

State of Minnesota
Department of Public Safety

Bureau of Criminal Apprehension
CJIS Section

Feasibility Study
for the
Automated License Plate Reader Project

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I. An Overview of the Project

A vendor request has been made to the Minnesota Bureau of Criminal Apprehension (BCA), Criminal Justice Information Systems (CJIS) section to examine the possibility of providing an additional service for law enforcement agencies in Minnesota. The service requested is the ability to utilize automated license plate reader (LPR) technology to locate stolen motor vehicles and motor vehicle license plates.

Robert Johnson, CJIS Director, initiated this study to:

- a) understand the experiences of other states that have piloted similar efforts
- b) estimate what costs, if any, would be incurred by the State
- c) identify any barriers that may be unique to Minnesota should BCA-CJIS decide to move forward in implementing this service

II. Research Approach

The approach utilized in this report involved the following activities:

1. Web searches for articles and information
2. Search of the FBI's Law Enforcement Online (LEO) site
3. Email requests for information
4. Telephone requests for information
5. Interview regarding BCA-CJIS current systems and infrastructure

High-level summaries of the information obtained to date are included Section III of this report.

III. Key Findings

1. Summary of web research

Additional references and links can be found in Appendix A

- There are a substantial number of LPR vendors and these vendors appear to have at least two distinct customer bases – one law enforcement agencies and the second parking facilities. Although the purpose of the data collection is very different, the technology is applied in the same manner.

LPR Markets Include:

- Access control
 - Airports
 - Entry/Exit points
 - Hotels
 - Industrial Property
 - Parking lots
 - Police/Government
 - Private Estates
 - Toll booths
- Web discussion group postings indicated that individuals may have an apprehension toward the implementation of this technology. It seemed to be viewed by many of the respondents as another “big brother” approach that could be applied to the citizenry by government. Therefore, delineation of specific purposes for which the tool may be used may be critical to the successful use of this type of investigative tool by law enforcement.

2. Summary of articles found on LEO Website

Several topic/working papers were discovered in a search of the LEO website. Those papers addressed extraction of the data for use with this technology, rules for participation, use of the data, research regarding the development of a separate server for LPR data that would be updated real time and accessible by law enforcement and, most recently, expanding the number of NCIC files that would be included in the extract for use with the LPR devices. Also located were additional newsletter articles detailing how the technology had been applied in various states.

Copies of these documents can be found at: \\bca-fs-01\shared\CJIS\CJIS Project Documentation\Active Projects\Automated License Plate Readers\Reference Materials\LEO.

3. Summary of responses to email requests for information

a. Ohio

In response to an email request sent to the Ohio State Highway Patrol, Jon Heil, Social Science Research Specialist, Ohio State Highway Patrol, Office of Strategic Services responded and two conversations were held, and

information was received via email. Jon forwarded three documents that summarize the 4-month pilot project conducted by the Ohio State Highway Patrol. These documents can be found at: \\bca-fs-01\shared\CJIS\CJIS Project Documentation\Active Projects\Automated License Plate Readers\Reference Materials\Ohio.

In Ohio's case, the findings were that they felt the technology was most successful either when the cameras operated from a fixed position (at toll gates) or when mounted in vehicles whose primary duties were auto-theft specific (i.e. auto theft task forces). During general patrol, they found the tool to be less effective. Ohio identified what they termed "four significant areas" that need to be addressed.

1. Improve technology to be better able to read license plates that have stacked or small characters (commercial plates)
2. Increase agency staffing levels to better enable agencies to follow-up on all confirmed LPR alarms (the fixed position cameras generated the highest volume of alarms – in this application there was not a patrol vehicle present at the time of the alarm)
3. Improve the accuracy of NCIC files by ensuring records are updated in a timely manner thereby reducing the number of "false" positive alarms (too large a percentage of the alarms were for vehicles that had already been recovered but were not removed from NCIC)
4. Improve technology to increase readability of license plates that have covers or low reflectivity

Additional Ohio findings included:

1. Staffing:
 - LPR technology had little impact on normal dispatcher duties.
 - The agency had no major problems in downloading NCIC data, although researchers found that 31 percent of "positive" alarms from Turnpike gates and 26 percent of "positive" investigative car alarms were no longer valid in the NCIC database.
 - The LPR technology increased the efficiency and productivity of officers by auto scanning license plates and reducing the need for individual file checks.
 - Officers appeared more comfortable using the technology during slow speed patrols, and found it more difficult during high speed activities.
 - Early implementation of the system required a large commitment of Information Technology (IT) staff. Ongoing

maintenance or an aggressive expansion of the system may require additional IT resources.

