

The Rapid Diffusion of License Plate Readers in U.S. Law Enforcement Agencies

A National Survey

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Executive Summary

License plate readers (LPRs) are arguably one of the most rapidly diffusing technologies in modern law enforcement. In addition to automatically scanning and checking license plates against databases of plates linked to vehicles and persons of interest to law enforcement, LPRs are also an information technology system that can record the date, time, and location of plates as they pass by. Thus, while LPRs have been used most often to detect stolen automobiles, they have also been used in investigations, to assist in finding missing people, and for general crime prevention purposes.

Given these characteristics, LPRs have the unique potential to improve police effectiveness by enhancing patrol, investigative, and other security operations, and they are viewed by many police agencies as a force-multiplier to many crime prevention and homeland security efforts. Because of its intuitive appeal and fast automation of what was once a slow process, police have expressed high interest in acquiring LPR technology. In fact, there has been a rapid adoption of LPRs in U.S. law enforcement in the last ten years. In response to this trend, the principal investigators had previously conducted a series of studies with colleagues regarding LPRs (see Koper, Taylor, and Woods, 2013; Lum, Merola, Willis (Hibdon), and Cave, 2010; Lum, Hibdon, Cave, Koper, and Merola, 2011; Merola and Lum, 2013; Merola, Lum, Cave and Hibdon, 2014; Taylor, Koper, and Woods, 2011, 2012).

Despite this rapid diffusion of LPRs, there continue to be very few studies on their use and effectiveness. To advance this research agenda, the PIs are further examining LPRs through a grant funded by the National Institute of Justice (Grant No. 2013-IJ-CX-0017). This study is examining the diffusion of LPRs in the United States and assessing their impacts and cost-efficiency for patrol and investigations. Here, we present one portion of the study—a national survey of LPR diffusion in the United States.

The survey was conducted with a stratified, representative sample of all agencies with over 100 or more officers. In total, 329 agencies responded for a response rate of 76.2%. Key findings from this survey include the following:

- Although research on the effectiveness of LPRs for reducing crime is very limited and inconclusive, LPRs have diffused rapidly across American police agencies. As of mid-2014, 59% of police agencies with 100 or more officers had LPRs, a three-fold increase since the Law Enforcement Management and Administrative Survey asked about LPRs in 2007. We estimate that by the

release of this report (December 2016), approximately 66% of these larger agencies had access to LPRs (Figures 2 and 3).

- For agencies choosing not to adopt LPRs, the reasons remain largely financial; either agencies do not have the funds to purchase LPRs, or they are prioritizing other technologies (Figure 1). Concerns over privacy and data storage are not major concerns hindering adoption of LPRs.
- On average, agencies with LPRs initially acquired three units but had eight by the time they were surveyed. However, a large majority (75%) of agencies with 100 or more officers own seven or fewer LPR units. Only about 5% of responding agencies own more than 25 units.
- Federal and state funding have played a key role in LPR adoption, as 40% of agencies using LPRs funded their initial purchases with federal grants and 21% did so with state funding (Figure 4).
- Police have adopted LPRs to address a range of crimes and problems besides auto theft (Figure 5). To varying degrees, police use LPRs for person and property crime investigations, vehicle enforcement, investigations of gangs and vice, searches for vulnerable individuals, and counter-terrorism activities. However, the most frequent use of LPRs continues to be for detecting stolen automobiles and license plates (Figure 7).
- Half of the LPRs used by respondents are mounted on patrol cars for general patrol, while about a quarter are deployed at fixed locations. Around 10% are deployed in other ways such as with specialized LPR units or investigative units. However, about 11% of LPRs owned by police are not in service (Figure 6).
- Managerial direction, tracking, and assessment of LPR use is limited. For example, only about a third of agencies that have LPRs collect performance metrics on their use and much LPR use occurs in the field without strategic direction. When asked, agencies often could not provide statistics on the number of arrests made with LPRs, the number of stolen autos recovered with LPR, or the number of times LPR assisted in an investigation.

- The uses and potential impacts of LPRs depend on the type of data to which agencies have access. Most agencies access stolen vehicle and license plate databases, and to some extent, vehicles wanted on AMBER alerts or open warrants (Figure 8). Much less accessed data include vehicles related to repeat offenders, those with a history of DUI or other serious violations, probationers and parolees, documented gang members, registered sex offenders, or those on the DHS watch list. Additionally, many agencies do not have their LPR systems linked to motor vehicle violation databases.
- While most agencies that responded to the survey have specific written policies related to LPRs (70%), and while this proportion has grown since a 2009 survey by Lum et al. (2010), agencies vary considerably on the types of items present in these policies (Figure 9). Agencies tend to focus policy on who can use LPR and how long data might be stored. How LPRs should be used for patrol, investigations, or crime analysis is not as frequently articulated.
- We also asked agencies for how long they retain data collected by LPRs. While some agency respondents did not have any clear policies regarding data retention, those who provided time frames gave time periods that varied widely, from one month or less, to indefinitely.
- Finally, the survey revealed that agencies are generally satisfied with LPRs and either intend to continue using them as they are or expand their use. The main concerns agencies express for the future of LPR use regard costs, not necessarily community concerns or lack of effectiveness.

The full report that follows can be found at George Mason University's Center for Evidence-Based Crime Policy technology webportal, <http://cebcp.org/technology/>, under "License Plate Readers."

1 Project Background

The license plate reader—more than any other technology (with the recent exception of body worn cameras)—is arguably one of the most rapidly diffusing technologies in modern law enforcement. License plate readers (LPRs) are both a sensory and information technology that can be mounted on mobile patrol cars or at fixed locations. LPRs read alphanumeric license plates on vehicles as they pass and instantaneously check those plates against an existing database of license plate numbers of interest to law enforcement. Plates “of interest” might include those associated with moving or parking violations, vehicles that have been recently stolen, of interest to a police investigation, or whose registered owners have open warrants or are being sought by the police. When a match is made, a signal alerts the officer to proceed. Officers then confirm with the dispatch or their mobile computer units that the vehicle or tag that generated the signal is indeed connected to an infraction, crime, or a person of interest, and proceed with further investigation, which might involve following the vehicle or initiating a stop.

Hundreds of automobiles can be scanned in minutes by LPR technology, thereby automating a process that, in the past, was conducted by officers manually, tag-by-tag, and with a great deal of discretion. Before LPRs, officers would be notified of stolen vehicles or license plates of interest from their command during roll calls, from “APBs” (all-points-bulletins) over the radio, or from other officers. If officers encountered suspicious vehicles, they would radio the license plate numbers to the dispatcher (or type them into their mobile computer units) to determine if the vehicle or tag was stolen or connected to a person or vehicle of interest. This process for one license plate could take many minutes, and officers might choose to stop vehicles before their requests for information were returned. LPRs have undoubtedly made this process faster and have also reduced the discretion of officers as to which license plates they check. In turn, LPRs arguably increase efficiency in an officer’s work and potentially lessen the possibility of profiling or implicit or explicit bias that might occur in traffic stops.

In addition to scanning and checking the status of license plates, LPRs are also an information technology system. As plates are scanned, a picture, the alphanumeric read, the date and time, and the location are stored. Because hundreds of plates are scanned in minutes, LPRs collect and store vast amounts of this data. Such data might go unused or be deleted, or police agencies may choose to save these records for future analysis or investigative purposes. Thus, while LPRs have been used most often to detect stolen

automobiles, they have also been used in investigations, to assist in finding missing people, and for general crime prevention purposes. For example, agencies might search LPR data to locate the possible whereabouts of a suspect's vehicle whose license plate may have been captured previously by an LPR.

Given these characteristics, LPRs have the unique potential to improve police effectiveness by enhancing patrol, investigative, and other security operations. Although limited by the data they access and by the frequency and ways they are used (for a detailed discussion of this issue, see Lum et al., 2010), LPRs are believed by law enforcement agencies to be a force-multiplier to many crime prevention and homeland security efforts and police have expressed high interest in acquiring LPR technology. This interest in, and appeal of, LPRs have led to a rapid adoption of LPRs in U.S. law enforcement in the last ten years.

This rapid adoption has occurred in an environment of little rigorous evaluation research on the effects of LPRs. In response to this trend and the need for more research, the principal investigators had previously conducted a series of surveys and outcome evaluation studies with colleagues regarding LPRs (see Koper, Taylor, and Woods, 2013; Lum, Merola, Willis, and Cave, 2010; Lum, Hibdon, Cave, Koper, and Merola, 2011; Merola and Lum, 2013; Merola, Lum, Cave and Hibdon, 2014; Taylor, Koper, and Woods, 2011, 2012). Numerous findings from those earlier studies indicated that the crime prevention effects of LPR are mixed, and more research was needed to better detect LPR's effects (if any) in both patrol and investigations. The current study, funded by the National Institute of Justice (Grant No. 2013-IJ-CX-0017), continues these efforts by examining the diffusion and use of LPRs by police in the United States through a national survey and by examining the effectiveness and cost-efficiency of LPRs in both investigations and patrol through experimental and evaluation research.

2 The Rapid Adoption of License Plate Readers in a Low Information Environment

The history of LPR adoption beginning in the United Kingdom and then in the United States is best characterized as one of rapid adoption in a low information environment. More specifically, law enforcement agencies have rapidly and readily adopted LPRs in the last ten years with little empirical evidence of the outcomes they can achieve and the consequences of their use. Because of their intuitive appeal, and because technology assessments showed that LPRs indeed operate as they should (and do so with great ease and efficiency), it seemed reasonable for law enforcement agencies to believe that LPRs would be a technology that they should acquire to assist in crime fighting, traffic-law enforcement, and public safety.

