

HIT THE ROAD, MAC: THE FUTURE OF SELF-DRIVING CARS

HEARING

BEFORE THE

COMMITTEE ON COMMERCE,
SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE

ONE HUNDRED NINETEENTH CONGRESS

SECOND SESSION

FEBRUARY 4, 2026

Printed for the use of the Committee on Commerce, Science, and Transportation



Available online: <http://www.govinfo.gov>

U.S. GOVERNMENT PUBLISHING OFFICE

64–347 PDF

WASHINGTON : 2026

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED NINETEENTH CONGRESS

SECOND SESSION

TED CRUZ, Texas, *Chairman*

JOHN THUNE, South Dakota	MARIA CANTWELL, Washington, <i>Ranking</i>
ROGER WICKER, Mississippi	AMY KLOBUCHAR, Minnesota
DEB FISCHER, Nebraska	BRIAN SCHATZ, Hawaii
JERRY MORAN, Kansas	EDWARD MARKEY, Massachusetts
DAN SULLIVAN, Alaska	GARY PETERS, Michigan
MARSHA BLACKBURN, Tennessee	TAMMY BALDWIN, Wisconsin
TODD YOUNG, Indiana	TAMMY DUCKWORTH, Illinois
TED BUDD, North Carolina	JACKY ROSEN, Nevada
ERIC SCHMITT, Missouri	BEN RAY LUJAN, New Mexico
JOHN CURTIS, Utah	JOHN HICKENLOOPER, Colorado
BERNIE MORENO, Ohio	JOHN FETTERMAN, Pennsylvania
TIM SHEEHY, Montana	ANDY KIM, New Jersey
SHELLEY MOORE CAPITO, West Virginia	LISA BLUNT ROCHESTER, Delaware
CYNTHIA LUMMIS, Wyoming	

BRAD GRANTZ, *Republican Staff Director*

NICOLE CHRISTUS, *Republican Deputy Staff Director*

LILA HARPER HELMS, *Staff Director*

MELISSA PORTER, *Deputy Staff Director*

CONTENTS

Hearing held on February 4, 2026	Page 1
Statement of Senator Cruz	1
Letter dated February 2, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Ken McLeod, Policy Director, The League of American Bicyclists	46
Letter dated February 3, 2026 to Senator Ted Cruz and Senator Maria Cantwell from Stefani Pashman, Chief Executive Officer, Allegheny Con- ference on Community Development	47
Letter dated February 4, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from members of the Consortium for Constituents with Disabilities (CCD) ..	48
Letter dated February 4, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Daniel Greene, Senior Director of Consumer Protection & Product Safety, The National Consumers League	52
Letter dated February 2, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Leah Shahum, Executive Director, Vision Zero Network	52
Letter dated February 3, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from members of the <i>United for Autonomy</i> coalition	53
Letter dated February 4, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from UVEye	54
Letter dated February 3, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Stacey D. Stewart, Chief Executive Officer, Mothers Against Drunk Driving (MADD)	55
Letter dated February 2, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Jacqueline Claudia, Executive Director, The White Line	56
Letter dated February 4, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from William Wallace, Director, Safety Advocacy; and Cooper Lohr, Senior Policy Analyst, Transportation and Safety, Consumer Reports	56
Letter dated January 30, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Alyssa Y. Tsuchiya, Director of Policy and Government Affairs, Clean Transportation Program, Union of Concerned Scientists	58
Letter dated February 4, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Christine Zinner, Federal Research and Advocacy Director, Alliance for Justice; Salena Zellers Schmidtke, Biomedical Engineer, BioInjury LLC; Michael Brooks, Executive Director, Center for Auto Safety; Joanne Doroshov, Executive Director, Center for Justice & Democracy; Courtney Griffin, Director of Consumer Product Safety, Consumer Federation of America; Rosemary Shahan, President, Consumers for Auto Reliability and Safety; Maeve Elise Brown, Executive Director, Housing and Economic Rights Advocates; Amber Rollins, Director, Kids and Car Safety; Ken McLeod, Policy Director, The League of American Bicyclists; Christine Hines, Senior Policy Director, National Association of Consumer Advocates; Robert Weissman, Co-President, Public Citizen; Joan Claybrook, President Emeritus, Public Citizen; Sean Kane, President, Safety Research & Strate- gies; Jennifer Smith, President, StopDistractions.org; Zach Cahalan, Execu- tive Director, Truck Safety Coalition, Citizens for Reliable and Safe High- ways, Parents Against Tired Truckers	59
Letter dated February 3, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Clarence E. Anthony, CEO and Executive Director, National League of Cities	61
Letter dated February 3, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Catherine Chase, President, Advocates for Highway and Auto Safety ..	62

IV

	Page
Letter dated February 3, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Advocates for Highway and Auto Safety, America Walks, American Academy of Pediatrics, Center for Auto Safety, Citizens for Reliable and Safe Highways (CRASH), Consumers for Auto Reliability and Safety, Disability Rights Education and Defense Fund (DREDF), GreenLatinos, Kids and Car Safety, League of American Bicyclists, Northern Virginia Families for Safe Streets, Parents Against Tired Truckers (P.A.T.T.), SMARTER, Inc. (the Skilled Motorcyclist Association—Responsible, Trained, and Educated Riders, Inc.), Stopdistractions.org, Trauma Foundation, and Truck Safety Coalition	72
Letter dated January 30, 2026 to Senator Ted Cruz and Senator Maria Cantwell from Sam A. Cabral, International President, International Union of Police Associations	74
Letter dated February 2, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Claire Stanley, J.D., Director of Advocacy and Governmental Affairs, American Council of the Blind	75
Letter dated February 2, 2026 to Hon. Ted Cruz and Hon. Maria Cantwell from Stephen Lieberman, Senior Director, Advocacy and Policy, United Spinal Association	76
Statement of Senator Cantwell	3
Statement of Senator Blackburn	34
Statement of Senator Peters	36
Article dated December 2, 2025 from <i>The New York Times</i> entitled, “The Data on Self-Driving Cars Is Clear. We Have to Change Course.” by Jonathan Slotkin	37
Statement of Senator Curtis	40
Statement of Senator Kim	77
Statement of Senator Moreno	79
Statement of Senator Luján	81
Statement of Senator Schmitt	84
Statement of Senator Markey	86
Statement of Senator Lummis	88
Statement of Senator Duckworth	90
Statement of Senator Young	93
Statement of Senator Rosen	95
Statement of Senator Fetterman	97
WITNESSES	
Lars Moravy, Vice President of Vehicle Engineering, Tesla	5
Prepared statement	6
Dr. Mauricio Peña, Chief Safety Officer, Waymo	9
Prepared statement	11
Jeff Farrah, Chief Executive Officer, Autonomous Vehicle Industry Association	14
Prepared statement	16
Dr. Bryan Walker Smith, Associate Professor of Law, University of South Carolina	30
Prepared statement	31
APPENDIX	
Response to written question submitted to Lars Moravy by:	
Hon. Amy Klobuchar	101
Hon. Tammy Baldwin	101
Hon. Tammy Duckworth	101
Response to written questions submitted to Dr. Mauricio Peña by:	
Hon. Amy Klobuchar	104
Hon. Tammy Baldwin	105
Hon. Jacky Rosen	106
Hon. Lisa Blunt Rochester	108
Hon. Tammy Duckworth	108
Response to written questions submitted to Jeff Farrah by:	
Hon. Tammy Duckworth	115
Hon. Amy Klobuchar	117
Hon. Lisa Blunt Rochester	120
Hon. Tim Sheehy	121
Response to written questions submitted to Dr. Bryant Walker Smith by:	
Senators Klobuchar, Duckworth, Blunt Rochester	123

HIT THE ROAD, MAC: THE FUTURE OF SELF-DRIVING CARS

WEDNESDAY, FEBRUARY 4, 2026

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The Committee met, pursuant to notice, at 10:03 a.m., in room SR-253, Russell Senate Office Building, Hon. Ted Cruz, Chairman of the Committee, presiding.

Present: Senators Cruz [presiding], Fischer, Blackburn, Young, Schmitt, Curtis, Moreno, Sheehy, Capito, Lummis, Cantwell, Klobuchar, Markey, Peters, Duckworth, Rosen, Luján, Fetterman, and Kim.

OPENING STATEMENT OF HON. TED CRUZ, U.S. SENATOR FROM TEXAS

The CHAIRMAN. Good morning. The Senate Committee on Commerce, Science, and Transportation will come to order.

America is at a crossroads in transportation policy. Autonomous vehicles, or AVs for short, are no longer theoretical. Like it or not, they are here, and they will be central to the future of roadways. AVs are now providing mobility to the disabled, improving auto safety, and advancing technologies that have the potential to save millions of wasted hours in traffic, and even more importantly, to save tens of thousands of American lives. Yet, Congress has failed to establish a clear Federal framework to govern AV deployment. That inaction is no longer neutral. It is unsafe.

Without Federal oversight, we risk a fragmented patchwork of State laws that could undermine safety, innovation, and American competitiveness. As we consider a Surface Transportation reauthorization bill, it is imperative that Congress act now to create a national standard for AVs. Even as some states seemingly wish to put up metaphorical roadblocks to AVs, other states are smartly getting into the fast lane. My home state of Texas understands that clear rules enable growth, investment, and safety. In Texas, AVs are moving freight on some highways and operating as taxis in cities like Austin, but AVs can't just stop at Texas' border.

We should be clear about the resistance to Federal action. Some insurance interests and advocacy groups argue against national standards, often under the banner of safety, while opposing reforms that would modernize our system. The vast majority of automobile accidents and crashes are from human error, but lower accident rates challenge business models built on high premiums driven by preventable collisions. The reality is this: the overwhelming causes

of roadway fatalities today are drunk driving and distracted driving. Autonomous technologies never drive drunk. Autonomous technologies, they don't text while driving. They don't change the radio station. They don't drop their sunglasses and look for them while driving down the freeway. Expanding AV deployment offers real, measurable opportunities to reduce these deadly behaviors and to improve safety on our highways.

If we want to save lives and avoid tragedy for almost 40,000 families each year, we don't need lawmakers saddling automakers with expensive junk mandates that make little to no real difference. Instead, we should follow the data, follow the evidence, which increasingly shows advanced AVs reduce crashes and prevent serious injuries. We need a consistent Federal framework to ensure uniform safety standards, liability, clarity, and consumer confidence.

Uncertainty benefits no one, not drivers, not manufacturers, and not State and local officials responsible for public safety. Some, but not all, insurers are responding to the data. Companies like Lemonade have lower premiums for vehicles using full self-driving mode, reflecting growing confidence and growing evidence that these systems reduce risk. The numbers confirm what many already see: technology designed to reduce human error makes roads safer. Let's also acknowledge that the technological progress from AVs won't endanger jobs. It will ultimately create them. AVs require American engineers, software developers, safety technicians, mechanics, manufacturing workers, and infrastructure specialists. AV deployment can support new, high-skilled jobs built in the United States by American workers. Moreover, AVs can make people more productive and traffic more bearable.

If Congress fails to act, we're not going to stop innovation. We'll simply push it elsewhere. China is moving aggressively to deploy autonomous transportation at scale. The technologies at stake were developed in the United States. They can be built by American workers, and they should be governed by American safety standards. A patchwork approach puts that leadership at risk.

Finally, let me be clear about one other thing. The American consumer will decide what they choose to drive. No one is and no one should be mandating AVs. This isn't like Biden's de facto mandate killing the gas-powered car, but government inaction should not deny consumers access to be able to choose safer options. A Federal framework for autonomous vehicles is not about picking winners. It's about setting clear rules, improving safety, creating American jobs, and ensuring that states like Texas can continue to lead. Surface reauthorization is the moment for Congress to act.

I'll now turn to Ranking Member Cantwell for her remarks.

**STATEMENT OF HON. MARIA CANTWELL,
U.S. SENATOR FROM WASHINGTON**

Senator CANTWELL. Thank you, Mr. Chairman. I think you know I certainly want to get the Surface Transportation bill done. I think I've mentioned it as my number one priority since your taking over the Committee, so I hope we will get to that. I don't know whether this kind of legislation is the appropriate place for that, but I do know that nearly 40,000 people die on the roads each year, and, thankfully, we have seen how innovation in vehicle technology can

make human drivers safer on the roads. For instance, automatic emergency braking technology has been shown to reduce injuries from rear collisions by 60 percent. These technologies are saving lives today.

Fully autonomous vehicles offer the potential to reduce crashes on roads, but we have seen the risk of letting companies beta test on our roads with no guardrails. In 2024, a report from NHTSA linked Tesla's autopilot to hundreds of crashes, including at least 13 fatal crashes and many more injuries. Safety advocates have linked 65 fatalities to Tesla's automated technologies. These tragedies have occurred in my state. In April 2024, Jeffrey Nissen from Stanwood, Washington, was killed when Tesla's autopilot system failed to recognize his stopped motorcycle. Tesla was allowed to market their technology, which they knew needed human supervision as autopilot because there were no Federal guardrails. In fact, it was the state of California, not the Federal Government, that forced Tesla to change its marketing or lose the ability to sell in that state.

So, I do believe that Federal agencies have a role, but what's happened so far is the Trump administration has tried to gut NHTSA. The Federal agency that is responsible for ensuring the safety of vehicles, he basically, and efforts of DOGE, lost 25 percent of their employees. I would say at this point in time, it's trying to figure out what are the latest and greatest technologies, and the people that understand them and can do appropriate oversight, not basically gut the Agency. At one point last year, the Office of Automation just had four people. Four people. Four people. I don't even know if they knew about automation, but only four people. Fewer resources mean less enforcement.

NHTSA launched 41 percent fewer recall investigations last year than in 2024. NHTSA recalls protect consumers. For instance, over 67 million Takata airbag inflators have been recalled in the U.S. after NHTSA confirmed that 28 people were killed when defective airbags exploded. Chrysler recalled 2.7 million vehicles after 51 people died in fires from gas tank ruptures and rear-end collisions. And I have a suspicion right now that a lot of repair dealers are installing faulty airbags from Chinese manufacturers that are failing to protect consumers. And where is NHTSA in protecting and finding out what is happening with these faulty airbags? Are we going to just continue to let people die in the United States?

Without strong Federal oversight, it is no wonder states are seeking to fill the void. You will hear today from witnesses that believe that the best way for the Federal Government to keep people safe is through a safety case for autonomous vehicles. Companies may try to reassure us that the safety case is a living, breathing document, but I have my own experience having seen this played out in the aviation sector, and all I can tell you is strong oversight is needed. Why? Because the best engineers working on the best safety is going to deliver the best product and the best economies for us, in addition to the best safety, so we cannot just rely on a checklist.

I do agree, Mr. Chairman, we need a new approach. I'm happy to work with you on that approach. I have—you know, industry proposals seek to force autonomous vehicles into the existing

framework of the Motor Vehicle Safety Act. This is the 60th anniversary of that law. The Federal Motor Safety Standards has prevented over 18 million crashes. However, the Federal Motor Safety Standards were designed to regulate bumpers, and car doors, and seat belts, and a variety of things that they're not on top of today. The law was passed 20 years before the first Windows computer was ever sold, so it's time for us to get a NHTSA that understands technology and knows what to do with it. This revolutionary technology needs a new approach to safety that provides for flexible guardrails for beta testing and a clear path to safe commercial deployment. It needs to have an educated, as I just mentioned, strong safety oversight from officials and the resources to make it the gold standard, just like we need in aviation.

I did find interesting the House debate on this similar hearing in which California Teamsters, basically, came out and called for a Waymo ban in which a lot of anxiety existed. Really, Mr. Chairman, underneath was the fact that a law most people were concerned about was somehow going to allow very large trucks to exist on our highways in automated vehicles. That seems to be the real crux of the issue, so just like everything else, the devil is in the details. The devil is in the details of how we get here. I noticed that after that hearing, that, again, Teamsters, safety advocates, even insurers, found fault with a preemptive strategy that was unclear. I think we're going to hear from Professor Smith about that.

I think the last point of your statement is that—well, I like two lines in your statement, “and people dying today not because we are careful about automated driving, but rather because we are careless about the safety generally,” and the notion that you—further quoting you, “I have read many versions of potential preemptive language.” In every case, the preemptive effect and even the preemptive intent of that language has been unclear to me.

OK, so we're dealing with this in AI, and I do think we have to talk about the overlay of AI and AV, and how that's going to work. And if we're going to have a preemptive strategy, then it has to be a real law, and it has to have real teeth, and we have to understand exactly what we're doing. But please understand, many Americans, including Teamsters, are very anxious about how this plays out for them, how this plays out for very large trucks, and how we move forward on advancing both the safety regime that we need here and to continue to be leaders. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you. I'd now like to introduce our witnesses for today. Our first witness is Lars Moravy, the Vice President of Vehicle Engineering at Tesla. Mr. Moravy oversees the design, testing, and engineering at Tesla and brings more than a decade of hands-on experience, or, more precisely, hands-off experience with automotive technology and vehicle safety. I will also note that I understand it's Mr. Moravy's birthday, so happy birthday, and to celebrate, we decided to hold a hearing. Our second witness is Mauricio Peña, the Chief Safety Officer for Waymo. In this role, he leads Waymo's comprehensive safety efforts, and brings decades of experience designing, testing, and deploying complex safety critical systems across the aerospace and autonomous vehicle sectors.

Our third witness is Jeff Farrah, the Chief Executive Officer of the Autonomous Vehicle Industry Association. He represents com-

panies across the autonomous vehicle sector, including technology, trucking, ride sharing, and automotive. Our final witness is Bryant Walker Smith. He is an Associate Professor of Law in the Joseph F. Rice School of Law at the University of South Carolina, where he researches emerging transportation technologies and teaches product liability, torts, and transportation law.

Mr. Moravy, we'll start with you. You're recognized for your opening statement.

STATEMENT OF LARS MORAVY, VICE PRESIDENT OF VEHICLE ENGINEERING, TESLA

Mr. MORAVY. Thank you, Chairman Cruz, Ranking Member Cantwell, and the members of the Committee for the opportunity to appear before you today. My name is Lars Moravy, and I am the vice president of vehicle engineering at Tesla. Over the past 15 years, I've had the privilege of engineering the best cars in the world in a uniquely innovative way. In my role, I lead a team of over 6,000 engineers, technicians, and analysts who work tirelessly to make vehicles, batteries, machines, and other products that people love. I oversee our vehicle design, automation, and product manufacturing processes. My team and I develop new systems to ensure the quality, reliability, and performance of these products. I'm incredibly proud of the work we do.

At Tesla, we believe autonomous vehicles are the future. AVs present an opportunity to significantly improve safety on the road and enhance accessibility to transportation for all Americans. AVs also provide an opportunity for the U.S. to create jobs and reassert its dominance in advanced manufacturing for the 21st century. U.S. automobile manufacturing was once a tremendous strength of this country, and Tesla believes it can be once again. In the face of an unprecedented global challenge, we as a country need to lead the way in AV innovation to make that a reality. Tesla's manufacturing footprint spans 52 million square feet across the country, making the U.S. one of the largest and most advanced electric vehicle production hubs in the world. Our Giga Texas headquarters alone is over 11.5 million square feet and ranks among the largest manufacturing buildings in the world.

We know that the future of vehicle manufacturing largely depends on investments made now, which is why we are doing everything we can to ensure that the U.S. is an industry leader for AVs and EVs. We believe that AVs can fundamentally reshape how we travel. At Tesla, we are relentlessly innovating to iterate and expand mobility, independence, and access for everyone. For example, our vehicles used in the autonomous driving services, or robotaxis, are designed to support various accessibility needs, such as screen readers and room for service animals. But we also understand that safety is paramount. At Tesla, safety has always come first. Human behavior is one of the leading causes of accidents, as drivers may be inattentive, distracted, speeding or impaired, and by removing this human distraction from the equation, AVs will dramatically cut accident rates.

We believe AVs are the next big jump in vehicle safety on our roads. We design our vehicles to exceed all relevant safety standards, and we're taking safety even further by pioneering AV tech-

nology designed to reduce collisions and save lives. Building on our industry-leading crash protection, active safety systems, and over-the-air safety improvements, we are developing advanced AV features to continuously improve performance. We work tirelessly to bring the safest cars to the market today and to leverage technology and ingenuity to create the safest cars of tomorrow. That's the reason my wife and I put our children in the back of a Tesla every day when we bring them to school because I know that the safety of our vehicles is second to none.

For America to lead in AV technology, we must modernize regulations that inhibit the industry's ability to innovate. Federal regulations for vehicles have not kept up with the pace of the rapid evolution of technology. Many standards were implemented decades ago and do not adequately address modern advancements, such as electric drivetrains, automated driving systems, and over-the-air software updates. We need American leadership for AV rules and regulations. NHTSA has the opportunity to set the standard not just in America, but in the world. To do so, Congress must take steps to modernize so NHTSA is equipped to address the realities of this new frontier. For America to maintain its position in global technological development and grow its advanced manufacturing capabilities, we must enact a Federal framework for the development and the deployment of AVs.

The Committee has the opportunity to position NHTSA as a global gold standard for AV development, and to do so, Congress must advance this Federal legislation so that these regulators are equipped to address the realities of a new frontier and innovators like ourselves have a clear direction forward. Just as the U.S. has historically led transformative technologies that reshaped global markets and enabled America to assert dominance in ways beyond mere transportation, it must now lead in the development of AVs. Tesla is committed to collaborating with Congress to create smarter, effective regulations that drive progress, increase safety, and make mobility accessible to all.

Thank you for the opportunity to testify today. I look forward to questions about Tesla's role in advancing the American AV industry.

[The prepared statement of Mr. Moravy follows:]

PREPARED STATEMENT OF LARS MORAVY, VICE PRESIDENT OF VEHICLE ENGINEERING,
TESLA

Chairman Cruz, Ranking Member Cantwell, and members of the Committee, thank you for the opportunity to appear before you today. My name is Lars Moravy, and I am the Vice President of Vehicle Engineering at Tesla. I fell in love with designing and building cars at the age of 16, when my brother and I spent a summer restoring a Volvo that had been sitting in my grandparents' barn for years. This love for building cars led me to a career in the car industry, and, in 2010, it led me to Tesla when I jumped at the opportunity to build the best cars in the world in an innovative way.

For the past 15 years, I have been doing just that. In my current role, I lead a team of over 6,000 engineers, technicians, and analysts who work tirelessly to make vehicles that people love. At Tesla, I oversee our vehicle design, automation, and manufacturing processes, and I develop new systems to ensure quality, reliability, and performance. I am incredibly proud of the work that we do each day.

I am excited to speak to you today about autonomous vehicles ("AVs"). Tesla believes that autonomous driving technology is the future, and we work every day to lead the transition to safer and more affordable transportation through autonomy.

Our teams are focused on designing, testing, and refining these systems through continuous innovation and a strong focus on real-world performance. AVs present an opportunity to significantly improve safety across our roadways. Moreover, this juncture in history is an opportunity for the United States to reassert its dominance in not just automobile manufacturing but advanced manufacturing for the 21st century. U.S. automobile manufacturing was once a tremendous strength of this country, and Tesla believes it can be once again. In the face of unprecedented global challenges, we as a country need to lead the way in AV innovation to make that a reality.

About Tesla and Our Vehicles

Founded in 2003 and headquartered in Austin, Texas, Tesla designs and manufactures electric vehicles, battery energy storage systems, solar products, and technologies that make clean energy accessible and affordable. As a proud American manufacturer with over 100,000 employees, our teams design, build, sell, and service our products in-house. We work every day to make technologically advanced products that are affordable and available at scale right here in the United States.

At inception, Tesla's mission was to accelerate the world's transition to sustainable energy through the development of electric vehicles. Since then, we have redefined the automotive industry by proving that electric vehicles can deliver superior safety, exceptional performance, and cutting-edge technology, all at scale. We have driven down the cost over the past decade, making these vehicles available to more and more Americans who want them. Today, Tesla's mission statement has evolved to building a world of amazing abundance. Realizing the vision of amazing abundance requires that the U.S. lead the world in advanced manufacturing and implement forward-thinking policies.

Tesla's manufacturing footprint spans approximately 52 million square feet across the country, making the U.S. one of the largest and most advanced production hubs in the world. Our Giga Texas headquarters alone is over 11.5 million square feet and ranks among the largest manufacturing buildings in the country. We know that the future of vehicle manufacturing is largely dependent on the investments made now, which is why we are doing everything we can to ensure that the U.S. is the industry leader for AVs and vehicles generally. Research has shown that widespread adoption of AVs could generate over three million new jobs by 2035, reduce delivery and consumer costs, and boost annual earnings for the average U.S. worker.¹ Studies show that the workforce needed to produce and maintain AVs could reach 455,000, which would provide incredible job opportunity to Americans with varied backgrounds and experiences. We at Tesla are not currently just in a race to develop the best AV in the world—we are in a race to ensure continued American leadership in one of this Nation's bedrock industries.

Our entry-level models are among the most competitively priced in the U.S. market for their range and technology. Our Model Y is the best-selling single vehicle model in the world. Four of the top five ranked U.S.-made vehicles in 2025 were Teslas, and Tesla has taken the top position as the best American-made vehicle since 2021.² We are proud and humbled that people want the cars we make. Our products are not only safe, fun to drive, and filled with cutting edge technology—they are responsibly sourced and manufactured right here in the U.S.

Now we are further accelerating our mission—and impact—through autonomy. Tesla is working to lead the way in autonomous vehicle development, creating vehicles that perform all driving functions, under all roadway and environmental conditions, without any need for human intervention.

The manufacturing and development of fully autonomous vehicles represents a major opportunity to create high-skilled American jobs across multiple industries. By driving America-first innovation, Tesla is working to ensure that the technology of the future is developed and built in the U.S. and deployed globally. We believe that AVs can fundamentally reshape how we travel and that the U.S. can be the leader in this next frontier—an autonomous future that is accessible to everyone. For example, vehicles used in our autonomous driving service, Robotaxi, are designed to support various accessibility needs, including room for service animals, screen readers, app-based verbal location assistance, and information available in

¹See *Securing America's Future Energy, America's Workforce and the Self-Driving Future* 9 (2018), https://avworkforce.secureenergy.org/wp-content/uploads/2018/06/SAFE_AV_Policy_Brief.pdf; see also *Opportunity AV: How Many and What Types of Jobs Will Be Created by Autonomous Vehicles?*, Chamber of Progress (Mar. 2023), <https://progresschamber.org/wp-content/uploads/2024/03/Opportunity-AV-How-Many-and-What-Type-of-Jobs-Will-Be-Created-by-Autonomous-Vehicles.pdf>.

²*American Made Index, Cars*, <https://www.cars.com/american-made-index/>.

29 languages.³ We are relentlessly innovating and iterating to expand mobility, independence, and access to opportunity for everyone.

Safety

AVs won't just make transportation more accessible to everyone; they will dramatically improve the safety, efficiency, and sustainability of car travel. The United States is experiencing what the Department of Transportation has described as a "national crisis" in motor vehicle safety. Motor vehicle fatalities and injuries increased in frequency in 2020–2021 after 30 years of steady reduction, notwithstanding steady improvements in vehicle safety design. At Tesla we fundamentally reject the disturbing trend that almost 40,000 traffic related fatalities occur each year.⁴ Increased cell phone usage in the past decade has created enormous potential for deaths and injuries on U.S. roads. In 2023 alone, 3,908 people were killed in motor vehicle crashes involving distracted drivers or drowsy drivers.⁵ Sending or reading a text takes drivers' eyes off the road for 5 seconds—at 55 mph, that is comparable to driving the length of an entire football field with your eyes closed.⁶ Our teams work tirelessly to address this epidemic by developing our automated driving systems and designing the safest vehicles from the ground up. AVs promise an innovative and proven technology that can eliminate collisions, injuries, and fatalities associated with high-risk human behavior.

Safety maximization is at the center of every product we build. We design each vehicle to exceed the standards of each safety category, redefining what safety on our roads should look like to achieve superior occupant protection. And we're taking safety even further by developing AV technology designed to drastically reduce accidents and save lives. Tesla is achieving this by building upon our industry-leading passive and active safety systems by building an end-to-end neural network that uses real-time data and over-the-air updates to continuously improve performance. Our vision is a future where AVs eliminate human error—the leading cause of traffic fatalities—while providing more affordable, efficient, and sustainable transportation for all.

Tesla's Robotaxi software stack, Full Self-Driving (Unsupervised) ("FSD Unsupervised") is trained using over 6.5 billion miles of real-world driving. FSD (Unsupervised) is an evolution of our industry leading Level 2 advanced driver-assistance system ("ADAS"), Full Self-Driving (Supervised) ("FSD Supervised"). Unlike Level 2 FSD (Supervised), Level 4 FSD (Unsupervised) performs the entire dynamic driving task and does not require an active and attentive human driver.

With FSD (Supervised) data as the foundation of our training technology for fully autonomous operations, we are able to achieve a greater level of roadway safety. FSD (Supervised)'s current performance has already demonstrated how much safer roadways can be with automated driving systems. For example, Tesla vehicles with FSD (Supervised) engaged drive on average 5.1 million miles before a major collision and 1.5 million miles before a minor collision. This is compared to U.S. averages of 699,000 miles and 229,000 miles, respectively.⁷ This seven-fold improvement in real-world performance is achieved in the broadest range of driving environments and road conditions, which in turn gives FSD (Supervised) the most miles driven and the broadest exposure to road, traffic, and weather conditions accumulated by any ADAS available to consumers today. Fully autonomous vehicles will only further these compelling safety statistics on American roadways.

Recent developments in the insurance industry offer an independent validation of the safety benefits associated with autonomous driving. In January, Lemonade, an insurance company, announced that it is reducing per-mile insurance rates for Tesla vehicles by approximately 50 percent when FSD is engaged, citing data that shows a significantly lower accident risk during autonomous operation. Lemonade's decision was not based on projections or theory; it was based on data demonstrating that FSD (Supervised) driven miles are much safer than human-driven miles.⁸

We are closer to a future of AVs than ever before. As discussed below, clear, modernized standards are essential to advancing safety, innovation, and consumer

³ *Get Started with Robotaxi*, Tesla, <https://www.tesla.com/support/robotaxi/getting-started>.

⁴ *NHTSA Estimates 39,345 Traffic Fatalities in 2024*, NHTSA (Apr. 8, 2025), <https://www.nhtsa.gov/press-releases/nhtsa-estimates-39345-traffic-fatalities-2024>.

⁵ *Distracted Driving*, NHTSA, <https://www.nhtsa.gov/risky-driving/distracted-driving;see%20also%20Drowsy%20Driving>, NHTSA, <https://www.nhtsa.gov/risky-driving/drowsy-driving>.

⁶ *Id.*

⁷ *Vehicle Safety Report*, Tesla, <https://www.tesla.com/fsd/safety>.

⁸ See Abhirup Roy, *Lemonade to cut insurance rates for Tesla drivers in endorsement of EV maker's software technology*, Reuters (Jan. 21, 2026), <https://www.reuters.com/business/autos-transportation/lemonade-halve-tesla-insurance-rates-miles-driven-with-software-assistant-2026-01-21/>.

choice in the automotive industry. How we develop and use autonomy—and the new capabilities it makes available to us—should be informed by its ability to enhance the human condition. Delivering abundance for all through autonomous technology is our goal. The number one factor when a consumer purchases a new car is safety. At Tesla, we not only bring the safest cars to market today but look toward the future to build the safest cars of tomorrow. That’s the reason my wife and I put our children in the back of a Tesla every day to drive them to school—because I know that the safety of our vehicles is second to none.

The Importance of Modernizing Regulations

For the U.S. to maintain its position as a leader in the automotive industry, and to cement our leadership in AV technology, we must modernize regulations that inhibit industry’s ability to innovate. If the U.S. does not lead in AV development, other nations—particularly China—will shape the technology, standards, and global market. And perhaps more importantly, China will be the dominant manufacturer of transportation for the 21st Century. The U.S. led the 20th century in sophisticated manufacturing by pioneering automobile and aircraft manufacturing because the U.S. led with advanced highway and air travel certifications. At Tesla, we are moving at the speed of technological innovation to combat the national crisis on our roadways, but we need Congress’s leadership to ensure a regulatory regime that supports progress, not impedes it. We urge Congress to ensure American leadership in manufacturing for the 21st century by enacting Federal legislation to unlock AV technology and address outdated regulations.

When the U.S. established the Federal Aviation Administration (“FAA”) in 1958 to improve and maintain safety standards, it gave innovators the framework needed to help Americans lead the world in aircraft development and commercial flight and make the U.S. the global gold standard for aviation. We now have the same opportunity with surface transportation. By empowering the U.S. Department of Transportation to create clear, national standards for autonomy, we can ensure that American companies—not foreign competitors—define the future of transportation.

Federal safety regulations for vehicles have not kept pace with the rapid evolution of vehicle technology. Many of the current standards were implemented decades ago and do not adequately address modern advancements such as electric drivetrains, automated driving systems, and over-the-air software updates. Modernizing vehicle regulations is essential to ensure they reflect real-world performance, enhance safety, and foster growth of the U.S. automotive industry.

For America to maintain its position in global technology development, we must enact a Federal framework for the deployment of AVs. This Committee has the opportunity to position the National Highway Traffic Safety Administration as the gold standard to lead the effort to unleash autonomy globally. To do so, Congress must advance Federal legislation so that regulators are equipped to address the realities of this new frontier and innovators have clear rules of the road.

Closing

Over the last 15 years, leading a team of world-class engineers to design and deliver groundbreaking electric vehicles that redefine safety, performance, and innovation has been both a privilege and a responsibility I’ve embraced with pride. Every innovation we’ve brought to life reflects our shared commitment to shaping the future of transportation.

Just as the U.S. has historically led transformative technologies that reshaped global transportation and enabled America to extend its leadership beyond transportation, it must now lead in the development of autonomous vehicles. Tesla is committed to collaborating with Congress to create smarter, effective regulations that drive progress, increase safety, make transportation accessible to all, and ensure the United States leads in autonomous vehicle innovation.

