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License Plate Reader (LPR) Systems:
USE CASES

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Introduction

A license plate reader (LPR) is a camera with character recognition that can quickly scan the license plate of a vehicle, compare it to current records of criminal or suspicious activity, and alert police of any notable matches. As with other pieces of police technology, LPRs have enhanced police effectiveness and efficiency, bolstering their ability to protect public safety. Prior to LPR technology, an officer on patrol had to manually enter a vehicle's license plate to identify vehicles that may be stolen or used in the commission of a crime. An LPR continuously scans all license plates as they pass by, and through its automated alert system, sends a notification to police if a vehicle may be a match to one reported at a crime scene, or a vehicle that may be of relation to a place or person of interest. This technology significantly improves a police officer's ability to target crime-related vehicles and allows officers to focus their attention on these specific vehicles. At the same time, however, members of the community have raised privacy concerns about police's increasing ability to collect data on members of the public.[1]

Police agencies derive their power from the communities they serve and are dependent on public trust. The ethical and responsible use of technology can help strengthen this relationship in a way that is mutually beneficial to both police operations and community satisfaction. In contrast, police technology leveraged without proper consideration for individuals' rights can harm public trust.

Much skepticism toward using LPR systems stemmed from misunderstandings about how these systems and the data they collect are used to promote public safety and influence agency policy. This document provides real-life examples of how an LPR is used to help clarify these misconceptions and to educate both the public and police agencies on how this technology can be useful.

How Does LPR Work?

LPRs scan a license plate when a vehicle comes into view. The system uses this scan to detect the vehicle's license plate number and uses that to retrieve other stored information about the vehicle such as make, model, color, and bumper stickers or distinguishing characteristics, depending on the system that is being used. Police officers can input a vehicle description or license plate number into the LPR system to learn where the vehicle was last seen or to receive notifications when a matching vehicle is detected by one of the LPRs in real time.

Use Cases

LPRs have become a valuable tool for police to be both proactive and reactive to crimes in the community by helping locate individuals affiliated with a particular vehicle. These situations may involve noncriminal incidents such as missing persons or parking violations. They may also

[1] For more information, see the IACP, *License Plate Reader (LPR) Systems: Survey of Police Use of LPR* (2022).

include suspected criminal incidents such as carjackings, AMBER Alerts,[2] homicides, or any crime where the suspect(s) flees in a vehicle. LPR software gives police valuable resources to locate possible suspect(s); get hits on license plates affiliated with "hot list" suspects;[3] and, if opted, access to local or national databases of other police agencies' LPR data.

The following use cases are assembled from publicly available news sources as well as verbal communications. References to public sources are included where available, and where references are not provided, the information was collected through interviews with police leaders. In some cases, the agency is identified, while in others, the interviewee chose to remain anonymous. All use cases provided are reflective of actual instances where LPRs have been used successfully.

Police License Plate Recognition Use Case Categories

The different ways in which police are using this technology generally fit into four different groupings, based on the activity or purpose:

1. Community Caretaking
2. Investigation
3. Crime Prevention
4. Traffic Compliance

Many of these uses can also be divided into two distinctly different intentions:

- Reactive policing—Response to a specific call or request from the community where a crime has already taken place. This includes using LPR for suspect identification, investigative leads, evidence collection, identification of traffic violations when police are not in the area, and parking enforcement.
- Proactive policing—Preventative measures for deterring crime that has not yet taken place. This includes crime deterrence, predictive policing, and administrative analysis.

Community Caretaking

Community caretaking refers to police responses to concerns over public safety and well-being. In these instances, officers are not seeking evidence or suspects.[4] Rather, community caretaking refers to the actions an officer takes when there is a threat of illness or injury or when an individual needs urgent assistance. Examples include cases of individuals facing a mental health crisis or drug and alcohol abuse. In the case of community caretaking, LPRs have been used to

[2] For more information, see United States Department of Justice, Office of Justice Programs, "Ambert Alert" (webpage).
[3] When a suspect's identity is known, any vehicle associated with that suspect can be added to a "hot list."
[4] Debra Livingston, "Police, Community Caretaking, and the Fourth Amendment," *University of Chicago Legal Forum* 1998, no. 1 (1998): art. 12.

locate missing and endangered persons and provide additional context pertaining to events that happened under suspicious circumstances.

