

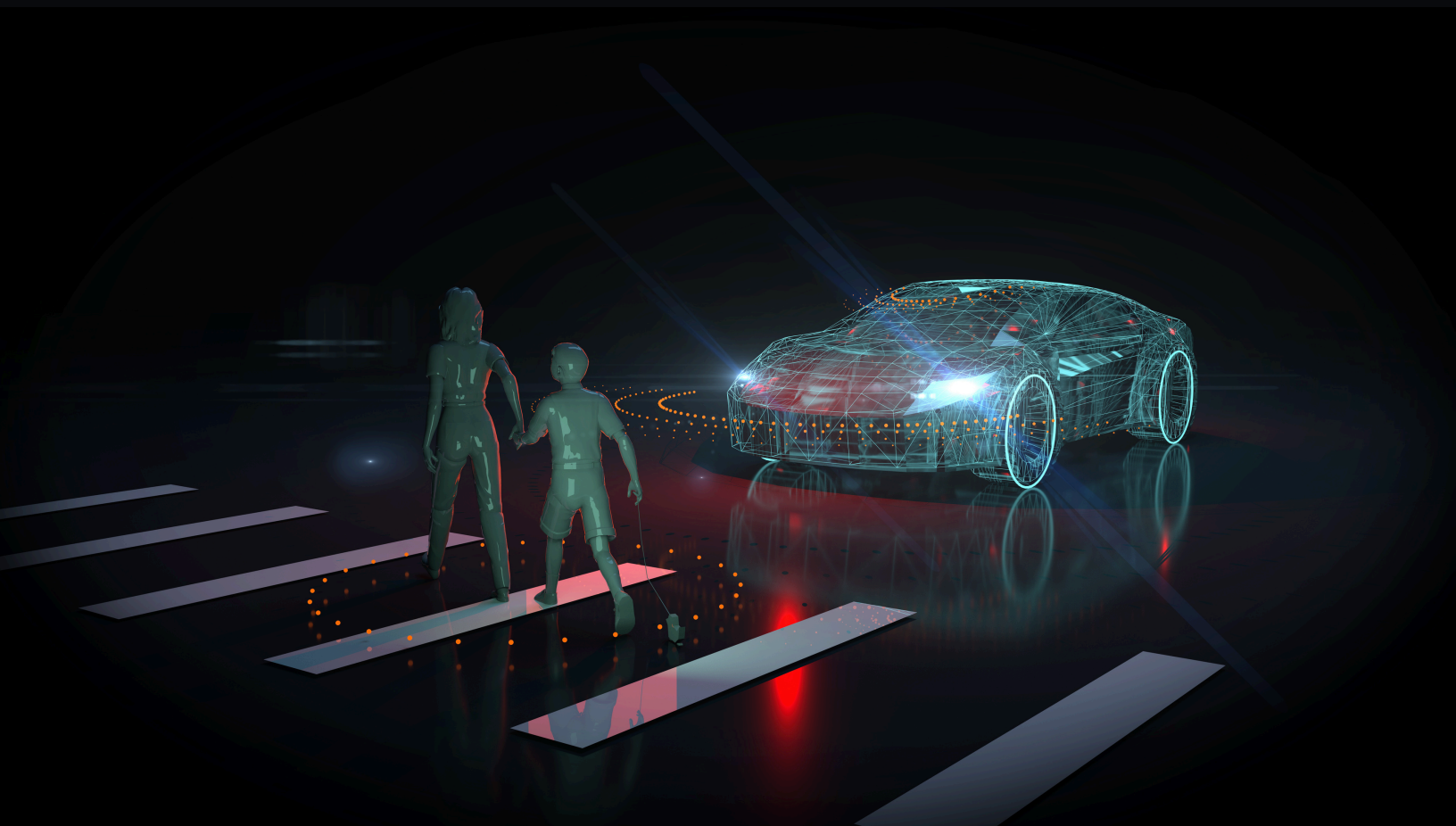
Forum at the Forum



POLICE EXECUTIVE
RESEARCH FORUM

The Future of Autonomous Vehicles and Policing

December 2025



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Autonomous vehicles (AV) are currently operating in only a few areas of the United States, including the cities of Austin, Texas; Phoenix, Arizona; and Los Angeles and San Francisco, California. These vehicles will almost certainly proliferate in the coming years, as the National Highway Traffic Safety Administration's (NHTSA) AV Test Tracking Tool¹ reports numerous companies are piloting AV programs across the country.

