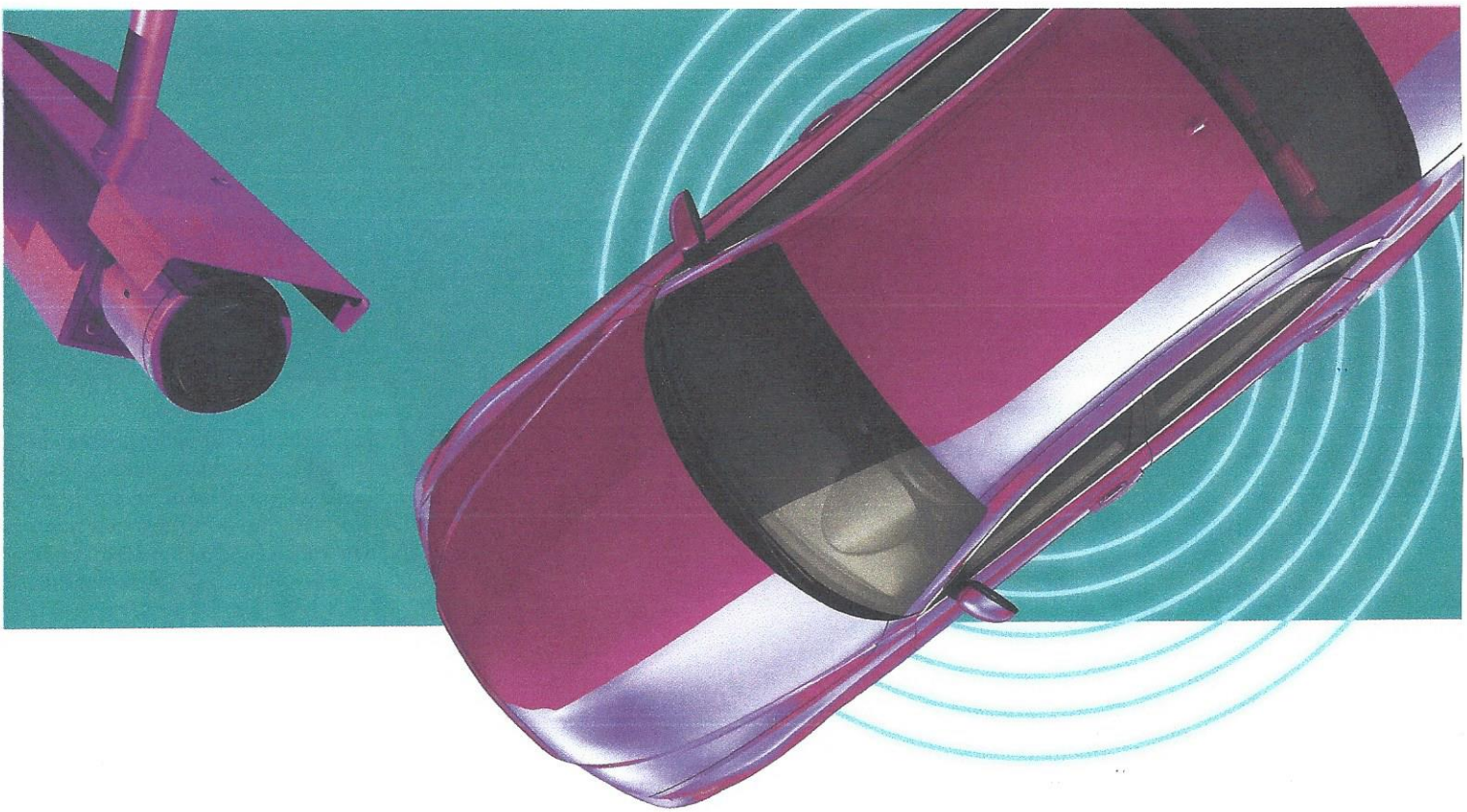


THREE NOVEL WAYS TO USE ALPR

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Leveraging License Plate Readers for Crime Prevention and Solvability

AUTOMATED LICENSE PLATE READERS (ALPR) ARE BEING UTILIZED ACROSS THE WORLD IN A VARIETY OF WAYS AND FOR MYRIAD PURPOSES. Law enforcement has primarily used these devices as a way to facilitate traffic enforcement, such as looking for expired plates, or to help identify vehicles where the vehicle itself is associated with the crime, such as an auto theft, or to find a wanted person. These use cases have been around for over a decade, and there is anecdotal evidence to suggest that ALPR are somewhat successful in aiding officers in their daily duties when used in these limited applications. While these successes are encouraging, law enforcement is merely scraping ALPR's potential. Political and privacy concerns aside, ALPR can be leveraged in proactive crime prevention efforts as well as in increasing crime solvability factors.



