



**Seattle** Office of  
Inspector General

Surveillance Technology Usage Review  
Automated License Plate Reader – Patrol (2021 and 2022)

---

As Required by Seattle Municipal Code 14.18.060

September 29, 2023

Office of Inspector General  
City of Seattle  
PO Box 94764  
Seattle, WA 98124-7064  
[oig@seattle.gov](mailto:oig@seattle.gov)  
(206) 684-3663



## Purpose

### Surveillance Ordinance Requirements

Per Seattle Municipal Code 14.18.060, OIG is required to annually review the Seattle Police Department (SPD) use of surveillance technology to assess compliance with the requirements of Chapter 14.18.

### Non-Audit Statement

This review was not conducted under Generally Accepted Government Auditing Standards (GAGAS); however, OIG has followed GAGAS standards regarding the sufficiency and appropriateness of evidence.




## Table of Contents

Executive Summary .....	2
Technology Description .....	4
A. 2021 and 2022 Surveillance Technology Usage.....	5
B. Data Sharing with External Partners and Other Entities.....	9
C. Data Management and Safeguarding of Individual Information .....	10
D. Impact on Civil Liberties and Disproportionate Effects on Disadvantaged Populations	10
E. Complaints, Concerns and Other Assessments.....	15
F. Total Annual Costs.....	15






## Executive Summary

The summary below highlights significant audit findings and recommendations regarding compliance with SMC 14.18.060.

14.18.060 Provision	Compliance Determination	Auditor's Findings	Recommendations
A. How surveillance technology has been used, usage frequency, and whether usage patterns have changed.	<p><b>Yes</b></p> 	Observed use of ALPR conformed to SPD policy on authorized and prohibited uses of ALPR.	No recommendations.
B. How often surveillance technology or its data is shared with other entities, including government agencies.	<p><b>Needs Work</b></p> 	Sharing of ALPR records in response to a Public Records Request did not adequately de-identify license plate numbers from locations and times they were scanned.	<b>Recommendation 1</b> SPD should develop a process for de-identifying ALPR records released through public disclosure, to the extent allowable under the Washington State Public Records Act.
C. How well data management protocols safeguard individual (personal) information.	<p><b>Yes</b></p> 	Records are being purged after 90 days in accordance with the SIR.	No recommendations.



14.18.060 Provision	Compliance Determination	Auditor's Findings	Recommendations
<p>D. How deployment of surveillance technologies impacted or could impact civil liberties or have disproportionate effects on disadvantaged populations, and how those impacts are being mitigated.</p>	<p><b>Needs Work</b></p> 	<p>Disproportionality in the collection of data creates risks, especially for historically marginalized communities, and East Precinct deployments are disproportionately high.</p> <p>SPD generally complied with policy to verify “hits” before acting. However, inaccurate or outdated information may still lead to erroneous vehicle stops.</p>	<p><b>Recommendation 2:</b> SPD should develop a strategy for deployment of ALPR-equipped vehicles that takes disproportionality of data collection into account.</p>
<p>E. A summary of any complaints or concerns about the surveillance technology and results of internal audits or assessments of code compliance.</p>	<p><b>Yes</b></p> 	<p>No complaints or concerns noted for 2021 or 2022.</p>	<p>No recommendations.</p>
<p>F. Total annual costs for use of surveillance technology, including personnel and other ongoing costs.</p>	<p><b>Yes</b></p> 	<p>Maintenance and licensing costs were \$3,395.</p>	<p>No recommendations.</p>



## Technology Description

The Automated License Plate Reader (ALPR) surveillance technology is a high-definition, infrared digital camera system. SPD has this system installed in eleven SPD patrol cars. Each system has three mounted cameras, allowing for a greater field of vision. SPD policy and the SIR state that SPD utilizes ALPR-equipped patrol vehicles to locate and recover stolen vehicles and license plates, to identify vehicles wanted in conjunction with felonies, to enforce protective orders, and to canvass the area around a crime scene.