The police services in the United Kingdom were early adopters of LPRs, and by 2006, all police forces in England and Wales had LPR capability (PA Consulting Group 2006; Home Office, 2007). Around this period many similar traffic-related scanning technologies were already available, including red light and speed cameras as well as tollbooth cameras, which use similar technologies. LPRs quickly gained popularity in U.S. law enforcement circles, and by 2007, the International Association of Chiefs of Police (IACP) set forth a resolution promoting the use and purchase of LPR with federal funds.¹ At that time, the 2007 Law Enforcement Management and Administrative Statistics Survey (LEMAS) estimated approximately 19% of agencies with more than 100 sworn officers had been using LPR technology.²

In 2008, the U.S. Department of Homeland Security Urban Area Security Initiative (UASI) invested millions of dollars for jurisdictions to acquire LPR. The UASI Program is a regional program that supports local law enforcement initiatives for preparedness for homeland security threats and terrorism. At the time, LPRs were estimated to cost between \$20,000 and \$25,000 per unit (see Lum et al., 2010), with additional costs for maintenance and data storage. Because of these expenses, most agencies using LPRs as of 2009 acquired the technology using federal grants or other government funds,

¹ See International Association of Chiefs of Police (2007). "Support for License Plate Reader Systems." Adopted at the 114th Annual Conference, New Orleans, Louisiana, October 16, 2007. Submitted by the Narcotics & Dangerous Drugs Committee, NDD.020.a07.

² The question from the 2007 LEMAS related to LPRs reads, "As of September 30, 2007, did your agency use any of the following technologies on a regular basis?" Under "Night vision/electro-optic" was listed "License plate readers" with answer options of 0—as of date, agency did not use LPR on regular basis; 1—as of date, agency did use LPR on regular basis; 9—don't know.

although some agencies purchased LPRs on their own using their own budgets (Lum et al., 2010).

By the time Lum and her colleagues conducted the first comprehensive random sample survey of the prevalence and use of LPR by police agencies in 2009, over a third of all law enforcement organizations with 100 or more officers responded they were using LPR systems (see Lum et al., 2010). Koper et al. found similar results in a survey conducted around the same time with agencies affiliated with the Police Executive Research Forum (Koper, Taylor, and Kubu, 2009). Both surveys also found that roughly one-quarter to one-third of agencies without LPRs planned on acquiring them soon. Similarly, a 2009 survey by IACP estimated that 23% of agencies used LPR overall, but that upwards of 50% of large agencies with 500 or more officers were using them (Roberts and Casanova, 2012). These findings show the rapid diffusion of LPR, especially in larger agencies, even in comparison to that of other popular policing technologies such as computerized crime mapping (see Weisburd and Lum 2005), in-field cameras, or forensic tools. At the time of the Lum et al. survey, most agencies responded that they were primarily using a small number of LPR devices (usually no more than four, but often one or two) mainly to detect stolen automobiles and license plates.

LPR use continued to grow, and in 2013, the LEMAS survey again asked whether agencies used LPRs.³ Findings estimated that 63% of law enforcement agencies with 100 or more officers had acquired LPR by 2013. In our 2014 survey reported here, our estimates were slightly lower—59% of agencies with 100 or more officers had acquired LPR. We also asked agencies if they planned to acquire LPRs in the next year or two, and our estimates indicate that between 66% and 73% of agencies with 100 or more officers are likely to either own or have access to LPRs by 2016. In other words, within a period of 10 years, LPR acquisition has most likely tripled. While we will discuss specific changes in the uses of LPRs (which have not changed that much between the Lum et al. (2010) survey and the current study), this rapid adoption is notable.

It is important to note that this rapid diffusion of license plate readers in the U.K. and U.S. occurred in the absence of consistent research on its crime control and prevention impact or cost-effectiveness. This is unsurprising; many law enforcement technologies and innovations are adopted for reasons unrelated to whether evaluation research exists to support adoption (Willis, Mastrofski and Weisburd 2007). Body-worn cameras are the most recent case in point. Body worn cameras have rapidly diffused in

³ The 2013 LEMAS question related to LPRs asked, “As of January 1, 2013, did your agency use any of the following TECHNOLOGIES to collect information?” with choices of “yes” or “no”.

just the last few years in law enforcement almost exclusively due to a push by citizens and governments for greater police accountability in light of high-profile officer-involved shootings and death-in-custody incidents. The rapid adoption of BWCs occurred only with a handful of studies available to speak on their effects.⁴ Other technologies, including those related to gunshot detection, forensics, surveillance, analysis, or records management, follow a similar trend. In fact, there have been relatively few evaluations of the crime prevention effectiveness of police technologies overall (Byrne and Marx, 2011; Koper, Lum, and Willis, 2015; Lum et al., 2011; Lum, Koper, and Willis, 2016; Lum and Koper, 2017). Thus, technology presents a unique challenge to evidence-based policing because they are often quickly adopted for reasons unrelated to whether they have been shown to lead to desirable outcomes.

For LPRs, positive assessments of their efficiencies and their ease of use have helped promote their rapid adoption. Indeed, the most common types of LPR research have examined technical efficiencies of LPR, as opposed to outcome effectiveness. These technical assessments have examined how fast or accurately LPRs scan and process license plates; how often they detect stolen automobiles in various settings or the hit rates of plates of interest in LPR data systems; comparisons of brands of LPR technology; or counts of misreads or other system errors (see, e.g., Cohen, Plecas, & McCormick, 2007; Home Office, 2007; Ohio State Highway Patrol, 2005; PA Consulting Group, 2003, 2004). With regard to efficiency of scanning, while there may be modest differences across vendors, these studies (and also agency experience with LPRs) indicate there is little question that LPRs are more efficient than traditional police practices to find stolen vehicles (e.g., officers individually checking the tags of suspicious vehicles with a dispatcher, mobile computer terminal, or "hot list" of stolen autos).

But scanning more tags more quickly does not necessarily create a cost-beneficial crime prevention outcome. If LPRs are positioned in places in which the probability of stolen autos driving by is low, or if stolen vehicles have yet to be reported, then efficiency is not matched by effectiveness. Similarly, while arrests and detection of stolen autos are necessary, these may not be connected to crime control or prevention of auto theft or other crimes.⁵ Further, if the underlying data that LPRs are accessing are limited only to stolen autos, LPR use for problem-oriented patrol, proactive and focused

⁴ However, unlike LPRs, research on BWCs is growing more quickly following its adoption (see Lum et al. 2015).

⁵ Some have argued that LPR is not meant to have a crime prevention effect and should not be judged as such. We disagree - the high cost of LPR and its increasing use require accountability to this primary function of the police.

deterrence efforts, or daily investigations may also be limited.⁶ Finally, LPRs also have social costs; citizens or interest groups may be concerned about whether LPRs pose a privacy risk greater than their benefits.

In terms of crime prevention, only two evaluations have examined the impact of LPR use on crime, both which were conducted around 2010. One of these by Lum et al. (2010; 2011) used a randomized controlled experiment to test the effects of LPR patrols in hot spots of automobile-related crime in two neighboring jurisdictions. In comparison to randomly assigned control hot spots in the two jurisdictions, the experimental LPR locations showed no change in either auto-related crimes (auto theft and thefts from autos) or other types of crime. Although the experimental dosage was relatively low and the LPR databases were limited to information on stolen vehicles, Lum et al. argued that these conditions reflected current LPR use, and that the results showed the need for further testing to show whether expanded LPR use in patrol can impact crime.

The other study was conducted by Koper and colleagues, who tested LPR using a randomized experiment in Mesa, Arizona (see Koper et al., 2013; Taylor et al., 2011; 2012). In that study, LPR use and non-use by a four-officer auto theft squad were examined at hot routes of auto thefts. They found that officers were more likely to detect and recover stolen vehicles when using LPR devices. Routes with LPR experienced reductions in calls for service for drug crimes that lasted longer-term, while those without LPR also experienced reductions in calls for service, but instead for persons-related calls and auto theft, and for shorter time frames. Koper et al. attributed these results to differences in the style of the patrols of officers with and without LPRs.

In total, these studies provide, at best, mixed indications regarding the effects of LPR on crime. Both tests were limited by small dosages of treatment, limited data in the LPR systems, and a small number of LPR devices. Since these experiments, as far as we know there have not been further experimental evaluations as to the effectiveness of LPRs, save the current ongoing project. With regard to LPR use in investigations, no outcome evaluations exist, despite its growing use in this arena of law enforcement. Given continued adoption, it is also unlikely that these findings had a moderating effect on LPR diffusion or the positive assessments of technical research around LPRs. In sum, evaluation research on LPRs remains scarce, despite the tripling (or greater increase) in the use of LPRs in police agencies with 100 or more officers in the U.S.

⁶ Additionally, although not studied here but explored extensively in Lum et al. (2010), Merola and Lum (2012), and Merola et al. (2013), the examination of the legitimacy and privacy impacts of LPR are also rarely examined.

An important start to building this evidence base is assessing the diffusion of LPRs in U.S. law enforcement, and understanding their current uses. We now turn to our survey findings of the diffusion and use of LPRs. This type of research evidence is essential for evaluating LPRs. First, the survey helped to identify potential agencies to partner with for both qualitative and quantitative evaluations of LPRs that will be the subjects of future reports. Second, as advocated in Lum et al. (2010), realistic evaluation for evidence-based policing requires researchers to test both common and also feasible uses of LPRs in law enforcement.

3 LPR Survey Methodology

To understand the diffusion of LPR technology in policing, we conducted a national, stratified, representative survey of large law enforcement agencies in the U.S. Below, we present the methodology for the survey and our results, comparing them with findings from previous surveys when appropriate.