2. Technology

- Overall, OSHP experienced few technical difficulties instituting the technology.
- LPR technology appears to be best suited for use on limited access, high auto theft corridors and for routine patrols at slower speeds.
- Ohio Turnpike gates offered an ideal opportunity to test LPR technology because fixed cameras were able to capture license plate images at slow speeds.
- Further research is needed to determine the effectiveness of fixed cameras at higher speeds.
- APR technology played a major role in the 50 percent increase in stolen vehicle recoveries on the Turnpike from 2003 to 2004.
- The mobile camera attached to the unmarked investigative car helped contribute to the 81 percent increase in stolen vehicle recoveries in OSHP's Cleveland Operations (auto theft task force)

b. Arizona

No response was received to email sent.

4. Summary of responses to messages left for information

a. Maryland

A conversation was held with Jillian Watts on October 23, 2006. Jillian indicated that Maryland has considered their state's implementation of the LPR units extremely successful. She indicated that the first day that the units were activated two stolen vehicles were recovered.

In implementing the technology, Maryland currently does a daily download from the FBI and publishes the data to a site that is available to participating agencies. The participating agencies then access the state's download site to update their LPR units. Memoranda of Understanding are used between the participating agencies and the Maryland CSO to ensure that each participating agency is aware of their responsibilities in regard to keeping their units updated and also to ensure that they understand that any alerts received from the LPR units must be re-run to ensure that the stolen status is valid and must also do a hit confirmation with the source agency.

Participating agencies are required to obtain and maintain their own LPR units and may choose from any available vendor.

When asked if she was aware of any implementations where the units were directly querying the stolen vehicle hot files, Jillian indicated that she was not aware of any, but believed that vendors were at least in the process of exploring this possibility and may already have this concept in development. Jillian did indicate that she thought that there may be a prohibition by the FBI on implementing this concept, but she was not sure. She provided contact information for Buffy Bonnefield (██████████) who was the individual Jillian had worked with in establishing their LPR program.

Jillian also stated that initially Maryland law enforcement had hoped to use the LPR technology to assist in additional specific proactive investigative functions. For example, it was proposed that officers responding to a crime scene would be authorized to activate the LPR units to capture the license plate information of vehicles in the vicinity of the crime and later utilize the data collected to identify potential interview subjects. This proposal was reviewed by the Maryland Attorney General's Office and the opinion returned was that the units could **not** be used for these types of functions. Permission was granted to utilize the data collected by the LPR units only to assess whether or not a potentially stolen vehicle had been encountered.

Note: No information was available from Maryland in electronic format.

- b. Arizona
No response was received to messages left.
- c. Tennessee
No response was received to messages left.

5. Assessment of current BCA-CJIS systems and infrastructure

- a. A meeting was held with BCA-CJIS staff (Patty Hunter, Ed Friedrichs and Arlene Pinlac) to assess whether implementing this type of technology would impact the way CJIS services are provided today. Two scenarios were explored.
 - 1. If LPR devices were configured to directly query the FBI's stolen vehicle files
 - 2. If LPR devices were configured to query against a file of stolen

vehicles that was obtained from the FBI and when a potential stolen vehicle or stolen vehicle license plate was "sighted" by the device an alert would be given to the law enforcement agency, who would then, in turn, run a query to ensure that the vehicle information was still in the active stolen vehicle files.

In either scenario, it was determined that since existing MN stolen vehicle queries spawn additional queries which may not be relevant in this case (or potentially allowed), if the query needed to be specifically restricted to returning information regarding NCIC stolen vehicles only, a new query may need to be developed. Otherwise, no significant impacts could be identified at this time.

- b. Patty Hunter followed up with Jim Solie (BCA-CJIS), in regard to scenario 1, to determine whether or not there would be an impact to BCA services if an increased load were placed on existing lines. Estimated increased in volume were based on the volumes identified in the Ohio State Highway Patrol documentation. It was reported back that an increase of 50,000 transactions per day would not significantly impact the system, however, if the volume were to increase by 100,000 transactions per day then alternatives would most likely need to be explored.

IV. Conclusions

1. Observations

- a. **States who have implemented this technology consider it to be very successful**

Basis

Discussions with individuals from Maryland and Ohio, and readings from news articles, etc. No articles could be found that indicated that the users of the technologies did not find value in implementing these capabilities.

b. Agencies who responded to the request for information have auto theft task forces utilizing the devices

Basis

Both Maryland and Ohio indicated that the technology was very successful when used as a support tool in auto theft task force environments.

2. Considerations

a. Cost to agencies

Basis

Although vendors have not been contacted directly, it appears that an average cost for a license plate reader unit is approximately \$20,000 each. If agencies will be required to purchase their own LPR devices, it may take them time to identify funding sources.

b. Two step process is now a three-step process

Basis

If an alert from the LPR unit is received, a second query is then run to verify the stolen status of the vehicle or plate, and a hit confirmation is also performed.

