



**Homeland
Security**

Science and Technology

TechNote

U.S. Department of Homeland Security



System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective assessments and validations on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

For more information on this and other technologies, contact the SAVER Program Support Office.

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License Plate Recognition Standards

License Plate Recognition (LPR) systems automatically identify vehicles by the information on their license plates. LPR systems use cameras and computer hardware and software to capture vehicle license plates and check the plates against designated criminal and watch list databases. Examples of law enforcement applications for LPR systems include stolen vehicle recovery, parking enforcement, locating fugitives/criminals, AMBER alerts, investigating crime scenes, surveillance, and policing checkpoints. The law enforcement community has recognized that minimum performance and interoperability standards for LPR systems must be developed.

Background

LPR systems include hardware components such as cameras, processing units, and displays. LPR systems often use a standardized internal Global Positioning System (GPS) to automatically provide a geo-stamp with date and time information for each plate read. This location data may be synchronized with an external Geographic Information System (GIS) or Automated Vehicle Locating (AVL) system. For systems installed on vehicles, the system must interface with other vehicle systems, such as the Mobile Data Computer (MDC) and vehicle power.

Performance specifications for LPR systems should include a minimum capture rate, plate/camera speed differential, camera field of view (FOV), and camera angle and position. Lighting conditions and capture latency periods are also important performance specifications that can affect applications at different times of the day and at various traffic volumes.

Temperature and moisture are important considerations. There may be existing standards to help with environmental protection, such as Ingress Protection (IP) for water and dust and National Electrical Manufacturers Association (NEMA) for enclosure protection. Also, LPR systems need to withstand specific levels of mechanical stress, shock, vibration, impact, and electromagnetic interference (resilient and non-intrusive).

Standardization Efforts

Currently, there are a growing number of in-car camera systems manufacturers that provide an LPR capability. The law enforcement community has recognized that minimum performance and interoperability standards for LPR systems must be developed. The following sections discuss standardization efforts with regards to hardware and software, interoperability, and privacy.

Hardware and Software Standards

The International Association of Chiefs of Police (IACP) has formed a Special Technical Committee (STC) of law enforcement practitioners, national laboratory representatives, and other subject matter experts to define standards and minimum performance specifications for LPR systems,

with each concentrating on a different aspect of the standardization. This effort, funded by the National Institute of Justice (NIJ), will result in an NIJ standard.

The STC's proposed standards include specific LPR software capability considerations such as user/administrator roles and privileges, hot list management, data addendums, audit logs, system status indicators, Graphical User Interface (GUI) layout, usage statistics for reporting (e.g., vehicle counts, reads, and hits), and visible and audible notifications.

Standards for image acquisition address a system's ability to: capture plates while in motion; recognize plates under various environmental conditions; use a standard image file format; have user-configurable plate image viewing options; allow live camera feeds for calibration; read characters at a defined minimum height; and read stacked and special characters. Additionally, image processing requirements under consideration for standardization include optical character recognition (OCR) accuracy and plate capture images. Plate capture images should include an infrared plate image and a color image of the vehicle.

From a data management perspective, the STC is addressing user-configurable minimum image resolution, import/export/interoperable data standards, compatibility with a common alert list system, data security, synchronized metadata, and system audit logs (e.g., date/time, location, hardware identification, and camera identification).

Interoperability

Agencies using LPR technology are collecting large amounts of data, with larger organizations collecting millions of LPR records daily. These LPR records could be beneficial in criminal investigations and counter-terrorism efforts if these records are shared between agencies. This raises the need for further standardization for interoperability to support LPR records sharing between agencies, taking into consideration the individual agencies' data retention and privacy policies.

Investigators and analysts could use LPR data to cross reference with other jurisdictions. For example, LPR data from one agency could be consolidated with LPR data from other nearby agencies, providing a more comprehensive analysis of a suspect's whereabouts to support an investigation. This data could also be automatically cross referenced with other data sets, such as records management or suspicious activity.

One of the major solutions to interoperability issues offered by the Federal government is to use a common data schema. The Department of Justice and the

Department of Homeland Security have established common architectures and data schemas for interoperability, such as the Justice Reference Architecture (JRA), National Information Exchange Model (NIEM), and National Data Exchange (N-DEX). As a subset under NIEM, LPR-specific schemas include the License Plate Recognition Data (LPRD) schema.

The International Justice and Public Safety Network (Nlets) has a pilot project to develop data specifications for the sharing of LPR data between states over the Nlets messaging system. This effort will allow states to send LPR capture data to a central database housed at Nlets. Law enforcement agencies will then be able to query the database for license plates of interest. The Nlets LPR query system then provides the querying agency with the plate read data including date, time, location, and originating agency. More information, such as images or metadata, could be obtained by submitting a second query for the specific file. An additional planned capability is proactive alerting where the system will scan incoming LPR data and alert the requesting agency if a plate matching their query enters the system. Nlets is also addressing LPR data quality, retention, dissemination, accountability, and security through a published set of policies.

Privacy

The IACP has published the *Privacy Impact Assessment Report for the Utilization of License Plate Readers*, which addresses the privacy concerns of the enhanced data collection, analysis, and dissemination of license plate data made possible by the LPR technology. The report provides information on the impact LPR systems can have on the public's privacy interests and makes recommendations for the development of information management policies to govern an agency's operation of an LPR system.

References

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