To derive a sample useful to our purpose of studying *both* LPR diffusion and how LPRs are used, we sought to develop a sampling strategy that would maximize the number of agencies in our sample that use LPRs. For this reason, we constructed our sampling frame using a database that previously asked about LPR use and that also included characteristics of police agencies. Specifically, we chose the 2007 Law Enforcement Management and Administrative Statistics (LEMAS) survey of state and local law enforcement agencies, which was the most recent LEMAS survey available at the time, to draw our sample.⁷

We selected the 2007 LEMAS for three major reasons. First, the 2007 LEMAS asked agencies whether they used LPRs, which gave us a starting point upon which to build our sample. Second, the 2007 LEMAS surveyed all U.S. law enforcement agencies with 100 or more sworn officers as well as a representative sample of smaller agencies, assembling a database of characteristics of these agencies for our analysis. Third, LEMAS also receives a high response rate for their survey. The 2007 survey had a response rate of 92% for agencies with over 100 officers, and 91% for agencies with fewer than 100 officers. This high response rate, in turn, helps provide a very accurate picture of the state of law enforcement across the U.S. at the time.

We did not include police agencies with fewer than 100 sworn officers in our survey. The rationale for focusing the survey on agencies with 100 or more officers is based on Lum et al.'s (2010) finding that only 3.7% of agencies with fewer than 100 officers had LPRs as of 2009, and that less than 10% were projected to have LPRs by 2010. Similarly, a survey conducted around that time by the International Association of Chiefs of Police estimated that only 13% of agencies with fewer than 100 officers had LPRs (Roberts and Casanova, 2012). Consequently, conducting a detailed examination of LPR use among small agencies would require a large survey sample in order to obtain a useful respondent sample of small agencies using the technology. Thus, we developed

⁷ The results of the 2013 LEMAS were not made publicly available until 2015.

our sampling frame from the LEMAS subsample of agencies with 100 or more officers (a total of 902 agencies).

We then drew agencies from three categories to obtain the final sample for our survey. First, we included all agencies with 500 or more officers, given that the 2007 LEMAS and also our own surveys indicated that these agencies are most likely to adopt LPRs. We also included all agencies that responded “yes” to using LPRs in 2007 on a “regular basis” (166 agencies). Finally, we took a 25% random sample of agencies with 100 to 499 sworn officers that did not use LPRs in 2007 (an additional 158). Our final sample included 431 police and sheriff’s agencies with law enforcement responsibilities.

We conducted the survey over several waves in 2014 to try to obtain the highest possible response rate from the 431 sampled agencies. We began the survey process in April 2014, when we mailed the surveys along with a letter detailing the purpose of the study to the chief executive (chief, commissioner, sheriff, etc.) of each agency in our sample. The agencies had a choice of filling out a paper copy of the survey and mailing it back or filling out the survey online. After one week, a reminder email was sent to the chief executive for each agency.⁸ In May 2014, we sent a second wave of reminders to non-respondents. In early June 2014, we sent a third wave of reminders to non-respondents. Finally, from early July 2014 to early August 2014, we conducted a fourth wave of reminders by calling each non-responding agency and encouraging their participation. We ended data collection mid-August 2014. In total, 329 agencies responded for a response rate of 76.2%. Comparing agencies that did and did not respond to our survey, no significant differences were found with regard to number of sworn officers or whether in 2007 they responded to LEMAS as having LPRs.

The survey instrument is attached as Appendix A. The survey began with a basic question about whether the law enforcement agency currently used LPR technology. Based on that response, we followed up with a series of questions. For the agencies that had not adopted LPR technology, we inquired as to why they had not adopted it and whether they planned on adopting it in the immediate future. For the agencies that had adopted LPRs, we asked questions related to adoption of LPRs, use of LPRs, agency policy on the use of LPRs, and challenges and future use of LPRs in the agency.

The adoption section of the survey asked about the year in which the agency first acquired LPRs, the number of units first acquired, the current number of LPR units in the agency, how the agency first learned about LPRs, and the primary funding source for the

⁸ Some reminder emails bounced back for being “undeliverable.” In these instances, we sent those agencies reminders through regular mail from this point forward.

initial purchase of LPRs. We also inquired about the factors involved in the agency's decision to adopt LPRs. Asking these questions not only would allow us to create a "diffusion of innovations" curve (see Weisburd et al., 2003; Rogers, 2003; Weisburd and Lum, 2005) for this technology but also to explore the motivations and support behind LPR adoption.

We then asked agencies a series of questions on how they use LPRs. Lum et al. (2010) found that the most common use of LPRs was to detect stolen automobiles. However, in our conversations with police agencies as well as the International Association of Chiefs of Police, agencies pointed to many other uses of LPRs in both patrol and investigations. Asking how frequently LPRs are used to carry out a wide range of activities, such as detecting stolen autos, monitoring traffic patterns, assisting with specific investigations, helping vulnerable people, or strengthening homeland security efforts (as initially hoped for by the UASI grants), is key to understanding the nature of LPR diffusion.

We also asked whether officers had discretion in using LPRs and if agencies kept track of LPR deployment and use, as well as various outcomes of LPR use (e.g., arrests for stolen automobiles, resolution of missing persons/vulnerable individual cases, etc.). Given that LPR use is determined by the underlying data available for LPRs to access, we asked agencies about the types of data that could be accessed by LPR systems they used.

The third set of questions in the survey focused on LPR policy. Specifically, did agencies have policies related to LPRs, and what exactly was contained in those policies? In addition, we inquired as to how long LPR records and scans were stored. And lastly, we asked agencies about their challenges with LPRs and future uses of LPRs. Although we are clearly in an age of rapid adoption of LPRs, did agencies find this technology valuable, and did they intend to continue using LPRs in the future?

We present the results of our survey in the next section ("*Results*"). All figures are weighted based on the stratified sampling design to provide representative estimates for the full population of agencies with 100 or more officers as reflected in the 2007 LEMAS survey (N=902),⁹ although unweighted sample sizes are provided in the notes below the graphs.

⁹ As described above, the sample frame was stratified according to whether agencies were using LPRs in 2007 (yes/no) and according to agency size (100-499 officers versus 500 or more officers). The combination of these categories thus resulted in four sampling cells. We sampled three of these cells

with certainty (i.e., both cells for agencies with 500 or more officers and the cell for smaller agencies that used LPRs in 2007) and drew a 25% random sample of agencies in the remaining cell (i.e., smaller agencies that did not use LPRs in 2007). In calculating the survey estimates, we weighted the data of agencies in each cell based on the universe of agencies in that cell divided by the number of agencies that responded in that cell. For example, the 2007 LEMAS survey had 629 respondents that were not using LPRs and had 100 to 499 sworn officers. In our survey, 120 agencies from this category responded (out of 158 sampled); therefore, these agencies received a weight of $629 / 120 = 5.24$. For agencies in the other sampling cells, weights were closer to 1 (because all agencies in those cells were surveyed), with some adjustment for non-response.

4 Results

The Adoption of LPR by Law Enforcement

Again, we remind the reader that all results presented are weighted based on our formula above. According to these weighted estimates, approximately 59% of agencies with 100 or more officers used LPRs as of 2014,¹⁰ while 41% did not. Of those agencies using LPRs, the vast majority (90%) owned their LPR units, 7% both owned and borrowed LPR units, and 3% primarily borrowed their LPR units. The proportion of agencies with over 100 officers that own LPRs (59%) reflects an approximately 60% increase in the use of LPRs by agencies with 100 or more officers (hereafter we refer to these agencies as “medium to large”) since the 2010 Lum et al. survey. Notably, not only does a majority of medium to large law enforcement agencies use LPR compared to very few agencies a decade ago, but of those agencies who replied that they still did not use LPR in 2014, more than half (57%) were at least “somewhat likely” to acquire LPRs in the next one or two years.

Comparing agencies with and without LPRs on a variety of characteristics as found in the LEMAS survey using independent samples t-tests, we found that larger agencies are more likely to have LPRs,¹¹ confirming an earlier finding by Lum et al. (2010). However, we did not find other significant differences in terms of agencies with and without LPRs with regard to common metrics of agency resources. For instance, although total budgets of agencies are closely correlated to the number of sworn officers, when examining the budget per sworn officer, there were no significant differences in this metric among agencies with and without LPRs. We also did not find significant differences between those agencies with and without LPR in terms of the percentage of sworn officers in patrol. Interestingly, we found that having fewer marked

¹⁰ As noted above, this is slightly below the 63% figure reported in the 2013 LEMAS, due likely to sampling error since our survey was conducted with a sample of medium to large agencies rather than the full population of such agencies. However, the primary emphasis of our report is on examining uses of LPR among agencies that have them. This issue has not been examined in LEMAS or other recent surveys.

¹¹ An independent samples t-test found a significant difference between the number of sworn officers in agencies with LPRs (mean=646.43, SD=2051.97) and those without LPRs (mean=282.47, SD=395.04) ($t = -3.765$, $p = .000$, equal variances not assumed).

vehicles per patrol officer was associated with a *greater* likelihood of having LPRs.¹² Agencies with and without LPRs also did not differ significantly in either their violent or property crime rates.¹³ We can only speculate on what might explain these findings.

Figure 1 shows the importance of reasons for agencies in *not* adopting LPR. The reasons agencies find most important relate to the costs of LPR or the conscious choice of agencies to spend money on other technologies or equipment. Agencies not using LPR do not give the reason for non-adoption as a lack of support from citizens or government officials. Even less of a concern is the difficulty in using LPR technology, or a belief that other agencies are not having success with the technology.

