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A New Federal Framework for Autonomous Vehicle Safety

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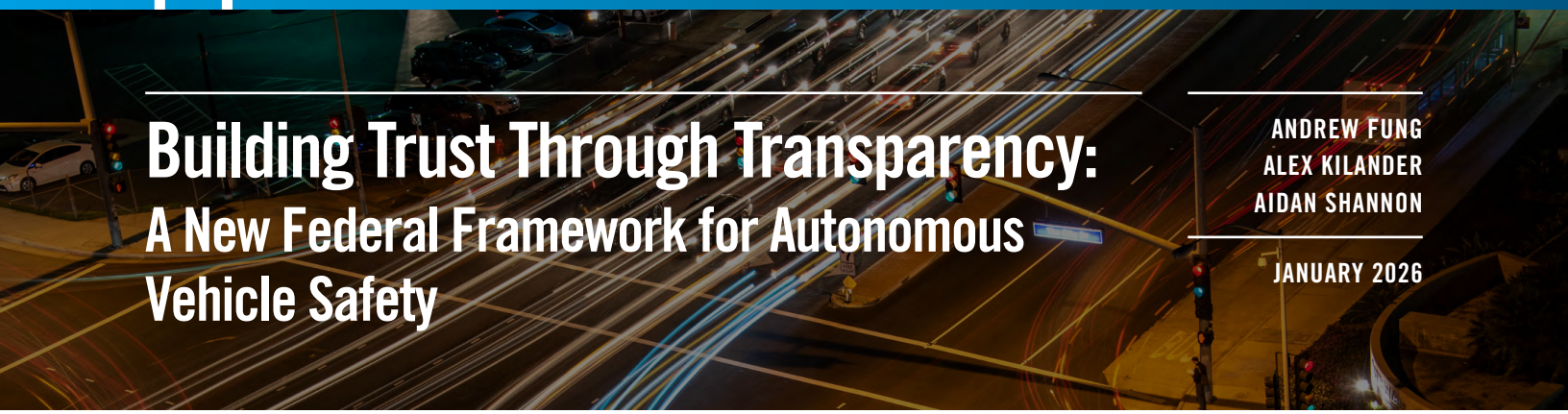

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INTRODUCTION

In October, Waymo, a self-driving car company owned by Google's parent company Alphabet, released its latest safety report from its autonomous ride-hailing service. The data is one of the most extensive public views into self-driving vehicle safety to date, claiming a 91% reduction in serious injury crashes compared to human drivers, alongside fewer airbag deployments, fewer crashes with pedestrian injuries, and zero fatalities.[1] Although the data is self-reported, if autonomous vehicles are truly as safe as Waymo suggests, it would be a major leap forward for safety in a country where road fatalities are a leading cause of death.[2]

Yet despite the potential public health benefits, polls consistently show public trust in autonomous vehicles (AVs) to be remarkably low. A recent survey found just 13% of U.S. drivers said they would trust riding in a self-driving vehicle, while 61% would be afraid to do so.[3] Such fears have given rise to a wave of backlash against the technology, with fierce opposition to the authorization of driverless ride-hailing services in cities and states across the country, along with proposed federal legislation from Senator Josh Hawley that would effectively ban driverless cars nationwide.[4,5]

Part of what fuels these fears is a lack of easily accessible, comparable, and independent data about AV safety. While the public can access some limited information about AV testing, it is fragmented across federal, state, and local lines, and cannot be directly compared because of differing reporting requirements and platforms. In the absence of high-quality data, eye-catching headlines and anecdotes about negative individual experiences with AVs dominate discourse.[6]

Undoubtedly, AVs raise real questions around liability, jobs, cybersecurity, and ethics. But they also offer immense promise to reduce crashes, improve independence for people underserved by public transit, decongest urban roads, and lower transportation costs. High-quality data

should be the foundation of discussion about these complex topics, not anecdotal speculation.

The solution is a unified federal AV reporting standard. We propose a two-layer approach, designed to build public trust and give regulators the details they need to properly oversee safety. First, a straightforward, public-facing dashboard allowing users to view crash rates and compare the safety of AVs directly to human-driven vehicles under various conditions. Second, a granular, comprehensive database accessible to researchers and regulators, giving them the detail needed to shape regulation. Built to preserve flexibility and privacy while limiting reporting burden, this approach focuses on public accessibility while protecting proprietary information and continuing to foster innovation.

