COLORADO
Division of Criminal Justice
Department of Public Safety

# In Detail: Automated License Plate Readers (ALPR)

An extended overview for public safety professionals

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## BACKGROUND

Automated license plate readers (ALPR) are high-speed cameras that automatically capture license plates and contextual photos of related vehicles in addition to providing information about the geographic location of where the plates were captured, the date and time the plates were captured, and the specific camera/unit that was used. The data directly captured by the ALPR are anonymous, providing no personally identifiable information (PII) on the occupants of the vehicle, registered owner, nor any description of the vehicle itself. The ALPR simply indicates that a plate was captured by their camera, whether mobile (e.g., mounted on a police car) or stationary (e.g., placed on a roadway or building) at a certain place and time. If a plate is put on a list of known stolen vehicles (i.e., a hotlist), then an alert would be sent, but not every plate captured will be reviewed for further details unless determined to be relevant to an ongoing investigation, necessary to locate a person (e.g., suspect, victim, missing people), or to protect the public or critical infrastructure during special events (IACP, n.d.).

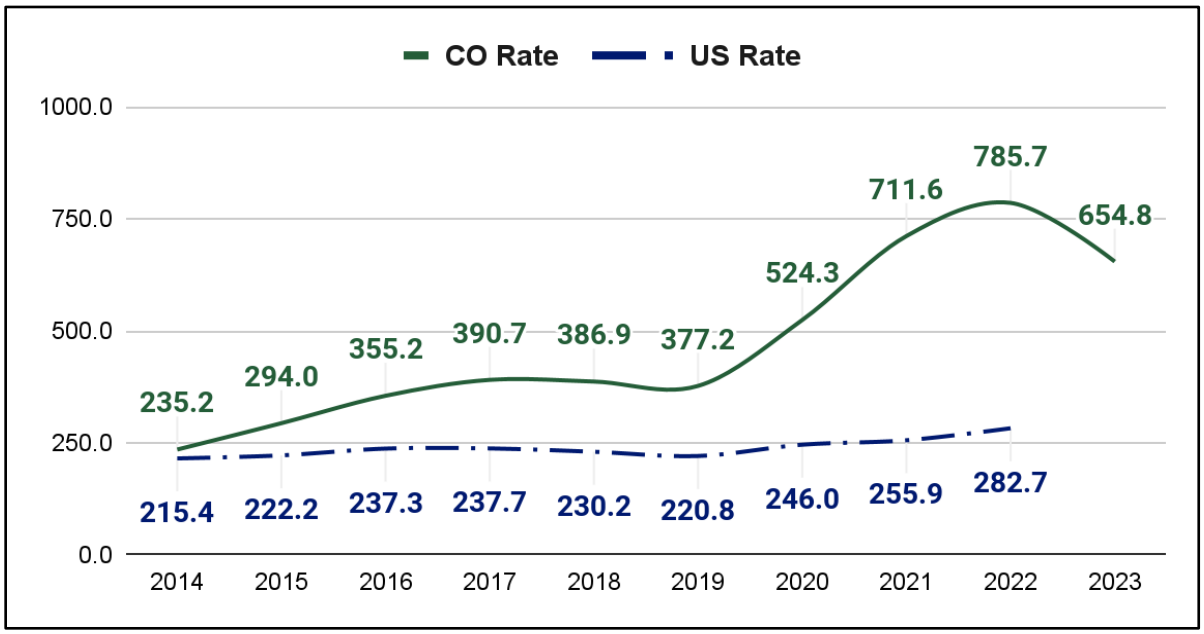
Data retention policies vary from state to state, but a Colorado Statute passed in 2014 (§24-72-113, C.R.S.) "requires that video or still images obtained by passive surveillance by governmental entities, such as images from monitoring cameras, must be destroyed within three years after the recording of the images" (NCSL, 2022). Currently, there are no federal laws "that explicitly govern or limit the use of ALPR technology or taking photographs of things that are plainly visible from public spaces by law enforcement agencies;" however, there are state-level policies that restrict ALPR access to authorized and trained law enforcement personnel only, which includes an audit trail that indicates who, when, and what data was accessed and a justification (e.g., ongoing investigation) for the access (IACP, n.d.).