Figure 1. Reasons for Not Adopting LPR Technology

	Not or Somewhat Important	Important or Very Important
Cannot afford LPR	43.3%	56.7%
Other technologies/equipment more important to acquire	46.2%	53.8%
Do not have access to license plate related data	88.1%	11.9%
LPR poses significant privacy/civil liberties concerns	89.1%	10.9%
Citizens do not support acquisition	92.8%	7.2%
Government officials in our jurisdiction oppose acquisition	93.1%	6.9%
Other agencies seem to be unsuccessful with LPR	95.7%	4.3%
LPR would be difficult to learn/use	96.4%	3.6%

Unweighted n for each selection ranges from 86 to 93.

The Diffusion of LPR in Law Enforcement

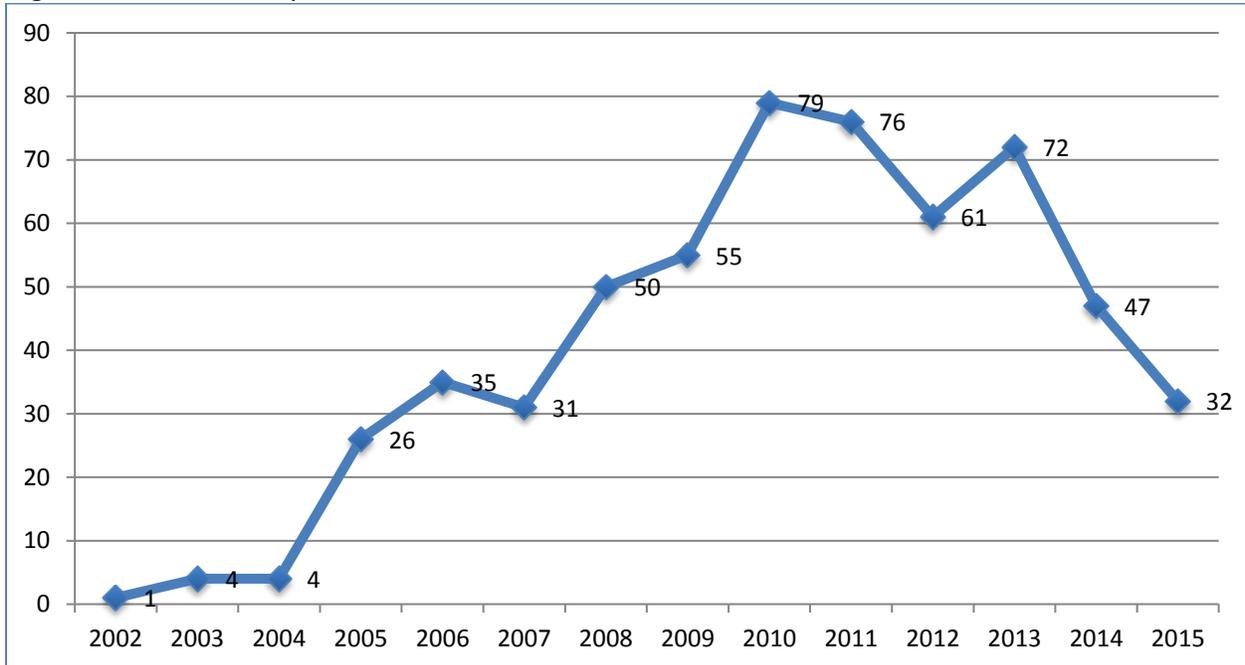
We also asked agencies that adopted LPR in what year that adoption occurred. The weighted estimates of adoption by year for agencies with 100 or more officers are shown in Figure 2 (eight agencies did not provide a year of adoption). To estimate the adoption of LPRs in 2014 and 2015, we used a conservative estimate by including only those agencies who replied that they would be likely (7.6%) or very likely (11.4%) to

¹² An independent samples t-test comparing the ratio of marked patrol vehicles to the number of officers assigned to patrol found a significant difference between this ratio for agencies with LPRs (mean=.837, SD=.425) and those without LPRs (mean=1.04, SD=.607) ($t = -4.844$, $p = .000$, equal variances not assumed).

¹³ As measured by the 2013 UCR, per 100,000 population.

adopt LPRs in the next one to two years.¹⁴

Figure 2. Year of Adoption

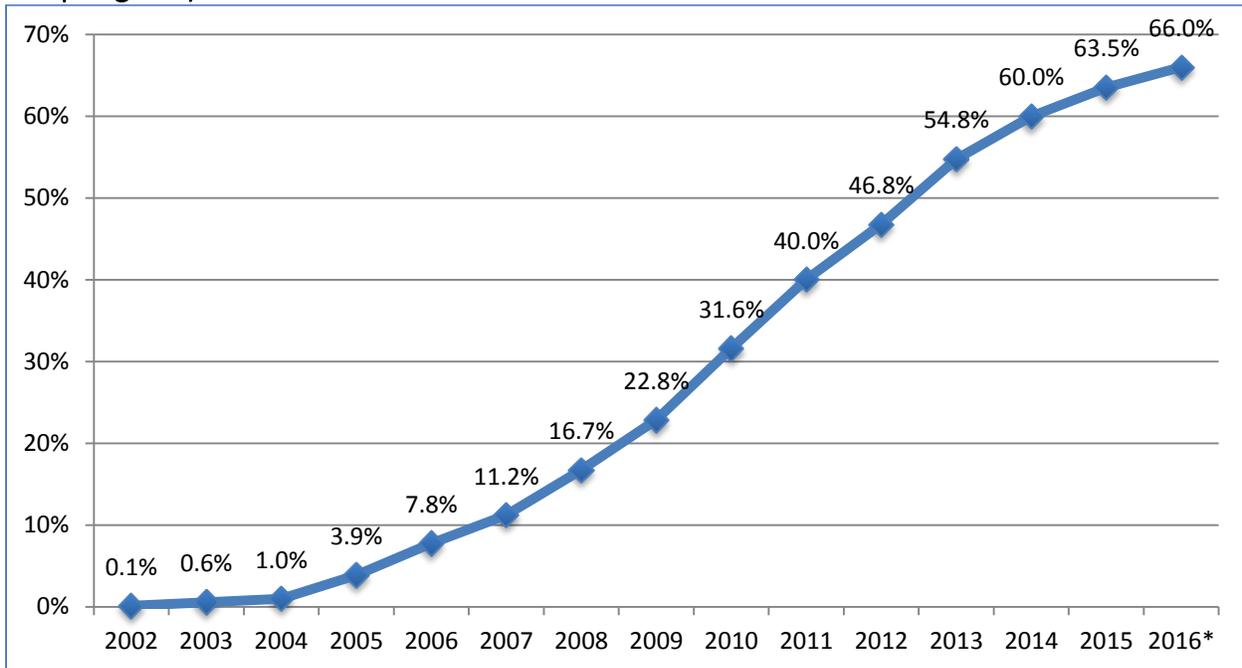


Based on weighted estimates for the population of agencies with 100 or more offices (n=902).

This data allowed us to construct a diffusion of innovations curve (see Rogers, 2003) for LPR adoption using the data from Figure 2 and to chart the yearly cumulative adoption over time in Figure 3. In the parlance of diffusion of innovations, the “S” curve for the diffusion of LPRs in law enforcement appears to be slowing. However, our conservative estimates suggest that by 2016, approximately 66% of medium to large agencies will likely have access to LPRs. If even half of those agencies who said they were “somewhat likely” to adopt or gain access to LPRs in the next 1-2 years did so, current adoption could be as high as 73% of agencies with 100 or more officers. However, the largest year-to-year increase in adoption of LPR seems to have occurred from 2009 to 2010.

¹⁴ Nineteen percent of agencies in our weighted sample indicated that they would be “likely” or “very likely” to adopt LPRs in the next 1-2 years. Thus for our weighted sample, this meant that 63 additional agencies were likely to adopt by 2016. We divided that by 2 and then added 31.5 to the total number of agencies who said they adopted LPR in 2014 (16), and used 32 as the estimated number of agencies who would adopt LPR in 2015.

Figure 3. The Diffusion of LPR Innovation Curve (Cumulative Percentage of Agencies Adopting LPR)

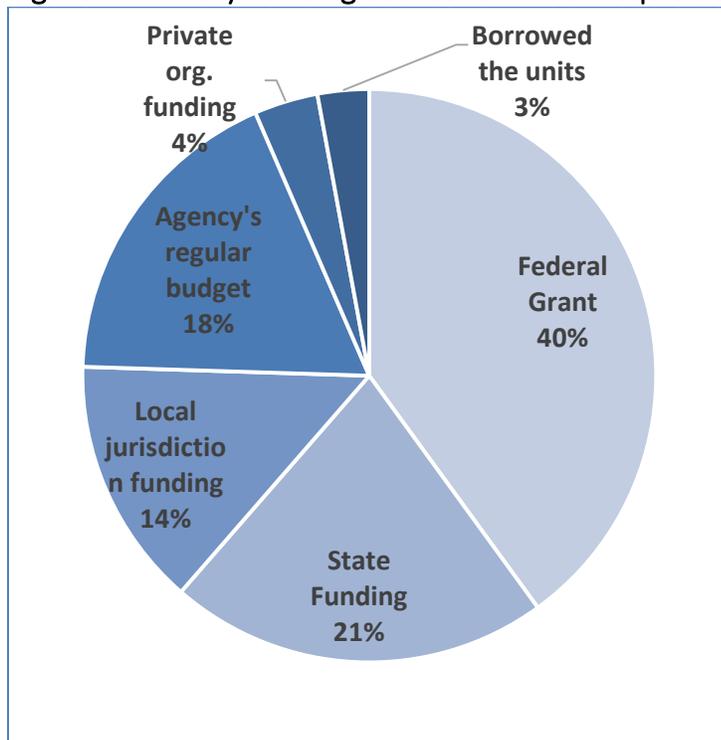


*Estimated. Based on weighted estimates for the population of agencies with 100 or more offices (n=902).