***Scans** are views of numbers captured by ALPR.*

*A **valid read** is a scan of a license plate.*

***Hotlist** is a list of vehicles and license plates wanted in connection with crimes.*

***Hit** is a potential match between a valid read and an item on the hotlist.*

*A **misread** is a valid read that initially registers as a hit but is a false positive.*

ALPRs recognize and scan strings of letters and numbers as they come into view; however, not all **scans** are of license plates. The ALPR may scan numbers printed on the side of a vehicle or even a building. **Valid reads** are scans of letter and number series the ALPR system recognizes as license plate numbers. Whenever the ALPR system registers a valid read, it compares that read against items on a **hotlist**, sourcing license plate information from the Washington Crime Information Center, the FBI's National Crime Information Center, Washington Department of Licensing, and SPD investigations. Both the hotlist and all scans are routed into a back-end system called Neology BOSS.

Approximately 0.1% of valid reads are unverified "**hits**," which are cases when the ALPR matches a license plate to a known item from the hotlist. Not all hits are true matches and require the officer to confirm. In some cases, the ALPR system may **misread** a digit (e.g., mistaking a "1" for an "l" or an "8" for a "B"). In other cases, the license plate contains the same digits as a known stolen vehicle but is from a different state. For example, the ALPR may register a hit for the hypothetical license plate "1234 ABC." In this scenario, the ALPR system indicates "1234 ABC" is from a stolen vehicle registered in Oregon; however, the plate read by the ALPR is from Washington state. The officer must visually confirm each hit by comparing the read and potential match to ensure that the digits and the issuing state match the hotlist record. When the officer confirms a match, the officer must verify it via radio dispatch or their mobile data computer (MDC) before taking any action.



### Data Limitation

SPD retains ALPR read and hit data for 90 days. Accordingly, data from deployments during this review period (2021 – 2022) had already been purged when this review began. SPD provided OIG with the ALPR Patrol Reads Statistics dataset, but these data were aggregated by day and could not be disaggregated to each deployment. As such, this review of 2021 and 2022 usage relies on Computer-Aided Dispatch (CAD) records to identify where and when ALPR-equipped vehicles were deployed over the review period.

*A **deployment** is the unique instance where an officer (or two-officer team) signs into service on an ALPR-equipped patrol vehicle during a shift.*

For the purposes of this report, OIG uses “**deployment**” to refer to the first time an officer (or two-officer team) signs into service on an ALPR-equipped patrol vehicle during a shift; because officers may sign in multiple times during a single shift, OIG counted only the first sign in for each shift. This measurement is sufficient to provide a general picture of use but is not exact. A vehicle may deploy to a certain sector or precinct but respond to events outside of that assigned area. Deployments also do not account for whether a vehicle is stationary or whether an officer has the ALPR system active while on patrol.<sup>1</sup>

To improve future analyses, OIG is working with SPD on developing a means to capture de-identified data about ALPR hits and reads which may be preserved longer than 90 days.

## A. 2021 and 2022 Surveillance Technology Usage

**SMC 14.18.060, § A:**  
*How surveillance technology has been used, how frequently, and whether usage patterns are changing over time.*

In 2021 and 2022, SPD had eleven ALPR systems equipped to vehicles. These vehicles include ten marked patrol cars allocated to precincts, and an unmarked vehicle. The unmarked vehicle was assigned to an SPD Captain and used primarily for demonstrations of the ALPR system, training, and troubleshooting purposes. This Usage Review examines deployments of the ALPR-equipped marked patrol vehicles.

<sup>1</sup> Additionally, the same officer may sign into their vehicle multiple times in the same shift and in the same general location (i.e., the same or a different sector within the same precinct). OIG removed these duplicates and counted the number of unique deployment sign-ins for each day in the 2021 and 2022 review period.



### Patterns of Use Across Seattle

SPD reported that ALPR-equipped vehicles are assigned to precincts based on the size of the jurisdiction; however, there is not a strategy or schedule for deployments within a given precinct. Use of the vehicles was described as first-come, first-serve for trained officers. This technology is used daily in a widespread manner in Seattle. Across the five precincts, SPD had at least three deployments every day in 2021 and in 2022. In total, there were 3,561 and 3,330 deployments in 2021 and 2022, respectively.