Thank you for the opportunity to provide this testimony today. I look forward to your questions about Tesla’s role in advancing the American AV industry.

The CHAIRMAN. Thank you. Dr. Peña, you’re now recognized.

STATEMENT OF DR. MAURICIO PEÑA, CHIEF SAFETY OFFICER, WAYMO

Dr. PEÑA. Chairman Cruz, Ranking Member Cantwell, and members of the Committee, it’s an honor to be here today. My name is Mauricio Peña, and I serve as the Chief Safety Officer at Waymo, America’s leading autonomous driving technology company. Waymo

is the first and only company in the United States to provide fully autonomous trips to the public at scale. That means that no human is behind the wheel. When you ride with Waymo, you can enjoy a safe and reliable ride in a space of your own. Thank you for the opportunity to discuss why autonomous vehicles are not just a technological marvel, but a moral and strategic imperative for the United States.

Tragically, 40,000 people die due to largely preventable traffic crashes on roads across our country every year, with hundreds of thousands more injured, often in life-altering ways. Globally, more than one million lives are lost to traffic collisions annually. That's the equivalent of 20 commercial airliners falling from the sky every single day. These aren't just statistics. They are parents, children, friends, and neighbors. At Waymo, we believe it doesn't have to be this way. Seventeen years ago, Waymo started as a moonshot, born out of a simple but radical idea that we could use technology to eliminate serious injury and death on our roads and make autonomous transportation accessible to people who are unable to drive themselves. Our mission is to be the world's most trusted driver, and achieving this mission starts with safety.

Today, we have driven nearly 200 million fully autonomous miles on public roads and served over 20 million trips to riders. The data shows that our technology, the Waymo Driver, is making roads safer where we operate. Data from our first 127 million fully autonomous miles indicates our Driver is 10 times less likely to be involved in a serious injury or, worse, crash compared to human drivers where we operate, and 12 times less likely to be involved in an injury-causing crash involving a pedestrian. We have developed the most rigorous peer review analysis to conduct apples-to-apples comparisons of human and automated driving data. We have a relentless safety first culture that starts at the top and flows through our rigorous governance processes. Every software update must be approved by our safety board before it ever reaches the road. For us, safety is not a competing priority. It is the foundation for every decision that we make at Waymo.

Today, because of American ingenuity, determination, and investment, AVs are a reality for millions of people. Right now, we operate a fully autonomous commercial ride hailing service for the public in Phoenix, the San Francisco Bay Area, Los Angeles, Austin, Atlanta, and Miami, providing more than 400,000 rides every week. Americans trust us to get them to their destination safely, and I'm inspired by the positive impact that we're making on their lives. Our riders are taking Waymo rides after their weddings, to gain quality time with their families, and even to the hospital to deliver their baby or back home with their newborn. We are there for our riders' most important moments as well as their daily needs.

Waymo is an American success story, but U.S. leadership is not guaranteed. We are locked in a race with Chinese companies for the future of autonomous vehicles. If they win this race, Chinese companies, not the U.S., will set the technical standards for the rest of the world. To win, the U.S. needs a predictable, durable national regulatory framework that sets a high safety standard based on a safety case. Without it, we face a fragmented landscape of

State regulations that foster uncertainty, slow investment, and create unequal access to the technology. To truly deliver on the promise of fully autonomous vehicles, we need Federal leadership, and we need it in this Congress.

Chairman Cruz, and members of the Committee, we share your goal of ensuring a national AV framework is included in the Surface Transportation reauthorization bill. American leadership in autonomous driving technology must be defended. We look forward to working with you to ensure that American safety and American innovation are the gold standard for autonomous driving around the world. Let's not cede the future. Let's lead it. Thank you, and I look forward to your questions.

[The prepared statement of Dr. Peña follows:]

PREPARED STATEMENT OF DR. MAURICIO PEÑA, CHIEF SAFETY OFFICER, WAYMO

Chairman Cruz, Ranking Member Cantwell, and Members of the Committee:

Thank you for the opportunity to testify on the state of the autonomous vehicle (AV) industry and the critical role of Federal leadership in ensuring a safer, more accessible, and more competitive future for American transportation. My name is Mauricio Peña, and I serve as the Chief Safety Officer at Waymo.

I. An American Innovation Success Story

Waymo's mission is to be the world's most trusted driver. Launched in 2009 as a Google moonshot, we were motivated by the belief that autonomous driving technology could improve road safety and eliminate road crashes due to human errors, such as impairment, distraction, and speeding, that contribute to the vast majority of the annual preventable roadway deaths in the United States and around the world.

Today, Waymo is no longer a research project with theoretical benefits. We are a 24/7 scaled commercial reality, carrying riders safely to their destinations with no one behind the wheel. We are already making roads safer in the cities where we operate. Waymo is the first and only company in the world providing fully autonomous, Level 4 trips to the public at scale, with service currently spanning six major U.S. metro areas: Phoenix, San Francisco Bay Area, Los Angeles, Austin, Atlanta, and Miami, with many more to come.

The maturity of our technology—the Waymo Driver—is reflected in our scale, having now completed nearly 200 million fully autonomous miles on public roads. This milestone was achieved entirely without a human behind the wheel. We provide more than 400,000 rides every week, and at the conclusion of 2025, our lifetime total exceeded 20 million trips. These are not just rides; they are essential connections for the people we serve: patients heading to medical appointments, travelers going to the airport, parents picking up their children from soccer practice, and even families bringing newborns home from the hospital. We are there for our riders through their every day moments, both big and small, and are proud to be getting them safely where they need to go.

As Waymo safely scales, we are growing a broad AV industry ecosystem with new businesses that hire workers to support fleets of AVs, including manufacturers that integrate Waymo's technology into base vehicles, mechanics and vehicle technicians who maintain AV fleets, and dispatchers and facilities managers who help run our operations. Our fully autonomous technology is designed and manufactured in Silicon Valley. The vehicles themselves are outfitted with our American-designed hardware and software at our facility in Mesa, Arizona, an investment that has created hundreds of local jobs. In every city we expand to, we create a broad spectrum of new roles, including many that do not require a university degree. We are already on the ground in more than twenty U.S. cities, and together with our partners, we are delivering new career opportunities that support our safe and convenient ride-hailing service.

We recognize that careers in the transportation industry will shift, even as new job opportunities emerge. Some *studies* suggest that 190 jobs will be required for the manufacture and servicing of every 1,000 vehicles. These include 95 in development and production; 30 in distribution; and 65 in maintenance, upgrades and repairs. We are investing in non-traditional pathways to careers in this industry, to ensure the opportunities are available to Americans of all backgrounds. This in-

cludes financial support for educational and skills programs in technical schools, as well as helping fund scholarships for students and working technicians attending programs outside of the traditional four-year college setting.

II. A Proven Safety Record Rooted in Data and Transparency

We are making these investments in America to tackle one of our most pernicious public health problems: the persistent road safety crisis that needlessly claims 40,000 lives annually in this country and more than one million people across the globe. At Waymo, we believe it does not have to be this way.

Our mission is to build the world’s most trusted driver—a goal that begins with a safety culture established at the highest levels of our leadership. We work every day to earn trust with our riders, policymakers, regulators, and partners through our transparent and exceptional safety record. This is the result of years dedicated to refining a comprehensive set of methodologies to assess safety across our technology and operations and ultimately to guide the deployment and safe operations of the Waymo Driver.

Through our operations in major U.S. cities, we are able to observe the proven, positive impact our technology is having on road safety, and we believe we have a moral imperative to pair our technology with ongoing investments in making America’s roads safer for everyone.

We conduct extensive safety comparisons between human and automated driving utilizing peer-reviewed methodology and retrospective analyses, which we then report to the federal Government. We have *found* the Waymo Driver has been involved in 10x fewer serious injury or worse crashes, 12x fewer injury-causing crashes involving a pedestrian, 5x fewer crashes with airbag deployment, and 5x fewer injury-causing crashes compared to human drivers covering the same mileage in the cities we serve, on the same road types, and in the same conditions we operate in.

Our reviews allow us to better understand the safety impact we have in the communities in which we operate, such as better protecting pedestrians and cyclists, or nearly eliminating collisions that occur in intersections. Using this methodology, Waymo regularly publishes *extensive safety data* that demonstrates that the Waymo Driver is meaningfully improving road safety and reducing related damage and injuries in the cities where we operate.

We are also working closely with external partners to learn from the safety performance of our technology. For *example*, we partnered with global reinsurance company Swiss Re to analyze our first 25 million fully autonomous miles, determining the Waymo Driver demonstrated better safety performance compared to human-driven vehicles (including those with ADAS features). Based on this analysis, we estimate that the Waymo Driver reduced property damage claims by 88 percent and bodily injury claims by 92 percent.

III. Determining Readiness Prior to Deployment

Prior to the deployment of driverless operations in a specific location, Waymo implements rigorous evaluation methods—referred to in the aggregate as our Safety Framework—to determine readiness of the Waymo Driver to engage in autonomous driving. We use this holistic approach to evaluate if the Waymo Driver is ready for deployment in a particular automated driving system (ADS) configuration, for a specific Operational Design Domain, and a given mileage scale. There is no single metric or methodology that captures the entire safety performance. Instead, it takes a suite of complementary methodologies—including simulation, real-world driving, and closed-course testing—to analyze and paint a comprehensive picture of the overall safety of the system. We use 12 methodologies that evaluate the autonomous system against a set of internal acceptance criteria. Some of these methodologies are widely-used, traditional safety activities such as Systems Safety, Verification and Validation, and Risk Management, and others are methodologies that Waymo has developed specifically for autonomous driving.

Waymo’s safety case serves an important safety assurance function by pressure testing the assumptions in our various safety methodologies as well as the credibility of the arguments and the evidence supporting those arguments. A safety case is *defined* as “a structured argument, supported by a body of evidence that provides a compelling, comprehensible and valid case that a system is, or will be, adequately safe for a given application in a given environment.” Use of safety cases as a *basis for certification* of complex safety-critical systems is common in several safety critical industries, including aerospace, nuclear, defense, oil and gas, and rail, and safety case methodology is used in many countries including the U.S. It ensures we can have a high degree of confidence that through application of our rigorous safety methodologies we have sufficiently mitigated unreasonable risks posed by the Waymo Driver prior to deployment.

Our safety record is also the result of rigorous internal oversight. We have a robust governance structure with three layers of accountability that culminates in the approval to deploy our vehicles. First, the leads of each of our twelve safety framework methodologies evaluate the system against a set of acceptance criteria within their domains and summarize their findings into a report that is provided to the second layer, our Safety Framework Steering Committee. This cross-functional group of senior leaders aggregate the evaluation results across methodologies and make a recommendation about our deployment to the third layer, the Waymo Safety Board. This Board is composed of the Chief Safety Officer, the Chief Product Officer, and one of our co-CEOs. Together, the body makes the ultimate decision for deployment approval. Without review through this rigorous governance process, we issue no software updates, make no determinations to increase our mileage or fleet scale, and make no updates to the scope of our service territories, among other key decisions.

Recently, Waymo's safety case approach has been independently audited by TÜV SÜD, a global leader in safety testing and certification. Their audit confirmed that Waymo's safety case program adheres to AVSC Best Practices and to the ISO 15026 industry standards, representing the state of the art for safety case assessment and management. Waymo views such independent audits as a fundamental component of our overall safety strategy.

IV. Expanding Mobility Options and the Benefits of AVs

Autonomous vehicles technology, like that offered by Waymo, represent a life-changing advancement for those who currently face significant transportation barriers, including seniors and people with disabilities who cannot obtain a driver's license. For blind and low-vision riders, Waymo provides a reliable, consistent, and independent mobility experience. Because Waymo owns and operates its fleet, we are uniquely positioned to integrate purpose-built accessibility features directly into our product. We believe the benefits of AV technology will reach the broadest number of riders most quickly through shared ride-hailing services like ours. To that end, we have made it a priority to develop inclusive features in partnership with the disability community, such as screen reader support for navigating our app, audio cues for the in-car experience, and custom "car honks" to help riders locate their vehicle at pickup.

V. Strategic Imperative: Winning the Global AV Race

Waymo is a proud American success story, but we are at a critical crossroads. The leadership our country established in the autonomous vehicle sector is now under direct threat. The United States is locked in a global race with Chinese AV companies for the future of autonomous driving, a trillion-dollar industry comparable in strategic importance to flight and space travel. Chinese competitors are scaling rapidly with heavy state support, and—second to Waymo—the largest AV fleets in the world are operated by Chinese AV companies.

The leading Chinese AV startups have tested on U.S. roads already, and are now taking those learnings and using them to bring their technology to other countries across the globe. We have seen reports that Chinese AV companies are moving quickly into international capitals in Europe, the Middle East, and Asia; in some cases, they are partnering with U.S. companies to accelerate their desired dominance. We cannot fall behind when it comes to this American-made technology.

In the absence of U.S. leadership on a national AV legislative framework, Chinese AV competitors will fill the gap and set the safety and technical standards for the rest of the world. The global race will ultimately come down to whether Chinese or American AV companies will drive the rest of the world, and Waymo wants America's innovators to win that race. We support Federal efforts, such as the Department of Commerce's Connected Vehicle rule, to protect our critical infrastructure and ban Chinese AV software in the U.S. starting this year.

VI. A Durable National AV Legislative Framework

We believe Congress has a once-in-a-generation opportunity to secure American leadership in this industry by creating a national AV legislative framework that sets a high safety standard for this industry. Greater certainty will unlock even more investment and prevent bad actors from undermining public trust in this novel, life-changing technology. We share the Committee's goal of ensuring a national AV framework is included in the Surface Transportation Reauthorization bill. This is the vehicle to ensure that the U.S. remains in the driver's seat of innovation.

Our key legislative priorities for national AV framework include:

- *Establishing a national safety baseline:* Require manufacturers to document a robust "safety case" for their automated driving systems, providing evidence of

safe performance of important driving competencies within the system's operational design domain.

- *National Safety Data Repository*: Establish a centralized repository for safety data, such as crashes and vehicle miles traveled, to provide easier access to crash information to state regulators and the public. This would not only standardize the current state-by-state patchwork of reporting but would also ensure consistent, industry-wide transparency and accountability in data reporting.
- *Modernizing FMVSS*: Update the Federal Motor Vehicle Safety Standards (FMVSS) to remove requirements for manual controls (*e.g.*, steering wheels and pedals) in vehicles specifically designed for autonomous use.
- *AV Accessibility Act*: Ensure the mobility benefits of AVs are fully accessible to people with disabilities.

To win the global AV race, the U.S. needs more than just innovation—we need a predictable, durable national regulatory framework that sets a high safety standard. Without it, we face a fragmented landscape of state regulations that creates uncertainty, slows investment, and creates unequal access to the technology. To truly deliver on the promise of fully autonomous vehicles, we need Federal leadership and we need it in this Congress.

Waymo has built a technology that is already achieving remarkable road safety outcomes. We look forward to working with the Committee to ensure that American safety and American innovation are the gold standard for autonomous driving tech standards around the world.

The CHAIRMAN. Thank you. Mr. Farrah, you're recognized.

**STATEMENT OF JEFF FARRAH, CHIEF EXECUTIVE OFFICER,
AUTONOMOUS VEHICLE INDUSTRY ASSOCIATION**

Mr. FARRAH. Chairman Cruz, Ranking Member Cantwell, members of the Committee, my name is Jeff Farrah, and I have the privilege of serving as the CEO of the Autonomous Vehicle Industry Association, the unified voice of the autonomous vehicle industry that is committed to American excellence in AVs. I am pleased to testify again this morning.

Now is a time of great excitement and promise for the American autonomous vehicle industry. AVs are no longer a futuristic dream of a safer world. Autonomous vehicles are here. They are carrying your constituents to medical appointments, enhancing supply chains for farmers and manufacturers, and creating high-quality, new jobs in a mission-driven industry. Autonomous vehicles are not just another application of AI. They are the exemplar of what AI becomes when it moves from the digital to the physical world. What Federal policymakers decide to do or not do on AVs will send a clear message about America's commitment to AI leadership.

I will use my opening comments this morning to describe two futures for members of this committee. We'll call them choice A and choice B. Choice A means seizing the moment for American leadership on autonomous vehicles. Under choice A, the future looks like this: safer roads as the U.S. drastically reduces the nearly 40,000 people who die on our streets each year, enough to fill National Stadium at a sold-out game; more accessible vehicles that finally give new mobility options to the millions of Americans who are left behind by our current transportation system which holds back the elderly, wheelchair users, the visually impaired, is too expensive, and often does not provide the routes to get people where they need to go; new American jobs that simply did not exist until they were created by the autonomous vehicle industry, jobs like AV fleet deployment specialists, technicians, fleet managers, and manufacturing workers. These jobs will power the future of the American

economy. Choice A can be ours if we want it. It does not require a dime of taxpayer funds, only Congress putting in place Federal rules of the road that allow American innovators to thrive.

We need action from Congress in these areas. First, raise the bar on safety for all autonomous vehicles by requiring the Department of Transportation to move forward on a series of rulemakings, including requiring that AV manufacturers develop a safety case; that is, evidence and documentation demonstrating why their vehicle is safe to be on the roads. The Department of Transportation should also require that AV companies abide by a series of driving competencies so the public understands that the vehicles are safe. Second, put AV data reporting on solid legal footing by enshrining in statute a national AV safety data repository that has NHTSA collecting data and sharing vital information with State regulatory partners. Third, modernize Federal standards related to vehicle controls that are intended for human drivers, thereby allowing innovators to develop next-generation vehicles that take meaningful steps forward on accessibility. A Federal framework should complement the 26 State AV deployment laws already in place, not replace them. Regulating autonomous vehicles is a shared responsibility between the Federal and State governments, but we need the Federal Government to step up. Under Choice A, we set the global standards, we build the technology here, we create high-quality American jobs rooted in U.S. communities. With Choice A, America doesn't just adopt autonomous vehicles, America defines them.

Then there is Choice B under which we reject this opportunity and fail to put in place a Federal policy framework. Choice B has the following consequences: China becomes the global leader on autonomous vehicles. At this moment, the People's Republic of China is devoting massive resources to the development of its national champions. It is not waiting to find out what American policymakers want to do. The state-run "Beijing Review" put it succinctly: "Chinese-developed autonomous driving technologies have made inroads into a growing number of global markets," citing activity in France, Spain, Switzerland, Luxembourg, Singapore, Saudi Arabia, and the United Arab Emirates, with one Chinese industry member calling the development of AVs "a hallmark of Made-in-China innovation." Finally, under Choice B, we accept the status quo: preventable deaths due to human error, transportation options that leave millions in the rearview mirror, faltering supply chains that let small businesses down, and States leading on AV policy with little guidance from their Federal counterparts.

Members of the Committee, I implore you to choose Choice A. This committee can, on a bipartisan basis, advance American leadership, increase safety standards, and create new, high-paying and fulfilling jobs. And with the Surface Transportation reauthorization bill before this committee, you have the perfect vehicle to lead. Thank you again for the opportunity to testify this morning.

[The prepared statement of Mr. Farrah follows:]

PREPARED STATEMENT OF JEFF FARRAH, CHIEF EXECUTIVE OFFICER,
AUTONOMOUS VEHICLE INDUSTRY ASSOCIATION

I. Introduction

Chairman Cruz, Ranking Member Cantwell, and members of the Committee, thank you for the opportunity to testify before the Committee on this important issue. My testimony addresses how this Committee should use this year's surface transportation reauthorization to advance a comprehensive Federal policy framework for AVs, including by implementing the ideas outlined in *Securing American Leadership in Autonomous Vehicles*, released by the Autonomous Vehicle Industry Association in January 2025.¹ The autonomous vehicle ("AV") industry appreciates the Committee's sustained engagement on AV policy, and we remain committed to working closely with Congress to advance American leadership on autonomous technology.

The Autonomous Vehicle Industry Association ("AVIA") is the unified voice of the AV industry, and we represent the world's leading technology, rideshare, automotive, trucking, and transportation companies.² Our mission is to bring the tremendous safety, mobility, transportation, and economic benefits of AVs—i.e., SAE International Levels 4- and 5-capable vehicles—to consumers and businesses in a safe, responsible, and expeditious manner and ensure the United States is the global leader on AVs.³ As of May 2025, vehicles operated by AVIA members have driven over 145 million autonomous miles on U.S. public roads, a distance roughly equivalent to the average distance between the Earth and Mars or driving around the Earth over 5,600 times.⁴ That figure is growing every day.

Over the past two decades, AVs have gone from science fiction to aspirational to commonplace on America's roads and highways, using advanced technology to perform all aspects of the driving task. In states as diverse as Arizona, Arkansas, California, Florida, Michigan, and Texas, AVs provide valuable transportation services, transporting both passengers through autonomous ride-hailing fleets and goods through trucking fleets and middle-and last-mile delivery operations. The U.S. Department of Defense has also embraced autonomous technology to keep America's soldiers safer.⁵ AVs will play a pivotal role in addressing critical challenges facing our nation, including by reducing the persistent and unacceptable level of traffic fatalities in our country, increasing transportation access, enhancing supply chain efficiency, reviving our industrial capacity, creating new jobs, and expanding economic output.

When discussing AVs and roadway safety, it is critical to distinguish autonomous vehicles from other types of technology. "Driver-assistance technology"—which can be found in tens of millions of cars and trucks on our roads today—is important and helpful, but it is not *autonomous* driving. Rather, the term "autonomous vehicle," or "AV," indicates that the vehicle is capable of driving on its own, without relying on or having any expectation that a human will be supervising the vehicle's actions. With an AV, the vehicle performs *all* aspects of the driving task on a sustained

¹ See *Securing American Leadership in Autonomous Vehicles*, AUTONOMOUS VEHICLE INDUS. ASS'N (Jan. 19, 2025), https://cdn.prod.website-files.com/67ee365c25e6530594bd40c2/683d8d2fa60ac22d542b1049_Securing%20American%20Leadership%20in%20Autonomous%20Vehicles1.pdf.

² AVIA members include Amazon, Aurora, AVRS, Avride, Bot Auto, Cavnu, Discount Tire, Doordash, Ford, Gatik, General Motors, Honda, International, Kodiak, Lyft, Motional, NGV, Nuro, Plus, Stack, Rivian, Tier IV, Torc Robotics, TaskUs, Terawatt, Uber, UPS, Volkswagen Group of America, Volvo Cars, Volvo Autonomous Solutions, Waabi, Waymo, and Zoox. See *Our Mission and Members*, AUTONOMOUS VEHICLE INDUS. ASS'N, <https://theavindustry.org/> (last visited Feb. 2, 2026).

³ SAE International's J3016 standard, which has been adopted industry wide, establishes a taxonomy for vehicle automation technologies that includes six levels of driving automation, rising from "No Driving Automation" (Level 0) to "Full Driving Automation" (Level 5). Level 2 systems (often called advanced driver assistance systems or "ADAS") are available on vehicles today and are capable of "partial driving automation," though they require human supervision at all times. Level 3 vehicles have "conditional driving automation," where the vehicle requires human interaction only in specific situations. Level 4 vehicles are defined as having "High Driving Automation." Only Level 3, 4, and 5 vehicles are equipped with automated driving systems ("ADS"). See SAE INT'L, TAXONOMY AND DEFINITIONS FOR TERMS RELATED TO DRIVING AUTOMATION SYSTEMS FOR ON-ROAD MOTOR VEHICLES, J2016 202104 (2021).

⁴ *New Report: AV Industry Surges Past 145 Million Autonomous Miles as AVIA Urges Policy-makers to Act*, AUTONOMOUS VEHICLE INDUS. ASS'N (May 19, 2025), <https://www.theavindustry.org/press-release/avia-releases-2025-state-of-av/>.

⁵ See *Accelerating Autonomous Vehicle Technology for the DoD*, DEF. INNOVATION UNIT (Apr. 3, 2024), <https://www.diu.mil/latest/accelerating-autonomous-vehicle-technology-for-the-dod>. AVIA member Kodiak Robotics is currently working with the U.S. Army's Army Robotic Combat Vehicles program. See *U.S. Army Robotic Combat Vehicle (RCV Program)*, KODIAK ROBOTICS (Nov. 9, 2023), <https://kodiak.ai/news/us-army-robotic-combat-vehicle-program>.

basis. These distinctions are vital to understanding AV technologies and have been laid out in detail within the SAE J3016 industry standard:



SAE J3016™ LEVELS OF DRIVING AUTOMATION™

Learn more here: [sae.org/standards/content/J3016_202104](https://www.sae.org/standards/content/J3016_202104)

Copyright © 2021 SAE International. The summary table may be freely copied and distributed AS-IS provided that SAE International is acknowledged as the source of the content.

	SAE LEVEL 0™	SAE LEVEL 1™	SAE LEVEL 2™	SAE LEVEL 3™	SAE LEVEL 4™	SAE LEVEL 5™
What does the human in the driver's seat have to do?	You are driving whenever these driver support features are engaged – even if your feet are off the pedals and you are not steering			You are not driving when these automated driving features are engaged – even if you are seated in "the driver's seat"		
	You must constantly supervise these support features; you must steer, brake or accelerate as needed to maintain safety			When the feature requests, you must drive	These automated driving features will not require you to take over driving	

Copyright © 2021 SAE International.

These are driver support features

These are automated driving features

What do these features do?

	These features are limited to providing warnings and momentary assistance	These features provide steering OR brake/acceleration support to the driver	These features provide steering AND brake/acceleration support to the driver	These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met	This feature can drive the vehicle under all conditions
Example Features	• automatic emergency braking • blind spot warning • lane departure warning	• lane centering OR adaptive cruise control	• lane centering AND adaptive cruise control at the same time	• traffic jam chauffeur	• local driverless taxi • pedals/steering wheel may or may not be installed
					• same as level 4, but feature can drive everywhere in all conditions

The United States is presently the global AV leader and the pace of deployments in the U.S. has steadily increased in recent years. But this progress has occurred in the absence of a Federal policy framework for AVs, leaving U.S. companies to fight with one hand tied behind their backs compared to competitors in China and other countries. In recent months, a broad consensus has emerged among stakeholders about the importance of a Federal framework for AVs. As a result, in November 2025, a diverse group of stakeholders announced the formation of *United for Autonomy* to forge ahead on Federal AV policy.⁶ *United for Autonomy* members include key stakeholders like the American Council of the Blind, Blinded Veterans Association, National Council on Independent Living, National Federation of the Blind, and United Spinal Association, as well as industry groups like AVIA, the American Trucking Associations, Alliance for Automotive Innovation, Consumer Technology Association, U.S. Chamber of Commerce, National Retail Foundation, and several other organizations. The breadth of membership in *United for Autonomy* speaks to the importance of AV technology for our country.

Today, policymakers are faced with a choice. We can maintain a void at the Federal level, which would support China's ambitions to dominate the global AV market and put U.S. states at the forefront of regulating a space that is calling out for Federal direction. Or the Committee can lead the way on a Federal policy framework that both supports safer roads, accessibility, and supply chains and answers key questions on AV design, construction, and performance. Advancing American AV leadership also serves to advance American artificial intelligence ("AI") leadership. Autonomous vehicles are *the* exemplar of what AI becomes when it moves from the digital to the physical world—what many are calling "physical AI." As with AI leadership, the stakes for leadership in AVs are high, and U.S. policymakers' actions—and inactions—are being closely watched by our strategic competitors. In addition, establishing a Federal policy framework will benefit an American public that increasingly is using AVs and loving the experience. Recent data demonstrates that passengers in AVs quickly become comfortable with the technology and want to ex-

⁶See UNITED FOR AUTONOMY, <https://www.unitedforautonomy.org/> (last visited Feb. 2, 2026).

perience it again.⁷ As we see more AV deployments, we can anticipate higher levels of public acceptance of the technology.

The AV industry is eager to engage with this Committee on AV-specific Federal policies that supplement the U.S. Department of Transportation's ("USDOT") broad authority to regulate vehicles on public roads. We commend Secretary Duffy and his team at the Department for their early and significant attention to AVs. In April 2025, Secretary Duffy announced a new Automated Vehicle Framework as part of the Department's Innovation Agenda, and this framework included early action items that are a welcome first step.⁸ It is imperative that this progress continues, and we are optimistic that under the leadership of Jonathan Morrison at the National Highway Traffic Safety Administration ("NHTSA") and Derek Barrs at the Federal Motor Carrier Safety Administration ("FMCSA"), more is yet to come.

II. The State of Roadway Safety

A Federal AV policy framework is especially needed at a time when the United States continues to face epidemic levels of fatalities on our Nation's roads. 2024 saw over 39,000 people die on America's roads, only a slight decrease from 2023, which recorded 40,901 deaths in motor vehicle traffic incidents.⁹ 2023 was the third year in a row to see traffic deaths above 40,000,¹⁰ a number of fatalities that previously had not occurred since 2007.¹¹ To put this in context, the number of traffic fatalities each year is equivalent to the number of people at a sold-out baseball game at Nationals Park.

Pedestrian deaths have also risen; 2022 was the deadliest year for American pedestrians since 1981, with 7,508 people killed.¹² That trend continued into 2024, with an estimated 7,148 pedestrians killed, nearly 20 percent higher than the number killed in 2016.¹³ The increase in roadway fatalities is consistent across vehicle types. In 2022, 5,969 people died in crashes involving large trucks.¹⁴ This increase is part of a decade-long 40 percent increase in such crashes.¹⁵ Further, in 2023, 114,552 large trucks were involved in crashes that resulted in an injury, a 12 percent increase since 2016.¹⁶ The toll of these crashes on families and communities is immeasurable, but the toll of motor vehicle crashes is not measured in fatalities and injuries alone. According to the National Safety Council, "the total motor vehicle injury costs" in 2023 were estimated at \$513.8 billion.¹⁷ When quality-of-life valuations are considered, the total value of societal harm from motor vehicle crashes is even higher and was estimated to top \$1.37 trillion in 2019.¹⁸

Research continues to confirm that human behavior is overwhelmingly the most common factor in fatal accidents on our roads. A NHTSA study found that over 55 percent of all people injured or killed in a roadway incident tested positive for one or more drugs (including alcohol).¹⁹ Drivers are also frequently distracted by electronics; during daylight in 2023, 6.4 percent of all drivers were looking at or using

⁷ See generally J.D. POWER, 2024 U.S. ROBOTAXI EXPERIENCE STUDY (2024).

⁸ See *Trump's Transportation Secretary Sean P. Duffy Unveils New Automated Vehicle Framework as Part of Innovation Agenda*, U.S. DEP'T OF TRANSP. (Apr. 24, 2025), <https://www.transportation.gov/briefing-room/trumps-transportation-secretary-sean-p-duffy-unveils-new-automated-vehicle-framework>.

⁹ NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., DOT HS 813 710, EARLY ESTIMATE OF MOTOR VEHICLE TRAFFIC FATALITIES IN 2024 1 (2025), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813710>.

¹⁰ *Id.*

¹¹ *Fatality Facts 2023: Yearly Snapshot*, INS. INST. FOR HIGHWAY SAFETY (2023), <https://www.iihs.org/topics/fatality-statistics/detail/yearly-snapshot>.

¹² GOVERNORS HIGHWAY SAFETY ASS'N, PEDESTRIAN TRAFFIC FATALITIES BY STATE 2022 PRELIMINARY DATA (JAN.–DEC.) (2023), <https://www.ghsa.org/sites/default/files/2024-12/2022-ped-report.pdf>.

¹³ GOVERNORS HIGHWAY SAFETY ASS'N, PEDESTRIAN TRAFFIC FATALITIES BY STATE 2024 PRELIMINARY DATA (JAN.–DEC.) (2025), <https://www.ghsa.org/resource-hub/pedestrian-traffic-fatalities-2024-data>.

¹⁴ NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., DOT HS 813 705, OVERVIEW OF MOTOR VEHICLE TRAFFIC CRASHES IN 2023 7 (2025), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813705>.

¹⁵ Nat'l Safety Council, *Large Trucks*, NSC INJURY FACTS, <https://injuryfacts.nsc.org/motor-vehicle/road-users/large-trucks/> (last visited Feb. 2, 2026).

¹⁶ *Id.*

¹⁷ Nat'l Safety Council, *Motor Vehicles: Introduction*, NSC INJURY FACTS, <https://injuryfacts.nsc.org/motor-vehicle/overview/introduction/> (last visited Feb. 2, 2026).

¹⁸ NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., DOT HS 813 403, THE ECONOMIC AND SOCIETAL IMPACT OF MOTOR VEHICLE CRASHES, 2019 (REVISED) 4 (2023), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813403.pdf>.

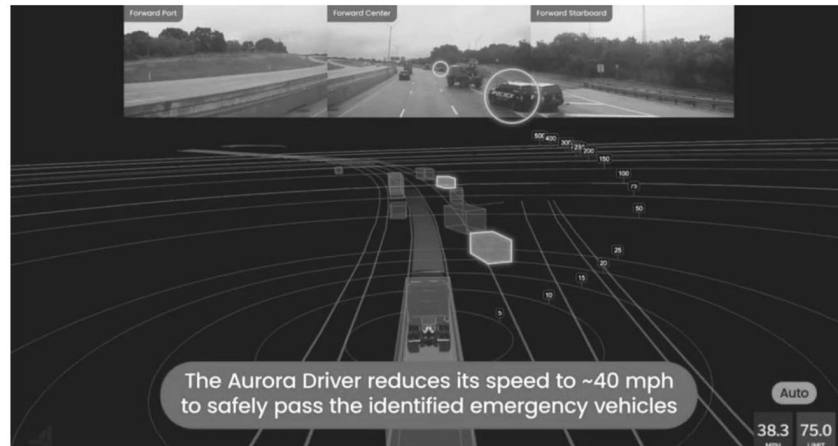
¹⁹ NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., DOT HS 813 399, ALCOHOL AND DRUG PREVALENCE AMONG SERIOUSLY OR FATALLY INJURED ROAD USERS 2 (2022), https://rosap.nhtl.bts.gov/view/dot/65623/dot_65623_DS1.pdf.

their handheld device.²⁰ Studies have found that drivers manipulating cell phones are two to six times more at risk for a crash.²¹ Several categories of behavior-related fatalities have increased in recent years, including police-reported alcohol-involved crashes and deaths of unrestrained passengers.²² Vehicle crashes are also the leading cause of spinal cord injury, and emergency room surgeons are on the front lines dealing with those crises every day.²³

America's roads are a dangerous place for drivers, passengers, and other road users, in large part due to the deficiencies of human drivers. However, the United States does not need to accept this status quo. By removing human error from the equation, AVs offer a vital tool for improving roadway safety.