In 2020, PERF and RAND published a report on the high-priority problems and needs related to AVs and law enforcement.² That report, the result of a workshop with practitioners and researchers, outlined a few key takeaways:

- Law enforcement must be able to communicate securely with AVs and their owners.
- Participants agreed that communication and collaboration among stakeholders is important.
- Stakeholders must establish standard protocols and procedures for law enforcement interactions with AVs.

1. AV Test Initiative, "Test Tracking Tool," National Highway Traffic Safety Administration, accessed September 24, 2025, <https://www.nhtsa.gov/automated-vehicle-test-tracking-tool>.

2. Sean E. Goodison et al., *Autonomous Road Vehicles and Law Enforcement* (Santa Monica, CA: RAND, 2020), https://www.rand.org/pubs/research_reports/RRA108-4.html.



To learn what may have changed since, PERF spoke with police officials from Austin, Los Angeles, Phoenix, and San Francisco about their experiences with this technology. Waymo is currently carrying passengers in all four cities. Cruise previously operated in Austin, San Francisco, and Phoenix. Zoox and Apollo have permits to test vehicles in San Francisco without a safety driver.³ These officials we spoke with reported a few common issues:

- Vehicles struggle with irregular street closures and traffic patterns, such as during a major event or emergency.
- Vehicles do not always respond appropriately when officers are directing traffic.
- Vehicles sometimes block traffic when picking up and dropping off passengers.
- Companies have different vehicles and different operating procedures, and officers cannot be expected to have detailed knowledge of multiple companies' equipment and practices.

Despite those issues, the law enforcement officials said that they have not found that AVs endanger the public any more than human drivers. "Overall, I would say it's working, it's just not pain free," Deputy Chief Nicole Jones of the San Francisco Police Department said at a March PERF meeting. "They are obeying most of the rules of the road. There are outlier incidents. We can't come out and demonize the industry, because overall they are doing a pretty good job."

Managing Traffic Issues

One recurring issue law enforcement officials reported is instances of AVs ignoring directions from officers and blocking traffic. These cases most commonly occur when the usual flow of traffic is temporarily modified, such as during a funeral procession or special event. While even a novice human driver can easily interpret a traffic cop's instructions, these advanced vehicles can have difficulty adapting quickly. When these instances arise, officers face the unusual challenge of managing a vehicle with no one at the wheel.

Common Traffic Issues

Police officials described some of the common traffic issues they see with AVs. "The vehicles have what's referred to as opportunistic behavior," Austin Police Chief Lisa Davis told PERF Annual Meeting attendees in May. "You might think they would stop on a dime and be very cautious, but they're not. If they see a yellow [light], they'll go through the yellow if no one is there."

3. "Autonomous Vehicle Testing Permit Holders," State of California Department of Motor Vehicles, accessed September 24, 2025, <https://www.dmv.ca.gov/portal/vehicle-industry-services/autonomous-vehicles/autonomous-vehicle-testing-permit-holders/>.

“In July 2024, Cruise stopped operating and Waymo kind of took the market. The vast majority of our Waymo issues have been the inconsistent response to traffic control, especially with mounted officers, opportunistic driving behaviors, and blocking or impeding traffic.”