Missing & Endangered Persons

LPR has been successful in aiding police in finding missing and endangered persons such as those who are missing under suspicious, unexplained, or involuntary circumstances or are missing and are considered to be at heightened risk of danger.

Mental health: ***Mount Juliet Police Department, TN***

A teenage male who had threatened suicide was driving around town in a vehicle. Police obtained information on the vehicle and used LPR to locate him, safely intervening before any actions of self-harm occurred.

Kidnapping: ***Livermore, CA***[5]

A woman contacted a sheriff's department to report that her mother had gone to meet a man she met online and never returned. The women had tried to contact her mother, but a man answered and would not allow her to speak to her mother, although she heard her crying in the background during the call. Using the photos found online of the unknown male, through a facial recognition search, they were able to identify a possible match. The agency then input the information for the suspect's license plate into the LPR system, which allowed officers to locate the vehicle. Upon search of the vehicle, they were able to locate the woman, who had been drugged, and safely rescued her.

Suspicious Circumstances

LPRs can also help explain suspicious circumstances that would otherwise be unknown. This can help determine whether a crime has occurred and assist police in identifying the most appropriate investigative procedural steps to follow, as well as, in some cases, provide explanation and closure for those close to a victim.

Deceased person: ***Grand Valley State University Police Department, MI***

A deceased person was found outside the campus of Grand Valley State University. Through the assistance of LPR technology in conjunction with cameras on campus, police learned that the individual had become intoxicated off campus and, while returning to campus, stepped out of a car, and died of cold weather exposure. Without the assistance of LPR, the police would most likely have utilized numerous resources in the investigation of this suspicious death and the family may not have received closure.

[5] Matt Pera, "Vigilant Solutions' Facial Recognition and License Plate Recognition (LPR) Technology Help to Locate Missing California Woman in Kidnapping Case," PRNewsire, February 15, 2018.

Investigation

During an investigation, LPRs can aid in discovering and collecting evidence, leading to the apprehension of known suspects; identifying unknown suspects; and recovering stolen vehicles. Further, stored LPR data can be used as an analytic tool to help agencies begin to understand and identify trends and patterns in risky behaviors or crimes. Following this, police can design intervention techniques that seek to interrupt those hazardous patterns.

LPR technology offers investigative leads that increase the probability of quickly solving crimes. When police know pieces of information about a suspect's vehicle, they can use that information in conjunction with an LPR system to locate the suspect. This increased efficiency can provide greater satisfaction for the victim, has the potential to prevent further criminal activity, and may free some police resources to be reallocated to other duties.

Apprehension of Known Suspects

When LPR technology locates a vehicle from the hot list, the system then notifies the police. Information gathered from LPR technology can assist with locating known suspects by narrowing investigative searches to locations where the suspects' vehicle(s) may frequently visit.

Organized retail theft: ***Anonymous Agency***

Police were alerted to a series of retail thefts at a shopping mall. Vehicles suspected to be associated with the thefts were added to the LPR system, and the LPR system was set to alert local police when any of the vehicles were at the mall. When alerted, police responded to the mall to investigate and gathered additional evidence by surveilling the tagged vehicle. This led to the apprehension of several suspects involved in organized high-end retail theft across state lines.

Apprehension of sex offender: ***Anonymous Agency***

An individual found guilty of sexual offenses was being monitored by locative technology but removed their tracking device and drove across the state on a crime spree. Police used LPR technology and discovered the individual's vehicle had been at several hotels overnight, narrowing possibilities of their current whereabouts. Officers patrolled the vicinity and located the individual.

Identification of Unknown Suspects

When a suspect's identity is unknown, LPR technology can be used to connect known vehicle information to a potential suspect, thereby providing additional investigative leads on the potential offender. Police can search LPR databases for matches to specific vehicle descriptions and set alerts to notify officers when those vehicles are in the vicinity of an LPR device. This information can lead to the identification and, if necessary, apprehension of the suspect.

Burglary: ***Redlands Police Department, CA***

A female teenager was home alone when she saw two people walking in her backyard. She hid in the bathroom and called the police. She heard the sliding glass door break and she screamed, causing the subjects to flee. She quickly looked out of her residence and observed a green vehicle speeding away. The vehicle's description was entered into their LPR system. Soon after, a fixed LPR camera mounted near the city boundary line captured the suspect vehicle leaving the area. The registered owner of the vehicle was on parole and wearing a GPS ankle monitor. The GPS on that monitor placed him at the location of the residence for five minutes. Based on the totality of the evidence, the subject was arrested.

