The Struggle Over Automated Driving in California's Cities

An STS Research Paper
presented to the faculty of the
School of Engineering and Applied Science
University of Virginia

by

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May 10, 2024

On my honor as a university student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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For about 20 years, tech companies and automakers have been developing highly automated road vehicles that do not require a conventional driver. Such robotic cars and trucks are typically called "autonomous vehicles" (AVs), though in fact they are not autonomous. They are robotic vehicles that operate deterministically. Promoters of AVs, and especially the companies that make and operate them, claim that such vehicles will be the future of urban mobility because they will be safer than conventional road vehicles. However, high-profile incidents involving AVs in testing permitted in places like California, have made their place on public roads contentious. Tech companies, automakers, insurers, advocates, transit agencies, and policy makers all compete for influence in determining the place of automated driving technology in the future of urban mobility. Although AVs have shown no capacity to play a leading part in urban passenger mobility, companies that stand to gain from AV sales and operations have sustained undue confidence in them by associating them with notions of technological progress and by exaggerating their safety relative to that of human-driven vehicles. These companies have specific strategies in swaying legislative and public opinion to align with their respective interests through either lobbying or public relations, but numerous incidents involving AVs have brought pushback from the public.

Review of Research

The deployment of automated vehicles on public roads has been extensively researched. Researchers have examined the impacts of such technology on safety and data security and have proposed regulations to better manage them. Saghir and Sands (2020) conducted an online survey of professional planners to document their general views about AV deployment. The found that planners generally favor new policies and regulations to maximize the benefits and

mitigate the costs of deploying AVs. The survey asked for the planners' views on AV safety, deployment time frame, and the level of impact on lifestyles. A majority felt AVs will make an impact on communities within the next ten years and believed that AVs will reduce collisions and pedestrian injuries. However, only 8% of those surveyed frequently incorporate AVs into plans and 36% sometimes do (Saghir & Sands, 2020).

Soriano, Doughtery, Soublet, and Tripeke (2015) discuss 2014 regulations the California DMV issued for manufacturers regarding testing and deployment of AVs. They explain how the autonomous vehicle is defined in California as "any vehicle equipped with technology that has the capability of operating or driving the vehicle without the active physical control or monitoring of a natural person" and defined a manufacturer as any person or company that manufactures a vehicle and equips it with autonomous technology. The regulations further explained the requirements for test drivers, testing procedures, accident reporting, and finances to cover damages.

Czech, Turoń, And Barcik (2018) discuss the importance of distinguishing automatic/automated from autonomous. They explain that a vehicle referred to as "automatic" or "automated" is not equipped with an intelligent system, rather it acts upon what it is commanded to do. An "autonomous" vehicle is equipped with intelligent systems which enable it to make decisions. They also refer to multiple classifications of autonomy from administrations globally including the National Highway Traffic Safety Administration (NHTSA) with all stating that the highest level of autonomy where the vehicle can drive without human input.

The work in this sociotechnical research is to document how organizations, social groups, and policymakers battle for influence that align with their respective interests how AVs are regulated, advertised, and should be perceived by the public regarding the potential impacts they

may cause. The strategies and agendas employed by the participant groups could have influenced the views and frameworks documented in the articles of this review of research.

Interacting Automated Driving Technology with the Public

California is one of the states that permit the deployment of AVs on public roads and this opportunity enables tech companies to create programs that showcase the capabilities of their AVs to the public. Two prominent companies developing and testing AVs in the state are Waymo and Cruise. Waymo is an independent subsidiary of Alphabet Inc. but began in 2009 as the Google Self-Driving Car Project. Their stated mission is, "to make it safe and easy for people and things to get where they're going" (Waymo, n.d.-a). Cruise was founded in 2013 by Kyle Vogt in San Francisco, joined by Dan Kan a year later. Their mission is divided into safety, sustainability with renewable energy support, and inclusivity (Cruise, n.d-a).