Table 1: SPD’s ALPR Read Statistics, 2021 – 2022					
Year	Deployments	Total Scans	Valid Reads	Misreads	Hits
2021	3,561	5,894,748	5,888,081	976	5,691
2022	3,330	4,595,145	4,589,514	948	4,683

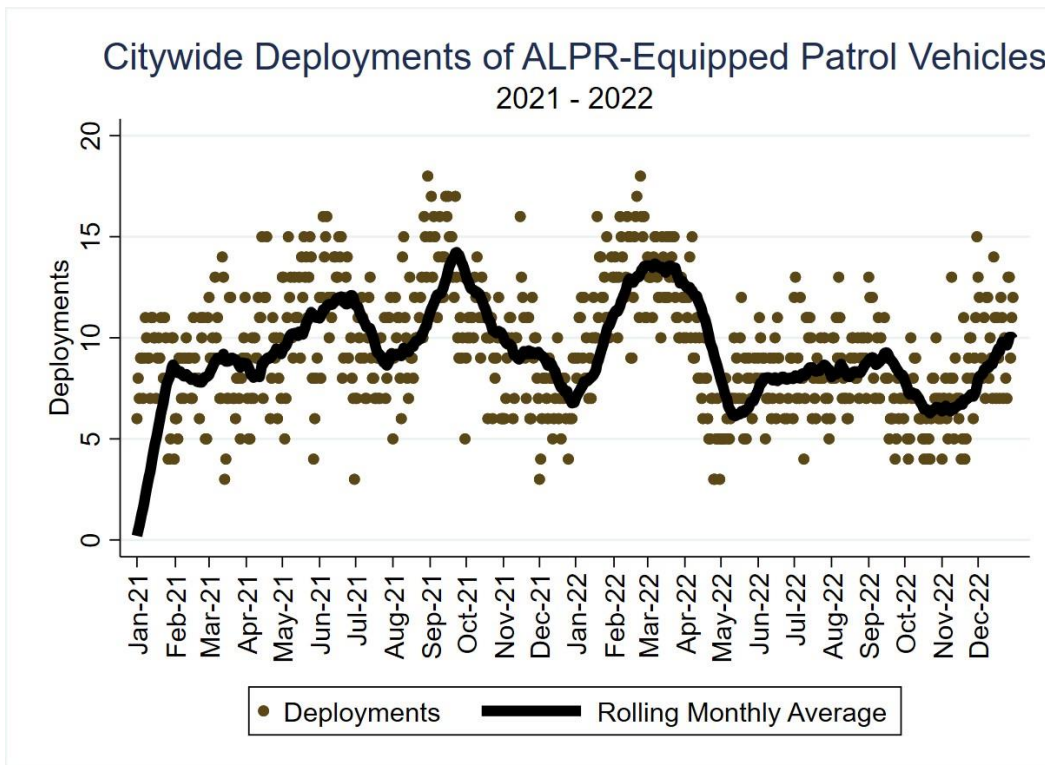


Figure 1 depicts a scatterplot of all deployments of ALPR-equipped patrol vehicles. Each dot represents a date between January 1, 2021, and December 31, 2022, and the corresponding y-axis value depicts the number of deployments across all precincts for that date. The monthly average line indicates the rolling 30-day average number of deployments.

The Citywide deployment frequency of ALPR-equipped vehicles varied throughout the two-year review period. Over the course of multiple months, the average number of deployments followed an alternating pattern of increasing then decreasing and so on.

### Allocation of ALPR-Equipped Vehicles

During the 2021 through 2022 review period, North Precinct had three ALPR-equipped vehicles, South and Southwest precincts had two vehicles each, and West Precinct had one vehicle. East Precinct had three vehicles in 2021 and two vehicles in 2022.