**Lt. William White,
Austin Police
Department**



Austin Lieutenant William White has observed some of the issues with Cruise, which previously operated in that city, and Waymo, which is currently on its roads. “In 2023 and 2024, the biggest issues we saw with Cruise were trouble deciphering lights and sirens and unpredictable driving behaviors,” he said in a May interview with PERF. “We had incidents where they were driving too close to emergency vehicles and not yielding properly to emergency vehicles. And when motor officers were trying to direct traffic, the Cruise vehicles would continually approach them, to the point that they became concerned about their safety.

The San Francisco Police Department has seen similar problems. “If there’s a sign posted that says, ‘No left turn between these hours,’ they will make the left turn on occasion,” said Deputy Chief Jones. “Is that happening every single day, all the time? No. What we see more is where they’re stopping. Like your Uber driver, they will stop wherever they feel like and take the lane of traffic—even if it’s the only lane—to stop and let people out.

“One of the primary issues in San Francisco is they have tremendous trouble dealing with human traffic control,” Jones continued. “If you have a motor unit that does escorts, motorcades, or things like that, they have a very difficult time following the instructions that you’re giving. Waymo does not have exterior voice-to-voice communication from the vehicle. So I’ve had my motor officers stopping vehicles at an intersection, and the Waymo has stopped, then driven around my motorcycle officer into the motorcade lane of traffic.”



Geofencing

To keep AVs away from areas where they may have trouble navigating traffic, police officials recommend working with companies to geofence potentially problematic locations. Geofencing will program details into the vehicles' maps to instruct them to stay out of a designated area.

"We worked to implement geofencing," Lieutenant White from Austin told PERF. "That was primarily for critical infrastructure—hospitals, police stations, EMS stations, fire stations, and schools—and also special events. Austin has a lot of events going on all the time, which creates a lot of traffic problems. So we want to geofence certain areas, because autonomous vehicles are not great at picking up new traffic patterns if we have to shut streets down. They'll freeze until they figure out what's going on. You may have to contact their dispatch and either get somebody to move the car or let an officer take over the car to move it. That can be time consuming, especially when traffic is backing up, and [it] can create safety issues. Generally, we recommend keeping them 1,000 feet from the areas we want them to stay away from.

"We created an automatic CAD [computer-aided dispatch] email that goes to the AV companies if there's a critical fire incident," White continued. "We talked about doing something for the police, and we discovered it doesn't apply in the same way to police because our calls are so dynamic. It wasn't practical, so we needed to come up with a better solution. We have an X [formerly Twitter] feed that lists critical incidents, and we told them they should monitor it. I sent them a list of keywords, like 'barricaded subject,' 'traffic crash,' or 'active shooter,' that they could flag on social media."

San Francisco has implemented a similar geofencing procedure. “When certain incidents occur, dispatch will send an automatic geofence,” Deputy Chief Jones said. “But as we know in policing, one shooting scene might require an entire block to be shut down and another may not. So a call type may not elicit the same reaction in every circumstance. What we’ve done in San Francisco is, if your dispatchers are going to reroute any of our transit buses, we ask them to call the autonomous vehicle companies and geofence the same area for them.”

Commander David Seitter of the Phoenix Police Department said geofencing has also been a challenge in his city, particularly around sports arenas: To set one up, the police department must go through the time-consuming process of calling the AV company to notify it about road closures.

Managing Traffic Issues

To address any issues that arise, AV companies generally provide law enforcement with a phone number officers can call any time of day and also have a way for a police officer or passenger to contact the company through the vehicle.

“Each company has their own way of operating,” said Lieutenant White from Austin. “For the most part it’s been kind of consistent, in that you could call their law enforcement number or try to connect directly with a dispatcher through the vehicle if there’s a problem. As long as the vehicles can do those two main things, that’s really helpful for officers.”

Waymo established a 24-hour hotline dedicated to connecting first responders with trained specialists and released an emergency response guide.⁴ For each call, first responders are asked to provide their name and agency, the AV’s unique identifier number and license plate number, and a description of the vehicle’s location.

4. “Waymo Emergency Response Guide and Law Enforcement Interaction Protocol,” Waymo, accessed September 24, 2025, <https://waymo.com/firstresponders/>.