III. AV Technology as a Vital Tool for Improving Roadway Safety

Improving road safety is the primary goal of the AV industry. Automated driving systems (“ADS”) are the heart and brain of an AV and are equipped with suites of sensor systems (including lidar, radar, and cameras) with sensitivities, capabilities, and reaction times well beyond those of a human driver. These sensors grant an ADS a 360-degree field of vision which can detect, track, and react to objects and people even when hidden from human perception due to vehicles, buildings, and other obstructions. For example, AVs are developed to specifically detect vulnerable road users—such as motorcycles, pedestrians, and cyclists—and then predict and safely respond to their unique behavior (e.g., motorcycle lane splitting). Included below are examples of what an AV “sees” when it encounters a vulnerable road user:



An Aurora autonomous truck safely and accurately detects an emergency vehicle, slows down, and changes lanes.²⁴

²⁰ NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., DOT HS 813 660, DRIVER ELECTRONIC DEVICE USE IN 2022 11 (2024), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813660>.

²¹ *Distracted Driving*, INS. INST. FOR HIGHWAY SAFETY, <https://www.iihs.org/research-areas/distracted-driving> (last visited Feb. 2, 2026).

²² NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., DOT HS 813 298, EARLY ESTIMATES OF MOTOR VEHICLE TRAFFIC FATALITIES AND FATALITY RATE BY SUB-CATEGORIES IN 2021 1 (2022), <https://www.nhtsa.gov/press-releases/early-estimate-2021-traffic-fatalities>.

²³ Jonathan Slotkin, *The Data on Self-Driving Cars Is Clear. We Have to Change Course*, N.Y. TIMES (Dec. 2, 2025), <https://www.nytimes.com/2025/12/02/opinion/self-driving-cars.html>.

²⁴ Aurora (@aurora_inno), X (Jan. 18, 2024, 5:01 PM), https://x.com/aurora_inno/status/1748103257128374548



A Waymo vehicle recognizes and adheres to a police officer directing traffic at a Los Angeles intersection.²⁵



A Kodiak autonomous truck recognizes a pedestrian on a highway from over 130m away at night, shifting to another lane to give the pedestrian extra space.²⁶

²⁵ Dmitri Dolgov (@dmitri_dolgov), X (Jan. 18, 2024, 7:04 PM), https://x.com/dmitri_dolgov/status/1748134215265456444.

²⁶ Kodiak (@KodiakRobotics), X (Mar. 21, 2024), <https://twitter.com/KodiakRobotics/status/1770870645116833872>.

Human error, including speeding and fatigue, is a major contributor to roadway incidents. AVs are designed to remove that error from the equation, as they do not drive distracted, angry, impaired, or tired. AVs have built a compelling safety record, supported by data collected by NHTSA via the agency’s Standing General Order 2021–01, through more than a decade of development, testing, and deployment, with over 145 million autonomous miles driven by AVIA members on public roads in the United States alone.²⁷

AVs also have quantifiable safety benefits. In January 2026, AVIA released its *Robotaxi Report* which released new data quantifying the safety-related economic savings.²⁸ The findings reveal substantial economic benefits from AV deployments. In San Francisco, where human-driven vehicles experience an injury crash rate of 8.04 per million miles driven on surface streets, Waymo’s AVs demonstrated a rate of 0.87 injury crashes per million miles—an 89 percent reduction.²⁹ In San Francisco, from March 2022 through June 2025, Waymo rider-only operations covering 29.88 million miles resulted in an estimated \$71 million in safety-related economic savings for city residents.³⁰

Reinsurer Swiss Re published an analysis of 3.8 million autonomous miles driven by passenger AVs operated by Waymo. The analysis found that when compared to baseline human drivers, Waymo AVs reduced property damage claims by 76 percent.³¹ These results led Swiss Re to conclude that Waymo’s AVs are “significantly safer towards other road users than human drivers are[.]”³² Waymo’s own review of over 56.7 million rider-only autonomous miles found that the company’s AVs demonstrated a 96 percent reduction of injury-involving intersection crashes and an 85 percent reduction in crashes with suspected serious or worse injuries when compared to human drivers.³³

A recent Chamber of Progress study found that replacing even 1.3 percent of California drivers with AVs could have prevented 411 fatalities between 2020 and 2022, while replacing 13 percent of California drivers could have prevented 1,342 fatalities in that same three year period.³⁴ Another study by the Virginia Tech Transportation Institute found that the full scale deployment of occupantless AVs for delivery services could reduce roadway deaths by 58.2 percent.³⁵

AVs are poised to improve roadway safety and help combat the glut of roadway deaths facing the United States today. By removing human error, AVs avoid the risks associated with driver distraction, fatigue, and incapacitation. Ongoing AV deployments are demonstrating the safety benefits of AVs, and the wider deployment of AVs will bring these benefits to communities across the country while helping to end thousands of tragic roadway deaths.

IV. Social and Economic Benefits of Widespread AV Deployments

In addition to increasing safety, the continued expansion of AV deployment will bring economic, supply chain, and social benefits to American communities. For millions of elderly Americans and individuals with travel-limiting disabilities, AVs can provide greater independence compared to mass transit or paratransit systems, opening the door for new employment opportunities, improved access to medical care, and better connection to their communities. AVs are poised to bring economic benefits at both societal and individual levels, and they can help grow the U.S. econ-

²⁷ AUTONOMOUS VEHICLE INDUS. ASS’N, *supra* note 4.

²⁸ AUTONOMOUS VEHICLE INDUS. ASS’N, AVIA ROBOTAXI REPORT (2026), https://cdn.prod.website-files.com/67ee365c25e6530594bd40c2/6930ab29af2f0cc7461e061b_Robotaxi%20Report.pdf.

²⁹ *Id.* at 14.

³⁰ *Id.*

³¹ Luigi Di Lillo *et al.*, COMPARATIVE SAFETY PERFORMANCE OF AUTONOMOUS- AND HUMAN DRIVERS: A REAL-WORLD CASE STUDY OF THE WAYMO ONE SERVICE (2023), <https://arxiv.org/ftp/arxiv/papers/2309/2309.01206.pdf>.

³² *Id.*

³³ *New Study: Waymo is Reducing Serious Crashes and Making Streets Safer for Those Most at Risk*, WAYMO (May 1, 2025), <https://waymo.com/blog/2025/05/waymo-making-streets-safer-for-vru>.

³⁴ KAITLYN HARGER, ANALYSIS: AVs IN CALIFORNIA COULD HAVE SAVED UP TO 1,300 LIVES, PREVENTED UP TO 5,000 MAJOR INJURIES OVER PAST THREE YEARS (2024), <https://progresschamber.org/wp-content/uploads/2024/03/AV-Safety-Research-California-Traffic-Fatality-Analysis-03-24.pdf>.

³⁵ CHRISTINA WITCHER ET AL., ESTIMATING CRASH CONSEQUENCES FOR OCCUPANTLESS AUTOMATED VEHICLES (2021), <https://utechworks.lib.vt.edu/server/api/core/bitstreams/a28aa936-8f89-4302-8859-ee54d34358e2/content>.

omy and support the economic competitiveness of American businesses across many industries.³⁶

A. Connecting People and Protecting Communities

By increasing transportation access and improving safety, AVs will serve many Americans who are left behind by today's transportation options. The USDOT estimates that 25.5 million Americans face travel-limiting disabilities³⁷ and roughly 560,000 people with disabilities never leave their homes due to transportation difficulties.³⁸ Over 7.6 million Americans live with significant vision impairment,³⁹ conditions which can leave them unable to operate a vehicle. This lack of mobility can contribute to a lack of economic opportunity. Only 22.7 percent of people with disabilities are employed, compared to 65.5 percent of people without a disability.⁴⁰ A study by the National Disability Institute found that the wider deployment of AVs could result in 4.4 million jobs for people with disabilities, which could create a 3.8 percent increase in U.S. GDP (nearly \$867 billion).⁴¹ Whether personally owned, serving as on-demand taxis, or as part of local paratransit services, AVs can provide greater autonomy to people with disabilities, letting them dictate how, where, and when they move through the world.

AVs also can provide vital connections to “transit deserts,” where there is a high demand but low supply of transportation. Access to transportation and average length of commute are connected to upward mobility,⁴² and studies have found links between public transit access, income, and unemployment.⁴³ A 2011 study showed that an average person can access only about 30 percent of all jobs and 25 percent of low- and middle-skilled jobs in a given metropolitan area via public transit within 90 minutes.⁴⁴ AVs can improve integration with mass transit by servicing direct trips to workplaces and other endpoints, providing first-mile and last-mile connections to transit, and by broadly increasing the overall supply of transportation services in a given area. Projections indicate that the transportation connections facilitated by the adoption of AVs would increase access to jobs within a metropolitan area by 45 percent by 2040.⁴⁵

Additionally, AVs can help alleviate inequalities in food access. A 2017 report by the U.S. Department of Agriculture's Economic Research Service (“ERS”) estimated that 54 million individuals, or 17.1 percent of the total U.S. population, had limited access to a supermarket or grocery store within 10 miles from their home.⁴⁶ AVs can improve access to food, both by transporting people to previously inaccessible grocery stores and by bringing food directly to their doors. With widespread deployment, AVs could improve access to fresh food for fourteen million low-income households living in “food deserts,” roughly 70 percent of the total low-income population.⁴⁷

³⁶ Jack Caporal, William O'Neil, and Sean Arrieta-Kenna, *Bridging the Divide: Autonomous Vehicles and the Automobile Industry*, CTR. FOR STRATEGIC & INT'L STUDIES (Apr. 14, 2021), <https://www.csis.org/analysis/bridging-divide-autonomous-vehicles-and-automobile-industry>.

³⁷ ADA at DOT: Accessibility Initiatives, U.S. DEPT OF TRANSP. (Feb. 13, 2025) <https://www.transportation.gov/accessibility>.

³⁸ BUREAU OF TRANSP. STAT., TRANSPORTATION DIFFICULTIES KEEP OVER HALF A MILLION DISABLED AT HOME (2012), https://www.bts.gov/archive/publications/special_reports_and_issue_briefs/issue_briefs/number_03/entire.

³⁹ Blindness Statistics, NAT'L FED'N OF THE BLIND, <https://nfb.org/resources/blindness-statistics> (last visited Feb. 2, 2026).

⁴⁰ Economic News Release, U.S. Bureau of Labor Stat., Persons with a Disability: Labor Force Characteristics Summary (Feb. 25, 2025), <https://www.bls.gov/news.release/disabl.nr0.htm>.

⁴¹ DOMINIC MODICAMORE ET AL., ECONOMIC IMPACTS OF REMOVING TRANSPORTATION BARRIERS TO EMPLOYMENT FOR INDIVIDUALS WITH DISABILITIES THROUGH AUTONOMOUS VEHICLE ADOPTION (2022), <https://www.nationaldisabilityinstitute.org/wp-content/uploads/2023/02/ndi-economicimpactsremovingtransportationbarriers.pdf>.

⁴² Mikayla Bouchard, *Transportation Emerges as Crucial to Escaping Poverty*, N.Y. TIMES (May 7, 2015), <https://www.nytimes.com/2015/05/07/upshot/transportation-emerges-as-crucial-to-escaping-poverty.html>.

⁴³ Gillian D. White, *Stranded: How America's Failing Public Transportation Increases Inequality*, THE ATLANTIC (May 16, 2015), <https://www.theatlantic.com/business/archive/2015/05/stranded-how-americas-failing-public-transportation-increases-inequality/393419/>.

⁴⁴ Adie Tomer et al., *Missed Opportunity: Transit and Jobs in Metropolitan America*, BROOKINGS (May 11, 2011), <https://www.brookings.edu/research/missed-opportunity-transit-and-jobs-in-metropolitan-america/>.

⁴⁵ RICHARD EZIKE ET AL., WHERE ARE SELF-DRIVING CARS TAKING US? 6 (2019), <https://ucusa.org/sites/default/files/attach/2019/02/Where-Are-Self-Driving-Cars-Taking-Us-web.pdf>.

⁴⁶ Alana Rhone et al., *Low-Income and Low-Supermarket-Access Census Tracts, 2010–2015*, U.S. DEPT OF AGRIC.: ECON. RSCH. SERV. 12 (2017), <https://www.ers.usda.gov/publications/pub-details?pubid=82100>.

⁴⁷ Sola Lawal, *Serving America's Food Deserts*, MEDIUM (July 15, 2020), <https://medium.com/nuro/serving-americas-food-deserts-a7442e922053>.

B. Moving Goods and Growing the American Economy

The integration of AVs into America's commercial fleets will help optimize the transportation of freight nationwide, bringing goods directly to consumers faster and strengthening at-risk supply chains. Autonomous trucking offers a means to address supply chain inefficiencies by filling workforce gaps, enhancing fleet flexibility, and reducing travel times.

The growth in autonomous trucking is poised to run in parallel with an ever-growing market for freight trucking, with the Bureau of Transportation Statistics estimating that freight activity in the United States will grow fifty percent from 2020 to 2050, reaching a projected value of \$36.2 trillion.⁴⁸ With trucking representing roughly 72 percent of all freight transportation tonnage,⁴⁹ the number of trucks on the road will need to grow as well. As demand for freight hauling continues to grow, AVs can help shippers keep up with that demand by supplementing and augmenting human driven fleets. With AVs hauling long-haul freight, more opportunities will be created for truck drivers in their communities. This will allow companies to strategically place drivers where they are needed most and ensure America's truck drivers can remain in and near their communities and sleep in their own beds.

For consumers, AVs are positioned to reduce personal transportation costs and reduce the cost of transporting goods across the economy. Studies have shown that the cost savings from the wider deployment of autonomous trucks could reduce the cost-per-mile of shipping goods by between 20 percent for 300-mile trips and 30 percent for 900-mile trips when factoring in other operational costs.⁵⁰ Savings from lower freight costs can then be passed on to consumers through lower prices on goods overall. Additionally, through the introduction of shared AV fleets, transportation costs—which amount to the second-largest expense for most households—could be reduced by as much as \$5,600 per year.⁵¹

C. Providing New Jobs

American workers stand to benefit from the greater adoption of AV technologies. One recent analysis found that AV companies are:

[I]ncreasingly seeking talent that not only develops cutting-edge technology but also manages large programs, ensures safety compliance, and builds resilient supply chains and operational infrastructures . . . The AV industry is moving in the opposite direction to the wider jobs market in North America. Talent needs are high, hiring is aggressive, and the industry is growing significantly. [H]iring in operations, corporate infrastructure, and safety illustrates an industry moving beyond the lab and into the real world.⁵²

NGV Talent has conducted additional research that demonstrates the AV operations career pathway for Americans. As demonstrated below, the AV industry is offering Americans high-quality jobs with abundant opportunities for advancement:

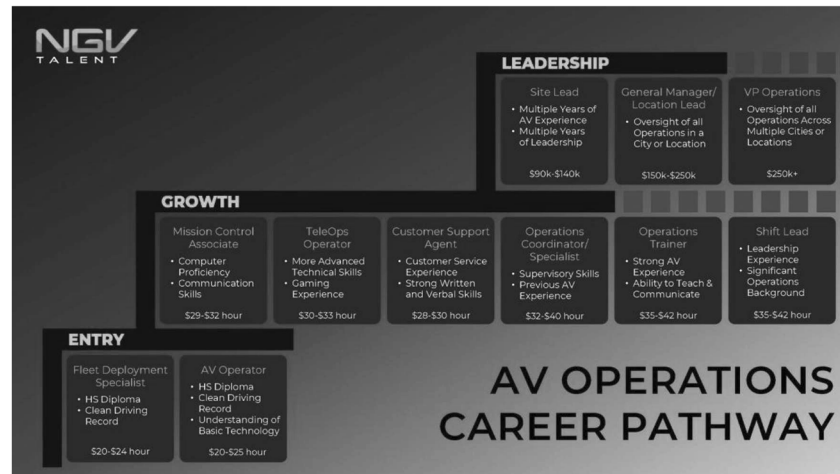
⁴⁸ *Freight Activity in the U.S. Expected to Grow Fifty Percent by 2050*, BUREAU OF TRANSP. STATS. (Nov. 22, 2021), <https://www.bts.gov/newsroom/freight-activity-us-expected-grow-fifty-percent-2050>.

⁴⁹ *ATA Truck Tonnage Index Increased 2.4 percent in May*, AM. TRUCKING ASSN'S (June 20, 2023), <https://www.trucking.org/news-insights/ata-truck-tonnage-index-increased-24-may>.

⁵⁰ RYAN JONES ET AL., ECONOMIC BENEFITS OF AUTONOMOUS TRUCKS (2024), https://advance.sagepub.com/users/912115/articles/1285791/master/file/data/2_Economic%20Benefits%20of%20Autonomous%20Trucks_Interim%20Report/2_Economic%20Benefits%20of%20Autonomous%20Trucks_Interim%20Report.pdf?inline=true.

⁵¹ SECURING AMERICA'S FUTURE ENERGY, *Fostering Economic Opportunity Through Autonomous Vehicle Technology* (2020), <https://safe2020.upenginepowered.com/wp-content/uploads/2020/07/Fostering-Economic-Opportunity-through-Autonomous-Vehicle-Technology.pdf>.

⁵² NGV TALENT, AV TALENT DEMAND REPORT 2, 12 (2025), <https://ngvtalent.com/wp-content/uploads/2025/05/AV-Industry-Talent-Demand-Report-2025.pdf>.



Additionally, a USDOT-funded study found that autonomous trucking will increase U.S. employment by up to 35,000 jobs per year on average.⁵³ AVs will coexist with America's truck drivers, and the AV industry is committed to creating more opportunities for all Americans. A growing AV industry will continue to create new job opportunities for workers with a range of educational backgrounds and experiences, including local drivers, technicians, fleet managers, safety operations specialists, sensor calibrators, operations center workers, transportation planners, and more. Indeed, the same USDOT study found that most autonomous trucking adoption scenarios would not lead to layoffs for existing truckers.⁵⁴

The AV industry has already created new jobs and brought new investment, tax revenue, resources, and human capital to states across the country, including Arkansas, California, Alabama, Arizona, Arkansas, Kansas, Nevada, New Mexico, Oklahoma, Pennsylvania, Michigan, Florida, Washington, Colorado, and Texas. Texas offers an ideal case study for how AV deployments can support the U.S. job market. Today, several hundred Texans are employed directly by AV companies. Opportunities for employment are rapidly growing where AVs are deployed. An AVIA analysis of its members demonstrates at least 118 active AV industry job openings right now in Texas, with a median wage approximately 208 percent higher than median wage for Texans.⁵⁵ As AV deployments grow, jobs will grow with them, with an estimated 190 workers needed for manufacturing and servicing every 1,000 AVs produced and deployed.⁵⁶ Nationwide, AVs could create over three million new jobs by 2035, all while expanding access to affordable delivery services, according to a study conducted by Steer.⁵⁷

AVs will bring myriad benefits to communities and individuals across the country. From connecting underserved communities and people with disabilities, to creating new opportunities for employment and independence, to boosting the economy by lowering transportation costs, AVs can help address a diverse set of challenges. To ensure the many benefits of AVs are realized, now more than it is critical ever to institute a supportive Federal policy framework that unlocks further pathways to widespread AV deployment nationwide.

⁵³ ROBERT WASCHIK ET AL., JOHN A. VOLPE NAT'L TRANSP. SYS. CTR., FHWA-JPO-21-847, MACROECONOMIC IMPACTS OF AUTOMATED DRIVING SYSTEMS IN LONG-HAUL TRUCKING 1 (2021), <https://rosap.ntl.bts.gov/view/dot/54596>.

⁵⁴ *Id.*

⁵⁵ See *QuickFacts: Texas*, U.S. CENSUS BUREAU (2025), <https://www.census.gov/quickfacts/fact/table/TX/BZA210223> (citing \$78,476 as median households income (in 2024 dollars), 2020 to 2024).

⁵⁶ STEER, OPPORTUNITY AV: HOW MANY AND WHAT TYPES OF JOBS WILL BE CREATED BY AUTONOMOUS VEHICLES? 6 (2024), <https://progresschamber.org/wp-content/uploads/2024/03/Opportunity-AV-How-Many-and-What-Type-of-Jobs-Will-Be-Created-by-Autonomous-Vehicles.pdf>.

⁵⁷ STEER, ECONOMIC IMPACTS OF AUTONOMOUS DELIVERY SERVICES IN THE U.S. XI (2020), https://www.steergroup.com/ites/default/files/2020-09/200910_%20Nuro_Final_Report_Public.pdf.

V. Competition with China for AV Leadership

America's leadership is integral to securing the economic growth, job creation, safety, and societal benefits offered by AVs. That leadership, however, is increasingly challenged by significant foreign competition, especially from China.

The Chinese government has invested heavily in AV development in recent years as part of its strategy to overtake and replace foreign market leaders. The Chinese market for AVs is estimated to grow from \$17.23 billion in 2024 to \$170.57 billion by 2033.⁵⁸ Research indicates that the total available market for Chinese robotaxis will increase to \$47 billion by 2035, up from \$54 million in 2025, driven by decreasing costs of hardware and algorithms and lowering operating costs for fleet owners. China is also expected to see revenues per robotaxi reach up to \$31,000 per year by 2035, higher than current revenues of up to \$9,000 per year.⁵⁹ Reflecting this potential, the Chinese government has supported the growth of the Chinese AV industry. A 2020 national strategy prioritized AV development and called for at least 20 percent of all new vehicles sales to have SAE Level 4 capabilities by 2030.⁶⁰ Then, in 2022, China's Ministry of Transportation released rules in an effort to commercialize driverless mobility.⁶¹ Beijing considers AVs a strategic sector; with government support, Beijing intends for China to become a world leader in AV technology by 2035.⁶²

More than 50 different Chinese cities are testing AVs and over 20 cities are actively testing both robotaxis and autonomous buses.⁶³ In August 2024, the Chinese government announced it had issued a total of 16,000 test licenses for AVs and approved 32,000 kilometers of roadway for AV testing.⁶⁴ Chinese technology company Baidu operates a fleet of about 1,700 vehicles, with roughly 400 robotaxis tested in Wuhan alone and over 900 AVs deployed in Beijing. Another Chinese robotaxi company, Pony.ai, currently provides over 26,000 trips every week in China. These robotaxi companies have plans to expand operations outside of China to places like Singapore, Dubai, and Abu Dhabi. Chinese robotaxi companies are also looking to Europe, considering launches in Germany, the United Kingdom, and elsewhere.⁶⁵ WeRide, for example, has obtained autonomous driving licenses in five countries and is performing autonomous driving R&D, testing, and operations in more than 10 countries.⁶⁶

Much of the AV growth in China has been government-driven, defined by policy support from the national to city level.⁶⁷ Industry growth in the U.S., on the other hand, has been market-driven. The U.S. should not seek to emulate Chinese policy. There is, however, a clear and present need for domestic policy that will allow innovators to flourish while prioritizing safety. Avoiding being outpaced by the Chinese AV industry will require partnership between American AV developers and Federal and state governments. This can be achieved through the creation of a Federal AV policy framework, as laid out in AVIA's *Securing American Leadership in Autonomous Vehicles* and by instilling public trust in AV technologies.

⁵⁸ RENUB RESEARCH, CHINA AUTONOMOUS VEHICLES MARKET REPORT BY LEVEL OF DRIVING, HARDWARE, SOFTWARE, VEHICLE TYPE, APPLICATION, PROPULSION, AND COMPANIES ANALYSIS 2025–2033 1 (2025), <https://www.researchandmarkets.com/reports/5562699/china-autonomous-vehicles-market-report-by-level>.

⁵⁹ ALLEN CHANG ET AL., ROBOTAXI: CHINA'S ROBOTAXI MARKET—THE ROAD TO COMMERCIALIZATION 9 (2025), <https://www.goldmansachs.com/pdfs/insights/goldman-sachs-research/robotaxi/report.pdf>.

⁶⁰ Takashi Kawakami & Naoshige Shimizu, *China's self-driving car push hits legal and cost roadblocks*, NIKKEI ASIA (Jan. 19, 2023), <https://asia.nikkei.com/Business/Automobiles/China-s-self-driving-car-push-hits-legal-and-cost-road-blocks>.

⁶¹ *Id.*

⁶² Linda Lew, *Chinese robotaxi companies outnumber Waymo in global push*, L.A. TIMES (Oct. 27, 2025), <https://www.latimes.com/business/story/2025-10-27/chinese-robotaxis-race-waymo-to-take-driverless-cars-global>.

⁶³ Xinhua, *Autonomous Driving Shifts into High Gear in China*, CHINA DAILY (Aug. 13, 2024), <https://global.chinadaily.com.cn/a/202408/13/WS66bace6da3104e74fddb9b9e.html>; Cao Yingying, *Testing on Public Roads a Leap Forward for L3 Autonomous Vehicles in China*, CHINA DAILY (June 17, 2024), <https://www.chinadaily.com.cn/a/202406/17/WS666f8a64a31095c51c5092fb.html>.

⁶⁴ Press Release, State Council of the People's Republic of China, 16,000 Test Licenses for Autonomous Vehicles Issued in China (Aug. 27, 2024), https://english.www.gov.cn/news/202408/27/content_WS66cd745ac6d0868f4e8ea485.html#:~:text=At%20a%20press%20conference%20in,senior%20official%20from%20the%20ministry.

⁶⁵ Lew, *supra* note 62.

⁶⁶ CHANG ET AL., *supra* note 59, at 18.

⁶⁷ *Id.*

VI. Building Public Trust in AVs

Public trust in AVs is critical to bring AV technology's benefits to communities across the United States. AV deployments have shown that public trust can be built through greater public exposure to the technology and transparency in operations.

A. Growing Public Trust in AVs

AV deployments have grown public trust in AV technology. For example, a study by J.D. Power surveyed residents of cities where AVs have been deployed and found that 77 percent of riders were comfortable with AVs being tested on streets and highways, compared to 35 percent of non-AV riders in the same city and 21 percent of individuals nationally.⁶⁸ According to the same study, 76 percent of non-riders expressed a desire to hear about others' experiences with AVs.⁶⁹ This demonstrates opportunities for public education to pave the way for expanded AV deployments that, in turn, benefit more people.

B. AVIA's TRUST Principles

The AV industry believes that public trust goes hand-in-hand with AV deployment, and that we must earn and maintain that trust. AVIA has created a set of TRUST Principles to guide our work with government, communities, and the public at large.⁷⁰ The TRUST Principles, when combined with the policy proposals in *Securing American Leadership in Autonomous Vehicles*,⁷¹ will help instill public trust and ensure benefits of AV technologies can reach more American communities. AVIA's TRUST Principles are:

- *Transparent Interactions with Government Officials and the Public.* This includes responding in a timely manner to appropriate questions and data requests from lawmakers and regulators, making experts available to address potential concerns, sharing incident information with regulatory officials as required under state and Federal regulatory frameworks, disclosing crash-related information as required by law, and fully participating in any formal crash investigations conducted by government officials. This also includes making safety evaluation reports public, engaging communities prior to commencing AV operations and on an ongoing basis, and providing public education on AVs through a variety of channels.
- *Responsible Integration into Communities and Deep Engagement with Law Enforcement and First Responders.* This includes early engagement with law enforcement and first responders prior to operating on public roads and implementing first responder interaction plans to provide important information about AVs to first responders. To further these efforts, AVIA formed the Law Enforcement and First Responder Engagement Council, designed to strengthen collaboration between the AV industry and first responders.⁷² The Council is comprised of law enforcement officials, first responders, and AV industry representatives, all of whom share the goal of ensuring AVs are deployed in a safe, responsible manner.
- *Upholding Cybersecurity and Privacy Standards.* AV developers should review and implement relevant cybersecurity and privacy best practices and standards for AV design, testing, and deployment, including conducting regular risk assessments, as appropriate.
- *Safety-First Culture and Governance.* By building safety-first cultures, AV developers prioritize safety in all aspects of vehicle design and operation. This can be supported through the development of regulatory standards for ADS design and performance, e.g., those relevant to safety cases and behavioral competency testing.
- *Transportation Policies that Will Increase Safety and Public Trust of AVs.* AVIA supports state and Federal policies that will increase public trust in AV technologies, including requiring first responder interaction plans, and requiring AVs be capable of complying with all applicable traffic laws and relevant Federal safety standards. This can also include crash reporting (and the creation

⁶⁸J.D. POWER, *supra* note 7.

⁶⁹*Id.*

⁷⁰See *Trust Principles*, AUTONOMOUS VEHICLE INDUS. ASS'N, <https://theavindustry.org/trust-principles> (last visited Feb. 2, 2026).

⁷¹AUTONOMOUS VEHICLE INDUS. ASS'N, *supra* note 1.

⁷²*Autonomous Vehicle Industry Association Introduces Law Enforcement and First Responder Engagement Council*, AUTONOMOUS VEHICLE INDUS. ASS'N (Sept. 25, 2024), <https://www.theavindustry.org/press-release/autonomous-vehicle-industry-association-introduces-law-enforcement-and-first-responder-engagement-council>.

of a National AV Safety Data Repository), increased funding for NHTSA and the FMCSA to reinforce their ability to administer Federal regulatory processes.

VII. Building a Strong AV Policy Framework That Complements State Regulation

In recent years, U.S. states have taken the lead on AV policymaking as the Federal government has struggled to move forward with a Federal policy framework. Today, 26 states have put in place AV deployment statutes.⁷³ Many of these laws follow common themes of authorizing Level 4 or 5 AVs within the state; requiring that AVs abide by traffic regulations; establishing appropriate protocols with law enforcement and first responders; and addressing state insurance requirements. The AV industry commends state policymakers for their interest in this life-saving technology and we hope to see more states pass AV deployment statutes in the coming years.

While state deployment laws are helpful, they are inherently limited to motor vehicle policy matters that can be regulated by U.S. states. Only the Federal government can implement uniform, nationwide rules governing vehicle design, construction, and performance. To advance American transportation and technological excellence, the Federal government must move forward on AV policy within its lane of authority that complements the policymaking of state governments. Leadership from the Federal and state governments is needed, and both must be working together to move AVs forward.

This year's surface transportation reauthorization presents an important opportunity for the Congress to advance a Federal policy framework on AVs and we encourage this Committee to seize the opportunity. In January 2025, AVIA released *Securing American Leadership in Autonomous Vehicles*,⁷⁴ which details a comprehensive set of Federal policy recommendations that would accelerate the safe and timely deployment of AV technology and solidify the U.S. as the global leader in this transformative field.

The intent of these recommendations is not to create an entirely new regulatory structure for AVs, but instead ensure that the existing regulatory structure, including the Federal Motor Vehicle Safety Standards ("FMVSS"), include considerations for the nature of ADS-equipped vehicles. AVs remain subject to the same self-certification process and recall requirements that traditional vehicles are subject to under the Motor Vehicle Safety Act. Importantly, NHTSA would still retain its authority to conduct investigations and inspections, as well as request records, from ADS manufacturers, just as it can for manufacturers of traditional vehicles and vehicle equipment.⁷⁵ The agency's traditional powers to investigate defects related to motor vehicle safety or non-compliance with FMVSS would likewise remain applicable to ADS.⁷⁶

To maintain and strengthen American leadership in the AV industry, Congress should enact Federal legislation that outlines the necessary statutory and regulatory elements that are critical to the industry's success. This legislation should include the full universe of AV use cases, from small delivery vehicles, to robotaxis, to commercial motor vehicles. Many of AVIA's policy priorities have been incorporated into the SELF DRIVE Act of 2026,⁷⁷ the AMERICA DRIVES Act,⁷⁸ and the AV Accessibility Act.⁷⁹ AVIA strongly encourages this Committee to consider these priorities as it considers its own AV legislation.

To best support the further development of the AV industry, Federal AV legislation should:

- *Require an "ADS Safety Case."* As directed by Congress, NHTSA should initiate rulemaking, informed by industry and the work of existing standards setting bodies, to require that commercially deployed ADS manufacturers develop, and

⁷³ The following states represented by Committee members have an AV deployment law in place: Texas, South Dakota, Mississippi, Nebraska, Kansas, Tennessee, North Carolina, Utah, Montana, West Virginia, Michigan, Nevada, New Mexico, Colorado, and Pennsylvania.

⁷⁴ AUTONOMOUS VEHICLE INDUS. ASS'N, *supra* note 1.

⁷⁵ See 49 U.S.C. § 30166.

⁷⁶ See 49 U.S.C. § 30118.

⁷⁷ See Safely Ensuring Lives Future Deployment and Research in Vehicle Evolution Act of 2026, H.R. _____, 119th Cong., discussion draft available here: https://d1dth6e84htgma.cloudfront.net/03_H_R_SELF_DRIVE_Act_c6810113bc.pdf.

⁷⁸ AMERICA DRIVES Act, H.R. 4661, 119th Cong. (2025), available here: <https://www.congress.gov/bills/119th-congress/house-bill/4661/text>.