Number of ALPR Deployments by Precinct, 2021 - 2022

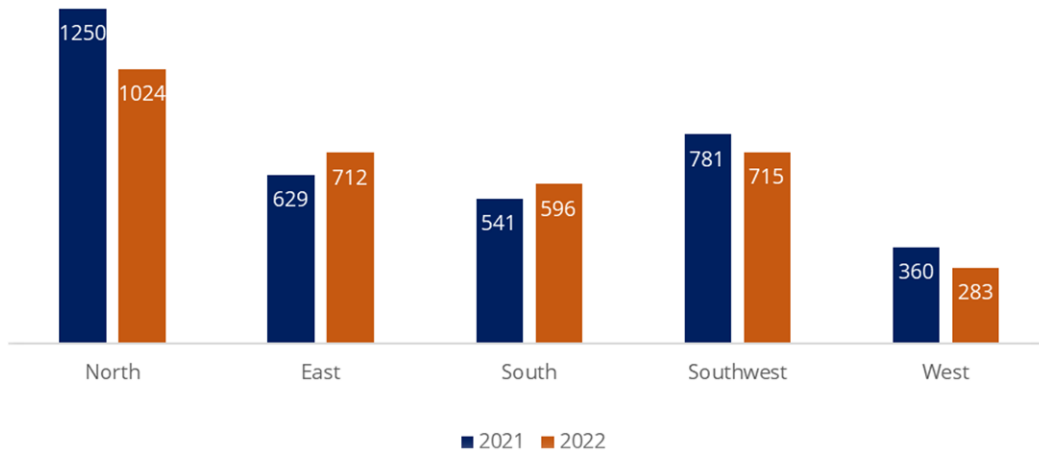


Figure 2 depicts the distribution of overall deployments by precinct for 2021 and 2022.

### Purpose of Use

ALPR-equipped patrol cars identify vehicles associated with criminal activity or missing persons. SPD Policy 16.170-POL-2 General Policy 3 – Authorized and Prohibited Uses states:

*ALPR systems will only be deployed for official law enforcement purposes. These deployments are limited to:*

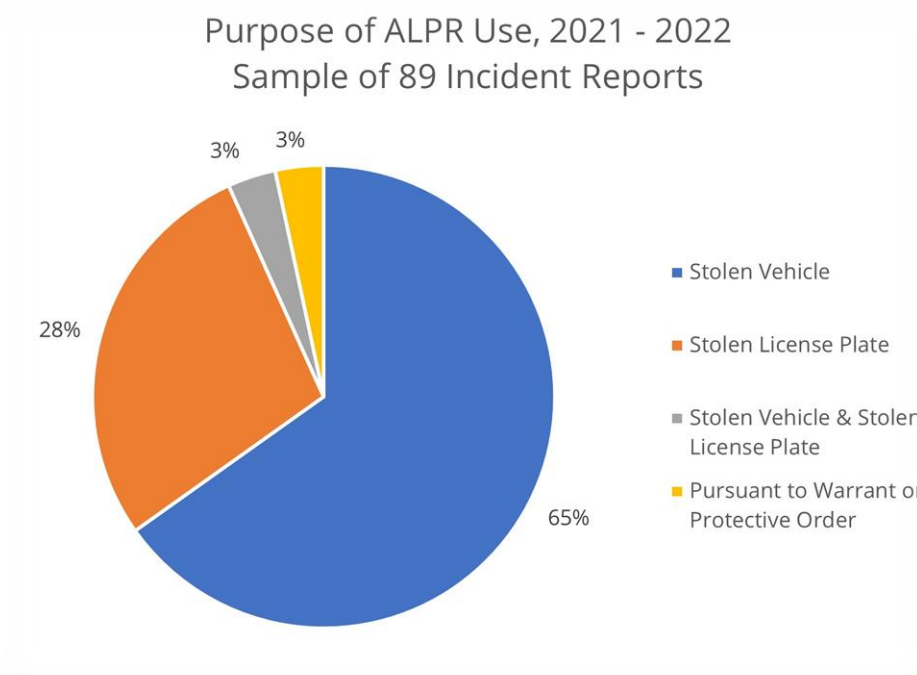
- *Locating stolen vehicles;*
- *Locating stolen license plates;*
- *Locating wanted, endangered or missing persons; or those violating protection orders;*
- *Canvassing the area around a crime scene;*
- *Locating Vehicles under SCOFFLAW; and*