Previous studies have shown ALPR's potential for solving major crimes. Currently, there are a lack of studies that have explored ALPR use in crime prevention and, quite frankly, this is attributable to the lack of imagination in leveraging the system. Originally, ALPR was marketed as a system to be strapped to the top of a patrol car assigned to traffic enforcement officers as a way to quadruple the amount of license plates an officer could run through a state or national criminal justice database. The arduous task of typing in a plate could now be automated and thus increase efficiency as well as arrests and citations. Although the technology was created in the 1970s, it was not widely adopted until the software and hardware got cheaper and more efficient. The late 1990s and the early 2000s saw more widespread distribution of the system and subsequent adoption into the traffic enforcement environment.

Fast forward to today, and most departments still embed ALPR systems into their traffic enforcement units. It is far rarer to see investigatory units and proactive units with ALPR systems in place. In this day and age of threat management, smarter criminals, and cutbacks, technology must be utilized to work in harmony with personnel and missions in order to achieve desired outcomes. ALPR has its place in this technology web as a crime fighter. Specifically, there are three novel uses of ALPR that, while they might challenge conventional workflows, can contribute to preventing and solving crimes.

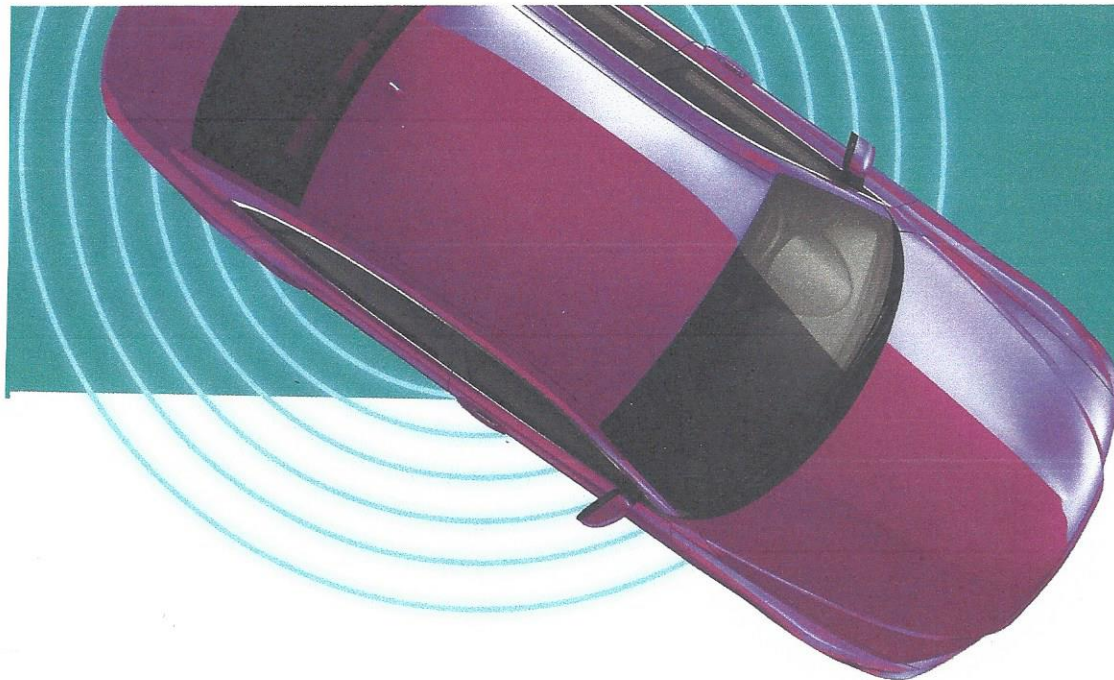
NOVEL USE 1: DATA SET COMPARISONS

Jurisdictions can be hundreds of miles long, can have populations in the hundreds of thousands, and have only a few hundred sworn officers to serve them. Public safety in this kind of environment is a daunting task to be sure, but not an