## IMPACT ON CRIME & INVESTIGATIONS

Investigators need one of three elements to solve a crime: a witness, physical evidence, or a confession (Klockars & Mastrofski, 1991 as cited in Willis, Koper, & Lum, 2018). These elements may not be as reliable as desired — witness statements may be misrepresented, physical evidence may be unavailable, and suspect confessions may be fabricated. The use of ALPR can help corroborate or disprove these elements by providing objective data on a vehicle's whereabouts during a specific time and place (Byrne & Marx, 2011 as cited in Willis, et al., 2018). A 2020 survey conducted by the Bureau of Justice Statistics found that 65% of participating local police departments used ALPR (Goodison & Brooks, 2023).

ALPR can be used to assist in locating a person of interest (e.g., suspect, victim, missing person), provide information and assistance to an ongoing investigation, or for crime prevention and public safety strategies. The most notable usage of ALPR is for identifying and locating stolen vehicles. Colorado continues to lead the nation in motor vehicle thefts (MVT) with a rate of 785.7 per 100K residents compared to the U.S. rate of 282.7 in 2022. In 2023, the MVT rate per 100K residents was at 654.8, a 17% decrease from 2022 (see Figure 1 below). The use of ALPR technology has the potential to assist law enforcement in reducing these high rates.

Figure 1. Colorado Motor MVT rate versus U.S. MVT rate per 100K residents, 2014-2023.




Source: Colorado Bureau of Investigation & Federal Bureau of Investigation, Crime Data Explorer (retrieved, 2/16/2024).

In 2022, the majority (79%) of secondary crimes related to MVT were property crimes, most notably destruction and vandalism (33%), theft from motor vehicles (21%), and stolen property (15%) (CBI, 2022). Using ALPR to help reduce MVT has a potential domino effect on reducing crimes as a whole.

## ALPR USAGE FOR OFFICERS

- Hotlists automatically identify and track vehicles (and plates) of interest and send alerts when hit.
- Increase arrest rates due to quicker response times using real-time data and alerts.
- Collect millions of vehicle and plate data to investigate current and past crimes.
- Data collected can provide a geographic timeline of vehicle travel patterns. (EFF, n.d.)

## CONTROVERSIES & ETHICAL CONCERNS

Support for ALPR usage varies on the circumstance for it being used; for example, people are generally more supportive of ALPRs to detect stolen vehicles, but are less supportive of using ALPRs to scan vehicles that had unpaid tickets or parking violations. Increased support for ALPR correlates with increased trust in law enforcement and whether the data collected were viewed as public information. Lower levels of trust in law enforcement is correlated with decreased support for ALPR, especially in racial and ethnic minority groups (Merola & Lum, 2014 as cited in Shjarback, 2024). In addition, a 2018 survey conducted with 405 non-law enforcement participants found that those with more knowledge of the usage of ALPR had “significantly lower levels of trust in police” (Merola, Lum, & Murphy, 2019).

There are concerns regarding privacy and civil liberties with the use of ALPR. Since ALPR can capture and store vast amounts of license plate data, there is a potential to create a detailed record of an individual's movements over time. The lack of consistent state or federal regulations on data retention and usage raises questions about how this information is stored, shared, and protected. Additionally, there is the risk of

misuse or unauthorized access to the collected data, leading to potential violations of individuals' privacy rights (ACLU, 2013). Critics argue that the widespread deployment of ALPRs without adequate safeguards may result in unwarranted surveillance and erosion of personal freedoms, highlighting the need for a thoughtful balance between security and privacy in the implementation of such technologies (Stein, 2023).

## CONSIDERATIONS

While ALPR has been used by law enforcement agencies to aid in crime prevention and investigations, the effectiveness of ALPR in reducing crime rates remains a complex and multifaceted issue as it depends on various factors, including their implementation, integration with other law enforcement tools, and adherence to privacy and data protection regulations. Public debate and regulatory oversight are crucial in ensuring a balance between crime prevention and individual rights. It is important to remember some key facts about ALPR:

- ALPR data is anonymous and does not provide information on the vehicle's occupants or the vehicle description itself. It only provides the license plate, contextual photo of the vehicle (e.g., back of the vehicle where the license plate is), when and where it was captured, and by what camera/unit it was captured (IACP, n.d.).
- While data may be stored for up to three years in Colorado, not every license plate is constantly monitored. Those placed on a hotlist will be flagged, and individual queries can be performed on specific plates, but every single individual’s movements are not being actively tracked or reviewed.
- ALPR has been shown as an effective crime deterrent and investigative tool:
  - The visible presence of ALPR may act as a deterrent to criminal activity, especially vehicle-related crimes, since the likelihood of being monitored and recorded may discourage opportunistic individuals from engaging in illegal activities involving vehicles (Shults, 2018).
  - ALPR data can be analyzed to identify patterns of movement and association between vehicles, potentially providing insight into criminal networks, creating a geographic profile of suspects, and detecting unusual or suspicious behavior (Shults, 2018).