Waymo vehicles are designed to detect emergency lights during a traffic stop and will pull over to a safe location when signaled. Once stopped, the vehicle can unlock its doors and roll down its windows to allow an officer to communicate with a Waymo representative. Each Waymo vehicle contains two copies of the vehicle owner information, registration, and proof of insurance. Officers can locate these documents behind the front driver-side or passenger-side sun visors.

Officers can disable a vehicle's self-driving capabilities by opening any of its doors or ensuring that the vehicle is in park or the parking brake is applied. In emergency situations, Waymo recommends that officers break a window on the vehicle if the doors are locked and immediate entry is needed. Otherwise, officers can call the Waymo hotline and have the doors unlocked remotely.

Waymo Rider Support specialists are available to communicate with passengers in the event of a traffic stop or collision. If a crash occurs, the vehicle will contact Waymo's Fleet Response specialists, who will call 911 in the case of injuries, blocked traffic due to a disabled vehicle, or other serious circumstances. First responders should be prepared for a Waymo support team to arrive on-scene for any major incidents.

Waymo tells first responders that they can have AVs placed into manual mode by either calling the Waymo hotline or by pressing any of the disengage buttons located on the vehicle's steering wheel to initiate an in-vehicle call with a support specialist. When manual mode is enabled, officers can take control of the vehicle or turn it off by pressing the "start-stop" button to the right of the steering wheel.

Issuing Citations

When police witness a vehicle operating in a way that breaks the law, they generally issue a citation to the driver. But there is no driver to cite in an AV, and laws have not yet evolved to account for this new technology.

California law enforcement cannot currently issue citations to autonomous vehicles, but they will gain that authority in 2026.⁵ "In California, we cannot issue an autonomous vehicle a citation for a moving violation," said Deputy Chief Jones from San Francisco. "So if they run a red light, you have no power to cite them."

In Austin, police officials have worked out a complicated process for issuing citations as they push their state legislature for a simpler solution. "We can issue parking citations relatively easily, and our transportation division has done that," said Lieutenant White from Austin. "But when they're committing a moving violation, our transportation division can't do that because it falls into the criminal side of things. I worked with our municipal court division to develop a process. It's overly complicated and cumbersome for officers, so they don't necessarily want to do it. We've issued three affidavits, which are the equivalent of a traffic citation, against autonomous vehicles for impeding traffic.

5. Max Dorow, "New California law aims to hold driverless car companies accountable for traffic violations," CBS San Francisco, October 6, 2025, <https://www.cbsnews.com/sanfrancisco/news/new-california-law-aims-driverless-car-companies-traffic-violations/>.

"When the officer sees a violation," White continued, "they have to fill out a criminal complaint, which is an affidavit of the violation they saw, as if they were going to go get warrant for somebody. They have to have another officer swear to it, then they have to send it to me. I have to verify the registered owner of the vehicle and the registered agent of the company in Texas. It's always the same, but I have to do it each time to make sure nothing has changed. Then, from there, I can complete the form and send it back to our municipal court for them to file the charge. So it's a lot more cumbersome than writing out a citation and handing it to somebody, of course. We're hoping that through legislation, some of these things will change, and it will be easier to hold them accountable for some of these behaviors."

Working with AV Companies

Police officials say that the AV companies have generally done a good job of proactively reaching out to law enforcement before their vehicles arrive in a municipality.

"They reach out to you when they come to your city," said Deputy Chief Jones from San Francisco. "I'm not talking to the engineer; I'm talking to the former law enforcement who has been hired by the company."

In Texas, municipalities are not allowed to regulate AV companies, so Austin city officials have found it's important to maintain good relationships with the industry. "We have our City of Austin autonomous vehicles work group, which we created in 2023 when Cruise first started operating in Austin," Lieutenant White said. "The Austin Transportation and Public Works division created this work group with all the stakeholders—police, fire, EMS, airport, and transportation and public works. Texas law states that municipalities cannot regulate autonomous vehicles. So one goal of our work group was to see what we can do to work with the companies to mitigate problems."