To convince the public that AVs are a viable, future mode of transit, the two tech companies deploy programs and projects that provide services to them. In September 2015, Waymo performed the first ever self-driving ride on public roads carrying a legally blind man, with no test driver and no police escort (Fairfield, 2016). Involving a passenger whose condition does not allow him to drive a car is for Waymo to showcase the validity of its technology and how it would serve a wider base of individuals who prefer personal mode of transit. In 2017, Cruise opened its fleet to employees to create a rideshare network in San Franscisco (Cruise, n.d.-a) with Waymo establishing their own network in the city by 2021 (Waymo, n.d.-b). The rideshare networks during this period were permitted by the state of California strictly for testing purposes, which meant they were not authorized to charge fares. This policy changed in 2022, when the California Public Utilities Commission (CPUC), delivered permits that allowed Waymo and Cruise to provide passenger services with a safety driver present in specific areas for

limited hours of the day (CPUC, 2022). The permits also authorized both companies to charge fares for these services if a safety driver is present. CPUC would go further, approving resolutions in August 2023 granting Waymo and Cruise conduct passenger service using driverless vehicles and charge fares during all times of the day (CPUC, 2023). This enabled the two companies to use their fleets to create robust networks at the capacity of Lyft and Uber. An additional advantage is noted by Waymo saying, "We constantly driving on public roads allows us evaluate and improve our performance, observe real-world situations, and further improve our software." (Waymo, n.d.-a).

In addition to rideshare, Cruise runs a community service program named "Cruise for Good," that sets at least 1% of the fleet for local needs like meal delivery (Cruise, n.d.-b) and free rides for late-shift service workers (Lenaghan, 2023). The company says these initiatives help fight food insecurity and are "an effort to increase equitable access to economic mobility." (Cruise, n.d.-b). Waymo participates in community engagement where they sponsor local events like movies, cycling, and the San Francisco Marathon which also gives them to showcase their technology to event-goers (Waymo, 2023a). The overall aim of these actions is to generate a positive response from the public for them to consider AVs as a viable option for use in the future. Waymo and Cruise both have large fleets of to fulfill these initiatives due to the involvement of major auto manufacturers. In 2016, General Motors (GM) acquired Cruise for $1 billion as part of its strategy to get self-driving cabs on the road quickly (Ziegler, 2016). The acquisition brought technical and vehicular support for Cruise to carry out their rideshare network. Waymo has a partnership with Jaguar, with the manufacturer providing all electric I-Pace vehicles. In Jaguar's press report, the auto manufacturer declared that up to 20,000 vehicles were to join Waymo's fleet in the first two years of production (Jaguar, 2018).

Influencing Formation of Regulations

Another strategy tech companies and automakers try to exert influence in determining the place of AVs on the road is lobbying. Concerning collective interests of an industry, trade associations are often involved. Waymo and Cruise are members of the Autonomous Vehicle Industry Association (AVIA). AVIA members consist of automakers, rideshare services, tech, and delivery companies whose mission is to "advocate for the safe and timely deployment of autonomous driving technology" (AVIA, n.d.-a). AVIA operates at a state, federal, and international level in creating frameworks on how policymakers should deploy and regulate AVs on public roads (AVIA, n.d-b). AVIA is involved in CPUC's management of its AV programs with an example being when it addressed questions from a ruling on new data reporting requirements. The general counsel, Ariel Wolf, explained in a letter why data currently collected by the California Consumer Protection and Enforcement Division (CPED) concerning AV operations is sufficient, why data should not be submitted to the Commission more frequently than quarterly, and why the new data collection should not take into effect right away (Wolf, 2023). AVIA, along with Waymo and Cruise, pour significant money into lobbying the state government, with the organizations collectively spending over $2 million in 2023, according to disclosures with the Secretary of State (Rosenhall, 2023). The money was allegedly spent on lobbying activities that included wine and fine dining involving nearly three dozen California state officials (Brewster, 2023). The lobbying push is what prompted CPUC to grant expansion of AV operations for Waymo and Cruise. Through simply giving favors towards policymakers, AVIA, backed by its members in the AV industry, can sway legislation that would align with their interests.