The average number of LPR units accessed or owned by individual agencies has been relatively low but generally growing. The average number of LPR units that a responding agency initially acquired or gained access to was 2.88 units (SD = 4.28). The average number of LPR units that agencies owned or had access to at the time of the survey was 7.93 (with a standard deviation of 17.67). To put this in perspective, 75% of agencies with over 100 officers own seven or fewer LPR units, and 90% of all agencies own less than 15 units. Only 5% of agencies own more than 25 LPRs.

Findings from our survey indicate that the diffusion of LPRs into law enforcement seems to have occurred as a result of two reasons – the availability of funding as well as word-of-mouth support for the use of LPRs by other law enforcement organizations, a finding similar to that found in Lum et al.'s (2010) survey conducted in 2009. Figure 4 indicates that a large proportion (40%) of initial LPR adoption was supported by federal grants, such as the UASI. When federal grant funds were not available, state and local funding supported the acquisition of LPRs for roughly a third of agencies. Less than a fifth of agencies supported their own financing of LPR units.

Figure 4. Primary Funding Source for Initial Acquisition of Respondent Agency's LPR Units



Based on unweighted n=225 agencies with LPR.

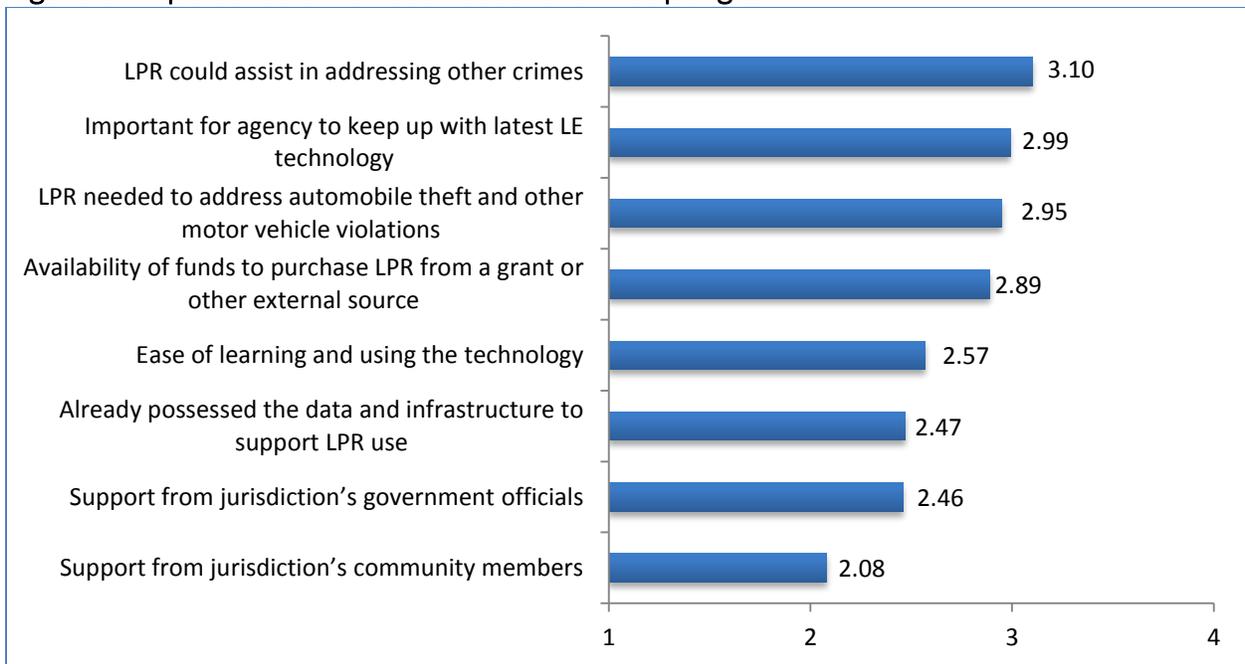
Further analysis indicates agencies that acquired LPRs using federal grants or state funding tended to be earlier adopters of LPRs compared to those that were funded otherwise.¹⁵ This is consistent with our findings above that the primary reason that agencies do not adopt LPRs is financial.

In addition to the influence of federal and state funding, agencies learn about LPRs from (and are generally encouraged to adopt them by) other law enforcement agencies (46%), a professional policing group (20%), or by the LPR vendors (25%). These influencing factors for the diffusion of many innovations and ideas in policing are not surprising. This also reveals an interesting lesson for policing researchers; innovations in policing will likely not diffuse across police agencies unless endorsed through existing social networks such as a neighboring police department, a professional law enforcement association, or perhaps even a local vendor (Willis and Mastrofski, 2011).

¹⁵ An independent samples t-test was conducted to compare the mean year of adoption between agencies that received federal or state funding versus those that did not. There was a significant difference in mean year of adoption for those receiving federal or state funding (mean=2009.54, SD=2.337) and those that did not (mean=2010.20, SD=2.806); $t=-3.158$, $p=.002$.

Figure 5 provides further insights into why agencies initially adopted LPRs. We asked agencies to rate a variety of potential reasons for adoption as “not important,” “somewhat important,” “important,” or “very important.” LPRs are viewed as most important in assisting in crime prevention and resolution, especially automobile theft and other motor vehicle violations. However, agencies rated the use of LPRs to address auto theft and motor vehicle violations as slightly less important than their use to address other types of crime. This is a departure from earlier surveys that indicated that LPRs were primarily adopted and used for thefts related to automobiles. This suggests that police are putting more emphasis on new ways to use LPRs that go beyond the detection of stolen vehicles (and also perhaps that they are recognizing the limits of LPRs for reducing auto theft). The availability of funding for LPRs is also an important reason for LPR adoption. But interestingly, agencies also responded that “keeping up with the latest technology” was a principal reason for LPR adoption.

Figure 5. Importance of Various Reasons for Adopting LPR



Mean scores based on a 4-point scale: 1 (not important), 2 (somewhat important), 3 (important), and 4 (very important). Unweighted n ranges from 219 to 224.

How LPR Systems are Used

Understanding and realistically evaluating the outcome effectiveness of LPRs in policing requires knowing how they are regularly used. Lum et al. (2010) found that

agencies primarily used LPRs to detect stolen automobiles, stolen tags, and other motor vehicle violations using LPRs that were usually mounted on patrol vehicles. In this survey, rather than only ask how LPRs were used, we specifically asked respondents about the total number of LPRs in their agencies and how each LPR was used.¹⁶ Results indicate that LPRs remain similarly used five years after the initial Lum et al. survey (Figure 6). LPR units are most commonly mounted on moving patrol vehicles, although a quarter are also planted at fixed locations. Interestingly, almost 11% of the total number of LPRs possessed by the respondents were not in service at the time of the survey. These out-of-service LPRs existed in 9% of agencies with LPR, which averaged 31% of their LPRs out of service.

Figure 6. How LPR Units are Deployed on a “Typical Day”

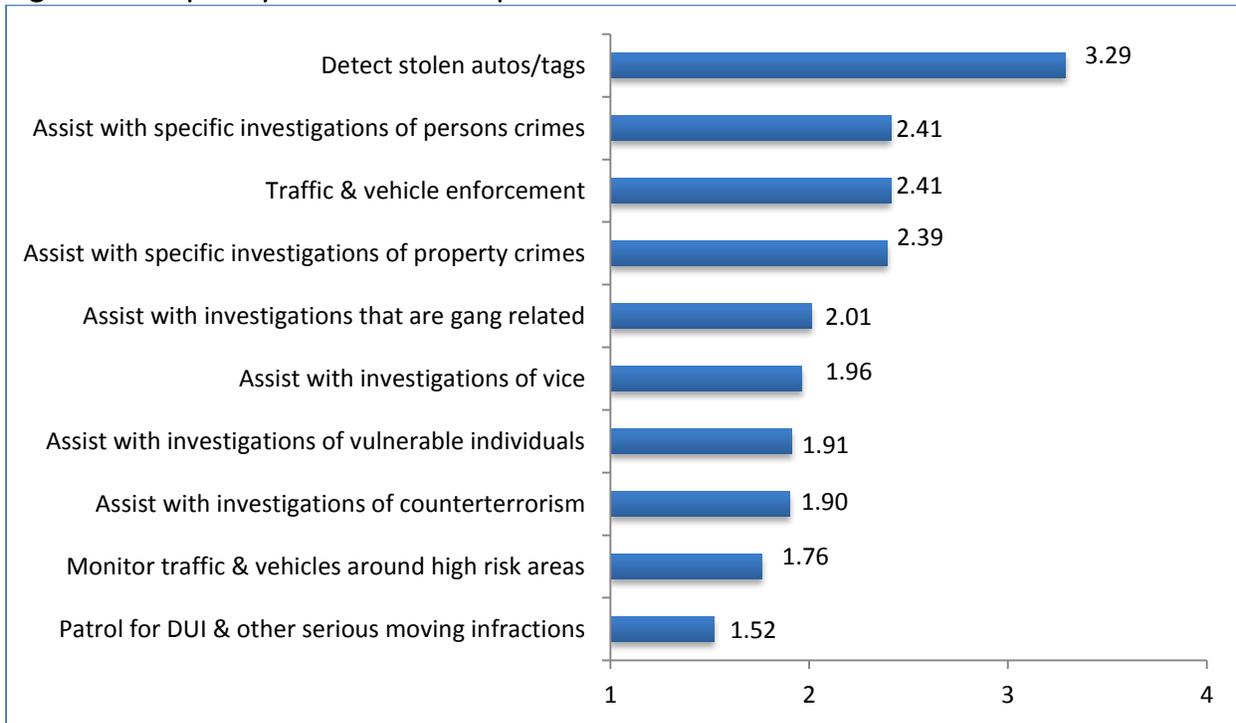
	Number of Units	Percentage of total
Mounted on patrol cars for general patrol	1586	50.1%
Fixed locations	817	25.8%
Not in service	335	10.6%
Used by specialized LPR units	197	6.2%
Used by other investigative units	135	4.3%
Used in other ways not described	52	1.6%
Unknown	42	1.3%
Total	3164	100%

Based on unweighted n=225 agencies with LPR.