ROAD SAFETY AND REGULATION TODAY

Over the past several decades, the National Highway Traffic Safety Administration (NHTSA) has successfully improved vehicle safety by creating and enforcing stringent mandates on vehicle design and safety equipment. Thanks to standardized safety testing and data collection, fatality rates have declined sharply since the 1970s, even as vehicle miles traveled have soared.[7] The combination of controlled crash testing and real-world accident data have created a culture of accountability, which has driven the adoption of safety-improving technologies from seatbelts to blind spot monitoring, making vehicles safer than ever before.[8]

Despite these safety improvements, however, driving remains one of the most dangerous aspects of everyday life in the United States. While traffic fatalities have fallen over the past several decades, progress has remained relatively stagnant over the past two decades.[9] In 2024 alone, nearly 40,000 people were killed in traffic crashes, and millions more were injured.[10] Among member countries of the International Traffic Safety Data and Analysis Group (IRTAD), the United States ranks among the worst, ranking the third highest in both traffic fatalities per capita and fatalities per vehicle mile traveled.[11]

Merely improving vehicles is insufficient to solve problems that stem from human error — for instance, alcohol impairment and speeding were involved in 30% and 29% of all crashes, respectively, in 2023.[12] Even as vehicles themselves become safer, humans remain the primary cause of many fatal crashes, a clear sign that overcoming the final hurdle in roadway safety will require innovations capable of reducing or removing that error altogether.

AUTONOMOUS VEHICLES AND THE FUTURE

Autonomous vehicles have the potential to address many of those safety problems, dramatically reducing collisions, injuries, and deaths. Advanced sensors, radar, and LiDAR — a remote scanning method that creates 3-D maps using lasers — allow these vehicles to continuously scan the environment in all directions, react faster than any humans, and consistently follow traffic laws.

Beyond safety, self-driving cars also have the potential to bring major economic and social benefits. AVs can provide mobility to seniors and those with visual impairments by connecting them to jobs and healthcare without dependence on others. They also have the potential to drastically reduce transportation costs by mitigating the need for personal car ownership and decongesting urban centers.

While progress has been made, this vision is not yet a reality. Simple automation technologies like lane keep assist and adaptive cruise control have given drivers in high-end vehicles a taste of a self-driving future, but these features still require drivers to be attentive at all times and only operate in limited conditions.

The most advanced systems are still under testing with autonomous ride-hailing services. Today, anyone can hail a ride in a fully autonomous vehicle in cities like San Francisco, Phoenix, and Austin, among others. Offered by companies like Waymo and Zoox, these rides are truly "autonomous," operating without human supervision within defined regions and navigating the wide range of conditions and scenarios that drivers face on city streets.

Despite these deployments, the vast majority of Americans have never ridden in or even seen an autonomous vehicle, given that they are operational in only a few cities. With little firsthand experience and limited accessible safety data, many consumers simply think that AVs are unsafe or unproven. In early 2025, an American Automobile Association survey found that only 13% of U.S. drivers would trust riding in a self-driving vehicle.[13]

This lack of trust has concrete policy implications, as lawmakers have begun proposing strict rules in response to public concerns. In 2025, Senator Josh Hawley (R-Mo.) proposed an "Autonomous Vehicle Safety Act" that would effectively ban driverless cars by requiring human operators in all AVs.[14] Similar measures requiring drivers in certain AVs have been proposed in California and Colorado, while local resistance has delayed the rollout of autonomous ride-hailing services in cities across the country.[15,16] In the current low-trust environment, the instinct for outright bans risks winning out over tempered regulation, hampering innovation and needlessly perpetuating thousands of avoidable traffic deaths.

CURRENT DATA COLLECTION PRACTICES

Low trust in AVs is further compounded by a lack of accessible and holistic data on their safety, especially when compared to data collection for normal vehicles. Since 1975, the NHTSA has maintained the Fatality Analysis Reporting System, a nationwide census of every fatal crash on public roads. It is complemented by the Crash Report Sampling System, which collects statistically representative data on all types of police-reported crashes. Together, these databases power the Fatality and Injury Reporting System Tool (FIRST), an intuitive, public-facing platform that allows policymakers, researchers, and the public to explore national crash trends through customizable charts, tables, and maps.[17] The tool demonstrates how structured, standardized data collection has made traditional vehicle safety measurable and publicly accountable. Yet AVs are notably absent from this system.

The data available on AV performance is sparse and fragmented. With no strong federal mandate in place, states have developed their own reporting rules. California stands out as one of the most detailed and transparent models. Its Department of Motor Vehicles requires AV manufacturers to file a report within 10 days of any collision involving an AV, whether or not it resulted in injury or was the fault of the AV. It also mandates annual disengagement reports that document every time a human safety driver took control from the autonomous system, along

with contextual details such as location, reason for takeover, and duration of human control. These incident-level disclosures offer an in-depth level of insight into how AVs behave in real-world conditions, but the raw reports are complex, non-standardized, and largely inaccessible to the general public.