- *Electronically chalking vehicles for parking enforcement purposes.*

*[...] ALPR will not be used to intentionally capture images in a private area or areas where a reasonable expectation of privacy exists, nor shall it be used to harass, intimidate, or discriminate against any individual or group.*

To assess compliance with this policy, OIG identified 286 unique reports from both 2021 and 2022 that reference use of this technology and randomly selected 35% (100 reports) for review. Eighty-nine of the 100 reports pertained to SPD ALPRs.<sup>2</sup> In all eighty-nine cases involving SPD ALPRs, SPD use of this technology conformed to their purpose of use policy – see *Figure 3* below.



*Figure 3 illustrates the distribution of ALPR purposes of use in a randomly selected sample of 89 reports from 2021 and 2022.*

<sup>2</sup> OIG omitted eleven of the 100 cases because those cases involved Parking Enforcement ALPRs.



## B. Data Sharing with External Partners and Other Entities

**SMC 14.18.060, § B:**  
*How often surveillance technology or its data are being shared with other entities, including other governments in particular.*

SPD reported it does not have a centralized method for sharing ALPR records with the entities listed below; therefore, it was not possible to assess how often SPD shared ALPR records with other government entities. However, Section 6 of the SIR allows SPD to share ALPR data with the following entities:

- Seattle City Attorney's Office
- King County Prosecuting Attorney's Office
- King County Department of Public Defense
- Private Defense Attorneys
- Seattle Municipal Court
- King County Superior Court
- Similar entities where prosecution is in Federal or other State jurisdictions
- Other law enforcement agencies
- Insurance companies
- Members of the public pursuant to the Washington Public Records Act, Chapter 42.56 RCW

In 2021 and 2022, SPD received and responded to one public disclosure request for Patrol ALPR data, which resulted in SPD producing 93,497 individual records of valid reads, including license plate numbers, date, time, address, and zip code.

**RCW 42.56.050**  
*protects against disclosure of information about a person is highly offensive or of no legitimate interest to the public.*

In accordance with the spirit of **RCW 42.56.050**, SPD split the data into two documents: in one, license plate numbers were redacted while in the other, dates/times were redacted. Despite the redactions, placing the documents side-by-side allowed each license plate, location, and date/time to be associated. In this instance the requestor was an academic researcher, however future requests may come from entities seeking to use this expansive record of vehicle locations within the city in ways that impact civil liberties.<sup>3</sup>

**Recommendation 1:** SPD should develop a process for de-identifying ALPR records released through public disclosure, to the extent allowable under the Washington State Public Records Act.

<sup>3</sup> ALPRs' potential impacts on civil liberties are discussed further in Section D of this report.



## C. Data Management and Safeguarding of Individual Information

**SMC 14.18.060, § C:**

*How well data management protocols are safeguarding individual information.*

### Data Retention

Neology BOSS is the back-end system that stores all scans and hits from ALPR systems. This system is located on-premises in a datacenter located at the Seattle Justice Center. OIG found that SPD maintains this system in accordance with the SIR. BOSS automatically purges patrol ALPR data including scans and hits after 90 days.

### Authentication and Authorization

Logins to the BOSS system are controlled with Active Directory Single Sign-On. Access is only possible from within the SPD internal network. To gain access to this network, the user must successfully complete a multi-factor authentication challenge requiring a physical token as a second factor.

### Backups

Seattle ITD personnel responsible for system backups identified that the City IT department is backing up only the system and operating system configurations. The Neology BOSS database, which contains the actual records of reads and hits captured by patrol vehicles, are not backed up. This is necessary to avoid accidentally retaining data beyond the 90-day retention limit set in the SIR.