We also asked agencies to describe how often LPRs are used for specific law enforcement activities. Figure 7 shows that detecting stolen automobiles and tags is still the most common use for LPRs, although agencies—on average—sometimes use LPRs for assisting with investigations of persons or property crimes, as well as for vehicle and traffic enforcement. LPRs are less frequently used for investigations related to vulnerable individuals or missing persons, counterterrorism, or driving under the influence and other serious traffic infractions.

¹⁶ In the survey we requested the total number of current LPR units that the agency has access to (Question Y4) and to specify how each unit was used (Question Y9). However, some agencies reported different totals in Y4 than the sum of Y9. To remedy this, if a count was missing in Y4, we replaced it with the sum of LPRs listed in Y9. If Y4 was greater than the sum in Y9, we counted the additional LPR as “unknown use,” above.

Figure 7. Frequency of LPR Use for Specific Activities



Mean scores based on a 4-point scale: 1 (never or almost never), 2 (sometimes), 3 (often), and 4 (always or almost always). Unweighted n ranges from 220 to 223.

Managerial direction, tracking, and assessment of LPR use is somewhat limited. For example, 54% of responding agencies give patrol officers full discretion over how they use their LPR units. About a third provide some direction to patrol officers on where to patrol with LPRs, while only 5% almost always provide such direction.¹⁷

Along similar lines, we also asked agencies whether they track their own uses of LPRs. About half of agencies using LPRs keep records on daily LPR deployment, such as the number of units in operation, who is assigned to LPR units, or the number of hours LPRs are used. Of those agencies that use LPRs for specific investigations, 61% reported that they record that use in their case files. Finally, only about a third of LPR agencies collect performance metrics associated with LPR use. However, when we asked agencies to provide statistics on, for example, the number of arrests made with LPR units, or the number of stolen automobiles recovered with LPR (Question Y13 in our survey), the majority of agencies could not provide this information. However, without adequate tracking of LPR use and performance, it will be difficult for agencies to assess the

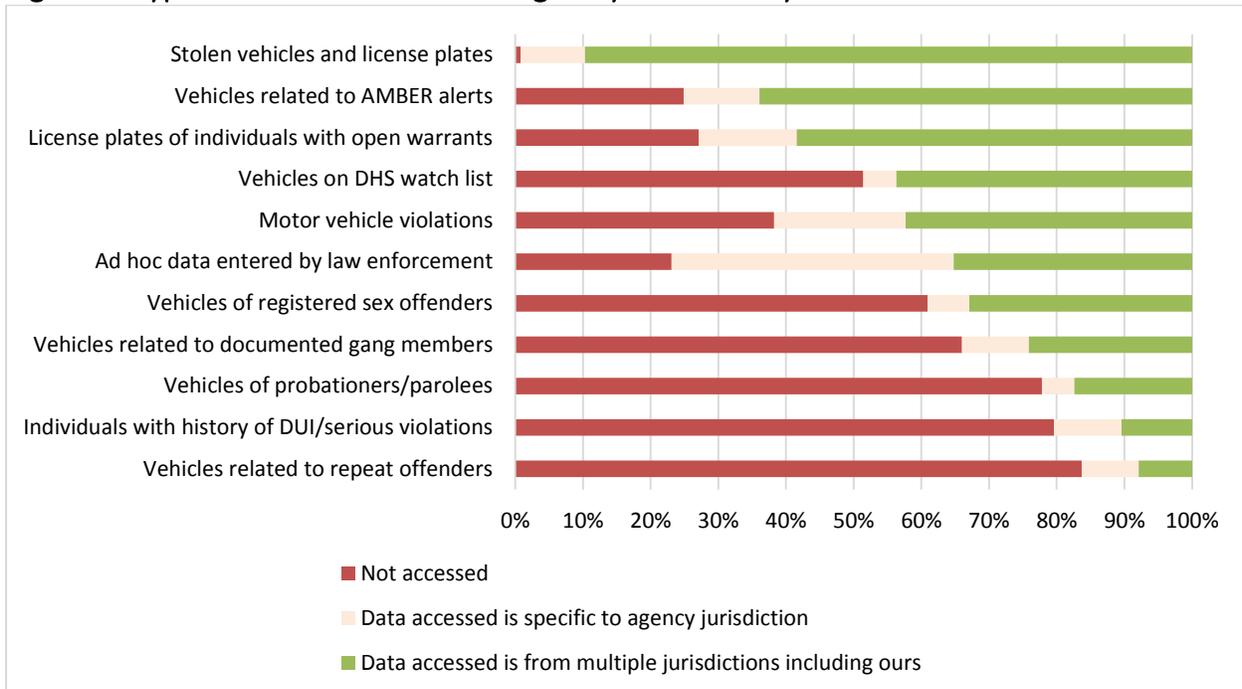
¹⁷ The other eight percent of agencies do not use LPR in their patrol units.

outcome effectiveness or the cost-benefits of what can be a potentially costly technology to the agency.

The use of LPRs also depends on the types of data of which agencies have access. For example, if only license plates of stolen automobiles are accessed by the LPR system, then LPRs can only primarily be used to deal with auto theft or license plate theft. However, agencies often can access other information in LPR systems as well. For example, automobiles of interest in the AMBER alert system for missing children might be included in the data that an LPR can access. Thus, agencies can use LPRs to potentially track vehicles associated with missing children. Agencies can also manually enter license plates “of interest” into LPR systems, including plates of vehicles linked to suspects who may be wanted by the police for questioning. Moreover, many of the data sources linked to LPR systems are multi-jurisdictional, thus expanding the range of vehicles of interest that police can potentially detect.

Figure 8 provides findings regarding the types of data accessed by agencies with LPR units. We gave agencies three choices: (1) that the data were not accessed at all; (2) that the data which were accessed were only available within that jurisdiction; or (3) that the data which were accessed were available from multiple jurisdictions, including the agency’s own jurisdiction. Figure 8 shows that the most frequent multi-jurisdiction data accessed by LPR units continued to be data on stolen vehicles and license plates (87.5% of agencies with LPR access this type of data) followed by Amber Alert (missing children) information (63.9%) or license plates of individuals wanted on serious criminal warrants (58.4%). Data least accessed by LPR systems includes vehicles related to repeat offenders or those with histories of serious driving infractions, as well as vehicles of probationers, parolees, documented gang members or registered sex offenders. Nearly 83% of agencies automatically upload (as opposed to manually upload) the data that were accessed by their LPRs, while almost 86% of agencies automatically downloaded data that were collected by their LPRs (reads and matches) into other data systems.

Figure 8. Types and Sources of Data Regularly Accessed by LPR Units



Percentage of responding agencies accessing each type of data. The unweighted n ranges from 216 to 225 for each choice.

Agency Policies on LPR Use and Data Storage

Lum et al. (2010) reported approximately 40% of larger agencies with LPR had some policy or standard operating procedure governing the use of LPRs. By the end of 2014, our survey indicates this proportion had grown to almost 70%. Figure 9 shows the specific policy components that agencies included in their LPR policies that seemed to be of greatest interest to law enforcement and communities. The most common LPR policy components were those surrounding the storage of LPR data and access to those data, as large majorities appeared to have detailed policies that covered various points falling under these general topics. It was less common for agencies to have specific policies governing the operational uses of LPRs in the field. However, between 52% and 60% did have policies governing LPR use for investigations and patrol, respectively.

Figure 9. Presence of Specific Items in Agency LPR Policies (% of agencies with item)



Percentage of responding agencies accessing each type of data. The unweighted n ranges from 140 to 146 for each choice.

We also asked respondents that used LPR to share how long they kept data collected by their LPR systems. These values ranged widely as shown in Figure 10, and sometimes were dictated by state law or by agency convention. While about a third of LPR agencies discarded LPR data within less than a year, about 40% kept LPR data for multiple years or indefinitely.