⁷⁹ AV Accessibility Act, H.R. 4419, 119th Cong. (2025), available here: <https://www.congress.gov/bills/119th-congress/house-bill/4419/text>.

provide upon request, a detailed record (often described as a “safety case”)⁸⁰ of the basis for the manufacturer’s conclusion that the design, construction, and performance of an ADS protects against an unreasonable risk to motor vehicle safety, as defined in 49 U.S.C. § 30102(a)(9). Safety cases have been used as part of safety assurance in a number of other fields, including energy,⁸¹ aviation,⁸² and defense,⁸³ and have been proposed for use with AI systems.⁸⁴ The ADS safety case would include: (1) a technical description of the ADS’s parts, capabilities, and integration into the vehicle platform, (2) explanation of how the ADS performs all elements of the driving task, (3) engineering methodologies used to design and assess the ADS’s performance and ensure the absence of unreasonable risk to motor vehicle safety, (4) a description of ADS’s safety performance, (5) evidence supporting the manufacturer’s claim for validating the ADS’s performance competencies, and (6) an explanation of how the ADS detects and responds to crashes.

- *Establish ADS Competencies.* Public trust in AVs is essential to their successful deployment. As part of the required safety case, ADS manufacturers should explain how their ADS meets a set of key competencies, including: (1) the ability to perform the entire dynamic driving task (“DDT”) within its Operational Design Domain (“ODD”) and to recognize and appropriately respond to the boundaries of its ODD; (2) accurately detecting and responding to relevant road users, including vulnerable road users and emergency vehicles and personnel; (3) transferring control back to human driver when necessary for Level 3 systems; (4) achieving a “minimal risk condition” as defined by SAE J3016 for Level 4 and 5 systems, when necessary; and (5) complying with applicable local traffic laws and laws relevant to the performance of the DDT.
- *Establish a National AV Safety Data Repository.* As directed by Congress, NHTSA should establish, implement, and maintain a National AV Safety Data Repository, to collect safety-relevant data about AV incidents and expand AV data reporting to include state-level location of AVs. This repository would provide timely information to the public and regulators to promote AV transparency and accountability. The database should include only material and relevant data and specify a meaningful minimum damage threshold for reportable crashes. NHTSA should further ensure that all information shared in the repository is subject to strict confidential business information protections.
- *Clarify and Modernize the FMVSS.* Whether by legislation or through congressionally directed action by NHTSA (by interpretation and/or regulatory changes) it should be clarified that the FMVSS requirements for manually operated driving controls and certain indicators and telltales are not applicable to Level 4 or Level 5 ADS-dedicated vehicles, since they are intended for an in-vehicle human driver only. Such action would support AV innovation by avoiding imposing requirements that do not advance safety and hamper the opportunity to re-imagine what motor vehicles look like and how they are designed, paving the way for greater accessibility, safety, and societal utility.
- *Revise the “Make Inoperative” Prohibition.* Existing Federal law prevents manufacturers, dealers, distributors, and repair businesses from disabling any safety-related device or design element required by an FMVSS in a vehicle for any purpose after its first sale. To ensure that innovative safety and technical features can be adopted, AV legislation should clarify that making a vehicle’s manual controls inaccessible or altering their functionality for safety reasons during autonomous operation does not run afoul of the “make inoperative” provision of the Motor Vehicle Safety Act (49 U.S.C. § 30122).

⁸⁰See, e.g., *Welcome to Safety Case 101*, AURORA (Mar. 8, 2022), <https://aurora.tech/newsroom/welcome-to-safety-case-101>.

⁸¹See, e.g., *What are Safety Cases? A Historical Overview*, SYNERGENOG (Dec. 12, 2024), <https://synergengog.com/what-are-safety-cases-history/> (explaining the history and the safety benefits of using safety cases when managing high-risk oil and gas energy and industrial facilities, including onshore processing plants, offshore fixed platforms, and floating vessels).

⁸²See, e.g., *Safety Case Development*, VA. TECH, <https://maap.ictas.vt.edu/capabilities/safety-cases.html> (last visited Feb. 2, 2026) (explaining the robust development of safety cases for aviation operations).

⁸³See, e.g., DSA 03.OME PART 1: DEFENCE CODE OF PRACTICE (DCOP) 103, U.K. DEF. SAFETY AUTH. (Aug. 2024), https://assets.publishing.service.gov.uk/media/689f2414cc5ef8b4c5fc44b4/DSA_03.OME_Part_1_DCOP_103_-_OME_Safety_and_Environmental_Case_-_SEC.pdf (describing the extensive requirement to use safety cases for the U.K. Ministry of Defence).

⁸⁴See Geoffrey Irving, *Safety cases at AISI*, AI SEC. INST. (Aug. 23, 2024), <https://www.aisi.gov.uk/blog/safety-cases-at-aisi>.

- *Expand the FAST Act Testing Exception.* An exemption included in the FAST Act (49 U.S.C. § 30112(b)(10)) permits only qualifying original equipment manufacturers to test and evaluate vehicles that do not conform to the FMVSS. AV legislation should further include a means for AV developers to conduct commercial operations, including the carrying of members of the public as passengers and transporting freight as part of that testing or evaluation.
- *Move Forward with an AV Demonstration Program.* Direct NHTSA to move forward with a voluntary AV demonstration program that offers uniform Federal rules that provide oversight for the safe design, construction, and deployment on public roads for ADS-equipped vehicles manufactured and operated by participants admitted into the program. Such a program would benefit AV developers seeking to demonstrate innovative vehicle designs while also providing NHTSA with additional data on AV operations beyond the safety data collected under the National AV Safety Data Repository proposed above.
- *Advance AV Cybersecurity and Privacy.* Congress should include in its comprehensive AV legislation language requiring AV manufacturers to develop cybersecurity and privacy plans for their technologies. Cybersecurity plans should include a written cybersecurity policy describing the manufacturer's practices for detecting and responding to cyberattacks, unauthorized intrusions, and false and spurious messages or vehicle control commands. For privacy, AV manufacturers should be required to develop a plan with respect to the collection, use, sharing, and storage of personal information collected by an AV and a method for providing notice to vehicle owners or occupants about the privacy policy.
- *Promote AV Accessibility.* Congress should support access to AVs for people with disabilities by passing the AV Accessibility Act.⁸⁵ The Act would prohibit states from issuing motor vehicle operator licenses in a manner that prevents people with disabilities, or other individuals without a driver's license, from riding as a passenger in an ADS-equipped vehicle. This Act also requires the Secretary of Transportation, in collaboration with the National Academies of Science, to conduct an accessible infrastructure study to determine the best practices for public transportation to improve the ability of Americans with blindness and other disabilities to find, access, and use ride-hail AVs, including during pickup and drop off.

AVIA is a partner of the United Spinal Association's SecureRide Coalition,⁸⁶ and would encourage Congress to provide funding for the testing and development of the Universal Docking Interface Geometry ("UDIG") wheelchair securement standard, which helps wheelchair users automatically and safely secure their wheelchairs in a motor vehicle. Funding is needed to expand UDIG testing to a wide array of vehicle configurations, including ADS-equipped vehicles with nontraditional seating arrangements, to ensure wheelchair users can secure their wheelchairs across vehicle designs, greatly expanding overall accessibility.⁸⁷

- *Support the Wider Deployment of ADS-Equipped Commercial Motor Vehicles.* To ensure uniform, national rules for operating autonomous commercial motor vehicles ("CMVs") in interstate commerce, AVIA recommends codifying the USDOT's 2018 interpretation that the Federal Motor Carrier Safety Regulations ("FMCSRs") do not assume that a CMV driver is always a human or that a human is necessarily present onboard a CMV, and that when a CMV does not require a human operator, none of the human-specific FMCSRs (*i.e.*, drug testing, hours-of-service, commercial driver's licenses, and physical qualification requirements) apply.⁸⁸ Further, to reduce barriers to interstate commerce, AV legislation should include a provision that when operating in interstate commerce, a CMV equipped with a Level 4 or Level 5 ADS is expressly allowed to operate without a human driver on board.

⁸⁵ Autonomous Vehicle Accessibility Act, H.R. 7126, 118th Cong. (2024) <https://www.congress.gov/bills/118th-congress/house-bill/7126/text>.

⁸⁶ See *SecureRide Coalition*, UNITED SPINAL ASS'N, <https://unitedspinal.org/secureride/> (last visited Feb. 2, 2026).

⁸⁷ For more details on UDIG research, see AVIA's recent response to a request for comment from the USDOT's Office of the Assistant Secretary for Research and Technology. See Comment Letter on Request for Information-Research Ideas To Support Nationwide Automated Vehicle (AV) Deployment from the Autonomous Vehicle Industry Association (Oct. 17, 2025), <https://www.regulations.gov/comment/DOT-OST-2025-1029-0026>.

⁸⁸ U.S. DEPT OF TRANSP., PREPARING FOR THE FUTURE OF TRANSPORTATION: AUTOMATED VEHICLES 3.0 (AV 3.0) 9 (2018), <https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/320711/preparing-future-transportation-automated-vehicle-30.pdf>.

- *Streamline and Update Regulations to Accommodate the Integration of ADS into CMVs.* This includes updating vehicle width limits to provide flexibility for the placement of sensors and other key safety technologies. This also includes updating regulations to allow for the use of cab-mounted beacons as a warning device, which would update antiquated regulations and improve safety for both autonomous CMVs and human drivers. In October 2025, FMCSA issued a waiver that allows ADS-equipped CMVs to use cab-mounted beacons on their vehicles rather than physically place warning devices on the roadway.⁸⁹ That waiver should be codified to ensure its benefits are available permanently.

VIII. Conclusion

The continued deployment of AV technologies will improve roadway safety and deliver substantial economic benefits across the country. To ensure these benefits are realized across the United States, we must preserve American leadership in the AV industry and implement a forward-looking Federal policy framework for AVs. I thank the Committee for its leadership on these important issues. The Autonomous Vehicle Industry Association stands ready to serve as a resource to the Committee on technical and policy matters and to work collaboratively to make safe autonomous vehicles a reality for Americans nationwide.

Senator CURTIS [presiding]. Thank you. Professor Smith, your five minutes.

STATEMENT OF DR. BRYANT WALKER SMITH, ASSOCIATE PROFESSOR OF LAW, UNIVERSITY OF SOUTH CAROLINA

Dr. SMITH. Thank you for your invitation. I'll offer seven points. First, American driving is dangerous. Automated driving could help if we're careful about it, but people are dying today, not because we're careful about automated driving, but, rather, because we're careless about road safety generally. Other countries do care. Driving in the U.S. is twice as deadly as in Canada and Australia. As a South Carolinian, I'm 10 times more likely to die in a crash than my friends in the U.K.—10 times. These countries aren't hiding some vast secret fleet of AVs. I can't yet hail a robotaxi in London, but I can cross the street.

Second, arrogance is careless. AVs have tremendous potential, but believing they will be a panacea virtually guarantees they won't because that confidence blinds us to risks. Many engineers working on AVs show humility. They talk with me about what's hard, what went wrong, and what's uncertain. They want to learn from local officials. I wish AV companies would show more of this humility in their PR. Third, the best proxy for the safety of AVs is the trustworthiness of AV companies. There are no self-driving or driverless cars. The companies that develop and deploy AVs are the drivers. This means that an AV is only as safe as the companies responsible for it. We can and should proactively assess their trustworthiness. AVs won't be perfect, but a company can still do right after its technology fails. It can explain what went wrong, how it's addressing the actual harm, how it's reducing future risks, and, critically, what it's learned more broadly. We need to see more of this. Doing right does not mean forcing victims into arbitrations, and it does not mean buying their silence and, thereby, misleading the public. These are betrayals of trust.

⁸⁹ See Letter from Fed. Motor Carrier Safety Admin. to Aurora Operations, Inc. (Oct. 10, 2025), <https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/2025-10/Letter%20to%20Aurora%20Operations%2C%20Inc.%20-Waiver%20of%20Warning%20Device%20Requirements%20Terms%20and%20Conditions.pdf>; see also OFF. OF SCI. & TECH. POLICY, WHITE HOUSE, TRUMP ADMINISTRATION SCIENCE & TECHNOLOGY HIGHLIGHTS: YEAR ONE 48 (2026), <https://www.whitehouse.gov/wp-content/uploads/2026/01/WHOSTP-2025-Wins.pdf>.

Fourth, safety is a marriage, not a wedding. Safety is a lifelong commitment that continues as long as an AV is on the road. It's not just a one-time test or certification or checklist. A credible safety case must be a living document that is clearly supported, robustly interrogated, and routinely updated. Vehicles placed on our roads stay there for decades and, therefore, need oversight for decades. NHTSA provides some of this oversight, and AVs will dramatically expand the scope of it, yet both NHTSA and FMCSA are tiny, under-resourced agencies with huge mandates.

Fifth, AVs are an especially visible part of a much broader discussion of AI. As a society, we're likely to place many of our hopes and fears about AI generally and AVs specifically. The Transforming Transportation Advisory Committee, which I vice-chaired, addressed many of these issues, including employment, accessibility, sustainability in the face of climate change, privacy vis-a-vis both companies and governments, and fundamental questions of power. For each, we need clear policy goals and an iterative approach to achieving them. Sixth, local government has essential expertise. Few appreciate how much local governments are subsidizing automated driving. First responders, for example, solve all kinds of problems today, from waking up people in robotaxis, to literally moving AVs that are stuck. These local officials deserve our respect. They want the people who remotely assist AVs to be in the U.S. They need to know AVs will help rather than hurt their response to disasters. They want to be able to ticket AV companies for moving violations just as they would any other driver. They emphasize that every city is unique, and AVs must operate accordingly.

Finally, we must empower, not disempower, our communities. Preempting State and local authority would be profoundly shortsighted, and I say this as someone who believes strongly in the potential of AVs. Many states want the Federal Government to lead on AV policy, but great leaders lead. Telling USDOT what to do and providing the resources to do it would help much more than telling states what not to do. Preemption could create litigation rather than certainty. It could bar states from getting unsafe vehicles and unsafe drivers, human or otherwise, off the road.

Our AV industry started through Federal research decades ago and then grew through our system of federalism. Brand America does have a serious credibility problem abroad, but preemption does not solve it. In a scary time of technological change, we need to make sure that communities and the people in them have control and feel in control. We can deploy both technology and policy in a way that protects and empowers them. Thank you.

[The prepared statement of Dr. Smith follows:]

PREPARED STATEMENT OF DR. BRYANT WALKER SMITH, ASSOCIATE PROFESSOR OF
LAW, UNIVERSITY OF SOUTH CAROLINA

Thank you for inviting my testimony. I would like to share seven points for your consideration.

First: We should *also* care about traffic safety when we're *not* discussing automated driving.

I think of a three-year-old in the hospital—hurt, scared, crying—who wants his mom to hold him and comfort him. But she's not there. She can't be. She died, while pregnant, because a drunk driver hit her.

This family is all too real, but they're not famous. After all, some 100 Americans will die in traffic today and every day. And even though these are deaths of violence—unexpected, often lonely, often painful—we don't really seem to care. Until it happens to us. Or until we start talking about something like automated driving.

I say this because we actually know how to prevent so much of the carnage on our roads. Other wealthy countries have *reduced* their traffic deaths in the 15 years we've been *increasing* ours. On a per-mile basis, driving in the United States is *twice* as dangerous as in Canada and Australia. As a South Carolinian, I'm ten times more likely to die in a crash than my friends in the United Kingdom. *Ten times.*

These countries are not hiding a vast secret fleet of automated vehicles. I can't yet hail a robotaxi in Toronto or Sydney or London. But I *can* cross the street.

I believe three things: Driving is dangerous. Automated driving could help, if we are careful about it. And people are dying today *not* because we are *careful* about automated driving but, rather, because we are *careless* about road safety generally.

Second: Arrogance is careless.

Believing that automated driving will be a panacea virtually guarantees it won't be, because that confidence blinds us to risks we don't expect and might even create.

The story of technology, and of policy, is about replacing an old set of problems with a new set of problems and hoping that, in aggregate, our new problems are less bad than our old problems.

An example: The first cars were hailed as environmentally friendly—because, unlike horses, cars don't poop. Except that it turns out they do. Even after the horrific smog and the mass lead poisoning of 20th Century America, here's a fact: A horse dumps about 25 pounds of manure a day, and a car dumps about 25 pounds of carbon dioxide a day.

I admire many of the mid-level engineers who are working on automated driving. Not just because they are doing incredible, important work. Also because, often, they show real humility. At least privately, they talk about what's hard, what went wrong, and what's uncertain. They want to listen to and learn from local officials. They engage with academic researchers, and they show their work.

I wish more automated driving companies demonstrated more of this humility in their public relations and in their lobbying.

Third: The best proxy for the safety of AVs is the trustworthiness of the companies developing and deploying them.

Automated driving currently encompasses a wide range of technologies, applications, business cases, and companies at various stages of maturity.

In my view, these companies “drive” and “operate” their AVs through a combination of their machine agents and their human agents. In other words, these vehicles are not “self-driving” or “driverless.” They have drivers, and those drivers are the companies developing and deploying them.

It follows that an AV is only as safe as the companies responsible for it. This is important, because while it is possible to evaluate the performance of an AV after a crash (provided relevant data are available and credible), it is much more difficult to determine the safety of an AV in advance. But we *can* proactively assess the trustworthiness—that is, the integrity—of the company driving that AV.

A trustworthy company shares its safety philosophy by explaining what it is doing, why it believes that to be reasonably safe, and why we can believe it. It makes a promise to the public that it markets only what it believes to be safe, that it will be candid about its limits and failures, and that when it fails it will make things right. And it keeps that promise by appropriately managing public expectations, by supervising the entire product lifecycle, and by mitigating harms promptly, fully, and publicly.

AVs will not be perfect. But in those moments of technological failure, a company can still do right. It can explain what went wrong, the steps it is taking to address the actual harm, the steps it is taking to reduce future risks, and—critically—what it has learned more broadly. One unforeseen risk points to many more foreseeable risks.

Doing right does not mean simply and repeatedly saying, in effect, “Of course our system is safe; there was an issue, but now we've fixed it.” It does not mean forcing victims into arbitrations that are almost certain to disfavor them. And it does not mean buying their silence and thereby misleading the public. These are betrayals of trust.

Fourth: Safety is a marriage, not a wedding

Safety is a lifelong commitment that begins when an AV is being developed and continues as long as that vehicle is on the road. Safety cannot be reduced to just

a one-time test, a one-time certification, or a one-time approval. A safety case must be a living document that is robustly interrogated and routinely updated.

The vehicles placed on our roads stay there for decades. They can outlast the federal safety standards to which they were certified (or from which they received an exemption) and even the companies that manufactured them.

NHTSA provides some oversight of these older vehicles through its authority over defects, but states primarily regulate operational safety on light-duty vehicles. And when these vehicles or their drivers—human or otherwise—are unsafe, it is states that can actually order them off our roads.

Automated driving, however, will dramatically expand the scope of NHTSA's oversight authority over these vehicles. An individual vehicle that is not properly maintained or whose occupants are not properly belted is not necessarily defective under Federal law. But if such a vehicle should not be operated, then an automated driving system that nonetheless engages on it could be defective.

Both NHTSA and FMCSA are tiny agencies with mandates that, even now, are impossible. Effectively supervising the operational safety of automated vehicles will require significant new resources for these agencies. This includes experts in specific technologies. It also includes hackers in the broad and best sense of the term: People who can deconstruct a system, question assumptions, see what's missing, and ask whether conclusions necessarily follow from premises.

Fifth: AVs are an especially visible part of a much broader discussion of AI.

Almost everyone interacts with motor vehicles almost every day. Because this mode of transportation is so visible, as a society we're likely to disproportionately focus many of our hopes and fears about AI generally on AVs specifically.

In late 2024, the U.S. DOT's Transforming Transportation Advisory Committee, which I vice-chaired, released recommendations about automated driving specifically and AI generally. We noted that the uncertain nature of both technology and regulation merits both clear policy goals and an iterative approach to achieving those goals.

We recognized the profound implications of AI. We also highlighted that many of these issues might fall outside the authority or capability of U.S. DOT to address. In some cases, such as privacy vis-à-vis both governments and companies, the lines of responsibility among Federal agencies are particularly unclear.

All of these topics, however, are within Congress's power to consider, if not fully to decide. Among many others, they include employment, social structures, access to justice, and power generally. And it is critical to consider the impacts of automated driving and other advanced technologies on communities as well as on individuals.

Sixth: Local government has essential expertise.

Very few people appreciate the extent to which local governments are currently subsidizing automated driving.

When AVs come to an area, local officials share maps of schools, information about special events and emergencies, and reports of incidents. Local first responders spot and solve all kinds of AV-related problems, from waking up people who are sleeping in the back of a robotaxi to literally moving AVs that are stuck. All of this amounts to a significant public investment.

These local officials who interact with AVs every day know more about them than almost anyone. They deserve our respect and our attention. They want to make sure that the remote assistants who play a critical role in automated driving are within the state and not on the other side of the world.

They want to know whether these automated driving companies have realistic disaster plans for the kind of disasters that could disable communications, render remote assistance impossible, and necessitate quick emergency response and evacuation. And they want to know how they can hold automated driving companies accountable for the kind of everyday moving violations that get regular drivers a ticket.

Fundamentally, they want to know that these companies are giving their communities the respect they deserve.

Finally: We must empower, not disempower, our communities.

Preempting state and local authority would be profoundly short-sighted—and I say this as someone who believes in the potential of automated driving.

Many states very much *want* the Federal Government to lead on AV policy. But great leaders *lead*. They actually do the work. They don't just order others to stop working. Telling U.S. DOT what to do (and providing the resources needed to do it) would be far more helpful than telling states what not to do.

Preemption would not necessarily create certainty. Rather, it could lead to years of litigation over what the relevant statutory language means and therefore what states can still do and therefore what companies can actually do. Over the years, I have read many versions of potential preemption language. In every case, the preemptive effect and even the preemptive intent of that language have been unclear to me.

Preemption would not necessarily improve safety. Again: It is states that can order unsafe vehicles and unsafe drivers—human or otherwise—off the roads. And it is states whose juries tell manufacturers to keep up with new technologies when federal standards fall behind. Automakers don't like to be sued. But they know how to manage, and the best ones take seriously their responsibility to fairly compensate victims.

Preemption would not necessarily improve global competitiveness. Our AV industry is flourishing today because of the foundational research that the Federal Government supported decades ago. And while Brand America does have a serious credibility problem abroad, this has nothing to do with our commitment to federalism at home.

In fact, this federalism offers *choice* to U.S. and foreign companies. Some companies have embraced California for the certainty they believe it offers, and some have embraced Texas for the flexibility they believe it offers. Waymo has done both, and now has activity in multiple states and even countries.

Finally, there is a fundamental issue that discussions about preemption often seem to overlook.

We find ourselves in a time of profound change. Change often involves a loss of control, whether actual or perceived. That can be scary and destabilizing both for individuals and for societies.

The ability of communities to set their own rules—and yes, even restrictions—on AVs acts as a steam release valve on a boiler. It keeps pressure from building up, and that in turn reduces the risk of catastrophic explosion.

Would I advise a community to ban AVs? Absolutely not. I would tell them that we should be concerned about automated driving but *terrified* about conventional driving. Nevertheless, preserving that option lets me have that conversation.

AVs will survive some location friction and a few modern-day Mackinac Islands—if we deploy them in a way that truly empowers communities and respects people.

Senator CURTIS. Thank you to our witnesses. We'll now begin our questioning, and I'll yield to my colleague, Senator Blackburn, to begin the questioning.

**STATEMENT OF HON. MARSHA BLACKBURN,
U.S. SENATOR FROM TENNESSEE**

Senator BLACKBURN. Thank you so much, and to each of you, thank you for taking the time to be here today.

Mr. Farrah, I want to come to you first. 2017, I was over in the House and chaired Comms and Tech over at the Energy and Commerce Committee, and that is when we took the first legislative text to the Committee to deal with autonomous vehicles and to allow this technology to flourish. We had worked on it for about 3 years to get to that point, and, of course, we had some folks that did not realize the safety components that come from working on this technology, so they chose to repeatedly shut down the guidelines that would be there for AVs. And I want you to just touch on how this technology, the autonomous technology, helps make our roads safer, helps make our vehicles safer and more responsive, and how it is helping to reduce fatalities?

Mr. FARRAH. Senator Blackburn, thank you very much for the question, and before I answer, I'll just say thank you very much for all your leadership going back to when you were in the House and now here in the Senate. And I'll say that it has been quite a few years since a lot of this discussion has started, but a couple of things have really changed. The first thing that's changed is this

is no longer science fiction. This is on roads. As I said in my opening statement, 26 states proactively authorize this technology. They are carrying passengers right at this very moment, so this is a reality for many, many Americans. The second thing that's changed is that we are no longer alone in the quest to have self-driving vehicles. We now have strategic competitors, most notably, the People's Republic of China, that are bound and determined to be the global leaders when it comes to autonomous vehicles. But without a Federal policy framework, we are asking our innovators to fight with one hand behind their back, and so that is why it's so important to pass a Federal policy framework.

And you touched on safety. This is the driving force behind our industry. We want to make our roads safer. We reject this idea that we just have to accept all the fatalities, accept all the injuries, accept millions of Americans being held back because vehicles are not accessible enough. And fundamentally, what we're trying to do with safety is we're trying to overcome human error. We're trying to overcome the things that Chairman Cruz talked about in his opening statement, the big drivers of fatalities in this country.

Senator BLACKBURN. And Mr. Moravy—pardon me—and Dr. Peña, let me come to you. I know that you all are working on safety, and we talked about this yesterday when we met, and thank you again for your time, and one of the things that people are concerned about is the amount of consumer data. They like the safety, they want you to innovate, they want to lower fatalities, but they're saying what kind of data are you getting? So, how are you all collecting and storing and working through the data? Mr. Moravy?

Mr. MORAVY. Thank you, Senator Blackburn, and I appreciate the time we had yesterday to discuss a little bit ahead of it. With regards to the data that we collect to improve our products, you know, we always use an opt-in policy, and that occurs when you select the advanced driving systems. We always aggregate and anonymize the data to ensure, you know, customer privacy, and then we use the swath of data that was collected, you know, to create generalizations about individual scenarios that we can improve.

Senator BLACKBURN. OK. So, you do not store the data from the car. You anonymize that data.

Mr. MORAVY. That's correct.

Senator BLACKBURN. All right.

Mr. MORAVY. The data comes to our central—

Senator BLACKBURN. Let me ask you this. I know you all are focused on U.S. production, so how are you dealing with supply chains? And, Dr. Peña, I'm coming with you to you on that one also after his answer.

Mr. MORAVY. Thank you, Senator Blackburn. Yes, as you may know, Tesla produces 4 of the 5 top U.S.-made cars, and we've always been committed to building locally. We produce all of the vehicles sold in the U.S. by Tesla in the U.S. We have facilities in both Texas and Fremont, California, that do that, and we work hard with our supply chain—

Senator BLACKBURN. OK.

Mr. MORAVY.—to ensure that they are also local to the U.S. and North America.

Senator BLACKBURN. OK.

Mr. MORAVY. Over 95 percent of our parts come from North America.

Senator BLACKBURN. OK. Dr. Peña?

Dr. PEÑA. We are not a vehicle manufacturer. We design and build an autonomous driving system, so that's the hardware and software that we then install onto a variety of vehicle platforms at our factory in Arizona.

Senator BLACKBURN. But are you affected by supply chains? Is that a constriction?

Dr. PEÑA. We like to have a stable supply of vehicles, and so it does affect us.

Senator BLACKBURN. OK. All right. That's what I wanted to know. Thank you.

Senator CURTIS. Thank you, Senator. I call on Senator Peters now for his questions.

**STATEMENT OF HON. GARY PETERS,
U.S. SENATOR FROM MICHIGAN**

Senator PETERS. Thank you, Senator Curtis, and thank Ranking Member Cantwell for deferring. I appreciate that.

As a senator from Michigan, I have long focused on issues related to autonomous vehicles, and I believe that today, more than ever, Congress cannot continue to stand on the sidelines when it comes to AVs. First, we know that this technology is a huge part of the future of the global automotive industry, but right now, as has been said, China is investing heavily in dominating the autonomous vehicle market. So, I believe it's absolutely imperative that we take action to ensure that American innovation and American standards lead the way on the world stage and not China.

Second, it's a matter of protecting good-paying American jobs. Congress cannot be silent on a technology that will literally shape the future of mobility. Automotive jobs have been at the heart of my state of Michigan and our manufacturing economy for over a century, and we need to ensure that those jobs stay here in America. And finally and most importantly, as has been said, this technology will save lives. Today, more than 100 Americans die on our roadway each and every day. As we sit here today, a hundred people will die today, and we must do everything we can to harness solutions with the power to bring that number as close to zero as possible, but that also requires building trust. Americans deserve to know with certainty that these vehicles will deliver safer streets and that Federal regulators have laid out clear rules of the road. The bottom line, it's up to Congress to do something, and that's why today, I'm calling on our Chairman and my colleagues on the Committee to work with me to make that a reality, and I'm calling for a bipartisan AV title in our next Surface Transportation bill. We can't wait any longer.

With that, I got a couple questions. First, Professor Smith, you and I share the position that it is both avoidable and unacceptable to have 40,000 deaths on our roads every year. And I believe we need to harness every solution to that problem, as evidenced by the hearing that I held on this issue last year, and I believe that AVs are certainly a part of that answer. However, even autonomous vehicles will not be perfect. We know that accidents will occur, and

I believe we should assess those incidents against the larger backdrop of our extremely dangerous roads today. So, my question for you is, in your opinion, how should legislators approach the idea of relative safety when it comes to AVs, and why should we not be satisfied with the default level of danger that we see on our roads today?

Dr. SMITH. Thank you, Senator Peters. Because the current level of carnage is horrific and is preventable, and we know how to prevent it. And so, with automated driving, we have these two different frameworks that are kind of intentioned. One, is the car framework: can we save one more person? The other is the aviation framework: any crash is a failure and unacceptable. And so, automated driving is, essentially, this challenge of shifting from that first paradigm to the second. And so, in assessing the safety of any crash, right, we could ask, well, did the system perform at least as well as a human driver in the equivalent scenario? Did it perform at least as well as a competing technology, and, importantly, did it perform better than the last one that failed? In other words, we can't have static standards. The bar has to keep going up.

Senator PETERS. Right. Well, I thank you for that answer, but I'd also, Mr. Chairman, like to enter into the record an op-ed from a neurologist published in the *New York Times* about his experience with car accident victims, and how recent peer-reviewed AV data is too promising not to pursue. I think it's important and would like to enter that in the record.

Senator CURTIS. Without objection.

[The information referred to follows.]

The New York Times

THE DATA ON SELF-DRIVING CARS IS CLEAR. WE HAVE TO CHANGE COURSE.

Dec. 2, 2025

By Jonathan Slotkin

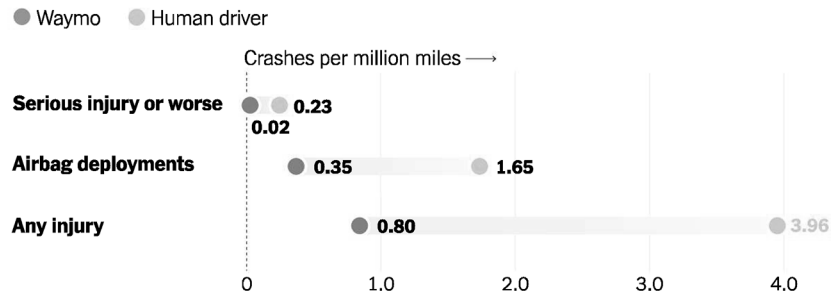
Dr. Slotkin is a neurosurgeon.

I recently got called to see a teenager ejected in a rollover car crash. The trauma team rushed him into surgery to stop major abdominal bleeding, but we all knew. When that much energy enters a skull, no operation can turn it back. He was declared brain dead. His death was a reminder of the staggering amount of suffering and loss of human life we accept from car accidents every single day.

The self-driving car company Waymo recently released data covering nearly 100 million driverless miles in four American cities through June 2025, the biggest trove of information released so far about safety. I spent weeks analyzing the data. The results were impressive. When compared with human drivers on the same roads, Waymo's self-driving cars were involved in 91 percent fewer serious-injury-or-worse crashes and 80 percent fewer crashes causing any injury. It showed a 96 percent lower rate of injury-causing crashes at intersections, which are some of the deadliest I encounter in the trauma bay.

So far, other autonomous vehicle companies don't report or they report incomplete data. Waymo, by contrast, published everything I needed to analyze the data: crash statistics with miles driven that allow accurate comparison with human drivers in the same locations.

Waymo's autonomous vehicles see dramatically lower crash rates than human drivers



Source: Waymo

If Waymo's results are indicative of the broader future of autonomous vehicles, we may be on the path to eliminating traffic deaths as a leading cause of mortality in the United States. While many see this as a tech story, I view it as a public health breakthrough.

The reasons autonomous vehicles are safer are straightforward. A system that follows rules, avoids distraction, sees in all directions and prevents high-speed conflicts will avert deadly collisions much more often.

These vehicles aren't perfect. A passenger heading to the airport was recently stuck inside a Waymo that looped a parking lot roundabout for five minutes. Waymo issued a recall last year to update the software on its vehicles after one hit a utility pole at low speed while pulling over.

And there have been two fatalities and one serious injury in crashes involving a Waymo vehicle. In all three cases, however, human-driven vehicles caused the collision: a high-speed crash that pushed another car into a stopped Waymo, a red-light runner hitting a Waymo and other vehicles before striking and injuring a pedestrian, and a Waymo rear-ended by a motorcyclist, who was then fatally struck by a hit-and-run driver.

This last instance may give some skeptical readers pause. There's a common misconception that these cars brake erratically and get rear-ended. But they are involved in far fewer rear-end injury crashes than human drivers are. And Waymo has never rear-ended another vehicle at injury level. Autonomous vehicle companies have to report every contact resulting in injury or property damage over \$1,000, while studies show that humans don't report the majority of accidents, even many with injuries.

In medical research, there's a practice of ending a study early when the results are too striking to ignore. We stop when there is unexpected harm. We also stop for overwhelming benefit, when a treatment is working so well that it would be unethical to continue giving anyone a placebo. When an intervention works this clearly, you change what you do.