AVs' Shortcomings Bring Opposition

The expansion in operations by Waymo and Cruise is concerning San Francisco city officials and advocacies. They feel the two companies are too eager in launching rideshare services when AVs have been involved in hundreds of crashes across California in the past five years and reports that test drivers often override the vehicles due to safety issues (Lu, 2023; Shaban et al., 2023). Since late February 2024 alone, the California DMV has received 690 Autonomous Vehicle Collision Reports (CA DMV, 2024). Incidents involving AVs not only consist of documented reports of collisions, but also interferences with critical services. San Francisco police and firefighters have reported instances where AVs interfere with critical services. One instance was when a Waymo AV was inching closer to the scene of a fire, almost running over a water line. It has brought frustration prompting the fire chief to declare, "…it is not our job to babysit their vehicles" (Kerr, 2023).

One of the most high-profile incidents involving AVs occurred on October 2nd when a woman was trapped under a Cruise AV after she fell victim to a hit-and-run by another vehicle. According to a Cruise spokesperson and San Francisco Police, the pedestrian was hurled in front on the Cruise vehicle, prompting it to "aggressively" brake and remain in its place, at the request of the police (Goswami, 2023). Since the October 2nd incident, Cruise has been under multiple investigations conducted by U.S. regulators and the National Highway Traffic Safety Administration (NHTSA) over incidents that reveal risk to passengers and pedestrians (AP, 2023). As of October 27, all Cruise driverless operations nationwide have been suspended after the California Department of Motor Vehicles (DMV) revoked the company's deployment and testing permits, citing risk to public safety.

The numerous incidents involving AVs have made government officials and the public reconsider their place on the road. Though Waymo can still commercially operate their fleet, their application to expand into San Mateo and Los Angeles counties was suspended for up to 4 months by CPUC. On January 19th, 2024, Waymo asked CPUC to expand into San Mateo County, but did not notify the county officials about the intended move. The county board of supervisors said no, with one of the members saying, “I don’t think the technology is there.” He goes further by expressing concern of AVs “wreaking havoc at 65 mph, playing bumper cars on Highway 101, …" (Korosec, 2024). Karen Bass, mayor of Los Angeles, expressed in a letter to CPUC how “local jurisdictions like Los Angeles have had little to no input in AV deployment and are already seeing significant harm and disruption” (Bass, 2023). This sentiment has now led to the introduction of state Senate Bill 915, the Autonomous Vehicle Service Deployment and Data Transparency Act. The act will give the power to local governments regarding the discretion of AV services rather than regulatory bodies such as CPUC (CBS News, 2024).

Advocacies have pushed for the decisions made by the governing bodies to halt expansion of AV operations. The International Brotherhood of Teamsters, simply known as the Teamsters, are America’s largest union known for advocating rights of freight drivers and warehouse workers. Their mission is to “organize to wrest their fair share from greedy corporations, …” (Teamsters, n.d.). Like AVIVA, the Teamsters have made a framework called the “Autonomous Vehicle Federal Policy Principles” for federal policymakers. It shows their deep interest in AV regulation, stressing the consideration of safety and workforce impacts on its members and “millions of other Americans who operate a vehicle for their livelihoods, and the public, who are increasingly asked to share the road with AVs” (McQuaid, 2023). In a press release, the union commended the Oakland City Council passing a resolution supporting Senate

Bill 915 with Pete Finn, president of a joint council commenting, “This technology is not safe, and it’s time we take control away from Big Tech and put it in the hands of our local communities” (McQuaid, 2024).