The following is a summary of additional arguments for and against ALPR (Diaz & Levinson-Waldman, 2020; Klawans, 2023; NYLN Youth Leader Blog, 2016; Shashirangana, Padmasiri, Meedeniya, & Perera, 2021; Spinks, 2023.).

| Arguments For ALPR | Arguments Against ALPR |
|---|---|
| 1. **Law Enforcement Benefits**: Helping locate stolen vehicles, identifying vehicles linked to criminal activities, locating individuals with outstanding warrants, and other benefits related to public safety, crime reduction, and crime prevention.<br><br>2. **Efficiency**: Automate the process of reading license plates, making it faster and more efficient than manual methods. This efficiency can be valuable in investigations and can help law enforcement respond more quickly to potential threats. | 1. **Privacy Concerns**: Potential invasion of privacy as the widespread use of ALPR raises concerns about constant surveillance, as they record all vehicles and license plates, not just those linked to criminal activities.<br><br>2. **Data Security**: The storage and retention of ALPR data raise concerns about data security. Unauthorized access to or misuse of the collected information could result in privacy violations and potential abuse. |

| Arguments For ALPR | Arguments Against ALPR |
|---|---|
| 3. **Traffic Management**: Can be used for traffic management, such as monitoring congestion, tracking traffic flow, and identifying vehicles violating traffic regulations.<br><br>4. **Amber Alerts and Missing Persons**: Quickly locate vehicles associated with Amber Alerts or missing persons, potentially leading to faster discovery and case resolutions. | 3. **Misuse of Data**: Risk that the data collected by an ALPR can be misused or abused, either by law enforcement or other entities. This includes tracking individuals' movements without sufficient justification.<br><br>4. **Accuracy Issues**: ALPR systems are not infallible and may misread license plates. False positives can lead to innocent people being wrongly targeted. |

## Technological Advancements

Technology and artificial intelligence (AI) have been advancing exponentially, contributing to increased ALPR capabilities and functions to assist law enforcement in accurate detections, criminal investigations, and issues related to staffing shortages. The implementation of ALPR technology has eliminated the need for manual labor of collecting and monitoring license plates, allowing law enforcement to do more with less (Lukens, 2024). Methodologies that yield more than 95% efficacy for ALPR have existed for more than 20 years and will continue to improve as technology and AI continue to progress (Heo, Kim, Jung, Lee, & Oh, 2007; Lee, Chen, & Wang, 2004; Luo, Sun, Zhou, & Lou, 2009). According to former police chief, Philip Lukens (2024), advancing ALPR technology can “improve the clearance rates and case solvability of law enforcement agencies, as well as enhance their accountability and transparency.”

ADDITIONAL INFORMATION & RESOURCES

- Major Cities Chiefs Association (MCCA), ALPR Working Group, Recommendations & Considerations *(pdf)*
- Colorado Department of Transportation (CDOT), Installing ALPR System on CDOT Right of Way *(pdf)*
- IACP: License Plate Reader (LPR) Systems: Use Cases *(pdf; IACP, 2024)*
- Check if a vehicle is stolen: Colorado Bureau of Investigation (CBI): Motor Vehicle (VIN) Verification System
- Check if a VIN matches the vehicle: National Highway Traffic Safety Administration (NHTSA) VIN Decoder

## Grant Programs

In June 2023, Colorado Senate Bill 2023-257 was passed to provide the Colorado Auto Theft Prevention Authority (CATPA) with $5M to address MVT-related concerns, including equipment such as ALPR (CATPA, 2023). In 2022, the Justice Assistance Grant (JAG) funded $2.4M in various law enforcement initiatives; of those, about $120K was specifically spent on ALPR (JAG, 2023). Finally, Colorado’s Crime Prevention through Safer Streets Grant Program has a budget of $3.7M that will invest in preventative measures and proactive initiatives between 2024-2026, including ALPR purchases (DCJ: Safer Streets, 2023).

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