There's a public health imperative to quickly expand the adoption of autonomous vehicles. More than 39,000 Americans died in motor vehicle crashes last year, more than homicide, plane crashes and natural disasters combined. Crashes are the No. 2 cause of death for children and young adults. But death is only part of the story. These crashes are also the leading cause of spinal cord injury. We surgeons see the aftermath of the 10,000 crash victims who come to emergency rooms every day. The combined economic and quality-of-life toll exceeds \$1 trillion annually, more than the entire U.S. military or Medicare budget.

This is not a call to replace every vehicle tomorrow. For one thing, self-driving technology is still expensive. Each car's equipment costs \$100,000 beyond the base price, and Waymo doesn't yet sell cars for personal use. Even once that changes, many Americans love driving; some will resist any change that seems to alter that freedom.

Not all autonomous vehicles are created equal. Many of the devastating crashes that capture headlines involve "driver assistance" systems—the kind found in millions of Teslas and other modern cars—where humans need to remain vigilant behind the wheel. Tesla recently released results suggesting that what it calls "full self-driving (supervised)" decreases the frequency of crashes, but we will still need

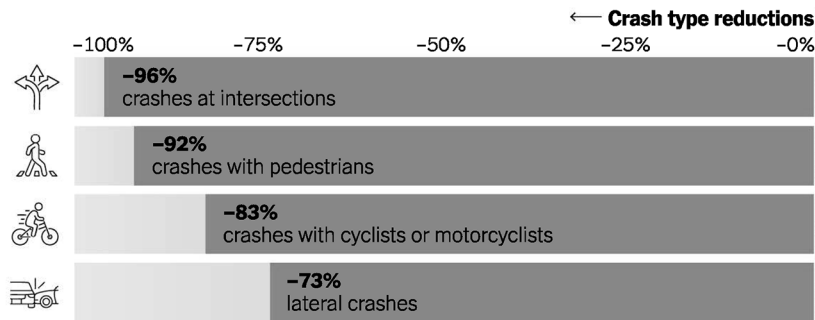
more independent analysis of that data before we can draw firm conclusions. And research on other partial automation vehicles has yielded mixed results. A study from the Insurance Institute for Highway Safety found “no convincing evidence” that partial automation reduces crash rates.

Waymo operates cars with no human driver. Its vehicles use cameras, radar, and the specialized sensors known as lidar, which create detailed 3-D maps. They operate only in cities where Waymo has studied every intersection.

We don’t yet know whether other autonomous vehicles will have a similar safety record. Tesla recently started a driverless pilot program (with a person supervising from the front passenger seat) in Austin, Texas, but has not released performance data yet. Other companies operate fully self-driving ride-hail services, but so far without comparable data transparency.

There is likely to be some initial public trepidation. We do not need everyone to use self-driving cars to realize profound safety gains, however. If 30 percent of cars were fully automated, it might prevent 40 percent of crashes, as autonomous vehicles both avoid causing crashes and respond better when human drivers err. Insurance markets will accelerate this transition, as premiums start to favor autonomous vehicles.

Compared to an average human driver over an equal distance, Waymo vehicles had...



Source: Waymo

Researchers predict that the shift to autonomous vehicles will take more than a decade. We should use that time to plan wisely. Autonomous vehicles improve safety remarkably when they replace humans driving personal vehicles, but if they end up primarily pulling riders from trains and buses, which are already exceedingly safe, there will be far less of a benefit. It makes sense to deploy these vehicles through commercial robotaxis, which is the current approach, but we need deliberate workforce planning to address the way that this will threaten the livelihoods of America’s millions of commercial drivers.

Rather than grapple with these challenges, many cities are erecting roadblocks. In Washington, D.C., local politicians have long postponed a key report that would facilitate the broader use of these vehicles despite 18 months of successful vehicle testing. In Boston, the City Council is considering mandating a “human safety operator” in every vehicle, effectively stalling meaningful deployment. Policymakers need to stop fighting this transformation and start planning for it.

Federal leadership is essential. Current regulations require companies to report crashes, but not the number of miles driven or where. We need the denominator, not just the numerator. Data-reporting requirements should include crash rates, miles driven and where, and safety performance. Independent auditors should verify this data against police reports, insurance claims and privacy-protected medical records.

This transformation will happen. We can guide it toward a safer, more equitable future or let it unfold haphazardly around us. There’s a future in which manual driving becomes uncommon, perhaps even quaint, the way riding horses is today. It’s a future where we no longer accept thousands of deaths and tens of thousands of broken spines as the price of mobility. It’s time to stop treating this like a tech moonshot and start treating it like a public health intervention.

Dr. Jonathan Slotkin is an executive and vice chair of neurosurgery at Geisinger Health System in Pennsylvania. He is a co-founder and general partner of Scrub Capital, a venture capital firm that invests in health care start-ups.

Graphics by Bhabna Banerjee. Source images by Valeriy Volkonskiy and Salah Uddin/Getty Images.

The Times is committed to publishing a diversity of letters to the editor. We'd like to hear what you think about this or any of our articles. Here are some tips. And here's our e-mail: letters@nytimes.com.

A version of this article appears in print on, Section SR, Page 5 of the New York edition with the headline: The Human Driver Is a Failed Experiment

Senator PETERS. One of the key reasons I believe Congress must act on autonomous vehicle legislation is because AVs represent a huge part of the future of the U.S. automotive industry. We need to not only make sure AV technology is developed here, we also need to make sure these vehicles and their sensor suites are manufactured in America as well. Michigan auto workers have led the Nation and made the U.S. automotive industry internationally competitive, and I believe they can do the same for autonomous vehicles.

Mr. Peña, Waymo currently does import vehicles from China to pair with its software stack, and I'm glad that you're moving away from this partnership. But from your perspective, how can Congress better ensure that AV companies prioritize U.S. manufacturing and union labor when it comes to building the vehicles' hardware of the future, and is this something that aligns with your company's vision of the future?

Dr. PEÑA. Senator, we design and build our autonomous driving system right here in America. And as I mentioned before, we use a variety of platforms, and we install an autonomous driving system onto those platforms in our factory in Arizona.

Senator PETERS. Great. Time is low. Mr. Chairman, could I just have—ask a question for the record, and appreciate that.

Mr. Farrah, some of your automotive manufacturing members, including Michigan's own General Motors and Ford, are driving consumer acceptance by introducing consumers to high levels of autonomy in their personal vehicles, including, as you know, hands-free highway driving and more. That includes the goal of introducing Level 3 hands-off, eyes-off driving technology for consumers to deploy when they choose. This way, autonomous technologies are delivering safety benefits in personally owned consumer vehicles today. Neither NHTSA nor Congress, though, has established a dedicated regulatory framework for Level 3 systems. What do you think are the greatest regulatory gaps today for Congress to fill the Level 3 deployment? I can enter that for the record to respond, unless you have a quick response.

Mr. FARRAH. With the indulgence of the Chairman, I would be very glad to elaborate on the response for the record. And certainly, Level 3 is an important piece of automotive technology, and I didn't want to miss the opportunity to thank you for all of your past efforts on behalf of the AV industry.

Senator PETERS. Great. Thank you. Thank you, Mr. Chairman.

**STATEMENT OF HON. JOHN CURTIS,
U.S. SENATOR FROM UTAH**

Senator CURTIS. Thank you. We welcome any other responses afterwards as well.

Well, I now yield to myself and appreciate our witnesses being here. Appreciate this topic. I think it's fair to say that there's broad agreement that Congress must lead on this. Professor Smith, I'll give you a little asterisk that states can play a role as well, and I think that's a worthy conversation. I think the real question isn't whether or not we should lead, but how we should lead without sacrificing data privacy, without sacrificing transparency, without sacrificing innovation. If not careful, the Federal Government can clamp down on innovation.

And with that in mind, I'd kind of like to turn to the data privacy part of this. Dr. Peña, I was in Los Angeles this weekend, and I noticed with some awe the number of your vehicles that I saw. Do you know roughly, off the top of your head, how many you would have, like, in a market, like in Los Angeles, how many vehicles?

Dr. PEÑA. I don't know—don't have exact number for you, but there are a few hundred vehicles down there.

Senator CURTIS. Yes, enough that you see them on almost every corner. Do you know, per vehicle, how many cameras are part of that?

Dr. PEÑA. We have, I think, 29 cameras, approximately.

Senator CURTIS. Twenty-nine. Are any of those internal?

Dr. PEÑA. Well, yes, we do have cameras internally to help our riders when they need it.

Senator CURTIS. Sure. So, if you take 29 cameras and you times it by a couple hundred vehicles, the potential for data collection. That was my first impression when I saw that vehicle go by with those cameras is the amount of data that potentially could be collected is staggering. And so, I think my first question for you and then Mr. Moravy is, like, what internal policies do you currently have for data privacy?

Dr. PEÑA. We have strong privacy protections for our riders. We don't share any personally identifiable information, and when we are driving, we collect information to make our Waymo Driver better. That is the only purpose of collecting data as we drive through our cities.

Senator CURTIS. So, as a former mayor, I would often be approached if somebody had an accident and they wanted to go get the traffic information from our recordings on the lights. Is that a scenario that's possible where law enforcement's going to come to you and say, hey, you were going by this intersection, share with us your recordings of what happened at that intersection?

Dr. PEÑA. Senator, we would only comply with a valid legal order, and even at that point, we will review it to ensure that is not too broad, and if we believe it's too broad, we can object as well.

Senator CURTIS. OK. Mr. Moravy?

Mr. MORAVY. Yes, similar to what Mr. Peña said, we do collect a bit of data. We have only eight or nine cameras in our vehicles today. All that data is for our consumers, as I mentioned before, as an opt-in policy, but it is aggregated and anonymized when it comes through to our servers for review. And to your point about whether or not we comply with, you know, Federal or State authorities for requests for data, actually, Tesla has been doing that for almost 15 years now with our vehicles and the recordings that

they take, both in our event data recorders and our cameras, whenever there is a pertinent legal order to do so.

Senator CURTIS. Yes, and I think that's—I don't want to overstate that point: compliant with law enforcement. I think more my point is the vast amount of data, particularly with 29 cameras collecting through a community, and have we really thought through that data and what to do with it. Mr. Farrah, I kind of turn to you as an industry. Is the industry ready for this data privacy question, and are you prepared or is industry prepared with future legislation to discuss how we deal with data privacy?

Mr. FARRAH. Senator Curtis, thank you very much, and I think that Mr. Peña articulated very well what's the industry standard, which is that you would need to get a valid order from a law enforcement agency or court in order to comply with that. And if it was appropriately overbroad, that would be something that the company would certainly evaluate, and I would say that, you know, we are very eager to participate. As Congress, as this committee takes on future data privacy discussions, we absolutely want to be a part of that process.

Senator CURTIS. Yes, and I would point out we've got good actors at the table today, but as industry grows, you'll have people who may not take good care of that data, and may have data breaches, and I just think it's something that's very important for us to consider.

We talked just briefly before the hearing about Utah. Utah would love to be a leader on this. We have the Olympics coming. We've talked a lot about safety. Could you briefly just discuss traffic congestion and how a state like Utah might use autonomous vehicles to deal with less traffic on the roads, and the impact that that could have on a state like Utah?

Mr. FARRAH. Absolutely, Senator, and as you know, I'm a huge fan of your state. As I told you, I've been there many times. And I will say that Utah is one of the 26 states that has an AV deployment statute, so you're very well positioned to take advantage of this, including for the upcoming Olympics. In terms of traffic congestion, what we're really trying to do is to give more transportation options. So, in many cases, for example, in Salt Lake, this may be an elegant solution for moving people through city centers in a more effective way in some sort of shared use vehicle. That's something that, you know, on a city-by-city basis, we're trying to give new optionality.

Senator CURTIS. I've used up my time, and I'll yield to our Ranking Member for her questions.

Senator CANTWELL. Thank you, Mr. Chairman. Professor Smith, you talked about trust and faith, and building that over a period of time. My point is that the information age is delivering a lot of technology change. I'm not sure Boeing understood software as well as they should've understood software. I think, here, we may not have a NHTSA that understands these challenges either, but we certainly can't dismantle them. And we need to have people—when it comes to AI or privacy, we need people in the Federal Government who are going to understand the issues. Otherwise, we're not going to do a good job. So, I think that's part of building that trust and faith you're talking about because you're going to continue to

repeat issues. Not everything is going to be known. You're still going to—again, there's a difference between a beta program and a large-scale program, and then something else you find out happens.

So, I'm trying to get to this point because we have these—you know, we have an autopilot issue. I mentioned a constituent of mine, Mr. Nissen, who was run over. He was on a motorcycle, and he was run over by a Tesla car on autopilot that the family is saying did not detect the motorcycle. This isn't like blaming it on the people who were supposed to be in the car, although that is a pretty big debate that, did the term, "autopilot," mean something to the users of Tesla and that they're responsible? But I think the family, in some of these cases—there was a case in Florida where they, basically, are saying, no, it's still negligence because of the way autopilot was marketed.

I'm assuming, Dr. Peña, you like this binding arbitration that your users are under now, that they sign an agreement, and then if something goes wrong—

Dr. PEÑA. Could you describe the arbitration—

Senator CANTWELL.—in the user for Waymo, you, basically, sign an agreement that, basically, if there's a dispute about what happened, you now are in a binding arbitration with the manufacturer, with Waymo, over the results of those cases.

Dr. PEÑA. Ranking—

Senator CANTWELL. I'm trying to get to liability here. I'm trying to get to liability.

Dr. PEÑA. Great.

Senator CANTWELL. So, you approve that now, correct?

Dr. PEÑA. Ranking Member Cantwell, I—that's not my area of expertise. My area is primarily AV safety, but I'd be happy to get back to you.

Senator CANTWELL. OK. My understanding, Professor Smith, these are just like binding arbitration contracts.

Dr. SMITH. It's very common in industry, yes, unfortunately.

Senator CANTWELL. And so, we are not going to take this common standard in software where I'm downloading a game or some app, and now we'll apply it to cars. We're just not going to do that. I'm not going to do that, and I'm not going to allow that to happen. I'm not going to sign a binding arbitration agreement with Waymo, and then basically say I can't sue them. I'm just stuck in binding arbitration. I guarantee you this Congress isn't going to be for that either. The Senate has already taken action trying to be more aggressive. But where do we go with this issue, you know, of building that trust that you're talking about and showing. Mr. Farrah just said he doesn't believe in preempting states. That's a good—that's a good thing, but how do we—how do we get this to the point where there is true liability so that people will build products and be accountable for them?

Dr. SMITH. Thank you, and the reality is that we all do sign these agreements every day agreeing to arbitration, and we don't realize it. We don't realize it matters until we're hurt, until we're the victims, and then we realize that we can't—we can't use the courts. And no one else realizes it because arbitration is often secret, and, therefore, that information is not coming out. So, you

talked very much about trustworthiness. The companies in this field are necessarily saying to regulators and to the public, trust us, and that needs to come with substance, right?

With great power comes great responsibility. So, they need to say, here's what we're doing, here's why we believe it's safe, and here's why you can trust us, and then that needs to be interrogated by, as you've described, competent, capable, well-resourced officials. The idea that our—that our automated driving office could fit in a McDonald's or our defects agency could fit in a warehouse is astounding to me for a country of this size and sophistication.

Senator CANTWELL. Well, I think not. I think the Chairman of this committee berated the then-CEO of Boeing, Dave Calhoun, for, you know, breaking that trust and faith. I think Kelly Ortberg is trying to reestablish it and to say that, no, it has to be based on good engineering and a constant accountability. But I do think figuring out the Federal responsibility so that we can have predictability and certainty, but it has to come with some liability. It just does, and when you look at these instances of NHTSA playing this role in the past, it also had to come with changing a culture. We're trying to change the culture of the FAA right now, but you're going to have to change the culture. You know, when companies just want to go along and just keep promoting airbags that don't work, then that's a problem. You got to get rid of and change the culture. So, anyway, I look forward to hearing more about what you think that Federal framework looks like. Thank you, Mr. Chairman.

The CHAIRMAN [presiding]. Thank you. Today, autonomous vehicles are being deployed on public roads, yet there's no unique safety standard for AVs from the Federal regulator, NHTSA. There's no Federal framework governing their deployment. There's no accountability or consistency across states. The patchwork of State laws means that driverless AVs can be deployed commercially in States like Texas, Arizona, and California, but they aren't allowed in New York, Massachusetts, and Vermont, where a driver must be present, or in the case of California, AV operational data must be turned over to regulators, but not in Florida or Michigan. Mr. Moravy, from Tesla's perspective, what risks does this regulatory gap create, and why is a clear national framework necessary sooner rather than later?

Mr. MORAVY. Thank you, Chairman Cruz. Appreciate the opportunity to answer this question. As an original, you know, equipment manufacturer up here of autonomous vehicles, a patchwork of State regulations really presents a lot of uncertainty for us in producing those vehicles. When we talk about FMVSS regulations, it's important that we homogenize them for, you know, purpose-built AVs so that we have certainty and, you know, we have a path forward that is consistent across all 50 states.

The CHAIRMAN. Dr. Peña, when incidents occur with AVs, they're highly scrutinized, in part because the technology is so novel and different. Recently, there have been incidents with Waymo involving school buses in Austin, and a child in Santa Monica, California. What safeguards has Waymo implemented since the school bus incidents in Austin, and how do you verify that these changes will protect school bus riders moving forward?

Dr. PEÑA. Thank you, Mr. Chairman. We take those incidents very seriously. Safety is our top priority, especially safety of children and pedestrians. We're evaluating every one of those events and developing fixes to address them, and we have already incorporated many changes to our software to dramatically improve our performance. And we are working with the Austin Independent School District to collect data on different lighting patterns and different conditions, and we're also incorporating those learnings into our system. But we do safely navigate thousands of school bus encounters every single week, and we're continuously learning and improving because our work is safety—on safety is never done.

The CHAIRMAN. And the report of Waymo striking the child in Santa Monica indicates the AV quickly slowed down from 17 mph to 6 mph. What lessons can be drawn from what occurred, and how might that have been different if a human driver had been driving?

Dr. PEÑA. Mr. Chairman, first I'd like to express that we are grateful that the young girl was able to walk away from the scene. And as you state, our analysis indicates that our technology was able to detect a young girl as she emerged from behind a tall SUV, brake hard, reduce speed, and reduce harm. And we performed an analysis as well of how we were compared with an always attentive human driver, and we found that the Waymo Driver would have responded faster than our models of an attentive human driver. So, in this case, I believe that we mitigated harm.

The CHAIRMAN. Question for both Mr. Moravy and Dr. Peña. In your assessment, what are the safety benefits of widespread adoption of AVs? What human lives do we think could be saved?

Mr. MORAVY. Yes. Thank you, Chairman Cruz. I mean, I think NHTSA has a legacy of safety over the years, and we've—the auto industry has made improvements since the 1970s when that was in—first in place, you know, on the road, getting us down to, as many folks have said, about 40,000 deaths per year, but in the last 20 years, that number has stayed pretty flat. I've been involved in some form of automotive safety over my career for the last 25 years, whether it's crash structures, airbags, seat belts, autonomous driving systems. I can tell you without a shadow of a doubt that the next big jump we have in reducing that number from 40,000 to hopefully a day where it's zero is autonomous driving. Simply put, an autonomous driver, you know, the system and the computer that operates it, doesn't sleep, doesn't blink, and doesn't get tired, and those are the real opportunities we have to face against the, you know, the serious crisis we have on our roads today.

The CHAIRMAN. By the way, one just marketing suggestion. I'm not sure I would use the litany from "The Terminator" to describe your AVs.

[Laughter.]

The CHAIRMAN. Dr. Peña, same question.

Dr. PEÑA. I think we have demonstrated our performance today. In over 100 million miles, our data shows that we are 10 times less likely to be involved in a serious injury collision as compared to human drivers in the cities where we operate, and data also shows that we're 12 times less likely to be involved in a pedestrian injury

collision in the cities where we operate. So, I think we're making a difference already.

The CHAIRMAN. All right. Final question. There's quite a bit of concern that the advent of AVs with automobiles may jeopardize jobs. At the same time, I think Tesla is demonstrating that AVs can produce an awful lot of high-paying jobs, that there is a strong positive job story. Share with this committee how many new jobs has Tesla's automatic driving system already created in Texas, and how many more are projected?

Mr. MORAVY. Yes. Thanks, Senator Cruz. As you mentioned, we build all our AVs here in North America and in Texas. We've invested over \$2 billion on a purpose-built AV line in Texas that will operate, first, at 1,200 jobs a shift, and then when fully ramped up, to 5,000 jobs. And that doesn't include our supply base, which is also largely here, and the exponential factor that that would have, perhaps 10 times that many.

The CHAIRMAN. Thank you. I've also received outreach from 33 stakeholders who support an autonomous vehicle Federal framework, and I ask unanimous consent that these be entered into the record.

Without objection, so ordered.

[The information referred to follows:]

THE LEAGUE OF AMERICAN BICYCLISTS
Washington, DC, February 2, 2026

Hon. TED CRUZ, Chair,
Hon. MARIA CANTWELL, Ranking Member,
United States Senate Committee on Commerce, Science and Transportation,
Washington, DC.

Dear Chairman Cruz and Ranking Member Cantwell:

The League of American Bicyclists writes in support of a national autonomous vehicle (AV) framework's inclusion in the Surface Transportation Reauthorization Bill, provided that an AV framework includes strong safety standards, including a "vision test," and does not preempt the ability of state and local governments to regulate the safe operation of AVs in the ways that they traditionally have regulated the safe operation of human driven vehicles. Especially while Federal safety standards are not yet adopted, it is critically important that state and local governments and the public have the traditional regulatory and legal tools that protect the public under our existing human driven vehicle framework. For the last five years, we have promoted the creation of a national AV framework that prioritizes safety, preserves consumer and worker rights, protects all road users, retains local control, ensures sustainable transportation, and guarantees accessibility and equity. We continue to support those *tenets* [1] and their inclusion in a national AV framework in the Surface Transportation Reauthorization bill.

The League of American Bicyclists (League) is a national nonprofit dedicated to creating a Bicycle Friendly America for everyone. Each year, thousands of cyclists are killed or injured on America's roads, often by drivers engaged in distracted driving and speeding. The most common crash type in cyclist fatalities in data from the National Highway Traffic Safety Administration is a motorist overtaking a cyclist and failing to detect the cyclist in time to avoid them, misjudging space, or otherwise failing to observe laws that require safe overtaking. Between 2015 and 2023, crashes where laws requiring a safe distance while overtaking were violated represented more than a quarter of cyclist deaths. In contrast, SAE Level 4 and 5 fully autonomous vehicles are designed to obey traffic laws and safely share the road with cyclists, pedestrians and other road users.

Fully autonomous vehicles have the potential to reduce cyclist injuries and fatalities on our Nation's roads, but we need leadership from Congress to establish a safety baseline and policy framework for AVs. This will ensure the technology's safety benefits are realized nationwide. For the League, it is critical that a Federal framework includes a "vision test" safety standard that provides objective data on the ability of AVs to detect, identify, and respond to cyclists, pedestrians, and other road

users. A “vision test” is essential to understand the performance of AV systems and promote public trust and understanding of their performance. Without standards in place, the tragic status quo for those who choose to cycle will be prolonged and injuries and deaths will be the only objective data we receive on AV performance.

Federal leadership at this moment can proactively help save lives, protect vulnerable road users, and ensure the United States leads the world in safe autonomous vehicle development and deployment. We urge the Committee to address the need for a national AV framework, including a “vision test,” alongside this reauthorization, and to incorporate the tenets that we support into that framework.

Sincerely,

KEN MCLEOD,
Policy Director,
The League of American Bicyclists.

ALLEGHENY CONFERENCE ON COMMUNITY DEVELOPMENT
February 3, 2026

United States Senator TED CRUZ,
Chairman
Senate Committee on Commerce,
Science, and Transportation
Washington, DC.

United States Senator MARIA CANTWELL,
Ranking Member
Senate Committee on Commerce,
Science, and Transportation,
Washington, DC.

Dear Senator Cruz and Senator Cantwell:

On behalf of the Allegheny Conference on Community Development, founded to strengthen the economic vitality and quality of life of the Pittsburgh region, I write to express our strong support for the continued advancement—and responsible, safe deployment—of autonomous vehicle technologies in the United States. This sector represents a major and growing economic development opportunity for southwestern Pennsylvania and for the Nation.

For decades, the Pittsburgh region has been a nationally recognized hub of innovation in autonomy. Beginning with Carnegie Mellon University’s No Hands Across America, NavLab 5 project—the first long-distance autonomous trip across the country—our region established itself early as a global leader in robotics and intelligent transportation systems. That foundation has since matured into one of the country’s most dynamic commercial ecosystems.

According to the Allegheny Conference’s *Forefront: Securing Pittsburgh’s Breakout Position in Autonomous Mobile Systems* report, the Pittsburgh region is now home to more than 71 firms with core operations in autonomy, supporting approximately 6,300 direct jobs and generating \$651 million in annual labor income. These firms represent a highly skilled workforce and a growing cluster that attracts investment, nurtures startups, and anchors cutting-edge research and commercialization.

In addition, continued growth in the autonomy sector is catalyzing new infrastructure and industry-serving assets. A prime example is the establishment of PennSTART, a high-speed transportation testing, research, and training facility designed to accelerate innovation while improving safety across the transportation sector. Opening this fall, PennSTART will help companies advance next-generation autonomous technologies while supporting workforce training and expanding the region’s capacity to host and grow this industry.

Given this significant and ongoing economic impact, I respectfully urge the Committee to champion policies that advance autonomous vehicle safety research, testing, manufacturing, and workforce development, enabling Pittsburgh to gain a competitive advantage in developing these technologies in the United States.

Sincerely,

STEFANI PASHMAN,
Chief Executive Officer,
Allegheny Conference on Community Development.

CONSORTIUM FOR CONSTITUENTS WITH DISABILITIES
February 4, 2026

Hon. TED CRUZ,
Senate Committee on Commerce,
Science, and Transportation,
Washington, DC.

Hon. MARIA CANTWELL,
Senate Committee on Commerce,
Science, and Transportation,
Washington, DC.

RE: Letter for the Record for the Hearing titled “Hit the Road, Mac: The Future of Self-Driving Cars”

Dear Chairman Cruz and Ranking Member Cantwell:

The undersigned members of the Consortium for Constituents with Disabilities (CCD) Transportation Task Force and friends write to submit a letter for the record for the February 4, 2026 hearing titled “Hit the Road, Mac: The Future of Self-Driving Cars”. As noted in the hearing announcement, autonomous vehicles (AVs) have the potential to save lives and could also “significantly expand mobility and independence for people with disabilities who are unable to drive, improving access to employment, healthcare, and the community.”

CCD is the largest coalition of national organizations working together to advocate for Federal public policy that ensures the self-determination, independence, empowerment, integration and inclusion of people with disabilities. The Americans with Disabilities Act (ADA) sought to “provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities.” Through AV policymaking, Congress has the opportunity to lead, uphold the ADA’s mandate, enhance safety, and improve lives and mobility for all.

To ensure people with disabilities benefit from AVs, the vehicles must accommodate passengers who remain in their wheelchairs, the human machine interface (HMI) must be accessible for people with sensory and cognitive disabilities, and AVs must be able to detect all types of disabled pedestrians. Access and safety for disabled passengers is not addressed in the discussion draft of the House SELF DRIVE Act of 2026. To ensure American leadership in AVs and automated driving system (ADS)-equipped vehicles, we urge you to consider and prioritize the safety and access needs of disabled passengers and pedestrians. We are also providing “*Disability Access in AVs and Motor Vehicles*” draft bill text (Access in AVs Draft) for your consideration.

Background

Nearly 1 in 5 people in the U.S. has a disability (more than 57 million). In addition, many older adults who acquire short or long-term disabilities or health conditions in both rural and urban settings will need accessible transportation options to access healthcare and remain active in their communities. The ADA was passed in 1990 yet significant barriers remain to accessible, affordable transportation.

Many people with disabilities cannot drive because of their specific disability, are currently unable to obtain a driver’s license, are denied transportation services, or cannot afford to purchase a wheelchair accessible vehicle (WAV).¹ It’s critical that ride-share and on-demand services provide disability access, yet there are not adequate WAVs, and trip denials for service animal users and other people with disabilities are rampant. There are no purpose-built wheelchair accessible passenger vehicles on the market today in the United States. Wheelchair users often pay nearly double the price of the vehicle for necessary aftermarket modifications, including to have a ramp installed or other features that require exemptions from the FMVSS.²

Without affordable, accessible transportation, people with disabilities are unable to travel to work, to school, to contribute to and participate in their communities, to support and spend time with family and friends, and live their lives to the fullest. A report by the National Disability Institute found that a critical barrier to competi-

¹A Bureau of Transportation Statistics (BTS) study of adults with disabilities found that roughly half of respondents 18 to 64 reported living in a household with income under \$25,000. Bureau of Transportation Statistics (2018). Travel Patterns of American Adults with Disabilities. Available at <https://www.bts.gov/travel-patterns-with-disabilities>.

²The aftermarket modifications for wheelchair accessibility are vitally important for the ability of wheelchair users to travel outside their homes. However, wheelchair users face an uncomfortable tradeoff between that access and their safety since the modifications may decrease the overall crashworthiness of the vehicle. People with disabilities regularly choose access over safety. This tradeoff exists because neither manufacturers nor NHTSA have obligations to make today’s passenger vehicles both safe and accessible to all people with disabilities and fail to do so voluntarily. As long as this tension exists, nothing in the proposed legislation should diminish access to after-market modifications of vehicles to provide vehicle access to people with disabilities.

tive integrated employment and entrepreneurship is a lack of accessible transportation options. Accessible, affordable, and sustainable AVs could lead to an additional 4.4 million jobs for people with disabilities, an additional \$867 billion in U.S. GDP, and \$1.6 trillion in U.S. output.³

Disability AV Advocacy and Engagement

The CCD Transportation Task Force has a track record of advocating for fully accessible AVs through adoption of cross-disability AV Principles and providing feedback on past AV legislative drafts.^{4,5} Many of our members also participated in three days of AV accessibility workshops in 2019 hosted by the Alliance of Automobile Manufacturers (an organization preceding the Alliance for Automotive Innovation) with government, industry and disability stakeholders, and U.S. Department of Transportation (USDOT) and U.S. Department of Labor (USDOL) listening sessions.^{6,7}

Manufacturers and transportation providers are developing, testing and deploying autonomous shuttles and passenger vehicles. We acknowledge AVs have the potential to dramatically improve access for people with disabilities. However, *the promise and safety of AVs will only be realized if the vehicles and the surrounding infrastructure are fully accessible, and the safety elements consider the needs of all people with disabilities.*

Recommended AV Legislation Provisions to Ensure Disabled Traveler Access & Safety

Licensing and Insurance—Legislation should prohibit discrimination on the basis of disability by states and any other governmental authorities in licensing and insurance.

Highly Automated Vehicles Advisory Council—An Advisory Council comprised of industry, consumer, safety, labor, civil rights and other stakeholders is necessary to continue discussions and identify barriers, unintended impacts and solutions. Disability representation is critical and should be included within any advisory council, and the Council should also be required to consider accessibility needs.

Disability Inclusive Safety Case, Frameworks and Self-Assessment Rulemakings—Safety case or self-assessment requirements should include accessible HMI that would ensure accessibility for people with sensory and cognitive disabilities, as well as physical accessibility of the vehicle for wheelchair users. We also support including ADS detection of and appropriate response to any vulnerable road user and strengthening this language to ensure a broad range of disabled and other road users are detected. A Disability Rights Education & Defense Fund brief on ableism in AV AI and algorithms recommends standards be set to ensure AVs can detect all people with disabilities and other members of marginalized communities outside

³National Disability Institute (December 30, 2022). Economic Impacts of Removing Transportation Barriers to Employment for Individuals with Disabilities Through Autonomous Vehicle Adoption. Available at <https://www.nationaldisabilityinstitute.org/reports/autonomous-vehicle-adoption/>.

⁴Consor/um for Constituents with Disabilities Transportation Task Force Autonomous Vehicle Principles, updated May 2022. Available at <https://www.c-c-d.org/fichiers/CCD-Disability-AV-Framework-Hearing-Letter-072523-FINAL.pdf>.

⁵CCD Transportation Task Force August 23, 2019 feedback on AV Bill Issues, including disability access, advisory committees, rulemakings, exemptions, privacy, safety evaluation reports and accessibility features, crash data, resources for NHTSA, consumer education, studies examining potential impacts, and infrastructure available at <https://www.c-c-d.org/fichiers/CCD-Transpo-TF-Feedback-on-AV-Bill-Issues-082319.pdf>. November 4, 2019 Feedback on AV Legislation Sections, including on a HAV advisory council, and disability exemptions available at: <https://www.c-c-d.org/fichiers/CCD-Transp-TF-Feedback-on-AV-Sections-110419.pdf>.

December 9, 2019 Feedback on AV Legislation Sections, including on new FMVSS and licensing and insurance available at <https://www.c-c-d.org/fichiers/CCD-Transp-TF-Feedback-on-AV-Sections-120919.pdf>. February 21, 2020 Feedback on AV Legislation Sections, including on consumer education, cybersecurity, personnel and staffing, and additional considerations available at: <https://www.c-c-d.org/fichiers/CCD-AV-Sections-Response-02-21-20.pdf>.

⁶Autonomous Vehicles and Increased Accessibility Workshops (May 3, July 19, September 10, 2019). Hosted by the Alliance of Automobile Manufacturers (an organization preceding the Alliance for Automotive Innovation). Washington, D.C. Summary Report, agendas and presentations available at <https://www.autosinnovate.org/avaccessibility>.

⁷U.S. Department of Labor (October 2019). Autonomous Vehicles: Driving Employment for People with Disabilities. Available at <https://www.dol.gov/odep/topics/AV-Info-Guide-Revised.doc>.