Pet recovery: ***Anonymous Agency***

When victims reported that their dog was stolen, police officers canvassed the neighborhood for evidence. Video footage from neighbors' doorbell cameras captured images that helped officers identify a suspect vehicle that had repeatedly passed the victim's house. Video footage showed an individual stepping out of their vehicle, grabbing the dog, and driving away. While the doorbell camera footage did not capture the vehicle's license plate, it gave police a description of the suspect's vehicle. Police searched the description against LPR hits, and a match was identified. This led to the identification, apprehension, and arrest of two suspects.

Homicide: ***California Highway Patrol***

A mother and her 6-year-old son were driving on a state highway when a car traveling in the same direction began to drive dangerously around their vehicle. The mother changed lanes and heard a bang behind her vehicle. The boy reported that his stomach hurt, and the mother realized that he had been shot. Police conducted an extensive investigation to identify and locate the suspected vehicle and its driver. The suspect's vehicle was observed in dash camera footage, and police searched databases from the Department of Motor Vehicles (DMV) and the National Insurance Crime Bureau (NICB) using the vehicle description, resulting in a list of 112 potential vehicles. With this list, investigators used LPR technology to compare hits with vehicles in use at the time and location of the shooting and in locations throughout the suspect's route after the shooting, narrowing the list. Two suspects from the same vehicle – a driver and passenger – were identified, arrested, and charged. Upon arrest, the vehicle and weapon used in the shooting were recovered.

Recovering Stolen Vehicles

LPR systems can be instrumental in the recovery of stolen vehicles. Without LPR, police may encounter a stolen vehicle only by chance, after stopping the vehicle for another reason and conducting an investigative records search of the vehicle's license plate. With LPR systems, police have access to automatic knowledge of each license plate in their vicinity as they patrol. Using LPR systems can alert police to relevant information on a suspect's location when the suspect's license plate is scanned by an LPR system. Since stolen vehicles are often used in the

commission of additional crimes,[6] identifying these vehicles and capturing their operators often provide intelligence that furthers other ongoing investigations.

Stolen vehicle: ***Anonymous Agency in the State of Oregon***

An officer was on patrol, and LPR notified the officer of a stolen vehicle in the vicinity. The officer stopped the driver, confirmed that the car was a stolen vehicle, made an arrest, and recovered the stolen vehicle. Without LPR, it is likely the vehicle would have gone unnoticed by the officer.

Stolen vehicles: ***New Orleans Police Department, LA***[7]

The agency installed LPRs in key intersections and egress points of the city to aid police in locating suspects connected to a crime. With the installation of the LPR systems, police were notified of the location of 29 stolen vehicles within less than a month.

Evidence Collection

LPR technology can also aid in evidence collection. For example, LPRs can be used to determine the travel patterns of a suspect or a victim. Additionally, multiple data points can be triangulated to learn about the travel patterns of a hot-listed license plate associated with a suspect or an organized crime group. Triangulating evidence from multiple sources often leads to a more comprehensive understanding of the events in question. Further, after vehicles are recovered, evidence of other criminal activity is often found inside those vehicles, which provides additional investigative leads. In such cases, the data captured in an LPR system may become evidence that can be used in court to corroborate a suspect's alleged actions.

Armed robbery: ***Katy Police Department, TX***

An armed robbery occurred at a department store in Katy, Texas. Initially, police did not have a license plate number for the suspect's vehicle, but they did have a description. A neighboring county reported that the same vehicle had been used in multiple robberies within their jurisdiction and provided a photo of the vehicle. Despite not knowing the license plate number, police conducted an investigative query of their LPR database using known characteristics of the vehicle. The investigation identified a vehicle matching the description. Police then set up an investigative alert so that officers would be notified if/when the LPR equipment located this specific vehicle. Police were soon notified of the vehicle's location and were able to apprehend the suspect before they committed another crime.