## D. Impact on Civil Liberties and Disproportionate Effects on Disadvantaged Populations

**SMC 14.18.060, § D:**

*How deployment of surveillance technologies impacted or could impact civil liberties or have disproportionate effects on disadvantaged populations [...].*

### Potential Impacts on Civil Liberties

Data collected by SPD ALPR systems constitute a limited record of vehicle locations within the city over a rolling 90-day period. The completeness of this record can be expected to vary based on how frequently a license plate is scanned by an ALPR. Thus, vehicles on a street frequently travelled by an ALPR-equipped car will be expected to have a higher incidence of scans stored in SPD systems. While license plates themselves are publicly viewable, they may be associated with a particular individual. Automated collection of such records at high

volumes could result in a detailed log of a person’s movement throughout the city and create the potential for misuse.

**Potential Disproportionate Effects**

As noted in Section A of this review, SPD does not have a deployment strategy that takes historic over-policing into account. Accordingly, SPD does not take steps to ensure equivalent surveillance throughout the city by ALPR-equipped vehicles.

**Disproportionality of Deployments by Precinct**

As discussed in the Technology Description section of this report, disaggregated data on ALPR hits per deployment were not available for the period under review. Such data would provide the most accurate picture of any potential geographic disproportionality.<sup>4</sup> In the absence of data capturing hits for each deployment, OIG compared the proportions of deployments to precinct size to understand whether the current allocation of ALPR-equipped vehicles creates disproportionate levels of surveillance between precincts.

ALPR Deployments Per Square Mile by Precinct,  
2021 - 2022

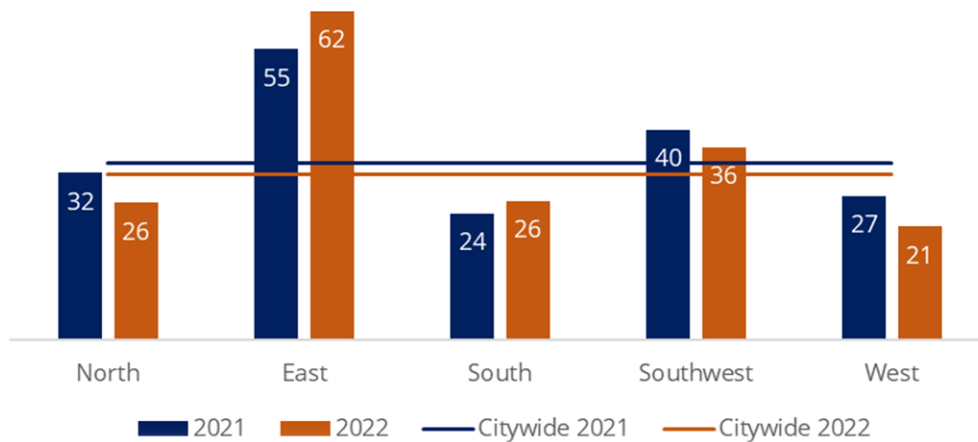


Figure 4 depicts the number of deployments per square mile in each precinct. Note: Figure 2 from Section A illustrates the total number of deployments per precinct, which results from the allocation of ALPR-equipped patrol vehicles. The deployment rates shown in Figure 4 adjust those totals to account for the number of square miles in each precinct to estimate the likelihood of repeat scans.

<sup>4</sup> OIG is currently in the process of collecting data on the locations of ALPR hits for 2023 to better inform any future analysis and recommendations in this area.

Precincts vary greatly in geographic size but likely have a cumulative amount of roadway that is proportionate to its area in square miles. The East Precinct is geographically the smallest precinct and has the highest per-square mile deployment rate. This means that ALPR-equipped patrol vehicles likely scanned a higher proportion of visible vehicles within the precinct and created more repeat-reads of the same vehicles on different days or from separate deployments relative to other precincts. Furthermore, East Precinct contains a high concentration of historically marginalized communities: approximately 40% of East Precinct residents live in a census tract categorized by Seattle’s Race and Social Equity Index to be the highest or second highest equity priority. Additionally, Capitol Hill is a historic LGBTQIA+ neighborhood center.