Meanwhile, other states collect little to no AV-specific data. Texas, for example, includes a checkbox on crash forms to indicate whether a vehicle was classified as an "Autonomous Unit" and what level of automation was engaged at the time of the crash, but it does not require details about system performance or cause. Many states simply have no tailored reporting rules at all. This uneven landscape makes it nearly impossible to evaluate safety across jurisdictions and creates uncertainty for AV companies that are considering expanding across the country.

In 2021, the NHTSA took a modest step toward correcting this with a rule that required crash reports for certain automated systems.[18] However, a 2025 amendment to this rule greatly narrowed those requirements, eliminating mandatory reporting for minor property-damage and allowing companies to shield key information – such as the software type, the conditions the vehicle was driving in, and even a plain language description of the crash – by classifying it as "confidential business information."[19] Many of these details are used by researchers and local officials to evaluate how AVs behave in real-world conditions, and allowing companies to redact them enables continued opacity rather than public accountability.

Lacking robust federal reporting requirements, some companies have taken it upon themselves to publish their own proprietary data, such as Waymo's recent data release.[20] Yet, because reporting requirements are not standardized, safety performance reports from individual companies can offer a curated narrative rather than a basis for objective comparison, reinforcing the need for a centralized and enforceable federal framework for AV safety data.

A UNIFIED FEDERAL REPORTING STANDARD

The good news is that the United States already has the tools it needs to build this framework. FIRST has shown how to make safety data intuitive and accessible to the public; California has shown how to collect rich, incident-level data useful to researchers; and companies like Waymo have demonstrated a willingness to disclose performance data. But no system does all three, and none of these models are nationally mandated or built for comparative analysis. The result is a fragmented landscape that satisfies neither researchers nor the communities being asked to adopt this technology.

PPI supports replacing the existing state patchwork with a new, unified federal AV data reporting standard for fully autonomous vehicles — meaning that those do not require a human operator in the vehicle — built on two layers. First, a foundation of comprehensive data made available to researchers, experts, and regulators that carries forward the country's culture of data-driven safety reforms. Second, an accessible, publicly available data platform that builds trust in both AV technologies and the regulatory process. The design balances confidentiality, privacy, and reporting burden to preserve flexibility and innovation. Building

on California's collision reporting practices and NHTSA's FIRST, it lets the public see clear rates and make comparisons while experts can access detail needed for oversight.

Comprehensive, standardized data is the foundation for effective regulation. A new federal standard needs to collect metrics like automated-mode vehicle miles traveled, hours traveled, fleet size, and contextual data like road type and environmental conditions. Less severe incidents, like hard-braking events, cut-ins, and intersection blockages, should still be reported, but only as monthly or quarterly aggregates, as long as they remain below a safe threshold. Stricter data reporting practices and corrective plans could be temporarily required for companies whose vehicles rise above these thresholds. Access to the most granular data would be limited to regulators and approved researchers, alleviating confidentiality concerns while still ensuring rigorous oversight. And because data would be collected under one standard, it would be easily comparable — a significant challenge under today's state rules.

The public-facing FIRST-AV platform would show key AV metrics in an accessible format. Instead of being forced to sift through individual incident reports and raw data logs, the public would see high-level rates and summaries of performance. For example, FIRST-AV could display total miles driven and incidents per million miles (or similar normalized rates) for AVs, broken down by relevant factors like road type or environmental conditions. Other statistics, such as hours in operation, number of trips, and fleet sizes, might also be included, all updated quarterly. Presenting the data as averages and trend lines, rather than raw numbers, would make it easily understandable to any reader without wading into technical details.

This tiered approach is designed to both protect public safety and encourage innovation. Total transparency in the form of massive unfiltered "data dumps" could chill innovation and rollout as companies move to protect their trade secrets from being exposed to competitors. On the other hand, overly broad carveouts to protect proprietary information become a shield against real safety concerns and leave regulators in the dark. This approach strikes a middle ground, making innovation easier while providing both the public and regulators with appropriate information.

A robust federal data reporting standard (and its FIRST-AV transparency tool) would not only aid regulators and the public, but also deliver tangible benefits to the autonomous vehicle industry. First, transparency bolsters trust, which is essential for broader AV adoption. By openly demonstrating strong safety records through credible data, companies can reduce public resistance to expanding AV services. Second, a single nationwide reporting framework could simplify compliance and provide certainty if federal policymakers choose to preempt onerous state requirements or bans. Today's tangle of state-by-state requirements creates a burden for companies and diverts resources away from innovation. In practice, a single federal framework means lower administrative costs, as firms can focus on meeting one standard instead of juggling multiple data regimes.

As Congress works on this year's surface transportation reauthorization bill, it has a timely opportunity to bolster public confidence

in autonomous vehicles and provide the industry the regulatory predictability needed for long-term adoption. By committing to our two-tiered federal framework, Congress can shift the national conversation from speculation to evidence and give policymakers and communities the tools to truly judge AV performance.

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