impossible one. Policing relies on playing a numbers game of sorts in order to achieve its overall goal of public safety. If a police officer wants to make a proactive narcotics case, there is a high likelihood that a known drug dealer might be a good place to start. Much like the narcotics officer looking to known drug dealers to make cases or solve crimes, beat officers rely on the same know-how to solve everyday crimes. Have a rape in a neighborhood? Officers should probably go talk to the local rapist who just got out of prison. However, in order to do this, there is a knowledge gap that needs to be bridged—who the likely re-offenders are and when they are likely to re-offend—which is where ALPR can assist.

A recent study found that released, convicted sex offenders are three times as likely to commit future sex crimes as compared to other criminals and that over 67 percent will be rearrested for any crime within nine years. Knowing the sex offenders in a given jurisdiction is the first step in filling the knowledge gap. This can be accomplished by simply flagging persons within the agency's record management system (RMS).

The second step in filling the gap involves leveraging technology. Criminals can display warning signs that they are about to offend or, in this case, re-offend. A proactive use for ALPR may be to temporarily install a system at an "at-risk" school zone. The purpose of the system would be to identify potential cars with ties to flagged individuals in the sex offender database. The system would send an alert when a known sex offender's vehicle triggered an ALPR at the school zone. It is simply an exercise in comparing ALPR data with RMS data in an automated fashion. Taking it a step further, a discrete ALPR system could be set up in an area where a serial rapist is operating—a neighborhood, stretch of downtown corridor, or on routes to remote "dumping grounds." Cross-comparisons between data sets is the first novel use of ALPR data and is probably the easiest to set up and use for most departments.



The concept of flagging individuals within a police system is one that is underutilized, but one that is of the utmost importance. ALPR relies on flags extensively to do its job. For example, to identify a plate as “expired” or “suspended,” a flag must be inserted into a database system by an entity, usually a state entity. Taking this a step further, local police departments can custom flag individuals, vehicles, or addresses to prepare them for future analysis or use. An example of this could be flagging a person as “dangerous,” so that if an ALPR identifies a vehicle associated with a “dangerous” individual, an officer can be alerted to this fact and act accordingly. An extension of this flagging system for use by ALPR in a crime prevention or solvability application would be to flag persons with warrants, or as parolees, probationers, sex offenders, or prolific offenders. Utilizing evidence-based policing principles to narrow down the base group for comparison, by creating flagged categories based off the future risk potential, and using the information in conjunction with ALPR data for cross-comparison, law enforcement can fill the knowledge gap.

NOVEL USE 2: TEMPORAL CROSS-TABULATION

Performing cross-comparisons on data sets is one outcome for this type of ALPR setup, but if that process fails, it still provides the data needed for another type of analysis. For instance, in the example scenario, during the course of the hypothetical investigation, no identified sex offender vehicle was found on cross-comparison. This is unfortunate, but the savvy commander in charge of the rape detail decided to leave the ALPR system in place. Over the next few days, another rape was committed in the area being analyzed, so there is a good chance that the suspect’s vehicle was captured—but there is no way of knowing which vehicle belongs to the suspect. As long as the new rape is attributable to the original suspect, the suspect pool can be narrowed down substantially by the use of ALPR. The commander knows that the suspect vehicle is in the captured data, but it needs to be refined further. The data can now be temporally analyzed and cross-tabulated in order to see if the same vehicle was in the area during both crime offenses. This may result in a

list of multiple suspect vehicles, but it will narrow the list for further investigation.

Temporal cross-tabulation is the second use for ALPR data and has multiple use case scenarios. This type of analysis is currently being used in conjunction with machine learning and artificial intelligence software for human trafficking and drug trafficking enforcement. The scenario looks like this: a vehicle is used to smuggle narcotics or humans into a location. Oftentimes, there is more than one vehicle, in a convoy of sorts, or there is a tail or lead vehicle to act as a lookout or as bait. ALPR is used to identify vehicles that travel in “packs” together at similar times and in similar locations. While one car pinging an ALPR system over and over again might not be suspicious, that same car always traveling with the same other cars in a group at different times is unusual. There is further investigation that would need to be done, but this could serve as an initial clue to key-in on certain suspects. ALPR would also be able to provide the type of registered vehicle if an investigation wanted to focus only on certain categories such as large trucks or cargo vans.