⁸Ian Moura for the Disability Rights Education and Defense Fund (November 2022). Addressing Disability & Ableist Bias in Autonomous Vehicles: Ensuring Safety, Equity & Accessibility in Detection, Collision Algorithms & Data Collection. Available at <https://dredf.org/addressing-disability-and-ableist-bias-in-avs/>.

the vehicle.⁸ Research and recent anecdotes suggest that not all AVs are being taught to detect people seated in their wheelchairs, service animal users, or people with darker skin tones, among others. The Access to AVs Draft requires a safety rulemaking for accessible AV HMIs and a rule for automated driving systems (ADS) to assess and validate the performance of sensing, perception, and response to disabled people outside the vehicle.

A mandate from Congress for all AV-related rulemakings to consider the needs of disabled travelers would ensure inclusion. The vehicle's ADS HMI and object detection outside the vehicle are critical components in any safety framework.

Updating Existing FMVSS Standards—Existing FMVSS must be updated to ensure the safety of AVs, including level 4 and 5. We strongly encourage Congress to require USDOT to include a review of how updated FMVSS will ensure the safety of fully accessible AVs, including those that are both electric and autonomous, and are built with wheelchair ramps and will require testing and deployment of automatic securement systems.⁹ The Federal safety framework must assume deployment of, and advance progress toward, fully accessible passenger vehicles (both large and small) as well as accessibility standards. These standards will not only increase public trust of AVs, but also a roadmap for those in the industry seeking to develop and deploy the safest, most accessible vehicle.

Examples of FMVSS related standards that require attention for passenger-related accessible ergonomics are active suspension and kneeling capabilities for level entry, vehicle doorway height and width for entry, rear passenger entry for ambulatory self-or assisted passenger transfers, passenger restraint systems, ramps and mobility equipment securement, and grab assistance throughout vehicles that allow for perpendicular movement. Any updates to the FMVSS must maintain the current exemptions to crashworthiness for modified vehicles to install a ramp until vehicles are fully accessible and such modification is no longer required for physical access. The Access to AVs Draft requires a standard for automated restraint systems for wheelchair users and ramps and ramp installations.

Preemption—Overly broad preemption provisions may unintentionally restrict AV accessibility or equity performance measures or requirements at the state or local level, including state laws that would mandate vehicle environmental standards to mitigate harm. While we understand the need for Federal standards of vehicle design and construction, we also encourage allowing states and local jurisdictions to seek higher performance requirements that also ensure the greatest access and benefits for disabled and other historically underserved travelers. Many cities like New York City, Chicago, and San Francisco have taken the lead in requiring accessibility from rideshare providers and taxis. Their leadership and innovation for service needs to continue to be allowed and local and state levels. The Access to AVs Draft bill prohibits discrimination on the basis of disability by AV operators that would protect the rights of disabled passengers and pedestrians should preemption be included.

Forced Arbitration—We strongly encourage inclusion of a prohibition on forced arbitration clauses in any AV framework. AV providers must be held accountable for injuries and property damage, and remedies available under applicable civil rights laws must be made available.¹⁰ Disabled passengers repeatedly face discrimination from rideshare and micromobility services and disabled pedestrians and cyclists routinely have dangerous interactions with vehicles in public streets and rights of way. The rights of disabled travelers should be protected to ensure a safe and quality experience. In order to fully protect their rights, all disabled people must have the option to take their claims, including those under civil rights laws and the ADA, to court.

Should forced arbitration be allowed, we urge upholding disabled travelers' rights. The Access to AVs Draft bill includes a provision and language limiting forced arbitration when involving death or injury of a disabled person, unfair practices affecting a disabled person, and harm to wheelchairs or service animals.

Crash Data—Required industry crash data should include whether vulnerable road users such as pedestrians or wheelchair users were involved. Whether assistive

⁸Ian Moura for the Disability Rights Education and Defense Fund (November 2022). Addressing Disability & Ableist Bias in Autonomous Vehicles: Ensuring Safety, Equity & Accessibility in Detection, Collision Algorithms & Data Collection. Available at <https://dredf.org/addressing-disability-and-ableist-bias-in-avs/>.

⁹The industry's safety standards for independent wheelchair securement and passenger restraint should be adopted by NHTSA and integrated into the FMVSS.

¹⁰We support provisions prohibiting some predispute arbitration claims. We also encourage remedies available under applicable civil rights laws be included.

devices such as wheelchairs, walkers, or service animals were damaged or harmed should also be included.

USDOT Personnel and Staffing, Resources for Development—We strongly encourage funding and identification of staffing and resource needs required to ensure accessibility and safety are prioritized in the development of AVs, as well as creating a department within the Center for Excellence, or a separate center, focused on accessibility of AVs. We also encourage the hiring of experts with disabilities who bring their own lived experience and informed perspective.

Infrastructure Data and Considerations—For travelers with disabilities to safely utilize, enter and exit an AV the surrounding infrastructure must be accessible. When data is collected through mapping or other means, AV service providers and government entities should collect and share infrastructure accessibility information, including areas where pick-ups and drop-offs may be unsafe. This data could then be used to identify necessary improvements.

Privacy—Passengers' health, disability status, and locations visited must not be shared or used for commercial or tracking purposes without the permission of the individual.

U.S. Access Board AV Standards Mandate—The U.S. Access Board currently provides accessibility guidelines and standards for policymakers and industry for transportation vehicles including buses and vans, rail cars and automated guideway vehicles and public rights of way.¹¹ There are currently no Federal accessibility standards for fully accessible AV passenger vehicles. USDOT has on their Inclusive Design Challenge webpage a list of existing standards, *e.g.*, wheelchair securement, that may be used as a guide for the time being.¹² There is also a summary report from the Alliance of Automobile Manufacturers-hosted AVs and Increased Accessibility workshops that identifies accessibility needs in detail.¹³ However, these do not hold the same weight, nor are they enforceable.

A mandate for the U.S. Access Board to draft AV standards is critical in any legislative framework. In addition, including a deadline within which the Department of Justice and USDOT must adopt the standards and providing sufficient funding for the Access Board to develop the standards is necessary.

Thank you for your consideration. Please contact CT Tyson at ctyson@dredf.org and Sarah Malaier, smalaier@afb.org, with any questions. We are eager to support your efforts to enhance safety and mobility for all.

Sincerely,

CCD Transportation Task Force Co-Chairs
 Danica Gonzalves, Paralyzed Veterans of America, danicag@pva.org
 Sarah Malaier, American Foundation for the Blind, smalaier@afb.org
 Tyler Beck, Epilepsy Foundation of America, tbeck@efga.org
Signatory Organizations
 Access Ready
 American Association of People with Disabilities
 American Council of the Blind
 American Foundation for the Blind
 American Printing House for the Blind
 Autistic Women & Nonbinary Network
 Christopher & Dana Reeves Foundation

Deaf Equality
 Disability Belongs
 Disability Rights California
 Disability Rights Education & Defense Fund
 Easterseals
 Epilepsy Foundation of America
 Muscular Dystrophy Association
 National Council on Independent Living
 National Disability Institute
 Paralyzed Veterans of America
 TDIforAccess
 United Spinal Association

¹¹The U.S. Access Board is an independent Federal agency that promotes equality for people with disabilities through leadership in accessible design and the development of accessibility guidelines and standards. Learn more and review the guidelines and standards they have developed at <https://www.access-board.gov/>.

¹²U.S. Department of Transportation Inclusive Design Challenge Resources. Available at <https://www.transportation.gov/inclusive-design-challenge/resources>.

¹³Autonomous Vehicles and Increased Accessibility Workshops (2019). Available at <https://www.autosinnovate.org/avaccessibility>.

NATIONAL CONSUMERS LEAGUE
 Washington, DC, February 4, 2026

Hon. TED CRUZ,
 Chair,
 Committee on Commerce, Science, and
 Transportation,
 United States Senate,
 Washington, DC.

Hon. MARIA CANTWELL,
 Ranking Member,
 Committee on Commerce, Science, and
 Transportation,
 United States Senate,
 Washington, DC.

Dear Chair Cruz and Ranking Member Cantwell,

The National Consumers League (NCL) respectfully submits this letter for the hearing titled "*Hit the Road, Mac: The Future of Self-Driving Cars.*" We applaud the Committee for exploring opportunities to support the safe and responsible deployment of autonomous vehicles (AVs).

NCL believes in the promise of AV technology. Technology that performs the entirety of the driving task safely, reliably, and free of behaviors that have contributed to the unacceptable number of crashes, injuries, and deaths on our Nation's roads each year. Technology that provides convenient, affordable transportation services for those who lack access to traditional mobility services, who are disabled, or who are elderly. Technology that more effectively and efficiently ships freight and delivers goods.

We also recognize that technology is only as reliable as its human developers. Without appropriate safeguards in place, the race to develop AVs may become a race to the bottom, where deploying quickly supersedes deploying safely and responsibly. Troubling safety incidents, regulatory black holes, and lax oversight threaten to disrupt this critical balance and the future of this technology itself. AVs will not save lives if they do not operate safely and adhere to state and local traffic laws. They will not bridge the mobility divide if we weaken enforcement of the Americans with Disabilities Act and preempt state and local accessibility laws. AVs will not benefit society if crash victims and their families do not have the right to seek justice in the courts. AVs will not create jobs and grow wages if we don't address how AVs may displace workers. AVs will not improve public health or the environment if congestion management and tailpipe emission laws are invalidated.

For self-driving cars to succeed, appropriate safeguards must be in place. We support establishing a Federal framework to ensure that the automated driving system (ADS)—the suite of sensors and software driving the AV—meets the need for motor vehicle safety and urge lawmakers to ensure that AVs comply with applicable safety standards. We urge Congress to protect Americans' rights to access the courts and preserve the appropriate role of state and local governments. We also encourage Congress to consider the workforce impacts of AV technologies that could jeopardize the livelihoods of millions of Americans gainfully employed in the driving profession.

We thank you for considering our perspective on autonomous vehicles.

Sincerely,

DANIEL GREENE,
Senior Director of Consumer Protection & Product Safety,
 The National Consumers League.

VISION ZERO NETWORK
 Oakland, CA, February 2, 2026

Hon. TED CRUZ, Chair,
 Hon. MARIA CANTWELL, Ranking Member,
 U.S. Senate Committee on Commerce, Science and Transportation,
 Washington, DC.

Dear Chairman Cruz and Ranking Member Cantwell:

On behalf of Vision Zero Network, thank you for the opportunity to submit comments to express our interest in a national framework for autonomous vehicles that prioritizes safety, first and foremost.

Vision Zero Network's mission is to help communities prevent traffic fatalities and serious injuries on America's roads. We work across the Nation to ensure that everyone can move about their communities safely, whether walking, biking, driving, or riding transit.

Instead of focusing simply on human error, we base our work on a Safe Systems approach across safe vehicles, safe roads, safe speeds, safe people, and emergency response, as shared by the *U.S. Department of Transportation* and reflected in Inter-

national Standard *ISO 39001*. (Also, please note that we discourage the use of the *outdated statistic* that “94 percent of traffic crashes are caused by human error,” which fails to accurately represent the influence of other factors on individual behavior, such as roadway and vehicle designs, speeds, and other policy decisions.)

We recognize the safety benefits that autonomous driving technology offers, as it can be designed to follow the rules of the road, including speed limits, which is critical, given that unsafe speeds play a role in more than one-third of traffic deaths. AVs—along with improved road designs, speed management policies, and safer vehicle designs—are all important tools to address the road safety crisis in this country.

To ensure fully autonomous driving technology delivers on its safety promises, we need a strong national AV framework to define and ensure an appropriate safety baseline. AV deployment should complement—rather than compete with—policies that support transit and safer street designs for all road users.

We encourage Congress to work with stakeholders to establish an AV framework defining a strong safety baseline that is aligned with Safe Systems principles that prioritizes human life and well-being.

Thank you for considering our perspective and for your leadership in advancing transportation safety.

Sincerely,

LEAH SHAHUM,
Executive Director.



February 3, 2026

Hon. TED CRUZ, Chair,
Hon. MARIA CANTWELL, Ranking Member,
United States Senate Committee on Commerce, Science and Transportation,
Washington, DC.

Dear Chairman Cruz and Ranking Member Cantwell:

Our organizations are members of the *United for Autonomy* coalition, which has come together in recognition of the significant benefits that autonomous vehicles (AVs) will bring the American public and to encourage policymakers to set in place a Federal policy framework on AVs.

We commend the U.S. Senate Committee on Commerce, Science, & Transportation for its upcoming hearing entitled, “Hit the Road, Mac: The Future of Self-Driving Cars.” We appreciate the Committee using this hearing as an opportunity to kick off its process for drafting Federal autonomous vehicle legislation. Congressional action this year on the surface transportation reauthorization presents an incredible opportunity to legislate regarding autonomous vehicles and promote American leadership. We encourage you to take advantage of this opportunity.

It is imperative that the United States create a Federal policy framework on AVs. In recent years, U.S. states have set the pace on AV policy and it is long past time

for the Federal government to establish Federal policy that supports safe autonomous deployment. We believe that such a framework will help ensure that millions of Americans are able to access the benefits of autonomous vehicles, which provide safer roads, greater supply chain resilience, and create new economic and enhanced accessibility opportunities for people with disabilities.

Autonomous vehicles have *driven* more than 145 million autonomous miles on U.S. public roads, a distance equivalent to the distance between Earth and Mars. These vehicles undertake diverse operations, carrying passengers across major U.S. cities like Phoenix, Austin, Los Angeles, and San Francisco, assisting with transit access in rural communities in the Midwest, filling in middle mile cargo roles in Arkansas, and hauling freight across Texas and beyond.

By prioritizing Federal AV legislation, the Committee will help the United States remain the global leader AVs amidst fierce competition with the People's Republic of China. China is the United States's closest strategic competitor on autonomous vehicles and determined to replace the U.S. A strong Federal policy framework will allow U.S. companies to compete and win.

AV legislation should promote safety, accessibility for people with disabilities, supply chain resiliency, and cybersecurity protections. We believe that strong policy measures in these areas will lay the foundation for years of growth and allow U.S. companies to lead the pack in developing standards and practices worldwide.

Thank you again for holding this critical hearing. We look forward to engaging with members of the Committee throughout the legislative process.

Sincerely,

Alliance for Automotive Innovation
American Council of the Blind
ACES
American Trucking Associations
Autonomous Vehicle Industry
Association Bay Area Council
Blinded Veterans Association
Chamber of Progress
Consumer Technology Association
Contra Costa Transportation Authority
Intelligent Transportation Society of America
Institute for Safer Trucking
MEMA. The Vehicle Suppliers Association

National Association of Manufacturers
National Venture Capital Association
National Retail Federation
Paralyzed Veterans of America
Reason Foundation
Road Safe America
TechNet
Truck & Engine Manufacturers Association
United for Autonomy
United Spinal Association
U.S. Chamber of Commerce
Zero Emission Transportation Association

CC: Members of the U.S. Senate Committee on Commerce, Science, & Transportation

UVEYE

Teaneck, NJ, February 4, 2026

Hon. TED CRUZ,
Chairman,
Committee on Commerce, Science, and
Transportation,
United States Senate,
Washington, DC.

Hon. MARIA CANTWELL,
Ranking Member,
Committee on Commerce, Science, and
Transportation,
United States Senate,
Washington, DC.

Dear Chairman Cruz and Ranking Member Cantwell,

On behalf of UVEye, a New Jersey-based developer and manufacturer of advanced vehicle inspection systems, I am writing to commend the U.S. Senate Committee on Commerce, Science, & Transportation for its upcoming hearing entitled, "Hit the Road, Mac: The Future of Self-Driving Cars." As a company focused on vehicle safety, we believe in the promise of autonomous vehicles ("AVs") as a tool to improve our transportation system and appreciate the Committee using this hearing as an opportunity to kick off its process for drafting legislation to create a Federal policy framework for AVs. This year's surface transportation reauthorization presents a unique opportunity to support the further development and adoption of advanced transportation technologies of all kinds, including AVs. We encourage you to take advantage of this opportunity.

UVEye is dedicated to creating safer vehicles and safer roadways for drivers, passengers, and pedestrians, by providing objective, consistent, and instant evaluations of the condition of a vehicle that help identify issues before they become safety hazards. Our patented AI-driven system uses 360° imaging to scan each vehicle in seconds, detecting under-body damage, tire wear, exterior dents or scratches, alignment

issues, and windshield defects. The system operates in all weather conditions—rain, snow, or mud—and delivers standardized, easy-to-read inspection reports. UVEye systems are installed in Original Equipment Manufacturing (OEM) facilities, rental fleets, auctions, dealerships, and heavy-duty/commercial fleets, scanning more than two million vehicles each month. This includes customers testing and deploying AVs. Trusted by industry leaders, UVEye’s technology is proven across millions of scans worldwide.

Just as AVs can make vehicles safer and more efficient by removing human error, our technology is helping make vehicles safer and more efficient by identifying issues that may be invisible during manual inspections—such as leaks, under-body damage, and worn or outdated tires—that can lead to breakdowns or accidents. UVEye provides an “always on” inspection process to substantially increase the likelihood of detecting safety issues. Faster inspections also keep vehicles on the road and mission ready.

A Federal policy framework on AVs is vital to supporting the safe, widespread deployment of AVs across the country, and help ensure that millions of Americans can enjoy the safety, mobility, and economic benefits of AVs. By crafting such a framework, the Committee will help the United States remain the global leader AV technologies and help drive further innovation in transportation.

Thank you again for holding this critical hearing. We look forward to engaging with members of the Committee on this and other issues as it continues its work on the surface transportation reauthorization process.

Sincerely,

UVEye.

MOTHERS AGAINST DRUNK DRIVING
February 3, 2026

Hon. TED CRUZ, Chair,
Hon. MARIA CANTWELL, Ranking Member,
United States Senate Committee on Commerce, Science, and Transportation,
Washington, DC.

Dear Chairman Cruz and Ranking Member Cantwell:

On behalf of Mothers Against Drunk Driving (MADD), we respectfully request that the Committee include a National Autonomous Vehicle Framework in the Surface Transportation Reauthorization Bill.

MADD is a national nonprofit dedicated to saving lives by ending drunk driving and supporting victims and survivors. Drunk driving remains the leading cause of fatalities on our Nation’s roads, with more than 12,000 fatalities a year.

Drunk driving deaths are 100 percent preventable. MADD supports preventing drunk driving through legislation like the HALT Drunk Driving Law that directs the National Highway Traffic Safety Administration to establish a Federal safety standard requiring new vehicles to include technology to prevent drunk driving. This is lifesaving technology that can and should be developed and implemented now.

Because fully autonomous vehicles (AVs) never drive drunk or impaired, we believe they are another important part of the solution to prevent drunk and impaired driving fatalities. Companies and the public need a strong Federal framework to establish a clear safety baseline for this innovative and life-saving technology.

A Federal AV framework will help build public trust and allow the safe adoption of technology that will save tens of thousands of lives each year.

If Congress acts now to establish a first-ever Federal policy framework for autonomous vehicles, we can ensure life-saving innovations create a multifaceted approach that will save lives on our roads nationwide.

We urge the Committee to develop a Federal AV framework to help drive a future where no more lives are lost due to drunk and impaired driving.

Sincerely,

STACEY D. STEWART,
Chief Executive Officer.

THE WHITE LINE
February 2, 2026

Hon. TED CRUZ, Chair,
Hon. MARIA CANTWELL, Ranking Member,
United States Senate Committee on Commerce, Science, and Transportation,
Washington, DC.

Dear Chairman Cruz and Ranking Member Cantwell:

On behalf of The White Line, we are supportive of a first-ever National Autonomous Vehicle Framework being included in the Surface Transportation Reauthorization Bill. Establishing a clear Federal safety baseline for fully autonomous vehicles is essential to ensuring this technology delivers on its promise to save lives.

The White Line is a national nonprofit dedicated to the urgent mission of protecting cyclists, pedestrians, and other vulnerable road users and ending preventable traffic fatalities. Approximately 40,000 people continue to die on U.S. roads each year, largely due to human error and choices, including speeding and impaired driving.

Our team members have ridden in Waymo SAE Level 4 fully autonomous vehicles and observed firsthand how the technology is designed to stay constantly vigilant, follow speed limits, and drive with the safety of other road users in mind. To save lives and prevent injuries on our roads, The White Line strongly supports efforts to develop and deploy Level 4 and Level 5 autonomous vehicles. The evidence so far indicates that in its current operational conditions, an advanced L4 automated driver system like the Waymo Driver can outperform human drivers across several safety metrics (crash rate, injury claims, etc.).

This technology can change the deadly road safety status quo, but the public needs Congressional leadership on regulation to establish a Federal AV policy framework and set a strong Federal safety baseline. Without this baseline, bad actors could undermine public trust in autonomous vehicles, slowing adoption of a life-saving technology. Delaying this framework is contributing to the constantly increasing number of preventable fatalities in the U.S. Surface transportation reauthorization offers a rare and urgent opportunity for Congress to lead. Federal action will save lives and ensure the United States establishes themselves as a leader for autonomous technology. We urge the Committee to act now.

With Respect,

JACQUELINE CLAUDIA,
Executive Director,
The White Line.

CONSUMER REPORTS
February 4, 2026

Hon. TED CRUZ, Chairman,
Hon. MARIA CANTWELL, Ranking Member,
Committee on Commerce, Science, and Transportation,
United States Senate,
Washington, DC.

Dear Chairman Cruz and Ranking Member Cantwell:

Consumer Reports (CR), the independent, nonprofit, and nonpartisan member organization, writes regarding the February 4, 2026, hearing, "Hit the Road, Mac: The Future of Self-Driving Cars." We ask that this letter be included in the hearing record.

For 90 years, CR has used rigorous research, independent testing, and evidence-based advocacy to advance vehicle safety innovations that protect consumers. We have championed everything from seat belts and anti-rollover systems to the latest crash avoidance technologies that can help prevent tragedies and reduce injuries both inside and outside the vehicle.

As the Committee considers a Federal framework for autonomous vehicles (AVs), we urge you to prioritize a consumer-centered approach that holds manufacturers and AV technology developers accountable, and ensures that safety and innovation go hand in hand. While we agree that AVs hold the potential to improve safety and mobility, they remain in a developmental stage, and there is much unknown about how AVs will ultimately affect consumers on our roads. As such, any Federal framework must take a prudent approach and be built upon rigorously evaluated safety data, not an unproven assumption that all AVs are safer than human drivers.

Whether the Senate’s framework is based primarily on companies’ safety cases or their compliance with performance standards—and we do think enforceable safety standards are important to include, even if the framework is primarily centered on safety cases—it is insufficient for manufacturers or developers of safety-critical AV technology to grade their own homework. Safety claims, incident reports, and compliance with Federal standards should be independently verified, with objective confirmation that the automated driving system operates safely on a consistent basis. Among other things, this means that the system can handle challenging environmental conditions, and detect and respond appropriately to all road users, including pedestrians, cyclists, law enforcement, and emergency responders. If an automated driving system is assuming the role of a human driver, then—at a bare minimum—it needs to be held to the standards for safe driving that we expect of human drivers in any given situation on the road.

These recommendations align with consumers’ views. According to a December 2024 Consumer Reports *nationally representative survey*, two out of three U.S. adults think vehicle safety

standards should be stricter for AVs than those for traditional passenger vehicles, and just 3 percent think safety standards for AVs should be less strict than for traditional passenger vehicles.¹ About six in ten (59 percent) strongly support a “vision test” requirement for AVs, with an additional 20 percent responding that they somewhat support this requirement.²

At the same time, we also recognize that AV technology blurs the line between the regulation of vehicle design, primarily a Federal role, and the regulation of driver behavior, which typically falls to states and localities. Because the automated system is now the driver, some industry groups would solve this dilemma by broadly preempting state authority to regulate AVs.

In our view, it would be a profound mistake to sweep away state and local safeguards. State and local officials already play a vital role regulating AV operations in their communities, in places where AVs have been deployed. These officials truly are on the front lines of road safety, overseeing AVs’ interactions with first responders, school zones, and human-driven vehicles.

They must retain the authority to protect their residents and manage their streets—and consumers agree. According to the same December 2024 Consumer Reports nationally representative survey referenced above, 52 percent of U.S. adults think their local government should keep the power to decide whether and how autonomous vehicles are allowed on roads in their community, compared to just 21 percent who say their local government should not keep this power.³

Effective oversight of AV technology also depends on regulators and the public having access to meaningful, high-quality safety data that goes beyond reports of severe crashes and fatalities. We support the establishment of a comprehensive national data repository that includes information on near-misses, system disengagements, hard braking, evasive steering, and other safety-critical events necessary to evaluate real-world system performance. Safety data should be specific and detailed enough to allow for meaningful analysis of system performance and safety outcomes.

Company claims regarding “confidential business information” should be permitted only for true trade secrets, and not for safety data or to hide concerning or embarrassing incidents from public scrutiny.

Additionally, the baseline expectation for AVs should be that they meet Federal Motor Vehicle Safety Standards (FMVSS). Relying on general exemptions from FMVSS for deployment—particularly on the basis of “overall safety level” compared to traditional vehicles—is likely to be opaque and unaccountable to the public compared to the rulemaking process. While AV-related updates may be needed to FMVSS, and some have already been implemented, FMVSS have performance requirements, not design mandates, which permit innovation while ensuring safety. Exemptions from FMVSS should be limited to equipment required for the driving task which may be fully replaced by automation, and granted only if backed by safety evidence provided through a publicly defined National Highway Traffic Safety Administration (NHTSA) process.

Looking ahead, while we agree that AVs have the potential to bring meaningful independence for numerous Americans, including people with disabilities and older adults, this potential will only be realized if a Federal framework explicitly mandates accessibility. The market alone will not guarantee that these vehicles are ac-

¹ Consumer Reports, nationally representative American Experiences Survey of 2,130 U.S. adults (Dec. 2024) (online at: article.images.consumerreports.org/image/upload/v1736806650/prod/content/dam/surveys/Consumer_Reports_AES_December_2024.pdf).

² *Id.*

³ *Id.* 27 percent are unsure.

cessible to wheelchair users or those with sensory impairments. Legislation should guarantee that AVs are designed with universal access in mind, including accessible human-machine interface and physical accommodations.

We thank the Committee for its consideration of our comments, and look forward to working with all member offices to ensure that a Federal framework for AVs puts consumers and their safety first.

WILLIAM WALLACE,
Director, Safety Advocacy.
COOPER LOHR,
Senior Policy Analyst,
Transportation and Safety.

cc: Members of the Committee on Commerce, Science, and Transportation

UNION OF CONCERNED SCIENTISTS
January 30, 2026

Hon. TED CRUZ,
Chairman,
Senate Committee on Commerce, Science, and Transportation,

Hon. MARIA CANTWELL,
Ranking Member,
Senate Committee on Commerce, Science, and Transportation.

RE: February 4, 2026 hearing, “Hit the Road, Mac: The Future of Self-Driving Cars”

Chair Cruz, Ranking Member Cantwell and members of the Senate Committee on Commerce, Science, and Transportation:

The Union of Concerned Scientists (UCS) is the Nation’s leading science-based nonprofit putting rigorous, independent science to work to solve our planet’s most pressing problems. On behalf of UCS’s half a million supporters, we write to help inform the Senate Committee on Commerce, Science, and Transportation’s consideration of autonomous vehicle (AV) policies.

Foremost, we urge the Committee to work closely with stakeholders on the interplay of Federal and state authority. There have been longstanding concerns about Federal AV legislation preempting states and localities from implementing their own policies and safeguards. For instance, *previous legislation* preempted states or subdivisions of states from enacting any law that can be read to be an “unreasonable restriction on the design, construction, or performance of highly automated vehicles,” with the term “unreasonable” left undefined.

A discussion draft was recently unveiled in the House, the *H.R. __*, the Safely Ensuring Lives Future Deployment and Research In Vehicle Evolution (SELF DRIVE) Act of 2026. At the House Energy & Commerce Subcommittee on Commerce, Manufacturing, and Trade hearing on Tuesday, January 13, 2026, Michael Brooks, Executive Director of the Center for Auto Safety *testified*:

The proposed preemption language would infringe on traditional state and local authorities to regulate traffic law, auto dealers, insurance, registration, licensing, crash investigation, safety and emissions inspections, congestion management, environmental laws, and various additional consumer protections. Critically, the proposed preemption language would also threaten the application of state negligence and product liability laws to AVs, given the extremely ambiguous language in the savings clause. Ultimately, the preemption scheme envisioned by the proposed SELF DRIVE Act would act to ensure that local authorities are powerless to protect citizens while weakening those citizens’ ability to pursue effective claims against irresponsible AV companies.

We concur with Mr. Brooks. We are concerned about overly broad preemption language in the SELF DRIVE Act. As the Senate considers its own AV legislation, we urge you to work with states and localities to ensure their authority to protect the health and welfare of their residents are protected from unintended consequences of autonomous vehicle legislation.

For additional information on the Union of Concerned Scientists’ work on autonomous vehicles, see:

- UCS explainer and principles: *Self-Driving Cars Explained*

- UCS report: *Where Are Self-Driving Cars Taking Us?*

Sincerely,

ALYSSA Y. TSUCHIYA,
Director of Policy and Government Affairs,
Clean Transportation Program,
Union of Concerned Scientists.

CC: Members of the Senate Committee on Commerce, Science, and Transportation

February 4, 2026

Hon. TED CRUZ, Chair,
Hon. MARIA CANTWELL, Ranking Member,
Committee on Commerce, Science, and Transportation,
United States Senate,
Washington, DC.

RE: Disregard for consumer safety, state and local law, and civil justice by the autonomous vehicle industry

Dear Chair Cruz and Ranking Member Cantwell:

We the undersigned, on behalf of the members of each of our groups individually, and all drivers, passengers, pedestrians and other road users nationwide, write today with grave concerns about the autonomous vehicle (AV) industry's relentless push for broad and unnecessary assertion of Federal authority and omission of vital consumer protections in AV legislation.

Amongst a host of provisions that would degrade consumer safety, the vague and incredibly broad preemption of state and local authority demanded by the AV industry would have wide ranging consequences on state and local laws crafted to ensure the responsible introduction of novel autonomous vehicles into the varying transportation ecosystems of U.S. cities. Additionally, at a time when so much is unknown about the safety performance of AVs, prohibiting the inclusion of mandatory arbitration clauses in contracts is critical to ensure that consumer claims are not forced into secretive courts of arbitration to protect companies from legal scrutiny and accountability.

States and their political subdivisions are already preempted from exercising their powers in the area of motor vehicle performance to ensure that Federal Motor Vehicle Safety Standards and other safety rules administered by the National Highway Traffic Safety Administration (NHTSA) are the law of the land. Despite this long-standing prohibition on state and local action, the AV industry continues to demand legislation proposing a preemption scope that extends far beyond the Federal government's traditional authority to regulate vehicle performance and ensure consistent national performance standards to help ensure vehicle safety.

The vague and broad preemption language favored by the AV industry would infringe on traditional state and local authorities to regulate traffic law, auto dealers, insurance, registration, licensing, crash investigation, safety and emissions inspections, congestion management, environmental laws, and various consumer protections. Not only does such preemption language prevent state law enforcement from enforcing the rules of the road, but it also prevents them from even *investigating* a crash. Critically, the industry-favored preemption scheme also threatens state negligence and product liability laws as they would apply to AVs, before any Federal safety standards are in place to ensure safe operation.

Ultimately, preemption as envisioned by the AV industry would act to ensure that local authorities are powerless to protect citizens while weakening those citizens' ability to pursue effective claims against irresponsible AV companies. Federal preemption is traditionally used as a tool for ensuring that Federal statutes or regulations, once enacted, are able to operate without conflict across the country. But the preemption structure proposed by the industry turns this model on its head, ensuring that even in the absence of Federal safety regulations governing AV performance or safety, consumers will have nowhere to turn when the inevitable problems raise their head.

This isn't a speculative threat—AV companies are already pushing back vigorously against state and local government efforts to protect citizenry. In Austin, TX, Waymo has ignored the safety requests of the local school district despite repeatedly failing to address its vehicles' inability to properly respond to the presence of school buses. Likewise in Santa Monica, CA, Waymo has sued the city to block efforts to enforce the local noise ordinance and protect its citizens' quality of life. A broad

grant of preemption will only embolden AV companies to ignore local impacts as the industry attempts to scale across the country.

Furthermore, the AV industry continuously and successfully lobbies state legislatures across the country to enact legislation precluding local authorities from enforcing laws that inhibit AV operations in any way. Ultimately, the industry's goal is Federal law prohibiting states from exercising authority to prevent negative impacts from autonomous vehicles, meaning that citizens will no longer be able to turn to their city or state as these problems continue to arise. As the industry is well aware, this will leave Americans with only one option to turn to—a creakingly slow-to-respond Federal government with zero autonomous vehicle regulations on the books and limited authority to address issues of local impact.

In the absence of any Federal safety regulations geared to ensure that AVs don't kill and injure road users, and a preemption scheme that prevents state and local authorities from stepping up to the plate to protect residents, injured parties would typically be able to turn to the civil justice system as a last resort. Yet even this avenue of consumer relief is actively being blockaded by the use of mandatory arbitration clauses. Whether they are in the terms of service of autonomous vehicle rideshare companies or those that will surely reside in future potential ownership or leasing agreements absent a legislative prohibition, mandatory arbitration clauses should not be allowed as a means to shield irresponsible AV companies from civil claims.

As you know, forced arbitration contract terms require consumers to adjudicate claims in forums that do not have the protections of the legal system—the rules of evidence and discovery do not apply, there is no requirement that arbitrators follow the law, there are no juries, and there is little to no opportunity for witness depositions. Moreover, arbitration proceedings are secretive, and the findings of arbitrators are seldom appealable. Additionally, because arbitration firms rely on repeat customers for their profits, it is unlikely that arbitrators will find for a consumer over the corporation likely to provide additional business in the future.