Whilst the Teamsters supports initiatives through legislative work, other advocacies make their views known through disruptive methods. An example is Safe Street Rebel. Safe Street Rebel is a San Francisco-based activist group that has launched a campaign against AVs called “ConeSF.” Stated issues the organization has revolve around accountability, labor, transit, police surveillance, and accessibility (Safe Street Rebel, 2023). To assure their message is heard, the group places traffic cones on the hoods of AVs, disabling them. The campaign is part of the group’s overall goal to eliminate ‘car dominance’ in cities and rather prioritize public transit and spaces (Paul, 2023). Videos of the trend have gone viral across social media, and it has left the tech companies unpleased. A Waymo spokesperson called the coning “vandalism” and a Cruise spokesperson said that “intentionally obstructing vehicles gets in the way of those efforts and risks creating traffic congestion for local residents” (Griswold, 2023). When Cruise’s license for AV deployment was suspended by CPUC followed by a halt of all operations, the group welcomed the move, stating that it was “long overdue” and that “our shenanigans made this an international story and forced a spotlight on the many issues with AVs” (Safe Street Rebels, 2023).

AV Companies Stand by Their Technologies

Despite the incidents during the testing phases and the criticism, companies like Waymo and Cruise insist that automated driving is the mode of transit of the future. Their main selling point is safety. They claim that AVs are safer than human operation because AVs are not subject to distraction or impairment. Prashanthi Raman, Vice President of Global Government Affairs at

Cruise, was quoted saying, “Our cars don’t drive drunk, they don’t get distracted” (Shaban et al.,2023). Waymo claims their technology already reduces traffic injuries and fatalities in areas they operate and created frameworks that state how they approach safety (Waymo, 2023a). By publishing an extensive framework on how they view safety, Waymo seeks to obtain credibility of policymakers and public trust.

AV companies often refer to the fatality and injury rates from vehicle crashes. The NHTSA estimates that in the first half of 2023, there were 19,515 fatalities in motor crashes (NHTSA, 2023). The companies believe that widespread use of AVs would substantially reduce this statistic and would report their own data research that supports this belief. In a December 2023 post on its website, Waymo reported that with data based on 7.14 million fully autonomous driven miles across San Francisco, Phoenix, and Los Angeles, their automated technology, Waymo Driver, demonstrated an 85% reduction crash rate involving any injury, from minor to severe and fatal cases compared to the human benchmark (Waymo, 2023b).

Waymo also refers to research conducted by insurance company Swiss Re where Waymo Driver, its technology, reduced property damages by 76% compared to human drivers (Waymo & Swiss Re, 2023). It is to note this was not an independent study, but rather part of a partnership between Swiss Re and Waymo. Insurance companies also have an interest in the future of AVs as they must accept a new set of risks that come with widespread AV use though with the notion that the AVs would reduce the amount of road accidents, it would also lower loss frequency for insurance companies (Carrier & Dishank, 2023). In a now deleted blog post that discussed its findings of the October 2nd incident, Cruise reported that it conducted simulations of the incident and concluded that if an AV was in place of the Nissan that initially hit the victim, the collision

would have been avoided (Cruise, 2023). In place of the blog is a statement that the post was removed “out of respect to ongoing regulatory engagement.”

Conclusion

The development of automated driving technology is moving fast, and it has created an important battle over its place on public roads. This battle largely influences how the deployment of “autonomous vehicles” is regulated. With the regulation and permits from the regulatory body CPUC because of lobbying from AVIVA and the backing of major auto manufacturers like GM and Jaguar, companies like Cruise and Waymo can operate robust fleets to display the ability of their technologies through various initiatives from providing rideshare to community service. It is in this phase though where incidents with other vehicles and pedestrians occur. The AV manufacturers insist their vehicles drive safer than humans by displaying their own simulations and data to support it, but now advocacies and local governments are pushing back realizing that the current structure for regulation and deployment of AVs in California is neither safe nor sustainable. The AV manufacturers with approval from CPUC can essentially bypass counties and cities to run operations and it often leads to incidents as the areas are not prepared for it since they have little say. For a successful integration of automated driving technology on roads, the respective responsibilities of regulations and discretion of allowing AVs need to be appropriately allocated and communicated among bodies with the consideration of the impacts on the citizens being a priority.

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