But Lieutenant White told PERF that companies are not always entirely forthcoming. "Waymo is always willing to meet with us and talk about issues, but I wouldn't say they've been as transparent with us as Cruise was," he said. "They haven't shown us any video. In fact, we've had issues where someone reported an incident, then Waymo has said they checked their video and the car operated within their parameters. Then I happened to find body-worn camera video from an officer and actually saw what the car was doing, and if those are the parameters it's operating within, it's violating the law. So we're able to come back and say, if these are your parameters, that's not what it's supposed to be doing."

The Los Angeles Police Department reports having a strong relationship with Waymo, the only AV company currently carrying passengers in the city. "My partnership with [the company's law enforcement liaison] was incredibly important," LAPD Commander Craig Valenzuela said at a March PERF meeting. "If I called and needed an answer, he picked up right away. And I felt like I did that for him if he needed something from me. So I would lean on that advisor."



Officer Training

Companies offer training for law enforcement agencies when their vehicles arrive in a city. "All the companies have been good about offering training," said Lieutenant White from Austin. "As they've come online, I've reached out to the department to let officers know when the company's coming to town and the training dates they'll have available. And the companies are good about coming out if you request training. The problem is that we're short-staffed, so it's hard for officers to get there."

Commander Valenzuela from Los Angeles recommended bringing vehicles to police stations to familiarize officers with the technology. "Get the cars out to your stations when they roll out, so people can stand next to them, look inside, and figure out where to press buttons," he said.

Industry Standardization

Police officials said that it is not currently too difficult to manage their relationships with the industry because they only have one or, at most, a few companies operating in their city. But they are concerned it will become more difficult as more companies begin offering these services. They see a role for the federal government in developing standards for these companies to help law enforcement.

"It's pretty easy right now because I have one point of contact with only one company," said Commander Valenzuela from Los Angeles. "But as these companies proliferate, I think we need to push them to create one set of standards and one call center."

Commander Seitter from Phoenix shared these worries, telling PERF that the city has developed protocols for working with the single AV company currently carrying passengers there, but officials are concerned about standardizing those procedures as new companies arrive.

"If there are 50 companies, my cops are not going to retain 50 different training videos and 50 different sets of information," said Deputy Chief Jones from San Francisco. "There will be more and more companies. Each company has a different operating platform. They have different ways you would take over the vehicle. There's not a set of standards in place yet. We've talked to NHTSA about this, and many of the people who are regulating these [cars] are coming to the table to figure out what to do. But there is no standardization across the industry."

Fire Danger Posed by AVs

The Waymo fleet in Los Angeles was targeted during protests in summer 2025, posing a new threat to the public and first responders. As images of the burning vehicles spread across the news and social media, the company temporarily suspended service to the portion of the downtown area experiencing unrest.⁶