The potential for inserting forced arbitration clauses into a contract between an AV operator or manufacturer and an individual consumer is ever present and creates an alternate system of justice when the inevitable defects in new technology occur. Such a result would create yet another incentive for unscrupulous manufacturers to put shareholders' interests ahead of safety concerns.

For years now the auto industry has been emboldened by the intrusion of forced arbitration in other fields. As a result, it is all too common for consumers to be deprived of their Federal and state rights by contracts conditioned on acceptance of forced arbitration as a means to resolve disputes. We have long believed that when a company makes a defective vehicle, they should use their engineers to build a better vehicle, and not their lawyers to find a legal loophole to avoid responsibility. To be clear, forced arbitration has no place in rideshare agreements or in the sale or lease of automobiles, be they used or new, human driven or autonomous.

Arbitration, when voluntarily consented to by both parties post-dispute is a fine dispute resolution mechanism. But the use of binding arbitration clauses continues to proliferate. Waymo's partnership with Uber to provide autonomous rideshare raises significant questions in this area, since Uber has zealously defended binding arbitration clauses at the expense of consumers for many years now, and Waymo currently uses forced arbitration as well. Future self-driving vehicles may be purchased or leased directly by consumers from multi-national manufacturers, creating an even greater power imbalance than when buying from a local dealership, enabling foreign manufacturers to insert forced arbitration provisions directly into consumer sales contracts.

This moment presents an opportunity to ensure that a practice designed to deprive consumers of their constitutional rights not be allowed to continue into the next generation of vehicles. Importantly, there is precedent in the area of forced arbitration and cars: 15 U.S.C. § 1226, the Motor Vehicle Franchise Contract Dispute Resolution Process Act. Passed into law in 2002, this law prevents auto manufacturers from forcing arbitration clauses on their franchisees, without consent. Consumers deserve the same rights when it comes to driverless vehicles.

Together, industry-supported preemption language and the absence of a Federal prohibition on mandatory arbitration would leave consumers without access to the civil justice system, unable to turn to state and local authorities to address the many negative consequences that AVs have and will continue to bring to our cities, and ultimately reliant on a Federal authority that has no plans to issue comprehensive AV safety regulations, and no ability to respond to negative ramifications at the state and local level.

Under this structure, consumers and localities would ultimately be forced to rely on the DOT's limited and oftentimes incredibly slow and ineffective defect enforce-

ment authority to address safety issues after they occur, while local authorities would be prohibited from regulating AV safety. These local authorities would also be prohibited from current or future regulation of AVs in the large range of other concern areas where states and cities have long used their authorities to minimize negative impacts of automobiles. This arrangement is unacceptable—consumers should remain the highest priority, not powerless bystanders, as autonomous travel continues to develop.

Thank you for your attention to this important matter,

Christine Zinner, Federal Research and Advocacy Director
Alliance for Justice

Salena Zellers Schmidtke, Biomedical Engineer
BioInjury LLC

Michael Brooks, Executive Director
Center for Auto Safety

Joanne Doroshov, Executive Director
Center for Justice & Democracy

Courtney Griffin, Director of Consumer Product Safety
Consumer Federation of America

Rosemary Shahan, President
Consumers for Auto Reliability and Safety

Maeve Elise Brown, Executive Director
Housing and Economic Rights Advocates

Amber Rollins, Director
Kids and Car Safety

Ken McLeod, Policy Director
The League of American Bicyclists

Christine Hines, Senior Policy Director
National Association of Consumer Advocates

Robert Weissman, Co-President
Public Citizen

Joan Claybrook, President Emeritus
Public Citizen

Sean Kane, President
Safety Research & Strategies

Jennifer Smith, President
StopDistractions.org

Zach Cahalan, Executive Director
Truck Safety Coalition, Citizens for Reliable and Safe Highways, Parents Against Tired Truckers

NATIONAL LEAGUE OF CITIES
Washington, DC, February 3, 2026

Hon. TED CRUZ,
Chair,
Committee on Commerce, Science, and
Transportation,
United States Senate,
Washington, DC.

Hon. MARIA CANTWELL,
Ranking Member,
Committee on Commerce, Science, and
Transportation,
United States Senate,
Washington, DC.

Dear Chair Cruz and Ranking Member Cantwell,

The National League of Cities remains committed to providing substantial feedback to the Commerce Committee on any proposed legislation on autonomous vehicles (AVs). With thousands of AV fleets driving on city streets and passenger rides increasing every day, America's cities have gained extensive practical understanding of how the policy and regulatory structure falls short for AV deployment. It has become clear where regulatory blind spots are causing clear risks to public safety without appropriate accountability and any legislation should work to address them.

As state and local government associations have shared with this Committee during previous Congressional sessions where SELF DRIVE was discussed and set aside, overly broad preemption will not advance autonomous vehicles safely. While the regulation of motor vehicle safety standards should remain a Federal obligation, state and local governments are the primary authorities concerning operational safety, including regulating the operation of motor vehicles after such vehicles have been constructed, the operators of those motor vehicles, as well as the rules of the road governing how motor vehicles are required to be safely operated on public roadways.

As incubators of innovation and the level of government closest to the people, local governments must retain the authority to initiate the necessary choices that best serve constituents and protect local public safety, privacy, and efficiency of the road network as new technologies like autonomous vehicles develop over time. The House SELF DRIVE Act as currently written will not ensure that autonomous vehicles consistently and reliably follow the rules of the road and are held accountable for safe operations in our communities.

We support a competitive American economy that embraces technology improvements including autonomous vehicles, but we must integrate them in a manner that ensures safe operations which is the role of states and local governments.

Sincerely,

CLARENCE E. ANTHONY,
CEO and Executive Director.

ADVOCATES FOR HIGHWAY AND AUTO SAFETY
February 3, 2026

Hon. TED CRUZ, Chair,
Hon. MARIA CANTWELL, Ranking Member,
Committee on Commerce, Science, and Transportation,
United States Senate,
Washington, DC.

Dear Chair Cruz and Ranking Member Cantwell:

Thank you for convening tomorrow's hearing, "Hit the Road, Mac: The Future of Self-Driving Cars." Advocates for Highway and Auto Safety (Advocates) urges this Committee to advance proven solutions to improve safety on our Nation's roads and establish sensible safeguards to ensure self-driving cars are developed and deployed safely. Advocates respectfully requests this letter be included in the hearing record.

Motor Vehicle Deaths Remain Historically High

America's roads are moving an ever-increasing number of people and goods.¹ This activity comes with a significant yet preventable human toll as well as infrastructure challenges and a robust price tag. On average, 112 people were killed every day on roads in the U.S., totaling nearly 41,000 fatalities in 2023.² This is a 24 percent increase in deaths in just a decade.³ An additional 2.44 million people were injured.⁴ Early projections for 2024 traffic fatalities remain at a similar historic high level; over 39,000 people are estimated to have been killed that year.⁵

In addition to the physical and emotional repercussions and infrastructure damage due to motor vehicle crashes, the annual economic cost is approximately \$340 billion (2019 dollars).⁶ This figure equates to every person living in the U.S. essentially paying an annual "crash tax" of over \$1,000. Moreover, the total value of societal harm from motor vehicle crashes in 2019, which includes loss of life, pain and decreased quality of life, was nearly \$1.4 trillion.⁷ When adjusted solely for infla-

¹2025 Report Card for America's Infrastructure, American Society of Civil Engineers, <https://infrastructurereportcard.org/cat-item/roads-infrastructure/>

²Traffic Safety Facts Research Note: Overview of Motor Vehicle Traffic Crashes In 2023, NHTSA, Apr. 2025, DOT HS 813 705, (Overview 2023).

³Overview 2023; and Traffic Safety Facts 2022: A Compilation of Motor Vehicle Traffic Crash Data, NHTSA, Dec. 2024, DOT HS 813 656 (Annual Report 2022); [comparing 2013 to 2023].

⁴Overview 2023.

⁵Traffic Safety Facts: Crash Stats, Early Estimate of Motor Vehicle Traffic Fatalities in 2024, NHTSA, Apr. 2025, DOT HS 813 710 (Early Estimates 2024).

⁶The Economic and Societal Impact of Motor Vehicle Crashes, 2019, NHTSA, Dec. 2022, DOT HS 813 403. (Economic and Societal Impact 2019).

⁷Economic and Societal Impact 2019.

tion, this figure amounts to over \$1.79 trillion.⁸ Research from the Network of Employers for Traffic Safety (NETS) finds motor vehicle crashes cost employers \$72.2 billion in direct crash-related expenses in 2019.⁹

These devastating crashes impact millions of Americans each year including the families of U.S. Department of Transportation (U.S. DOT) Secretary Duffy and Members of Congress. These tragedies result in long-lasting effects which often are not accounted for in statistics alone. For every single death and serious injury, there is a horrific ripple effect forever changing the lives of children, parents, friends and communities. However, the solutions to meaningfully reduce its impact are known, including vehicle safety improvements.

Federal Safety Standards Prevent Motor Vehicle Crashes, Save Lives, Avert Injuries and Reduce Associated Costs

Advocates always has enthusiastically championed proven vehicle safety technology and for good reason—it is one of the most effective strategies for preventing deaths and injuries. According to the National Highway Traffic Safety Administration (NHTSA), “[t]he FMVSS [Federal Motor Vehicle Safety Standards] remain NHTSA’s core way of ensuring that all motor vehicles provide the requisite level of safety performance and provide it within a technical timeframe.”¹⁰ In fact, the agency has estimated that from 1968 through 2019, NHTSA’s safety standards have prevented more than 865,000 deaths, 49 million nonfatal injuries and damage to 65 million vehicles.¹¹ In addition, during that time frame the comprehensive societal benefits amounted to \$17.3 trillion, using 2019 dollars.¹²

In 1991, Advocates led the coalition that supported enactment of the bipartisan Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991¹³ which included a mandate for front seat airbags as standard equipment. As a result, by 1997, every new car sold in the United States was equipped with this technology and the lives saved have been significant. Frontal airbags have saved an estimated 70,059 lives from 1968 to 2019, according to NHTSA.¹⁴

Advocates built on this success by supporting additional proven lifesaving technologies as standard equipment in all vehicles in other Federal legislation and regulatory proposals. These efforts include: tire pressure monitoring systems;¹⁵ rear outboard 3-point safety belts;¹⁶ electronic stability control;¹⁷ rear safety belt reminder systems;¹⁸ brake transmission interlocks;¹⁹ safety belts on motorcoaches;²⁰ rear-view cameras;²¹ safer power window switches;²² advanced driver assistance systems (ADAS);²³ advanced impaired driving prevention technology;²⁴ rear designated seating position alert (hot cars);²⁵ enhanced vehicle hood and bumpers to better protect vulnerable road users;²⁶ and, advanced head lamps.²⁷

The recent regulatory action undertaken by NHTSA to require pedestrian automatic emergency braking (PAEB) on light passenger vehicles is an excellent exam-

⁸ CPI Inflation Calculator, BLS, available at https://www.bls.gov/data/inflation_calculator.htm, calculated from Jan. 2019–Jan. 2025.

⁹ Cost of Motor Vehicle Crashes to Employers—2019, Network of Employers for Traffic Safety, March 2021.

¹⁰ 89 FR 76923, Sep. 19, 2024.

¹¹ Kahane, C. J., & Simons, J. F. (2024, December). Fatalities, injuries, and crashes prevented by vehicle safety technologies and associated FMVSS, 1968 to 2019—Passenger cars and LTVs (Report No. DOT HS 813 611). National Highway Traffic Safety Administration.

¹² NHTSA: 50 Years of Vehicle Safety Standards Saved Hundreds of Thousands of Lives, Prevented Millions of Injuries.

¹³ Pub. L. 102–240 (Dec. 18, 1991).

¹⁴ Kahane, C. J., & Simons, J. F. (2024, December). Fatalities, injuries, and crashes prevented by vehicle safety technologies and associated FMVSS, 1968 to 2019—Passenger cars and LTVs (Report No. DOT HS 813 611). National Highway Traffic Safety Administration.

¹⁵ Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act, Pub. L. 106–414 (Nov. 1, 2000).

¹⁶ Anton’s Law, Pub. L. 107–318 (Dec. 4, 2002).

¹⁷ Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA–LU), Pub. L. 109–59 (Aug. 10, 2005).

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ Moving Ahead for Progress in the 21st Century (MAP–21) Act, Pub. L. 112–141 (Jan. 3, 2012).

²¹ Cameron Gulbransen Kids Transportation Safety Act of 2007, Pub. L. 110–189 (Feb. 28, 2008).

²² *Id.*

²³ Infrastructure Investment and Jobs Act, Pub. L. 117–58 (Nov. 15, 2021).

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.*

ple of the benefits of requiring effective safety systems as standard equipment. The agency predicts that PAEB will save 362 lives, mitigate over 24,000 injuries annually and result in a yearly cost benefit of between \$5.8-\$7.2 billion. The Final Rule for PAEB issued in 2024 also noted that the end user price for the safety technology for a popular make and model vehicle, a Toyota Camry, is \$240.24.²⁸ This cost is modest, particularly given the returns on the investment. Moreover, research performed by the Insurance Institute for Highway Safety (IIHS) has found that AEB can reduce front-to-rear crashes with injuries by 56 percent. Any delay in implementing the Final Rule is an unnecessary safety setback.

Research also demonstrates that lifesaving vehicle safety technologies are not the chief contributor to increased prices for new cars. IIHS/Highway Loss Data Institute (HLDI) President David Harkey recently wrote in an article, “Sacrificing safety is not the way to make cars affordable,” “. . . safety features aren’t the main thing pushing up prices.”²⁹ Buyers are paying more for convenience features such as hands-free power liftgates, puddle lights and automatically retracting mirrors. Size is also a major factor: Americans continue to gravitate toward larger vehicles.³⁰ Additionally, a 2023 study by Consumer Reports (CR) found that “[c]ommonly reported changes in average transaction prices appear to be primarily driven by shifts toward larger, more expensive SUVs and away from smaller and cheaper cars, rather than from the cost of technology improvements in individual models.”³¹ As a result, CR concluded that “[t]hese findings prove that regulators can and should be aggressive in ensuring that automakers continue to deliver cost-effective technology improvements that save dollars and lives.”³²

Experimental Autonomous Driving Technology Remains Unproven

In stark contrast to the effectiveness of Federal standards and proven safety technology, cars equipped with various levels of automated driving systems (ADS), for which there are no FMVSS, already have been involved in numerous serious and deadly crashes, many of which have been subject to investigation by the National Transportation Safety Board (NTSB) and NHTSA.³³ As NHTSA noted in the 2025 Notice of Proposed Rulemaking (NPRM) on the ADS-Equipped Vehicle Safety, Transparency, and Evaluation Program (AV STEP), vehicles equipped with automated driving systems (ADS) “. . . often struggle with driving tasks that humans consider relatively simple.”³⁴ Furthermore, according to data collected by NHTSA’s Standing General Order (SGO) 2021–1 requiring manufacturers to report certain crashes involving vehicles equipped with ADS or SAE Level 2 ADAS, there have been approximately 1,874 crashes involving ADS and 3,003 with ADAS. These include 51 crashes resulting in a fatality.³⁵

In addition, several San Francisco transportation agencies submitted comments to the California Public Utilities Commission in 2023 detailing numerous dangerous incidents involving AVs operating in the city.³⁶ These events include:

- Interfering with emergency response operations including 18 incidents documented by the San Francisco Fire Department in which AVs put firefighters and the public at risk.
- Making planned and unplanned stops in travel lanes that have interfered with transit service and blocked traffic.
- Intrusions into construction zones where City employees were working.
- Obstructions caused by AVs having to interpret and respond to human traffic control officers.

²⁸ Federal Motor Vehicle Safety Standard No. 127; Light Vehicle Automatic Emergency Braking (AEB); AEB Test Devices, NHTSA, Final Regulatory Impact Analysis, April 2024.

²⁹ David Harkey, Sacrificing safety is not the way to make cars affordable, IIHS Insight (Jan. 20, 2026).

³⁰ *Id.*

³¹ Consumer Reports, Vehicle Price Trends Fuel Economy and Safety Improvements Come Standard.

³² *Id.*

³³ Ian Duncan and Aaron Gregg, *Crashes involving Tesla’s Full Self-Driving prompt new Federal probe*, WaPo (Oct. 18, 2024).

³⁴ 90 FR 4132.

³⁵ Standing General Order on Crash Reporting: For Incidents Involving ADS and Level 2 ADAS, NHTSA, available at <https://www.nhtsa.gov/laws-regulations/standing-general-order-crash-reporting>, last accessed Dec. 17, 2025.

³⁶ San Francisco Comments on the Draft Resolution Approving Authorization for Waymo Autonomous Vehicle Passenger Service Phase I Driverless Deployment Program, R.12–12–011 (May 31, 2023).

- Erratic driving.³⁷

According to recent media reports, similar issues continue to occur including failing to stop for school buses,³⁸ ceasing operating in the middle of city streets during a power outage³⁹ and traveling on light rail tracks causing the robotaxi's passenger to flee.⁴⁰ The NHTSA and the NTSB have opened investigations into the incidents involving school buses. Just last week, a child was reportedly hit by an autonomous vehicle during school drop off.⁴¹

Many promises have been touted about AVs bringing reductions in motor vehicle crashes and resultant deaths and injuries, lowering traffic congestion and vehicle emissions, expanding mobility and accessibility, improving efficiency, and creating more equitable transportation options and opportunities.⁴² However, as auto industry leaders have acknowledged, these outcomes are far from certain.⁴³

Additionally, supporters of AVs often assert that these vehicles will improve roadway safety by inaccurately stating that 94 percent of crashes are due to human error pointing to a report from NHTSA as support for this misleading claim. However, the agency stated in the same document with this statistic that “[a]lthough the critical reason is an important part of the description of events leading up to the crash, it is not intended to be interpreted as the cause of the crash nor as the assignment of the fault to the driver, vehicle, or environment.”⁴⁴ [Emphasis added.] In addition, NTSB Chair Jennifer Homendy has declared that using the statistic in such a manner is “dangerous” and “[a]t the same time it relieves everybody else of responsibility they have for improving safety, including DOT.”⁴⁵ Proponents of AVs also have made the claim that these vehicles will prevent 90 percent of crash fatalities.⁴⁶ Yet, as NHTSA states in the AV STEP NPRM, “[t]his proposal recognizes that the potential of ADS is still largely unproven.”⁴⁷

AV manufacturers and proponents of the technology often claim that AVs are safer because they don't get tired, distracted or drive impaired. While some AVs may be readily able to avoid crashes caused by those human drivers who operate impaired, fatigued or distracted, they also may cause crashes that sober, alert and engaged drivers would routinely avoid. AVs, which are essentially billion-dollar pieces of equipment with years of research, should not drive better than only the worst drivers on the road.

Often, claims made about the safety of their operations do not provide a complete picture. For example, as of September 2025, “Waymo has driven 127 million rider-only miles without a human driver.”⁴⁸ Human beings drove 3.2 trillion miles on U.S. roads in 2023 alone. Thus, in its entire history from approximately 2019 to September 2025, Waymo vehicles have operated without a human driver for less than 0.004 percent of the mileage driven on U.S. roads by human drivers in a single year.⁴⁹

Waymo claims reductions in “serious injury or worse crashes,” “airbag deployment in any vehicle crashes,” and “injury-causing crashes.”⁵⁰ However, over 40 percent

³⁷Id. at pgs. 9–11.

³⁸Mary Cunningham, *Waymo recalls more than 3,000 vehicles over faulty software following school bus violations*, CBS News (Dec. 11, 2025).

³⁹Grace Eliza Goodwin, *Waymo robotaxis stop in the streets during San Francisco power outage*, BBC News (Dec. 22, 2025).

⁴⁰Mickaela Castillo, *Waymo passenger flees after car drives on Phoenix light rail tracks*, AZ Family News (Jan. 8, 2026).

⁴¹Washington Post, *Waymo robotaxi hits child at school drop-off, triggering safety inquiry*, Jan. 19, 2026.

⁴²Autonomous Vehicle Industry Association, *State of AV Report 2025*.

⁴³Kristopher Brooks, *The main reason why self-driving cars are not ready for prime time*, CBS News (May 1, 2024); Nilay Patel and Andrew J. Hawkins, *Pete Buttigieg is Racing to Keep Up with Self Driving Cars*, The Verge (Jan. 6, 2022); Rebecca Fannin, *Where the billions spent on autonomous vehicles by U.S. and Chinese giants is heading*, CNBC (May 23, 2022).

⁴⁴Singh, S. (2015, February). Critical reasons for crashes investigated in the National Motor Vehicle Crash Causation Survey. (Traffic Safety Facts Crash Stats. Report No. DOT HS 812 115). Washington, DC: National Highway Traffic Safety Administration.

⁴⁵Hope Yen and Tom Krisher, NTSB chief to fed agency: Stop using misleading statistics, Associated Press (Jan. 18, 2022).

⁴⁶Iyad Rahwan and Azim Shariff, *Self-Driving Cars Could Save Many Lives. But Mental Roadblocks Stand in the Way*, Wall Street Journal (Apr. 6, 2021).

⁴⁷90 FR 4132.

⁴⁸<https://waymo.com/safety/impact/>

⁴⁹Traffic Safety Facts 2023: A Compilation of Motor Vehicle Crash Data, NHTSA, DOT HS 813 738, Aug. 2025, available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813738>

⁵⁰<https://waymo.com/safety/>

of the crashes reported by Waymo pursuant to the SGO had no human occupants in the vehicle. The absence of passengers in a Waymo vehicle in a crash by default lowers the injury rate and could be unrelated to the safety performance of the vehicle given that there was no occupant available to be injured. Moreover, if the goal of AV operations is to transport people, claiming a safety benefit from crashes where no occupant is present is incongruous. Additionally, the majority of the incidents reported by Waymo pursuant to the SGO involved the Waymo vehicle being struck in the rear on roads with speed limits of 25 mph or less, conditions not generally associated with airbag deployments. In sum, Waymo vehicles are operating on roads with lower speed limits, and are over involved in rear end crashes, with a large number of incidents not involving passengers in the vehicle.

Lastly, the SGO does not provide the data needed to fully analyze the operational difficulties and incidents that are occurring with Waymo vehicles. To properly assess the safety of these operations, additional performance data beyond crashes is needed considering recent events such as Waymo vehicles traveling on light rail tracks and passing school buses.⁵¹

The U.S. is Not Lagging Behind Other Countries in Deployment

In sharp contrast to what is happening in the U.S., other countries are taking a more calculated, careful and cautious approach to the development of AVs.⁵² Often-repeated claims about the U.S. “falling behind” other countries in the “race” for AVs are simply not true nor supported by research. For example:

- China continues to require permits or restricts operations of AVs on its roads to only those areas approved by the authorities.⁵³ In fact, the Nation recently delayed plans for production of AVs after a deadly crash.⁵⁴
- Germany continues to require permits, approvals, and limits areas of operation for AVs.⁵⁵
- In Japan, the introduction of Level 4 vehicles will be controlled and limited to specific, lightly populated areas.⁵⁶
- The latest United Nations Economic Commission for Europe (UNECE) regulations will limit operations to restrict risks and oversee approval through testing and other requirements.⁵⁷

In sum, no country is selling fully automated vehicles for unfettered use to the public and by many accounts, none will be for a significant amount of time.⁵⁸ According to the most recent KPMG analysis, the U.S. ranks fourth in the world for AV readiness, while China stands at number twenty.⁵⁹ The U.S. is not lagging behind other countries in allowing AVs to go to market, but we are behind in establishing comprehensive regulations to ensure public safety will not be jeopardized or diminished.

The AV Tenets Offer a Sound and Sensible People-and-Safety-First Approach to AV Deployment

To identify a people-and-safety-first path forward on AVs, Advocates and numerous stakeholders developed the “AV Tenets.”⁶⁰ These sound and sensible policy positions should be a foundational part of any national AV policy. The AV Tenets are based on expert analysis, real-world experience, and public opinion. They have four main categories including: (1) prioritizing safety of all road users; (2) guaranteeing accessibility and equity; (3) preserving consumer and worker rights; and, (4) ensur-

⁵¹ Mickaela Castillo, Waymo passenger flees after car drives on Phoenix light rail tracks, AZ Family News (Jan. 8, 2026); Mary Cunningham, Waymo recalls more than 3,000 vehicles over faulty software following school bus violations, CBS News (Dec. 11, 2025).

⁵² Autonomous vehicles: cross jurisdictional regulatory perspectives update, Oct. 7, 2022.

⁵³ China drafts rules on use of self-driving vehicles for public transport; Aug. 8, 2022, Reuters; and Baidu bags China’s first fully driverless robotaxi licenses, Aug. 7, Reuters. Real driverless cars are now legal in Shenzhen, China’s tech hub, Jul. 25, 2022, TechCrunch+.

⁵⁴ Keith Bradsher, China Delays Plans for Mass Production of Self-Driving Cars After Accident, NY Times (Dec. 23, 2025).

⁵⁵ Germany completes legal framework for autonomous driving | Federal Cabinet approves new ordinance, Apr. 2022, Malterer, M.

⁵⁶ Japan to open roads to autonomous vehicles in 2023, Nov. 28, 2022, Wessling, B., The RobotReport.

⁵⁷ New rules to improve road safety and enable fully driverless vehicles in the EU, Jul. 6, 2022, UNECE.

⁵⁸ Lawrence Ulrich, Driverless Still a Long Way From Humanless, N.Y. Times (Jun. 20, 2019); Level 5 possible but “way in the future”, says VW-Ford AV boss, Motoring (Jun. 29, 2019).

⁵⁹ Autonomous Vehicle Readiness Index, KPMG, 2020,

⁶⁰ See: <https://saferoads.org/autonomous-vehicle-tenets/>.

ing local control and sustainable transportation. They are supported by a coalition of more than 65 organizations representing consumers, public health and safety experts, pedestrians, bicyclists, disability rights activists, emergency responders, law enforcement, labor and others.

Requiring that AVs meet minimum performance standards, including for cyber security and a “vision test” to ensure the vehicle can respond to all people, vehicles and objects in the roadway environment, is essential. In addition, AV operations must be subject to adequate oversight, including a comprehensive database accessible by vehicle identification number (VIN) with basic safety information. These are fundamental prerequisites to prevent crashes caused by AVs and boost consumer confidence in this burgeoning technology. While the AV Tenets were first established in 2020, the approach remains relevant today as progress in advancing key safeguards to ensure safety and the purported societal benefits of AVs has not been met.

Legislation to Improve Safety for Vehicles Equipped with an ADS Must be Advanced; Anti-Safety Measures Should be Opposed

Advocates supports: the AV Safety Data Act, S. 3742/H.R. 4376, which will help to ensure U.S DOT is getting important data on the operations of AVs; the Stay in Your Lane Act, S. 3536, to compel manufacturers of vehicles equipped with an ADS to identify the operation design domain (ODD) for which the systems can safely operate and restrict operations to such; and, the Know Before You Drive Act, Discussion *Draft*, which will ensure consumers have accurate information on the capabilities of partially automated driving systems and AVs.

Advocates opposes discussion draft versions of the Motor Vehicle Modernization Act (Discussion *Draft*), which fails to ensure that the U.S. New Car Assessment Program (NCAP) is upgraded to meet its international counterparts and provides a pathway for mass exemptions from safety standards for vehicles equipped with an ADS, and the Safely Ensuring Lives Future Deployment and Research In Vehicle Evolution (SELF DRIVE) Act of 2026 (Discussion *Draft*), which perpetuates anti-safety measures proposed in past AV legislation including: a lack of new safety standards to ensure the self-driving systems perform to a minimum level of safety; preemption of states’ ability to protect users on their roadways prior to Federal AV regulation; weakening of current safety data reporting requirements; and, a lack of regulation of remote AV operators, among other issues. Advocates also opposes the Autonomous Mobility Ensuring Regulation, Innovation, Commerce, and Advancement Driving Reliability in Vehicle Efficiency and Safety Act (AMERICA DRIVES) Act (H.R. 4661), to preempt state laws requiring a human driver or a remote operator in commercial motor vehicles (CMV) operating with an ADS Level 4 or 5 (ACMVs) and update regulations as well as inform future regulations to make them favorable for ACMV operations including for emergency beacons, and the Autonomous Vehicle Acceleration Act (S. 1798), to modify existing safety standards to support mass deployment of AVs as outlined in a 2016 Volpe Center *Report, Review of Federal Motor Vehicle Safety Standards (FMVSS) for Automated Vehicles*.

Major Contributors of Crashes Must be Addressed with Effective Solutions

We urge this Committee to continue to address the leading contributing factors to motor vehicle crashes. In 2023, alcohol impaired driving resulted in 12,429 people killed;⁶¹ speeding resulted in 11,775 people killed;⁶² 10,484 vehicle occupants killed in crashes were unrestrained;⁶³ and, crashes in which at least one driver was distracted resulted in 3,275 fatalities.⁶⁴ In 2023, 7,314 pedestrians and 1,166 pedalcyclists were killed in traffic crashes.⁶⁵ Motorcycles continue to be the most hazardous form of motor vehicle transportation;⁶⁶ 6,335 riders were killed in 2023.⁶⁷ From 2013–2023, fatalities involving pedestrian increased 53 percent, pedalcyclists

⁶¹Traffic Safety Facts Research Note, Overview of Motor Vehicle Traffic Crashes in 2023. DOT HS 813 705 April 2025.

⁶²*Id.*

⁶³*Id.*

⁶⁴*Id.* These crashes are known to be underreported and undercounted.

⁶⁵Traffic Safety Facts: Overview of Motor Vehicle Traffic Crashes In 2023, April 2025, DOT HS 813 705.

⁶⁶The Economic and Societal Impact of Motor Vehicle Crashes, 2019 (Revised), NHTSA, Feb. 2023, DOT HS 813 403.

⁶⁷Traffic Safety Facts: Overview of Motor Vehicle Traffic Crashes In 2023, April 2025, DOT HS 813 705 [Overview 2023].

increased 55 percent and motorcycles increased 35 percent.⁶⁸ Additionally, in 2021, the most recent year for which data is available according to the Non-Traffic Surveillance (NTS) system, an estimated 3,990 people were killed in non-traffic motor vehicle crashes, an increase of 26 percent from 2020.⁶⁹ These issues are persistent, and the solutions are known and available, yet remain underused, underfunded or are not required as standard equipment in vehicles.

Advanced driver assistance systems (ADAS) can mitigate the issues of impairment, speeding, distraction and fatigue

Crashes, including those that result from some of the leading contributors to fatalities, can be prevented or mitigated by AEB and other ADAS systems. Research by IIHS has demonstrated significant crash reductions associated with these safety systems.⁷⁰

We urge this Committee to conduct oversight to ensure the U.S. DOT issues the Final Rule for AEB in heavy vehicles and lane departure warning (LDW) and lane keeping assist (LKA) in passenger vehicles, as Congressionally mandated. Additionally, we urge Congress to direct NHTSA to enhance the AEB rule by including bicycle and motorcycle rider detection and response in all lighting conditions. Research conducted by IIHS found that clothing which makes pedestrians stand out to human drivers may make them invisible to automated crash prevention systems, so ensuring AEB operates properly in all lighting conditions is essential.⁷¹ As noted, the Final Rule for AEB in passenger vehicles must be swiftly complied with, absent added delay.

We also urge Congress to direct U.S. DOT to issue standards and requirements for other vehicle safety technologies shown by research to reduce crashes and impacts, including as noted by IIHS research, blind spot detection, rear AEB and rear cross traffic alert.

Impaired Driving

In 2019, the total comprehensive cost of drunk driving over the .08 percent blood alcohol concentration (BAC) limit was estimated at nearly \$296 billion.⁷² Adjusted for inflation only, that amounts to \$373 billion in 2025 dollars.⁷³ The total cost to employers of motor vehicle crashes with an alcohol-impaired employee or dependent driving (both on-the-job and off-the-job) was \$8 billion in 2018 (expressed in 2019 dollars).⁷⁴ Accounting for inflation only, that amounts to over \$10 billion in 2025 dollars.⁷⁵

According to NHTSA, between 2011–2020, an average of almost 10,500 people were killed each year due to alcohol impaired driving crashes.⁷⁶ The Infrastructure Investment and Jobs Act (IIJA) directed NHTSA to issue a FMVSS requiring passenger motor vehicles to be equipped with impaired driving prevention technology by 2024.⁷⁷ IIHS research estimates that passive impaired driving prevention technology will save more than 10,000 lives each year, once widely deployed.⁷⁸ The agency issued an Advanced Notice of Proposed Rulemaking (ANPRM) in January 2024 but has taken no further regulatory action.⁷⁹ Until NHTSA completes this overdue rulemaking, lives will continue to be needlessly lost, injuries suffered and associated costs expended. As such, we urge this Committee to employ its oversight authority to ensure NHTSA swiftly issues a Final Rule.

⁶⁸ National Center for Statistics and Analysis. (2025, April, Revised). Traffic safety facts 2022: A compilation of motor vehicle traffic crash data (Report No. DOT HS 813 656). National Highway Traffic Safety Administration.

⁶⁹ National Center for Statistics and Analysis. (2024, April). NonTraffic Surveillance: Fatality and injury statistics in non-traffic crashes in 2021 (Report No. DOT HS 813 539).

⁷⁰ Real-world benefits of crash avoidance technologies, IIHS, July 2023.

⁷¹ IIHS, High-visibility clothing may thwart pedestrian crash prevention sensors (Jan. 9, 2025).

⁷² The Economic and Societal Impact of Motor Vehicle Crashes, 2019, NHTSA, Feb. 2023, DOT HS 813 403 available at [https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813403;\[Economic Impact 2019\]](https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813403;[Economic Impact 2019]).

⁷³ CPI Inflation Calculator, BLS, January 2019 to January 2025 dollars, available at <https://data.bls.gov/cgi-bin/epicalc.pl>.

