at the time of their introduction.

Other ANPR systems and claims

There are ANPR systems currently in operation in both Australia and other parts of the world, the suppliers of which claim that they can capture details of reflective AND non-reflective number plates. For example, the Perceptics Company www.perceptics.com/prodcuts/lpr manufacture a Licence Plate Reader (LPR) / ANPR system that "... can read all types of licence plates: retro-reflective, non-retro-reflective, embossed, flat and others...". Perceptics LPR systems are in operation in Melbourne.

The Integrated Multi-Pass System (IMPS) operating in various countries in South-East Asia advertise "We read (retro) reflective and non-reflective plates at the same time!". Also, Zamir Recognition Systems Ltd in Jerusalem advertise their LPR system that can recognise reflective and non-reflective plates with one unit.

There are suppliers who claim their systems can adequately read reflective and non-reflective number plates. Therefore, to blend these systems smoothly into existing number plate manufacturing processes, it is suggested that Queensland consider an ANPR system that can capture both reflective and non-reflective backgrounds, which would provide both registration and enforcement organisations with an optimal system, with minimal impact. To assist with system improvements the RTA will provide complete sets of all plates manufactured in NSW to potential suppliers to help them train their system libraries, if possible, to detect the non-reflective style plates. It is also considered necessary that there be a rigorous assessment of the claims made by ANPR equipment suppliers such as their detection rates being of 90% - 96% which may be considerably lower once field tested.

In addition, the accuracy of ANPR technology is also understood to be limited in relation to its "library" of plates retained within the system itself for reference purposes. It is understood that the more plates required for retention in the library, the slower the system is to respond, because it must check all configurations. This restriction may lead to a proposal from enforcement agencies or, at least from ANPR equipment suppliers, for standard style plates. However, each registration jurisdiction must also consider its commercial number plates operations. This issue may require registration jurisdictions to move to reflective plates across the board much sooner than expected.

Summary:

The preceding discussion outlines a number of important issues relating to evaluating the potential road safety benefits of ANPR technology. The use of such technology although of benefit in detecting unregistered vehicles does little to deter drivers to drive either unlicensed or unregistered.

NSW, while using ANPR technology, is also looking at the new generation of products in the market place. To support the use of this technology and to maximise its effectiveness NSW is working closely with Licensys to produce reflective style plates for all new products scheduled for release during 2008.

The National Rugby League plate style is the first style that is to be addressed. All new product releases will have reflective materials to help maximise ANPR detection and recognition rates.

NSW will also work with potential equipment suppliers to enhance their ANPR system capabilities in relation to non-reflective plate styles.

The change to reflective materials should help both the future enforcement capabilities of jurisdictions while also assisting the commercial business needs.

Finally, all developments in the application of ANPR within the RTA are considering the nationwide implication of data collection and privacy as part of system design.

Recommendation:

That the Travelsafe Committee review the issues raised by the RTA and consider strategies to address the outlined limitations of the technology.

RTA contact: David Stuart-Watt
Director, Licensing Registration and Freight
Telephone: (02) 9218 6998