OIG did not observe misuse or improper sharing of ALPR data; however, disproportionality in data collection presents an ongoing risk to some disadvantaged populations. OIG recommends SPD take the following proactive steps to mitigate this risk in the future.

**Recommendation 2:** SPD should develop a strategy for deployment of ALPR-equipped vehicles that takes disproportionality of data collection into account.

### **Verification of Hit Accuracy Prior to Action**

While ALPR systems greatly expand the capabilities to identify potentially stolen vehicles and license plates, the systems also present risk of erroneously identifying vehicles and license plates that are not actually stolen. An additional risk for SPD ALPRs is not identifying the issuing state of a plate. Based on the annual summary statistics (shown in Table 1 in Section A), there was one misread for every five unverified hits recorded in 2021 and 2022.<sup>5</sup> These risks are mitigated by SPD Policy requiring verification of a potential hit prior to action. SPD Policy 16.170-POL-2 General Policy 4 states:

- *ALPR operators will compare the digital image of the license to the Hotlist information to verify the Hit for both the state and characters on the plate.*
- *ALPR operators will confirm the ALPR information by radio or Mobile Data Computer (MDC) to immediately confirm the Hit prior*

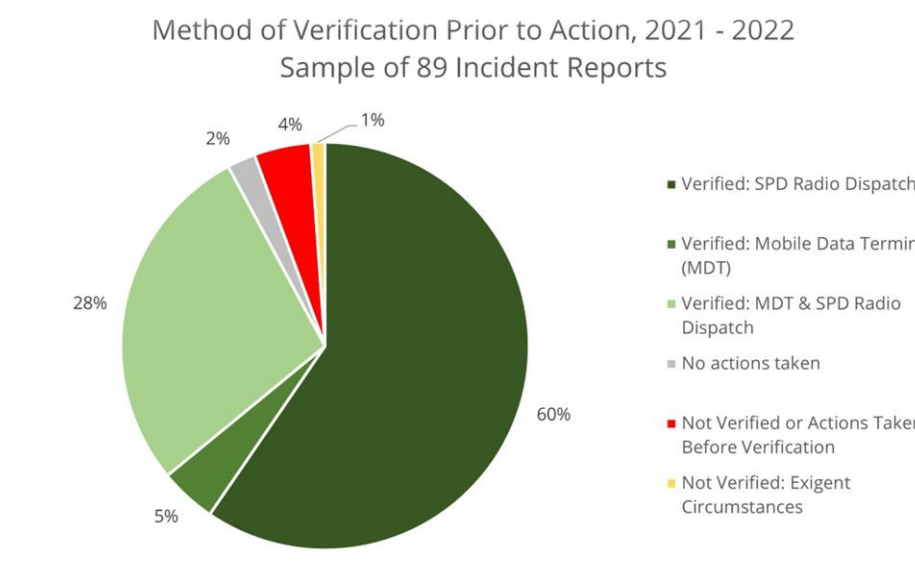
---

<sup>5</sup> This is likely an undercount because officers do not always log all misreads appropriately.

*to taking enforcement or other type of police action (absent exigent circumstances).*

- *ALPR operators will enter a disposition for all ALPR Hits by selecting either “Accept” or “Misread” before removing the Hit from the computer screen.*

In the sample of 89 cases OIG reviewed, SPD officers complied with the verification policy 82 times. Officers double verified using both SPD radio dispatch and their MDC on 25 occasions. On four occasions in the sample, there was no evidence that a verification occurred prior to action.<sup>6</sup> On two occasions, officers took no action, and on one occasion, officers acted prior to verification due to exigent circumstances, which conforms to SPD policy.<sup>7</sup>



*Figure 5 illustrates the distribution of verification methods ALPR-trained officers used from a sample of 89 reports of incidents between 2021 and 2022.*

<sup>6</sup> For cases not conforming to SPD policy, OIG reviewed the written narratives, CAD event logs, and body-worn video to assess conformance.