However, it was learned by Bob Johnson, in conversation with FBI CJIS staff, that direct query access of the stolen vehicle files by LPR devices will not be authorized.

c. Information is out of date

* Best chance of recovery is when vehicle is first reported stolen. FBI statistics from 2000 on stolen vehicle recoveries indicated that 57 percent of stolen vehicles recovered were found the first day that they were stolen.

Basis

October 22, 2001
 9 A. M. Eastern Time Washington D.C.
 FBI National Press Office
 Crime in the United States, 2000

The survival analysis model employed in this study reveals the patterns and chance of recovering the stolen cars based on the number of days elapsed since the theft incident. Based on the NIBRS data used in the analysis, 57.08 percent of the stolen motor vehicles are recovered in the first day and 79.43 percent are recovered during the first six days, which indicates that the first few days after the theft are critical in recovering the stolen vehicles. The longer the vehicle is in the possession of the criminals, the less the chance of recovery.

d. CJIS' current 10 x 5 rather than 24 x 7 service hoursBasis

To be of value to the law enforcement agencies, the most current file must be made available to them on a daily basis. CJIS staff currently does not provide 7-day a week service. If this technology were to be implemented it would seem that it would need to be a joint effort with the BCA Communications Unit which does provide 24 x 7 service.

V. SUMMARY

This summary is based on the precept that any implementation of this technology would be solely for the purpose of locating stolen vehicles and stolen vehicle license plates.

From the point of view of the ability to complete the tasks within the BCA required for implementation, it is believed that the BCA has existing staff with the skill sets and authorities needed to make the data available to law enforcement to support this functionality – some of which include

- completion of a memorandum of understanding or similar document between the FBI and the BCA
- drafting of a memorandum of understanding or similar document between the BCA and local law enforcement agencies

- identifying and implementing a process for obtaining the most current data available from the FBI and posting it to a secure site for download by law enforcement agencies
- identification of hardware and security equipment needed to securely make the data available to law enforcement agencies for download
- although BCA staffing issues may be a temporary roadblock, it seems well within reasonable probability that some accommodations could be made to ensure that current FBI files are available in a timely manner for local agency use

From an authority perspective, it is believed to be well within the authority and responsibility given to law enforcement officials to proactively work to resolve crimes of this type. It is also a responsibility of the BCA CJIS unit to make information available to law enforcement officials to enable them to investigate and resolve crimes.

From a philosophical point of view, the key to whether or not the effort could be successful and whether or not it would be well received by the public, legislature and others, will be dependent on the completion of the Privacy Impact Assessment (PIA) and conversation with key policy makers; to include those internal to the Department of Public Safety, key Legislators and citizen advocate groups.

From a practicality point of view, it would be prudent to first identify whether or not this is a service to which law enforcement agencies would be willing to commit significant financial resources in order to acquire the equipment needed to utilize the downloaded data. Once this assessment has been completed, the BCA could then assess the work it would need to do as it relates to the number of agencies that would commit to utilizing the service in order to make a determination as to whether or not it would be a prudent use of BCA resources.

Appendix A – Excerpts from Website Searches

1. LPR Tutorial

<http://www.licenseplaterecognition.com/>

2. LPR Pricing

Source: <http://www.nlectc.org/justnetnews/05252006.html>

"Mobile License Plate Reader Technology Shows Great Potential" *Police and Security News* (04/06)
Vol. 22, No. 2, P. 24; Siuru, Bill <http://www.auto-theft.info/FBI-Stats1.htm>

Automated License Plate Reader (ALPR) technology offers many promising applications for officers engaging in surveillance or seeking wanted suspects. Examples are automatically reading vehicle plates and matching them against wanted lists, or conducting surveillance in nearly any lighting condition and setting. One system on the market is the Mobile Plate Hunter 9000, offered by Remington Elsig Law Enforcement Systems, which is able to work at patrol and highway speeds and is used by agencies including the Los Angeles County Sheriff's Department and the New York State Police. A newer system is the Automatic License Plate Reader, made by Motorola using the Police ALPR Graphic Interface System (PAGIS) developed by England's PIPS Technology. This system combines the camera and the infrared illumination device into a single unit, with an adjustable narrow band filter to enable quality image capture in even very bad environmental and lighting conditions. As many as four camera/illuminators can be combined in a multiplex or "Muxed" mode. Although it currently costs about \$20,000 for each mobile installation of these systems, the price is likely to decline as more are put into use, and stationary versions of the technology are available from both vendors as well as other companies. <http://www.policeandsecuritynews.com>