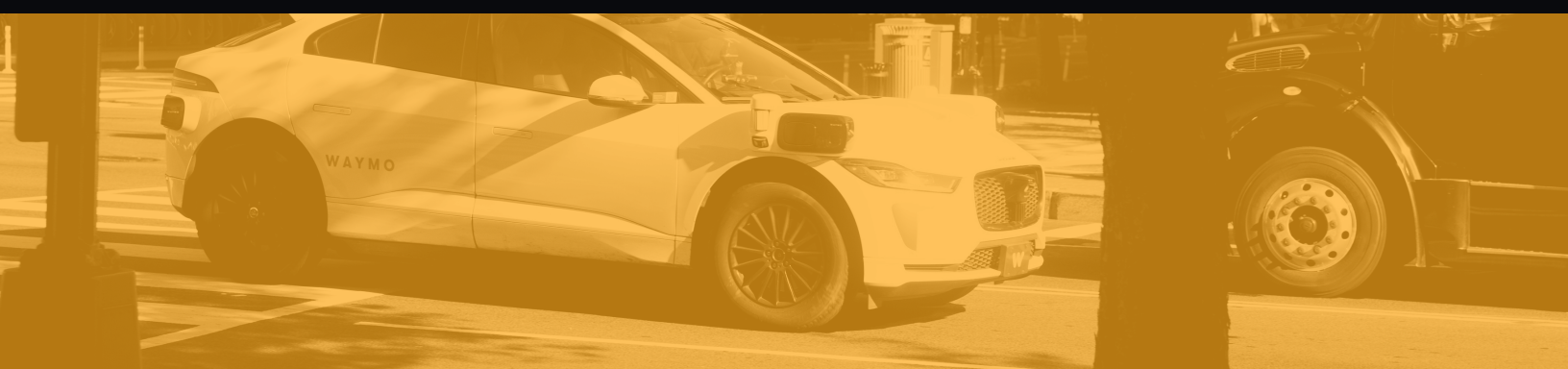
“We had three Waymos sent to the area impacted by the rioting. Those are driverless vehicles with lithium-ion batteries. [Protesters] lit them on fire, and the cars burned,” said Los Angeles Police Chief Jim McDonnell in a June interview with PERF. “The fire department didn’t go into the riot zone because they need force protection, which wasn’t available to us at the time. But if they were to go in and put water on the fire—which they wouldn’t, because they know what they’re doing—that would have created a toxic gas. So that’s a concern.”

Waymo vehicles contain two 12-volt batteries located near the front and rear of each vehicle, connected by a high-voltage (HV) battery pack that runs along the underside of the car. If ignited, these batteries can reach temperatures above 1,000 degrees Celsius, according to a 2024 publication in the *Journal of Power Sources*.⁷ Electric vehicle batteries exposed to extreme heat will release toxic vapors including sulfuric acid, nickel, lithium, copper, and cobalt.⁸ These fumes cause throat burns and difficulty breathing and can prove fatal in cases of extended exposure.⁹

According to Waymo, minor vehicle fires that do not affect the HV system can be treated with standard firefighting methods. But once the HV battery is exposed to high temperatures, the vehicle must be considered unsafe and personal protective equipment is needed.

“Battery fires can take up to 24 hours to extinguish. Consider allowing the battery to burn while protecting the surrounding areas,” Waymo advises.

6. Caroline Petrow-Cohen, “Waymo Halts Service in Downtown Los Angeles amid ICE Protests,” *Los Angeles Times*, June 9, 2025, <https://www.latimes.com/business/story/2025-06-09/waymo-halts-service-in-downtown-los-angeles-amid-ice-protests>.
7. Jingyuan Zhao et al., “Battery Safety: Fault Diagnosis from Laboratory to Real World,” *Journal of Power Sources* 598(2024), 234111, <https://doi.org/10.1016/j.jpowsour.2024.234111>.
8. *Waymo Autonomously Driven Jaguar I-PACE: Emergency Response Guide and Law Enforcement Interaction Protocol* (San Francisco: Waymo, 2025), 34, <https://waymo.com/firstresponders/>.
9. Deni Ellis Bechard, “Thermal Runaway Explains Why Waymo Cars Burned So Completely in the Recent Los Angeles Protests,” *Scientific American*, June 9, 2025, <https://www.scientificamerican.com/article/why-the-waymo-car-fires-in-recent-los-angeles-protests-caused-the-robotaxis/>.



Recommendations

The following recommendations, based on PERF's conversations with police officials, are for law enforcement agencies in jurisdictions with AVs.

1. Coordinate with AV companies before their cars arrive in your jurisdiction.
2. Institute policies and training for officers on interacting with AVs.
3. Coordinate with other local agencies and emergency responders to establish procedures for AVs.
4. Establish a system for keeping AVs away from major events, closed roads, and any other areas where they could cause traffic congestion or a public safety hazard.
5. Working with state and local government officials as necessary, develop a way for officers to easily issue traffic citations to AVs.