Figure 10. Length of Time Agencies Retain Data Collected by LPR¹⁸

Length of time	%
1 month or less	17.6%
More than 1 month, less than a year	15.9%
1 year	11.6%
2-4 years	12.7%
5-7 years	11.8%
Indefinitely	15.0%
Do not know/chose not to answer	15.5%
Total	100.1%

Challenges and the Future of LPR Use

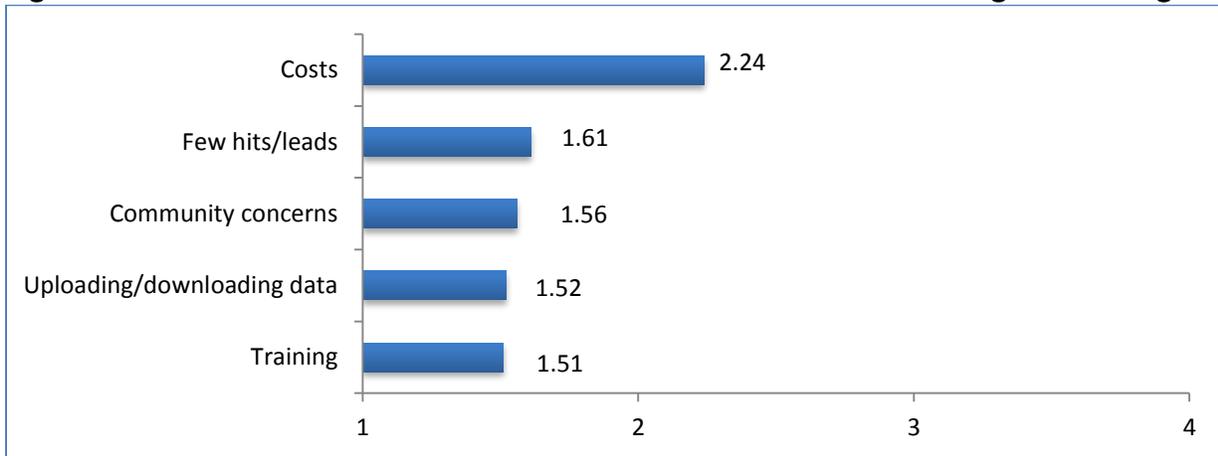
Finally, we asked agencies about whether they were satisfied with LPRs, what types of challenges they encountered with them, and whether they would continue using LPRs in the future. A majority of agencies (55.8%) were “very satisfied” with their LPRs, while another 34.9% were “somewhat satisfied.” Additionally, almost all agencies with LPRs intended to continue their use, and almost half (48.7%) wished to expand their use.¹⁹

When asked about problems surrounding LPRs, agencies generally indicated no major concerns. As shown in Figure 11, costs associated with LPR systems were the leading concern cited by agencies, but even this problem was only rated as a “small” problem on average. Issues surrounding training, data issues, LPR results (i.e., hits), and community concerns were all rated on average as being somewhere between no problem and a small problem.

¹⁸ This graph is based on qualitative data collected in our survey and is not weighted.

¹⁹ These proportions are weighted estimates based on population of ≥ 100 sworn officers.

Figure 11. How Much of a Problem Each of These Issues Have Been for Agencies using LPR



Mean scores based on a 4-point scale: 1 (no problem), 2 (small problem), 3 (moderate problem), and 4 (big problem). The unweighted n ranges from 214 to 216.

Interestingly, while the media has covered possible issues related to community concerns about LPR use, police agencies did not report this as a major concern. Nonetheless, 61% of agencies using LPRs had issued a press release to their communities regarding the acquisition and use of LPRs (see Question Y8).²⁰ More generally, previous research has shown complicated findings about the relationship between police and their communities regarding LPRs. The public remains generally unaware of LPR use, and when they are, they are supportive of certain types of LPR uses more than others (Lum et al., 2010; Merola and Lum, 2012; Merola et al., 2014). In particular, our previous community surveys on LPRs indicated the public was less supportive of using LPRs for everyday traffic and parking violations, but more supportive of using LPRs to solve serious crimes. More importantly, support for LPRs was found by Merola and Lum (2013) to be predicted by citizen trust in the police; if citizens trusted the police, they were more likely to support their agency's use of LPRs.

²⁰ This proportion is a weighted estimate based on population of ≥ 100 sworn officers.

5 Conclusions

LPR technology has rapidly diffused in U.S. law enforcement. In a period of less than ten years, LPR adoption has increased at least threefold in agencies with 100 or more officers, and the number of LPRs per agency has more than doubled. While LPR use still primarily focuses on recovering stolen automobiles and license plates using mounted LPR units on vehicles, LPR use has expanded into other types of investigative and deployment uses (e.g., mounted at fixed locations). While the adoption of LPRs seems to be slowing, agencies that have LPRs do not seem to be abandoning them. Rather, we suspect that both the forces of diffusion and saturation of LPRs as well as resources shifting to body worn cameras and other technologies may have contributed at least partly to this slowdown.

It is important to emphasize that the rapid diffusion of LPRs has occurred in a low information environment, at least with regard to outcome evaluations. Currently, only two experimental studies exist on the crime prevention effectiveness of LPRs, and most other assessments only confirm LPRs' efficiencies and technical abilities. Understanding whether LPRs can actually impact crime, and more importantly *when and how* they can be used to optimize their crime prevention potential, are important questions to examine. Law enforcement agencies have already purchased LPRs and will likely keep them. Thus, finding ways to optimize the use of LPRs for the public good is essential evidence that needs to be built.

Given the variety of ways that agencies are now using LPRs, there is a need to build an evidence base testing both patrol and investigative applications of LPRs using different types of mobile and fixed deployments. It would also be useful to know whether LPRs are being reinvented in new or innovative ways. These are the subjects of our patrol and investigative studies that follow this survey. It is also important to determine whether and how LPRs can be used to address different types of crimes besides auto theft effectively. Further, police and researchers must assess how the effectiveness of LPR use is affected by the scale of LPR deployment and the types of data fed into LPR systems. Questions regarding the former issue seem particularly critical at this stage of LPR diffusion. In particular, what are the most effective ways for agencies to utilize small numbers of LPRs, and what is the potential return on investment for acquiring larger numbers of the devices?

Police managers can also facilitate this process by doing more to systematically track the ways that LPRs are used and the outcomes of those uses. For example,

managers could track the specific areas in which LPRs have been deployed; how specifically LPRs have been deployed (e.g., fixed or on patrol cars); the number, nature, and results of license plate matches achieved with the LPRs (e.g., vehicles recovered and arrests made); the number and outcomes of investigations for which LPRs or LPR data have been used; and whether crime was reduced in areas where LPRs were deployed. Agencies can then use these results to refine their use of this technology. Without tracking LPR use and outcomes, evaluating their effectiveness is difficult.

Using LPRs for the public good equally requires agencies to have a clear understanding of whether LPRs have negative impacts on their communities or generate negative reactions from citizens. Citizen reactions to police efforts are just as important to measure and work towards in democratic policing (Lum and Nagin, 2016), and LPRs pose specific challenges to law enforcement agencies in this regard. For example, citizens might be concerned about how long agencies retain data and how that retained LPR data is used. At the same time, previous research (see Lum et al. 2010) seems to indicate that citizens have less problems with agencies using LPR captured data for investigations, and more problems with agencies using the LPR systems to scan for everyday traffic and parking violations (a use of LPR that does not use stored LPR data). Finally, previous research indicates that agencies with poor legitimacy and trust of their communities generally will enjoy less support from their citizens for technologies like LPR. Using LPRs with a keen eye towards not reducing the agency's legitimacy with citizens requires taking these findings from previous research under consideration.

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Appendix A: LPR Survey

[The survey instrument used for this study appears on the next nine pages.]

To complete and submit this same survey online please go to:
[URL]

On the email and letter introducing this survey, a UNIQUE SURVEY ID was provided. Please write that code here: _____

Does your agency currently use automated license plate readers (LPR)?

Yes ____ (If yes, skip to Section II: “Survey for agencies that use LPR”)

No ____ (If no, continue with ONLY Section I below: “Survey for agencies that DO NOT use LPR”)

SECTION I: Survey for agencies that do not use LPR

N1. Please mark how important each of the following reasons is as to why your agency has not adopted or implemented LPR (or stopped using LPR). If any of these choices are inadequate, you will have the opportunity to add a choice at the end:

	Not important	Somewhat important	Important	Very Important
a. We felt that other technologies and/or equipment were more important to acquire than LPR.				
b. We could not afford LPR technology (including purchasing and maintenance).				
c. We believed LPR would be difficult for our personnel to learn and use.				
d. We felt the use of LPR posed significant privacy and civil liberties concerns.				
e. We do not have the access or the capability to enter license plate or related data into LPR systems.				
f. Our jurisdiction’s government officials (i.e., city council, county or state governments) opposed or did not approve of our acquisition of LPR.				
g. Citizens within our community do not support the acquisition of LPR.				
h. We have seen other agencies use LPR with unsuccessful results.				
i. Aside from the items identified above, are there any other significant reasons that explain why your agency does not currently use LPR? If so, please provide them here: (write below)				

N2. How likely is it that your agency will acquire LPR technology within the next 1-2 years?

- _____ Very likely
- _____ Likely
- _____ Somewhat likely
- _____ Not likely at all

Agency information

The following information is gathered for follow-up purposes only and will not be used to identify your agency's responses in reporting the results of this survey.

N3. Agency name: _____

N4. Mailing address of your agency: _____

N5. Name and position of individual who can best respond to further inquiries about responses to this survey: _____

N6. Phone number of individual named above: _____

N7. Email of individual named above: _____

N8. What is the population count for the jurisdiction your agency is responsible for? _____

N9. How many full-time, authorized sworn officers are currently in your agency? _____

**STOP HERE IF YOU ARE AN AGENCY THAT DOES NOT USE LPR.
PLEASE MAIL YOUR RESPONSES BACK TO THE CEBCP IN THE SELF-ADDRESSED
STAMPED ENVELOPE.**

Thank you for your time and effort in completing this survey. Your agency's participation in this survey will be invaluable in enhancing our understanding of how LPR technology has impacted US law enforcement agencies. For more information on the Center for Evidence-Based Crime Policy at George Mason University and its evidence-based policing research projects, visit www.cebc.org.

SECTION II: Survey for agencies that use LPR

Please enter the SURVEY ID from the cover letter/email introducing this survey here _____

A. Adoption

Y1. Which of the following best describes your agency’s current access to LPR technology?

- _____ Our agency has its own LPR units.
- _____ Our agency borrows LPR units from another jurisdiction/agency.
- _____ Our agency has its own LPR units and also borrows units from another jurisdiction/agency.