Hit and run: ***Gainesville Police Department, FL***[8]

A pedestrian was struck and killed by an individual operating a vehicle. After the incident, the driver fled the scene. LPR technology, in conjunction with information from witnesses and

[6] For more information, see the IACP *Vehicle Crimes Auto Theft Educational Awareness Report* (2017).
[7] Matt Sledge, "New Orleans' Crime-Fighting Network of License-Plate Cameras Close to Completion," *Nola.com,* October 24, 2017.
[8] Katie Delk, "Man Accused of Killing UF Student in a Hit-and-Run Expected to Change Plea Monday," WUFT, March 25, 2022.

cellphone data obtained with a search warrant, was instrumental in identifying the driver of the vehicle that fled the scene. The driver was arrested and charged with failing to stop for a crash involving a death.

Crime Prevention

Leveraging LPR technology can help prevent crime before an offense occurs. In some cases, knowing that the area employs LPRs may be enough to deter potential offenders from committing an offense. In other cases, LPR may not change a potential offender's intentions but can generate potential investigative leads and facilitate police intervention before any harm is done.

Proactive policing: ***University of Memphis Police Department, TN***

During an overnight shift, an officer was patrolling a known high crime area and noticed two individuals acting suspiciously as he approached their location in his patrol vehicle. When the officer got out of his car, one of the suspects shot at him from behind. A total of four suspects all fled in different directions. With the use of neighborhood Ring cameras and surveillance footage, it was later learned that the suspects were looking for unlocked cars and attempting to steal catalytic converters. Following the release of a Be-On-The-Look-Out (BOLO), an LPR camera identified the vehicle, which led to the arrest of one of the suspects. The suspect ultimately confessed leading to the arrest of all four suspects, in which two had felony warrants.

Personal protection: ***Bar Harbor Police Department, ME***

After being assaulted by her son, a mother moved to a new residence without disclosing her new address. Her son was able to locate her new residence and texted her, threatening that he was planning on going to the new address. The mother notified the police of her son's intended action. LPR was instrumental in providing investigative leads that helped police locate her son at a hotel in the community and to intervene before he was able to visit his mother.

Traffic Compliance

LPRs can aid cities with traffic compliance by establishing an automated system for parking and tolls, as well as citations and fines. LPR cameras are sometimes used in conjunction with sensors that monitor the speed of passing vehicles to deter unsafe driving. The exact ways in which LPR is used to monitor and enforce traffic compliance can vary by state/jurisdiction as well as community sentiment around what level of traffic enforcement is most appropriate for the public safety of that community. Additionally, agencies and cities can analyze this data to make decisions regarding infrastructure, construction, and development plans. By understanding traffic trends provided by LPR systems, cities can ensure any planned renovations have a minimal impact on drivers and community members.

Parking and Tolls

LPRs can be used to enforce parking and charge tolls by comparing vehicles with approved license plates pre-entered into the system. Additionally, LPRs can be used to determine the appropriate toll a driver must pay for the duration spent in a parking lot or on an expressway. This can reduce traffic, reduce wait times, and enhance security.

Persistent Toll Violations: ***Metropolitan Transportation Authority, NY*** [9]

Officers with the Metropolitan Transportation Authority are tasked with tracking persistent toll violators of the agency's bridges and tunnels. Between December 12-15 of 2023, officers seized 44 vehicles registered to persistent toll violators, which accounted for about $922,500 in unpaid tolls and fees. Not only have LPRs proven helpful in deterring persistent toll violators, but they have also proven helpful in locating and removing unlawful drivers from the road. A vehicle that was intercepted based on a hit from an LPR system also identified an uninsured driver that was a persistent toll violator, with a suspended registration.

Parking: ***The City of San Jose, CA*** [10]

The City of San Jose utilized LPR systems to take pictures and report license plate numbers of vehicles that violated city parking rules. The LPR systems aided in issuing citations for violations such as residential permit parking violations or timed parking violations.

Citations and Fines

LPRs can be used to address traffic violations, such as speeding or driving through a red light. The ability of these automated systems to identify and distribute citations and fines for traffic violations may relieve officers of these duties and allow police agencies to reallocate their resources outside of traffic violations.

Speeding in a school zone: ***Bibb County Sheriff's Office, GA*** [11]

Three surveillance cameras coupled with LPRs were installed in school zones to identify vehicles driving 10 miles per hour (mph) or higher over the speed limit during set hours. The cameras recorded the license plate tags and checked the registration of speeding vehicles. During the final two weeks of school, more than 2,000 citations and 5,000 warnings were issued, offering a deterrent mechanism in school zones to prevent further speeding incidents that would have otherwise been unreprimanded and protecting the safety of school children.