<sup>7</sup> In the case of exigent circumstances, an officer driving an ALPR-equipped patrol vehicle encountered a vehicle that returned an unverified hit for a stolen vehicle. Before the officer could verify the hit, the occupant of the vehicle drove away at a high speed. The officer disengaged pursuit after the occupant struck another vehicle.



**High Risk Vehicle Stops** occur whenever an officer stops a vehicle on reasonable suspicion, probable cause, or a warrant and when such a stop may threaten the safety of the officer.

Because the ALPR hotlist acquires criminal justice information from various sources, there will inevitably be a small number of administrative errors or outdated information automatically imported into ALPR systems. Though OIG observed a high rate of officers verifying hits prior to action, the risk of initiating **high risk vehicle stops** (HRVS) without proper justification still exists. In two incidents reviewed, SPD officers verified hits due to outdated or misleading hotlist information, which led to erroneous stops.

In one instance, SPD officers verified an ALPR hit with dispatch, confirming that the license plate and vehicle matched that of a stolen vehicle. Officers conducted a stop of the vehicle with firearms drawn and detained the driver. Only after officers compared the VIN on the stopped vehicle with the VIN of the stolen vehicle, did they realize the stolen license plate had been swapped onto a car of the same make, model, and color. The detained driver complied with officers' instructions throughout the incident but was visibly upset and confused by his detainment. Although he and his vehicle were released, he was still subject to the stress of a HRVS.

In another instance, SPD officers stopped a pair of men in a parking lot following a stolen vehicle hit. Officers did not appear to validate the hit before initiating the stop in this case, but the hit was nonetheless accurate. Officers in this case did not draw their firearms or detain the subjects. The subjects explained that the vehicle had been stolen, but recently recovered and that recovery had not yet been reported. After investigation, the officers allowed the men to leave in their vehicle.

Incidents like those described are rare and not attributable to the ALPR system, 911 dispatch, or responding officers. However, they highlight a risk that as ALPR greatly increases an officer's ability to identify potentially stolen vehicles, it also increases the likelihood that upstream administrative issues or license plate swaps will result in vehicle stops that subject innocent individuals to significant risk.



## E. Complaints, Concerns and Other Assessments

**SMC 14.18.060, § E:**  
*A summary of any complaints or concerns received by or known by departments about their surveillance technology and results of any internal audits or other assessments of code compliance.*

### Office of Police Accountability (OPA) Complaints

No complaints or concerns were submitted to OPA in 2021 or 2022.

### City of Seattle Customer Service Bureau Complaints

No complaints were submitted to the City of Seattle Customer Service Bureau during 2021 or 2022.

### Internal Audits or Assessments

No internal audits or assessments were conducted in 2021 or 2022.

## F. Total Annual Costs

**SMC 14.18.060, § F:**  
*Total annual costs for use of surveillance technology, including personnel and other ongoing costs.*

SPD reported that Seattle IT did not have cost records for 2021; however, in 2022, SPD recorded \$3,395 in licensing costs for this technology. It was not feasible to calculate personnel costs for this technology for either year, given the high number of officers trained to operate ALPR-equipped vehicles and the number of deployments.





**Surveillance Technology Usage Review**  
**Automated License Plate Reader – Patrol (2021 and 2022)**  
***Recommendations Response***

1. SPD should develop a process for de-identifying ALPR records released through public disclosure, to the extent allowable under the Washington State Public Records Act.

SPD Management Response

Concur  Do Not Concur

Estimated Date of Implementation: Q2 2024

Proposed Implementation Plan: SPD will work with the City Attorney's office to develop a process to respond to these requests in a way that complies with the law, and addresses this recommendation.

2. SPD should develop a strategy for deployment of ALPR-equipped vehicles that takes disproportionality of data collection into account.

SPD Management Response

Concur  Do Not Concur

Estimated Date of Implementation: 2025

Proposed Implementation Plan: Establish a working group that incorporates DEI advisor to develop and then operationalize a strategy.