Y2. In what year did you first acquire or gain access to LPR technology for your agency? _____

Y3. How many LPR units did your agency **initially** obtain or gain access to? _____

Y4. How many LPR units does your agency **currently** own/have access to? _____

Y5. What was the primary funding source for that **initial** acquisition of your agency’s LPR units?

- _____ Federal grant
- _____ State funding
- _____ Local jurisdiction funding
- _____ Agency’s regular budget
- _____ Private organization funding
- _____ None, we borrowed the units from another organization

Y6. How did your agency **initially** learn about LPRs?

- _____ Directly from a LPR vendor
- _____ From another law enforcement agency
- _____ From the US Department of Justice or any of its components (e.g., NIJ, BJA, BJS, COPS Office)
- _____ From a professional or national policing group (i.e., IACP, PERF, Police Foundation, National Sheriff’s Association)
- _____ The media
- _____ Other, please describe _____

Y7. When your department made the initial decision to adopt/use LPR, how important was each of the following in making your initial decision?

	Not important (or not part of decision)	Somewhat important	Important	Very Important
a. We needed LPR to address the specific crime problem of automobile thefts and other motor vehicle violations.				
b. We felt that LPR could assist the agency in addressing other crimes besides automobile theft.				
c. The availability of funds to purchase LPR from a grant or other external source.				

	Not important (or not part of decision)	Somewhat important	Important	Very Important
d. Ease of learning and using the technology.				
e. We had the data and data systems infrastructure to support the use of LPR.				
f. Support from our jurisdiction's government officials (i.e., city council, county or state governments).				
g. Support from our jurisdiction's community members.				
h. Our agency felt that it was important to keep up with the latest law enforcement technology.				
i. Aside from the items identified above, were there any other reasons that explain why your agency made the initial decision to acquire LPR? If so, please describe here:				

Y8. Has your agency ever issued an official press release or media alert regarding your acquisition and use of LPR units?

Yes
 No

B. Use of LPR Systems

Y9. Please describe the most common deployment of your agency's LPR units on a typical day. The total number listed should equal the total number of LPR units that you currently have.

	Number of LPR units
a. Fixed locations	
b. Mounted on patrol cars for general patrol	
c. Used by a specialized unit of LPR officers (not including those on patrol cars listed above)	
d. Used by other investigative units	
e. Used in other ways not listed above	
f. Not in service	

Y10. Please describe how often LPR is used for these specific types of activities?

	Never or almost never	Sometimes	Often	Always or almost always
a. To detect stolen automobiles and/or tags				
b. To conduct traffic and vehicle enforcement, (e.g., registration, license, insurance violations, unpaid parking tickets)				

c.	To proactively identify and stop individuals who have history of driving under the influence or serious moving violations				
d.	To monitor traffic patterns and vehicles around high-risk locations				
e.	To assist with specific investigations of crimes against persons (e.g., homicide, robbery, sex crimes, assaults)				
f.	To assist with specific investigations of crimes against property (e.g., burglary, theft, fraud, property destruction)				
g.	To assist with specific investigations of vulnerable individuals (e.g., juvenile runaways, missing persons, mentally ill, elderly)				
h.	To assist with specific investigations of vice (e.g., narcotics, smuggling, prostitution, gambling)				
i.	To assist with specific investigations or enforcements that are gang related				
j.	To assist with specific investigations of counterterrorism or homeland security				
k.	If you use LPR units or the data collected by LPR for purposes other than those listed above , please describe here:				

Y11. For officers using LPR **in general patrol duties**, which statement best describes this use?

- _____ Officers generally have full discretion in where to patrol with LPR.
 _____ Officers are sometimes directed where to patrol with LPR units by their supervisors.
 _____ Officers are almost always specifically directed where to patrol with their LPR units.
 _____ Our agency does not use LPR in uniformed regular patrol.

Y12. Please answer yes or no to the following questions about your agency's tracking of LPR use:

	Yes	No
a. Our agency records information on daily LPR deployment, such as the number of units in operation, who is assigned to LPR units, and number of hours LPR is used.		
b. When LPR is used for a specific criminal investigation, that use is recorded in the investigator or detective's case management system or folder.		
c. Our agency regularly collects performance measures associated with LPR use.		

Y13. For the year **2013**, please fill out the following statistics regarding the outcomes of LPR use *if known*. If your agency does not collect a statistic, please indicate this in the far right column.

	Total number	We do not collect this statistic
a. Arrests made for stolen vehicles or tags directly due to LPR		
b. Stolen automobiles recovered as a result of LPR		
c. Arrests made for crimes other than autotheft, stolen tags or motor vehicle related violations and citations as a result of LPR		
d. Vulnerable persons cases (missing, juvenile, mentally ill, elderly) solved as a result of LPR		
e. Does your agency collect any other performance measures related to LPR use that were not mentioned above? If so, please describe here:		

Y14. Please mark the types of information that are regularly accessed by LPR units (also known as “hot lists”). Please indicate if the information is specific **only** to your jurisdiction, or if it also includes information from other jurisdictions.

	Not accessed	Data accessed is specific to our jurisdiction	Data accessed is from multiple jurisdictions including ours
a. Stolen vehicles and license plates/tags			
b. Motor vehicle violations (parking tickets, registration, license, and insurance violations)			
c. Data regarding individuals with histories of driving under the influence or serious motor vehicle violations (e.g., excessive speeding)			
d. License plates of individuals with open criminal warrants			
e. Data entered on an ad hoc basis by law enforcement officials regarding persons/vehicles of interest			
f. Vehicles of probationers and/or parolees			
g. Vehicles of registered sex offenders			
h. Vehicles related to AMBER alerts			
i. Vehicles related to documented gang members			
j. Vehicles related to repeat offenders			
k. Vehicles related to people on the Department of Homeland Security watch list			
l. Are there other sources of data that your LPR units access that are not listed above? Please describe here:			

Y15. For the majority of the data that is **accessed by** LPR (also known as “hot lists”), which of the following best describes how this data is placed into the LPR system?

- The data is uploaded manually, by a unit or individual (with officers able to add real-time data as needed).
- The data is uploaded automatically, through a database link in an information technology system (with officers able to add real-time data as needed).

Y16. For the majority of the data that is **collected by** LPR, which of the following best describes how this data is retrieved?

- The data is downloaded from the LPR system manually, by a unit or individual into a database or information technology system.
- The data is downloaded from the LPR system automatically, by a wireless or intra/internet system into a database or information technology system.

Y17. Besides searching this data for specific investigations, does your agency analyze or use the data scanned by LPR units in any other way? Please describe in detail:

C. Your agency’s policy on LPR

Y18. Does your agency have a specific written policy regarding LPR use?

- Yes (If yes, continue below with question Y19)
- No (If no, continue at question Y20)

Y19. The next set of questions asks about specific content of your LPR policy. Please indicate (yes or no) whether your LPR policy addresses each of the following:

	Yes	No
a. Who is authorized to use LPR units		
b. Who is required and assigned to maintain LPR units		
c. Who is responsible to upload the data or “hot lists” that is accessed by LPR units		
d. Limitations on what types of data or “hot lists” can be accessed by LPR units		
e. Requirements for accuracy and timeliness of uploading data or “hot lists”		
f. Who is responsible to maintain the data collected by LPR units		
g. Who is authorized to access the data collected by LPR		
h. Specific circumstances under which data collected by LPR can be accessed		
i. With whom (individuals or organizations) the data collected by LPR can be shared		
j. How long data collected by LPR units can be retained or stored		
k. How data collected by LPR units will be discarded		
l. How public requests for information regarding LPR will be addressed		
m. Whether there are reporting requirements when data collected by LPR units are accessed		

	Yes	No
n. The specific ways that LPR are to be used in uniformed patrol/traffic enforcement		
o. The specific ways that LPR are to be used in investigations		
p. The specific ways that LPR are to be used by crime analysis units		

Y20. For the data the LPR records and scans (license plate, time and location of scan, etc.), please specify exactly how long that information is stored? (i.e., “10 days”, “4 months”, “2 years”, “indefinitely”):

Y21. Are there any exceptions to this length of time that data is stored? Please describe here:

D. Challenges and Future Use of LPR

Y22. Please rate your agency’s level of satisfaction with LPR:

- _____ Very satisfied
- _____ Somewhat satisfied
- _____ Somewhat dissatisfied
- _____ Very dissatisfied

Y23. For each of the following, please rate how much of a problem each of these issues has been for your agency in using LPR:

	No problem	Small problem	Moderate problem	Big problem
a. Costs of maintaining, keeping, funding, and/or acquiring LPR				
b. Community concerns related to your agency’s use of LPR, including privacy and civil liberties issues or legal challenges				
c. Getting few “hits” or leads for investigations with LPR				
d. Training officers and investigators to use LPR				
e. Uploading and/or extracting data into/from LPR				
f. If there are other challenges that you have faced with LPR not mentioned above, please describe here:				

Y24. Which of the following best describes the future of LPR in your agency?

- We intend to continue using the LPRs we have
- We intend to expand our LPR usage
- We intend to reduce our LPR usage
- We intend to discontinue our use of LPR

Agency information

The following information is gathered for follow-up purposes only and will not be used to identify your agency's responses in reporting the results of this survey.

Y25. Agency name: _____

Y26. Mailing address of your agency: _____

Y27. Name and position of individual who can best respond to further inquiries about responses to this survey: _____

Y28. Phone number of individual named above: _____

Y29. Email of individual named above: _____

Y30. What is the population count for the jurisdiction your agency is responsible for? _____

Y31. How many full-time, authorized sworn officers are currently in your agency? _____

PLEASE MAIL YOUR RESPONSES BACK TO THE CEBCP IN THE SELF-ADDRESSED STAMPED ENVELOPE.

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