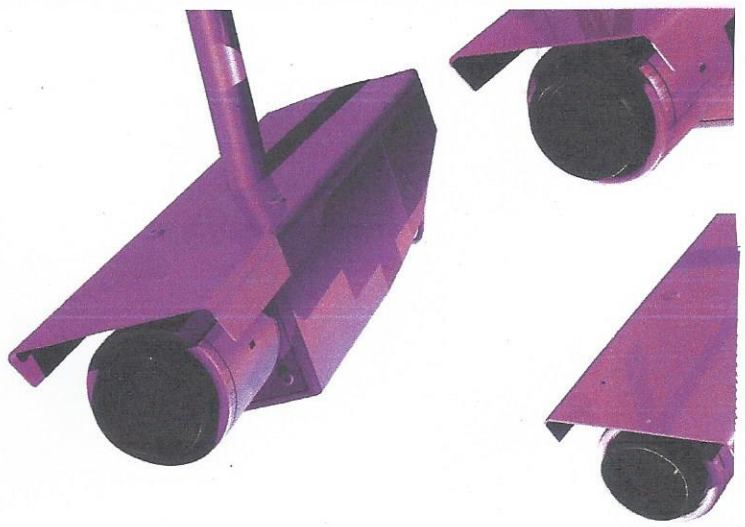
While federal entities are using fairly sophisticated, expensive software to perform these types of analysis, it can also be performed manually at a lower cost. Crime analysts are a growing resource in many police departments. A properly trained analyst could perform temporal cross-tabulations in an application such as Microsoft Excel. Data could also be imported into a link analysis software such as I2 to further explore relationships among certain plates, vehicles, or suspects through link analysis. Money helps bend the time curve and increase efficiency, but a limited budget is not an impossible hurdle to overcome and should not be viewed as a reason not to implement a robust ALPR system. The more important factor in temporal cross-tabulation analysis is having the proper data available in a user-friendly format. One of the biggest hurdles to overcome in the use of any technology to solve crimes is the perception of overall usefulness of the technology. If the technology is too difficult to use or if it is viewed as having no added benefit, it will not be utilized appropriately.

NOVEL USE 3: THREAT AND RISK MANAGEMENT

A third novel use of ALPR is its potential for threat and risk management. Behavioral threat analysis, threat management, all-hazards risk assessments, and leakage identification are all methods to stop targeted violence from happening. Smaller geographical communities, such as college campuses or work campuses, are especially poised to adopt ALPR technology for this use as it is ideal in that type of environment. Identifying the increased risk for a violent outcome is only one part of the threat continuum. Stopping the threat or identifying further changes in the risk assessment are equally as important. Placing ALPR within an area identified for a potential violent act is a proactive approach to mitigate risk.

Workplace violence is an ever-growing threat, and researchers agree that it will take a combination of entities such as fusion centers, employers, and local jurisdictions to overcome the knowledge gaps and reduce risk. Different entities have different pieces of the puzzle, and the assimilation of the data is paramount to see the big picture. ALPR can provide a piece of situational awareness to the puzzle. Once an individual is identified as presenting an increased risk for a violent act, ALPR can be deployed and targeted for that individual. If the individual's car and plate are known, then ALPR can alert police if the individual's vehicle shows up in a specific area. This is ideal for parking garages, buildings with limited

parking, and along roads with limited egress to certain geographical locations. A domestic offender can be identified as he or she drives onto a property rather than when he or she walks through the door. A disgruntled employee can be identified as he or she parks in a garage rather than when he or she shows up at the boss's office. Minutes and seconds of forewarning are precious in averting mass shootings and workplace violence, and ALPR can provide those. It is simply a matter of flagging a target and creating an appropriate alert. ALPR is getting so sophisticated that it can even send an alert on a certain make and model of car—if the offender takes a tag off or switches to a different plate, ALPR alerts could still be activated for the make and model of a target vehicle.



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