[9] Colleen Wilson, "MTA ramps up vehicle seizures of bridge, tunnel toll evaders (northjersey.com)," *North Jersey,* December 15, 2023.
[10] City of San Jose, "Automated License Plate Reader (ALPR) Parking Compliance Cameras" (webpage).
[11] Laura Corley, "New Automated Traffic Cameras Catch Thousands Speeding in Bibb School Zones," 13WMAZ, June 28, 2022.

Speeding: ***The City of Baltimore, MD***[12]

Six cameras were installed on Interstate 83 following many serious crashes, in an effort to prevent future incidents. These cameras captured any vehicle going more than 12 mph over the set speed limit. If a vehicle was captured speeding, a citation for the violation was sent to the vehicle's registered owner via mail. Within the first 30 days, more than 84,000 instances of speeding were recorded.

Analysis

LPRs can be used to collect data on traffic-related activity, which can be analyzed for information such as traffic patterns and trends, as well as potential criminal activity. Additionally, the data collected can be used to inform infrastructure upgrades and enhance roads as well as future city projects.

Analysis: ***Belle Meade Police Department, TN***

Data captured from LPR was used in conjunction with other investigative data sources to measure or validate trends in traffic flow and/or investigate associated criminal activity. This analysis helped allocate police patrol resources to maximize effectiveness and efficiency.

Analysis: ***The City of College Park, MD***[13]

Data captured from the state LPRs was compiled to analyze traffic data. This data was used to help the state make development decisions, as well as decisions on construction projects and infrastructure.

Other Considerations

LPR systems are just one example of investigative technology that can be used by police agencies. Over time, technology has made tremendous progress and will continue to evolve in the future. Although specifications for the use of a particular technology may vary, the overarching principles of responsible implementation of technology do not. The *IACP Technology Policy Framework*[14] outlines nine principles that should be considered when using any kind of technology in policing:

- Specification of use
- Policies and procedures
- Transparency
- Privacy

[12] Emily Opilo, "Speed Cameras Are Coming to I-83 in Baltimore in February. Here's What You Need to Know," *Baltimore Sun*, December 13, 2021.
[13] Eric Myers, "Maryland Uses Surveillance, Data to Track Motorists, Traffic" *Maryland Reporter*, December 10, 2019.
[14] For more information, see the IACP, *Technology Policy Framework* (2014).

- Data minimization
- Security
- Data retention, access, and use
- Performance evaluation
- Auditing and accountability

These principles can be applied to the use of LPR systems. First, agencies must clearly define instances when LPR systems and their associated data can or cannot be accessed and by whom. This will depend on the agency's intended purpose and objectives of implementing LPR equipment. The purpose and objectives as well as the specific criteria for use should be clearly articulated in agency policy. All employees should be aware of their agency's LPR policy. Moreover, agencies should consider sharing their LPR policy with the community—either by publishing the LPR policy publicly or by simply communicating the policy goals and intentions of deploying the technology through other available communications channels (community meetings, social media, etc.).

The next group of principles suggests appropriate limitations to police use of technology to protect the rights of individuals. Data minimization means that any technology should collect only the data necessary to fulfill that system's objectives; it should be no more invasive than necessary. The benefits of any technology and any data collection must be considered against potential risks of harm including potential violations of individual rights and liberties. Similarly, the data stored in LPR systems should be kept securely and shared only with those employees who have proper authorization and a business purpose to access it. How long agencies keep the data they collect must also be considered; just like data minimization, data should be retained long enough to support the program's intended objectives and destroyed when it no longer serves a justifiable purpose.

Audits and evaluations are important to ensure the system is functioning as intended and that employees are adhering to the policies laid out for them. Systems should regularly be evaluated with quantifiable metrics of the agency's intended goals outlined in their policy; additionally, regular review and oversight of who is accessing system information and for what purposes is important to ensure the technology is being used ethically and responsibly. Policies are effective only when they are adhered to and enforced.

In addition to the principles outlined above, police agencies should also consider that their relationship with their community is unique to each jurisdiction and its social climate. What works best for one jurisdiction may not be the most satisfactory solution for another. Police agencies must find a balance between ethical uses of LPR technology and protecting the privacy of the community. Nonetheless, in any agency, through transparent data usage, clear communication, and informative interventions, police agencies can use LPR and other technology to improve both public safety and build public trust.

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