⁷⁴ Cost of Motor Vehicle Crashes to Employers 2019; Network of Employers for Traffic Safety.

⁷⁵ CPI Inflation Calculator, BLS, January 2019 to January 2025 dollars.

⁷⁶ 89 FR 830 (Jan. 5, 2024).

⁷⁷ Pub. L. 117–58, § 24220 (2021).

⁷⁸ Alcohol and Drugs, IIHS.

⁷⁹ 89 FR 830 (Jan. 5, 2024).

Speeding

Speeding-related crashes cause \$46.4 billion in economic costs and \$225 billion in comprehensive costs (2019).⁸⁰ These costs account for 14 percent of all economic costs and 16 percent of all societal harm (measured as comprehensive costs) from motor vehicle crashes.⁸¹ If these costs were updated for inflation alone, in 2025 they would equate to \$58.6 billion in economic costs and \$284 billion in comprehensive costs.⁸² Speeding-related crashes cost employers nearly \$10 billion in 2018 (expressed in 2019 dollars); the majority are a result of off-the-job crashes.⁸³ If this cost were updated for inflation alone, in 2025 it would equate to \$12.6 billion.⁸⁴

Excess speed can contribute to both the frequency and severity of motor vehicle crashes. At higher speeds, additional time is required to stop a vehicle, and more distance is traveled before corrective maneuvers can be implemented. Speeding reduces a driver's ability to react to emergencies created by driver inattention, unsafe maneuvers of other vehicles, roadway hazards, vehicle issues (such as tire blowouts) or perilous weather conditions. Increases in speed also can mean life or death for vulnerable road users (VRUs) who lack the protective structure of a vehicle. While many drivers have a proclivity to exceed posted speed limits or may approve of higher speed limits, AAA has found that raising speed limits leads to a very minimal reduction in time on the road noting, "Raising speed limits is often thought of as a way to improve traffic flow and to allow drivers to get to their destinations more quickly. However, AAA research shows that driving at higher speeds increases risk which can outweigh the potential benefits of saving a few minutes of time."⁸⁵

Intelligent speed assistance (ISA) can provide information to drivers about present speed limits, warn drivers when a vehicle speed is above the limit, prevent a vehicle from exceeding the speed limit, or maintain a set speed.⁸⁶ The U.S. DOT Volpe Center released research, "New York City Intelligent Speed Assistance Pilot Evaluation," in 2024 which showed "ISA produced a 64 percent reduction in overall speeding and an 82 percent decrease on high-speed roads."⁸⁷ The IIHS found that more than "60 percent of drivers would find it acceptable if their vehicle provided an audible and visual warning when they exceeded the posted speed limit."⁸⁸ The NTSB has recommended that NHTSA require ISA in all new vehicles that, at a minimum, warns drivers when they exceed the speed limit. States have already started acting on this technology; Washington State, Virginia and the District of Columbia have enacted laws for ISA use for repeat and/or extreme speeding offenders. All states should be incentivized to follow suit, and ISA should be required on all new vehicles in the next surface transportation reauthorization bill.

Occupant Protection

Seat belt use is a proven lifesaver. From 1975 to 2019, seat belts prevented over 403,000 fatalities and saved society approximately \$2.5 trillion in economic costs.⁸⁹ Seat belts serve as the first line of defense against injury or death for vehicle occupants when crashes occur. According to NHTSA, the combination of an airbag plus a lap and shoulder belt reduces the risk of death in frontal crashes by 61 percent.⁹⁰

⁸⁰The Economic and Societal Impact Of Motor Vehicle Crashes, 2019, NHTSA, Feb. 2023, DOT HS 813 403.

⁸¹*Id.*

⁸²CPI Inflation Calculator, BLS, Jan. 2019 to Jan. 2025, available at <https://data.bls.gov/cgi-bin/cpicalc.pl>.

⁸³Cost of Motor Vehicle Crashes to Employers 2019; Network of Employers for Traffic Safety.

⁸⁴CPI Inflation Calculator, BLS, Jan. 2019 to Jan. 2025, available at <https://data.bls.gov/cgi-bin/cpicalc.pl>.

⁸⁵AAA: Higher Speed Limits don't mean Faster Commutes, July 13, 2023, available here: <https://info.oregon.aaa.com/aaa-higher-speed-limits-dont-mean-faster-commutes/>

⁸⁶European New Car Assessment Programs: Speed assistance systems, available at <https://www.euroncap.com/en/vehicle-safety/the-ratings-explained/safety-assist/speed-assistance/>

⁸⁷New York City Intelligent Speed Assistance Pilot Evaluation, October 2024. Available here: <https://www.nyc.gov/assets/dcas/downloads/pdf/fleet/nyc-intelligent-speed-assistance-pilot-evaluation-2024-oct.pdf>

⁸⁸ISA in the USA? The likelihood of U.S. drivers accepting and using intelligent speed assistance, Reagan, Ian J., Cicchino, Jessica B., *Transportation Research Part F: Traffic Psychology and Behaviour*, February 2025.

⁸⁹The Economic and Societal Impact of Motor Vehicle Crashes, 2019 (Revised), NHTSA, Feb 2023, DOT HS 813 403, available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813403>. [Economic Impact 2019].

⁹⁰Lives Saved by Vehicle Safety Technologies and Associated Federal Motor Vehicle Safety Standards, 1960 to 2012, Passenger Cars and LTVs, With Reviews of 26 FMVSS and the Effectiveness Of Their Associated Safety Technologies in Reducing Fatalities, Injuries, and Crashes; NHTSA, Jan. 2015, DOT HS 812 069, available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812069.pdf>.

Sadly, for passenger vehicle occupant fatalities in 2023, it is estimated that nearly half (49 percent) were unrestrained.⁹¹

Seat belt reminder systems have been proven to improve seat belt use and save lives.⁹² Congress as part of the Moving Ahead for Progress in the 21st Century Act (MAP-21) directed NHTSA to amend Federal safety standards to require these systems in the rear seats of passenger vehicles (previously these systems were only required for the front driver's seat although most automakers also equipped the front passenger seat).⁹³ NHTSA recently issued a Final Rule requiring a seat belt use warning system for rear seats by September 1, 2027. The rule also updates and enhances the current seat belt warning requirements for the driver's seatbelt and extends these requirements to the front outboard passenger seat by September 1, 2026.⁹⁴ We urge the Committee to conduct oversight to ensure it is implemented without delay to improve vehicle occupant safety.

Distractions Driving

Crashes in which at least one driver was identified as being distracted imposed an economic cost of \$98.2 billion in 2019.⁹⁵ Adjusted for inflation only, that amounts to \$123.9 billion in 2025 dollars.⁹⁶ In 2018, distracted driving crashes cost employers nearly \$19 billion.⁹⁷

Driver distraction is known to be a major contributor to motor vehicle crashes.⁹⁸ However, the true impact of distracted driving remains unclear due to issues with the underreporting of crashes involving distraction, including differences in police crash report coding and database limitations.⁹⁹

In 2023, over two trillion text and multimedia messages were sent or received in the U.S. Mobile wireless data traffic has risen dramatically over the last decade, from 3 trillion megabytes in 2010 to 100.1 trillion in 2023.¹⁰⁰ Research has shown that because of the degree of cognitive distraction these devices cause, the behavior of drivers using mobile phones (whether handheld or hands-free) is equivalent to the behavior of drivers at the threshold of the legal limit for alcohol in most states (0.08 percent BAC).¹⁰¹ Crash risk increases dramatically—as much as four times higher—when a driver is using a mobile phone, with no significant safety difference between handheld and hands-free phones observed in many studies.¹⁰² A study by the Virginia Tech Transportation Institute found that text messaging increased the risk of a safety-critical driving event (*i.e.*, crashes, near-crashes, crash-relevant conflicts and unintentional lane deviations) by 23.2 times.¹⁰³ Sending or receiving a text message causes the driver's eyes to be off the road for an average of 4.6 seconds. When driving 55 miles per hour (mph), this is the equivalent of driving the entire length of a football field with one's eyes closed.¹⁰⁴

⁹¹National Center for Statistics and Analysis. (2025, May). Occupant protection in passenger vehicles: 2023 data (Traffic Safety Facts. Report No. DOT HS 813 730). National Highway Traffic Safety Administration.

⁹²84 FR 51076 (Sep. 27, 2019).

⁹³Pub. L. 112–141, § 31503 (MAP-21).

⁹⁴90 FR 390 (Jan. 3, 2025). Multi-stage manufacturers and alterers have an additional year to comply.

⁹⁵The Economic and Societal Impact of Motor Vehicle Crashes, 2019, NHTSA, Feb. 2023, DOT HS 812 403.

⁹⁶Bureau of Labor Statistics Inflation Calculator.

⁹⁷Cost of Motor Vehicle Crashes to Employers 2019, NETS, 2018 data expressed in 2019 \$.

⁹⁸Blincoe, L., Miller, T., Wang, J.-S., Swedler, D., Coughlin, T., Lawrence, B., Guo, F., Klauer, S., & Dingus, T. (2023, February). The economic and societal impact of motor vehicle crashes, 2019 (Revised) (Report No. DOT HS 813 403).

⁹⁹Traffic Safety Facts Research Note: Distracted Driving 2022, April 2024, NHTSA, DOT HS 813 559, available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813559>.

¹⁰⁰2024 Annual Survey Highlights, CTIA.

¹⁰¹Fatal Distraction? A Comparison of the Cell-Phone Driver and the Drunk Driver, Strayer, D.L., Drews, F.A., Crouch, D.J., University of Utah, Department of Psychology, available at <https://journals.sagepub.com/doi/10.1518/00187200677724471>.

¹⁰²McEvoy, S.P.; Stevenson, M.R.; McCartt A.T.; Woodward, M.; Haworth, C.; Palamara, P.; and Cercarelli, R. 2005. Role of mobile phones in motor vehicle crashes resulting in hospital attendance: a case-crossover study. *British Medical Journal* 331(7514):428; available at <http://www.bmj.com/content/331/7514/428;> and Redelmeier, D.A. and Tibshirani, R.J. 1997. Association between cellular-telephone call and motor vehicle collisions. *The New England Journal of Medicine* 336:453–58, available at <http://www.stat.wmich.edu/naranjo/articles/nejmcellphone.pdf>.

¹⁰³What is Distracted Driving? Key Facts and Statistics, DOT NHTSA, citing Olson, R.L., Hanowski, R.J., Hickman, J.S., Bocanegra, J.; “Driver Distraction in Commercial Vehicle Operations”, VTTI, Sep. 2009, available at <https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/DriverDistractionStudy.pdf>.

¹⁰⁴Blueprint for Ending Distracted Driving, NHTSA, June 2012, DOT HS 811 629, available at <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/811629.pdf>.

The IIJA directed U.S. DOT to conduct research regarding the installation and use of driver support systems, also known as driver monitoring systems, to minimize or eliminate driver distraction and automation complacency within three years and report to Congress within six months of the completion of the research.¹⁰⁵ The Euro NCAP is already evaluating these systems including for non-fatigue impairment detection.¹⁰⁶ In addition, several major automakers include some type of driver monitoring/driver support technologies in their vehicles sold in the U.S.¹⁰⁷

Vulnerable Road User (VRU) Safety

Crashes involving pedestrians resulted in \$17.6 billion in economic costs and \$112.5 billion in comprehensive costs in 2019.¹⁰⁸ Accounting for inflation alone, this would equate to \$22.2 billion in economic costs and \$142 billion in comprehensive costs in 2025.¹⁰⁹ Crashes involving bicyclists resulted in \$5.6 billion in economic costs and \$32.2 billion in comprehensive costs in 2019.¹¹⁰ Accounting for inflation alone, this would equate to \$7 billion in economic costs and \$40.6 billion in comprehensive costs in 2025.¹¹¹

Lack of conspicuity is a roadway safety issue, especially for VRUs. Of the 7,314 pedestrians killed in traffic crashes in 2023, 77 percent occurred in dark conditions.¹¹² Also in 2023, there were 1,166 pedalcyclists fatalities, and 53 percent occurred in dark conditions.¹¹³ Improvements to vehicle lighting would afford drivers additional time to identify and respond accordingly to pedestrians, bicycle riders and other VRUs in the roadway. The IIJA directed U.S. DOT to issue a Final Rule updating the headlamp standard (FMVSS 108) and permitting adaptive driving beam (ADB) headlamps within two years. ADB headlights are a lighting technology which uses headlight beam modification to increase illumination of the road while avoiding glare to other traffic. While the U.S. DOT has taken action to allow use of ADB, it should improve the standard and require them.¹¹⁴ This action has been recommended by the NTSB and others.¹¹⁵ According to IIHS, 44 percent of headlight systems tested on model year 2024 vehicles earned a good rating.¹¹⁶ About 23 percent of the systems tested were rated marginal or poor because of inadequate visibility, excessive glare from low beams for oncoming drivers, or both.¹¹⁷ Ensuring that the U.S. DOT takes action to improve the headlamp standard and advance a requirement should be pursued by the Committee.

Additionally, the IIJA included a provision directing NHTSA to issue a Notice for Public Comment on updating hood and bumper standards for passenger vehicles to “to reduce the number of injuries and fatalities suffered by pedestrians, bicyclists, or other vulnerable road users.”¹¹⁸ In September 2024, NHTSA issued a Notice of Proposed Rulemaking (NPRM) to establish a new FMVSS to ensure passenger vehicles are designed to mitigate the risks of serious injuries and fatalities in crashes involving pedestrians including children.¹¹⁹ The standard proposed in the NPRM would save 67 lives annually with the benefits far outpacing the costs by establishing test procedures simulating a head-to-hood impact and performance requirements to minimize the risk of head injury.¹²⁰ While this is a step in the right direction, we urge the Committee to ensure that the U.S. DOT pursues a comprehensive upgrade.

¹⁰⁵ Pub. L. 117–58, § 24209 (2021).

¹⁰⁶ European New Car Assessment Program: Assessment Protocol—Safety Assist Safe Driving, Implementation 2023, V 10.4, Euro NCAP, Feb. 2024

¹⁰⁷ IIHS, Partial automation safeguard ratings.

¹⁰⁸ The Economic and Societal Impact of Motor Vehicle Crashes, 2019 (Revised), NHTSA, Feb. 2023, DOT HS 813 403.

¹⁰⁹ CPI Inflation Calculator, Bureau Of Labor Statistics, Comparing value Jan. 2019 to Jan. 2025.

¹¹⁰ The Economic and Societal Impact of Motor Vehicle Crashes, 2019 (Revised), NHTSA, Feb. 2023, DOT HS 813 403.

¹¹¹ CPI Inflation Calculator, Bureau Of Labor Statistics, Comparing value Jan. 2019 to Jan. 2025.

¹¹² Traffic Safety Facts 2023 Data: Pedestrians, NHTSA, DOT HS 813 727, Jun. 2025.

¹¹³ Traffic Safety Facts 2023 Data: Bicyclists and Other Cyclists, NHTSA, DOT HS 813 739, Jul. 2025.

¹¹⁴ Federal Motor Vehicle Safety Standards; Lamps, Reflective Devices, and Associated Equipment, Adaptive Driving Beam Headlamps, Final Rule, NHTSA, 87 FR 9916, Feb. 22, 2022, NHTSA–2022–0013–001.

¹¹⁵ See related NTSB investigation reports.

¹¹⁶ IIHS, Headlights, available at: <https://www.iihs.org/research-areas/headlights>

¹¹⁷ IIHS, Headlights, available at: <https://www.iihs.org/research-areas/headlights>

¹¹⁸ Pub. L. 117–58, § 24214 (2021).

¹¹⁹ 89 FR 79622 (Sep. 19, 2024).

¹²⁰ 89 FR 76926.

Annually, motorcycle crashes cost nearly \$17 billion in economic impacts and \$107 billion in societal harm as measured by comprehensive costs based on 2019 data.¹²¹ Accounting for inflation alone, in 2025, this would equate to over \$21 billion in economic impacts and over \$135 billion in societal harm.¹²² Serious injuries and fatalities accounted for 83 percent of total comprehensive costs of motorcycle crashes, compared to 60 percent of the total comprehensive costs of all motor vehicle crashes.¹²³

Motorcycle riders continue to be overrepresented in fatal traffic crashes.¹²⁴ IIHS evaluated on-road data and found motorcycle anti-lock braking systems (ABS) were associated with a 22 percent reduction in the rate of fatal crash involvements.¹²⁵ Requiring ABS as standard equipment via a FMVSS on new motorcycles will prevent and mitigate crashes. European Union General Safety Regulation (EU GSR) has required ABS fitment on motorcycles since 2016. IIHS most recently filed a Petition for Rulemaking to require ABS on motorcycles with NHTSA in 2023.¹²⁶ We urge the Committee to pursue a standard for this safety improvement in the next surface transportation reauthorization.

Child Passenger Safety

Since 1990, over 1,100 unattended children have been killed in “hot cars,” and 7,500 more have been injured.¹²⁷ Cost effective technology exists to prevent these tragedies now. The IIJA directed U.S. DOT to issue a Final Rule within two years requiring all new passenger motor vehicles weighing less than 10,000 pounds to be equipped with a system to alert the operator to check rear-designated seating positions after the vehicle engine or motor is deactivated by the operator. The U.S. DOT has not taken regulatory action and should issue a Final Rule which requires the system to detect occupants in the entire passenger compartment rather than rely on reminder systems which are less effective. Of note, Euro New Car Assessment Program (NCAP) added testing of child detection systems in 2023 (protocol), and from 2025 onwards will only be assigning points for direct sensing systems.¹²⁸ We urge the Committee to direct U.S. DOT to comprehensively elevate NCAP and minimally adopt protocols from global NCAPs which have advanced beyond the U.S. program.

Thank you for your consideration of these issues. We look forward to working with you to address the public health crisis of motor vehicle crashes.

Sincerely,

CATHERINE CHASE,
President.

cc: Members of the Committee on Commerce, Science, and Transportation

February 3, 2026

Hon. TED CRUZ, Chair,
Hon. MARIA CANTWELL, Ranking Member,
Committee on Commerce, Science, and Transportation,
United States Senate
Washington, DC.

Dear Chair Cruz and Ranking Member Cantwell:

In advance of tomorrow’s hearing, “Hit the Road, Mac: The Future of Self-Driving Cars,” the undersigned write to urge you to pursue a people-and-safety-first approach to the development and deployment of autonomous vehicles (AV). Guardrails to ensure the safety of road users on public roadways must be established. More-

¹²¹ The Economic and Societal Impact of Motor Vehicle Crashes, 2019 (Revised), NHTSA, Feb. 2023, DOT HS 813 403.

¹²² CPI Inflation Calculator, BLS, January 2019 to January 2025 dollars.

¹²³ The Economic and Societal Impact of Motor Vehicle Crashes, 2019 (Revised), NHTSA, Feb. 2023, DOT HS 813 403.

¹²⁴ NHTSA, Motorcycle Safety, available at: <https://www.nhtsa.gov/road-safety/motorcycles>
¹²⁵ Motorcycle Antilock braking Systems and Fata Crash Rates: Updated Results, Aug. 2021, IIHS.

¹²⁶ IIHS, Petition for rulemaking: Upgrade Federal Motor Vehicle Safety Standard No. 122, Motorcycle Brake Systems (49 CFR 571.122), to require antilock braking systems (ABS) for new on-road motorcycles (Nov. 9, 2023).

¹²⁷ Kids and Car Safety, Hot Cars, available at: <https://www.kidsandcars.org/hot-cars/media-resources>

¹²⁸ See: <https://www.euroncap.com/media/79888/euro-ncap-cpd-test-and-assessment-protocol-v12.pdf>

over, we urge you to reject proposals that undermine the safety for vehicles equipped with an automated driving system (ADS) and other road users. Improving public safety, realizing societal benefits and advancing AVs and innovation are mutually achievable goals.

A comprehensive and thoughtful approach to AV development and deployment would include these sensible safeguards:

Minimum Standards for ADS and Foundational Safety Technologies

- Safety standards to ensure that the ADS will “see” and safely respond to all road users, vehicles and infrastructure in the roadway environment (aka a “Vision Test”) are elemental.
- Performance standards for safety technologies can save lives now as well as contribute to an automated driving future. These include: automatic emergency braking (AEB) that detects and responds to all road users, vehicles and roadway infrastructure; lane departure warning (LDW)/lane keeping assist (LKA); blind spot detection with intervention; intelligent speed assistance (ISA); occupant detection; and, a system to ensure a driver is sober, aware and capable. The AV will need to see and respond to everyone and everything in the roadway environment, stay in its lane, be aware of other road users before switching lanes or turning, adhere to the speed limit, know if an occupant is in the vehicle and ensure a driver can take over from the ADS at a moment’s notice for vehicles equipped with a partial ADS system.

Retain States’ Rights to Protect Their Road Users

- States must not be hampered from taking action to ensure safety on their roadways including by establishing requirements to report safety and crash data, to limit operations due to safety deficiencies, to support enforcement of traffic safety laws and to conduct crash investigations.

Collection of and Public Access to Comprehensive Safety Data is Essential

- The National Highway Traffic Safety Administration (NHTSA) established the standing general order (SGO) to require the reporting of safety data for vehicles equipped with a level 2 advanced driver assistance system (ADAS) and an ADS. The SGO is a needed step in the right direction and should be improved to collect new safety data and made permanent.
- States and localities must have access to recent and robust safety data to make determinations on AV operations.

Establish Accessibility Requirements

- While the AV industry has consistently included accessibility and mobility improvements for people with disabilities as a top priority, known and persistent issues including wheelchair securement remain unsolved. Remedies must be required.

Address Safety Considerations for Remote Operators

- AV operations are using remote operators (ROs) and remote assistants (RAs) to overcome deficiencies in their ADS and bolster their operations.
- Information on the scope of ROs/RAs and the safety deficiencies they are addressing is currently undocumented, yet needs to be, to understand the safety and readiness of related ADS.
- Safety issues related to use of ROs/RAs must be identified and safeguards established including but not limited to restrictions on the number of vehicles each RO/RA is managing, limitations on hours of service (HOS), requirements for a commercial drivers license (CDL) and experience operating related vehicles.

Include Workforce Protections

- Workforce issues for certain working drivers must be addressed.

Prevent Mass Exemptions from Federal Motor Vehicle Safety Standards (FMVSS)

- A procedure for exemption (up to 2,500) from FMVSS already exists. Provisions that permit mass exemptions from current FMVSS, particularly in the absence of new standards to ensure the safety of the ADS, are dangerous.

Curb Allowances for Testing and Demonstration

- Under current law, motor vehicle manufacturers can introduce vehicles that do not comply with Federal safety standards into interstate commerce for the sole purposes of testing and evaluation.

- Current law should not be expanded to allow more groups to take advantage of this allowance or to monetize the testing period.

Roadway safety must be prioritized in the approach to AVs. On average, 112 people were killed every day on roads in the U.S., totaling nearly 41,000 fatalities in 2023.¹ Early projections for 2024 traffic fatalities remain at a similar historic high level; over 39,000 people are estimated to have been killed that year.² The public health crisis on our roadways should not be exacerbated with additional dangers caused by AVs.

Thank you for your consideration of these issues. We respectfully request this letter be included in the hearing record.

Sincerely,

Advocates for Highway and Auto Safety
 America Walks
 American Academy of Pediatrics
 Center for Auto Safety
 Citizens for Reliable and Safe Highways (CRASH)
 Consumers for Auto Reliability and Safety
 Disability Rights Education and Defense Fund (DREDF)
 GreenLatinos
 Kids and Car Safety
 League of American Bicyclists
 Northern Virginia Families for Safe Streets
 Parents Against Tired Truckers (P.A.T.T.)
 SMARTER, Inc. (the Skilled Motorcyclist Association—Responsible, Trained, and Educated Riders, Inc.)
 Stopdistractions.org
 Trauma Foundation
 Truck Safety Coalition

cc: Members of the Committee on Commerce, Science, and Transportation

INTERNATIONAL UNION OF POLICE ASSOCIATIONS
January 30, 2026

Senator TED CRUZ, Chairman,
 Senate Commerce Committee,
 Washington, DC.

Senator MARIA CANTWELL, Ranking Member,
 Senate Commerce Committee,
 Washington, DC.

Honorable Senators:

As President of the International Union of Police Associations, I am writing to express my concerns about the deployment of autonomous vehicles in our communities. We represent rank and file active duty law enforcement professionals across this great nation, including the U.S. territories of Puerto Rico and the Virgin Islands.

Autonomous vehicles present a serious and unacceptable danger at police, fire, and emergency medical scenes.

Emergency scenes are not predictable environments. They involve hand signals, verbal commands, temporary traffic patterns, flares, cones, and split-second judgment by trained responders. Autonomous systems cannot reliably interpret these conditions and cannot exercise discretion when lives are on the line.

Police officers, firefighters, and paramedics routinely work in active roadways. A vehicle that hesitates, misreads an officer's direction, or fails to recognize an evolving scene is not just a technological inconvenience, but potentially a lethal hazard.

How can a public safety officer stop one of these vehicles that is entering an area restricted because of a hazardous material, active shooter or crime scene?

When autonomous vehicles malfunction or behave unpredictably at emergency scenes, responders are forced to manage the technology instead of saving lives. That

¹Traffic Safety Facts Research Note: Overview of Motor Vehicle Traffic Crashes In 2023, NHTSA, Apr. 2025, DOT HS 813 705, (Overview 2023).

²Traffic Safety Facts: Crash Stats, Early Estimate of Motor Vehicle Traffic Fatalities in 2024, NHTSA, Apr. 2025, DOT HS 813 710 (Early Estimates 2024).

risk is unacceptable. Accountability is also unclear when autonomous systems cause injury, block emergency access, or trigger secondary crashes.

We believe that deployment of autonomous vehicles should not proceed without proven, enforceable safeguards that protect first responders and the communities they serve.

Respectfully,

SAM A. CABRAL,
International President.

AMERICAN COUNCIL OF THE BLIND
Alexandria, VA, February 2, 2026

Hon. TED CRUZ, Chair,
Hon. MARIA CANTWELL, Ranking Member,
United States Senate,
Committee on Commerce, Science, and Transportation,
Washington, DC.

Dear Chairman Cruz and Ranking Member Cantwell:

The American Council of the Blind (ACB) writes in support of a first-ever National Autonomous Vehicle Framework being included in the Surface Transportation Reauthorization Bill.

ACB is a national nonprofit representing the millions of Americans who are blind or have low vision, advocating for access to independently live, work, and fully participate in all aspects of society.

SAE Level 4 and 5 fully autonomous driving technology has the potential to be a safe, reliable, on-demand mobility option for those who are blind or have low vision across America, including those who can never hold a driver's license. However, there is an urgent need to establish a Federal policy framework for AV technology. Currently, reliable transportation can be a major barrier for people who are blind or have low vision. If a person does not live in a community with a strong public transit infrastructure, accessing transportation can be immensely difficult.

This keeps our community from important responsibilities such as procuring employment because we have no way to get to a place of employment. Since the advent of major rideshare companies, the blind community has become regular users. However, blind and low vision passengers are routinely denied rides from rideshare drivers. Most specifically, persons like myself, who get around with the guidance of a trained guide dog, I am constantly denied rides by drivers who refuse to let a dog in their car despite Federal laws. This creates a barrier in accessing such transportation. I have even heard stories from blind travelers without guide dogs who have been denied rides simply because the driver does not want the hassle of accommodating a person with a disability. The wonderful thing about an autonomous vehicle is that it cannot discriminate against a person for any reason. In the approximately six times I have traveled in an autonomous vehicle, I had no fear of being denied a ride. I was able to travel freely, safely, and easily to the places I needed to go. I felt safe in my experiences because I know the technology is safer than that of a human being who is more prone to error. When I ride in a vehicle with a rideshare driver who is displeased with my presence in his or her car, I feel far more unsafe than I do in a vehicle designed with safety in mind.

Most people who are blind or have low vision cannot drive a vehicle. This leaves them completely dependent on other drivers or public transportation. The creation of autonomous vehicles is opening a long-closed door for our community. As a person who developed by visual impairment at a young age, I have never been able to drive a car. So, when I took my first independent ride in a Waymo in Phoenix, Arizona in April of 2025, it was the first time in my life I was able to travel in a car completely by myself. It is difficult to put into words how free and independent I felt during that ride. I can only imagine the opportunities such services will offer to the blind and low vision community as the service becomes more widespread across the Nation.

A national AV framework would define fully autonomous vehicles, set a strong Federal safety baseline, and provide the regulatory certainty companies need to invest, expand services, and compete. Without Federal leadership, this technology will continue to roll out piecemeal as each state has to reinvent the wheel when it comes to AVs. This risks leaving many blind Americans behind. For those who live in accessible cities such as San Francisco, California or Phoenix, Arizona, the opportunity has opened numerous doors. However, for those who do not, the exciting opportunity seems unobtainable. As a Maryland resident, I dream of the day autonomous vehi-

cles come to the greater Washington, D.C. area. Because I have had a few limited experiences in Arizona and California, it makes my desire to access such transportation increase that much more. I urge Congress to take the steps necessary to allow the process to move more quickly so that blind and low-vision Americans from across the country can access this life changing service.

Establishing a national AV framework will ensure that blind Americans can freely choose this life-changing mobility innovation. The American Council of the Blind respectfully urges Congress to act. Please reach out if you have any questions. I can be contacted at (202) 559-2041.

With Gratitude,

CLAIRE STANLEY, J.D.,
Director of Advocacy and Governmental Affairs.

UNITED SPINAL ASSOCIATION
February 2, 2026

Hon. TED CRUZ,
Chairman,
Committee on Commerce, Science, and
Transportation,
U.S. Senate,
Washington, DC.

Hon. MARIA CANTWELL,
Ranking Member,
Committee on Commerce, Science, and
Transportation,
U.S. Senate,
Washington, DC.

Dear Chairman Cruz and Ranking Member Cantwell:

On behalf of the United Spinal Association, we respectfully request that the Senate include a National Autonomous Vehicle (AV) Framework in the upcoming surface transportation Reauthorization Bill. The AV moment is upon us. The time to enact a life-saving, life-changing technology national safety baseline and regulatory certainty for new market expansion is now. An AV framework is a critical opportunity for the United States to lead the world in advancing safe mobility technology with the promise to expand freedom and independence for millions of Americans in both rural and urban sectors, especially for the Nation's 5.5 million wheelchair users.

United Spinal has almost 70,000 members, more than 40 chapters, 107 support groups, and over 120 rehabilitation facilities and hospital partners nationwide. Founded by paralyzed veterans in 1946, we are dedicated to enhancing the quality of life of all people living with spinal cord injuries and disorders (SCI/D), paralysis, neurological conditions and other mobility disabilities, including veterans, and providing support and information to loved ones, care providers and professionals. We also work collaboratively with Spinal Cord Injury Model (SCI) System Centers and the Model Systems Knowledge Translation Center that provide innovative research and support in the field of SCI, traumatic brain and burn injuries.

United Spinal has a long history of supporting accessible transportation for America's wheelchair users. We are acutely aware that wheelchair accessible AVs can be a true game changer in elevating the quality of lives of wheelchair users. For untold numbers of wheelchair users, especially those living in rural areas, the lack of transportation options serves as a major obstacle to gain entry to the job market or to sustain employment. Wheelchair accessible AVs would help level the playing field for wheelchair users.

In fact, a recent analysis¹ based on "the estimated change in labor force participation by people with disabilities facilitated by an increase in mobility due to AV adoption" has found that under a moderate scenario, "an increase in the labor force participation by people with disabilities of 15 percent, is projected to result in 4.4 million direct jobs for people with disabilities and 9.2 million total jobs across the U.S. The U.S. GDP and output are projected to increase by \$868 billion and \$1.6 trillion, respectively. Direct income, those associated with the wages and earnings of people with disabilities, is projected to increase by \$160 billion, while total income is projected to increase by almost \$417 billion." Further, the analysis found that, "Total Federal tax revenue, associated with the increase in direct, indirect, and induced employment is projected to be almost \$93 billion, or a 1.8 percent increase in total Federal tax revenue."

Some of our community members have experienced Waymo's SAE Level 4 fully autonomous driving technology and learned how this technology can help expand mobility for people with disabilities. Establishing a Federal AV framework would

¹ See: <https://www.nationaldisabilityinstitute.org/wp-content/uploads/2023/02/ndi-economic-impactsofremovingtransportationbarriers.pdf>

provide regulatory certainty, allowing companies to invest in and expand their services. Otherwise, people with disabilities could be left behind. We have a long-standing relationship with AV companies working to improve the accessibility of their services and are optimistic about the potential momentum a Federal framework could provide to design, develop and deploy wheelchair accessible AVs.

United Spinal's SecureRide Coalition² was initially formed to tackle the AV industry-wide challenge of developing a single automated wheelchair securement standard and system for application in autonomous vehicles. It soon became apparent that the work must be expanded to provide for a securement system that could provide for seamless, safe and independent travel across all transportation modes—from public transit and ride-shares to rail and air.

The Coalition's work built upon an existing voluntary industry safety standard that has been safety tested by researchers such as those at the University of Michigan's Transportation Research Institute (UMTRI).³ While the Universal Docking Interface Geometry (UDIG) standard has not yet been commercialized, two National Highway Traffic Safety Administration (NHTSA) Small Business Innovation Research (SBIR) Grant recipients are working to bring a securement system based on the UDIG standard to commercialization. This 2-point UDIG-based securement system should replace the predominantly current labor intensive (requiring another individual other than the wheelchair user) and time-consuming 4-point securement system (four tie-down straps must be attached to the wheelchair as well as to the vehicle floor).

Importantly though, further research is necessary to provide seamless, safe and independent securement in a variety of vehicle types. Specifically, research is needed on an automated system that, using a UDIG standard, secures a wheelchair within a motor vehicle utilizing a deployable anchor. A deployable anchor will allow a wheelchair user to roll past an anchor that can be deployed from a recess in the vehicle floor or an anchor that can be deployed laterally from either side of the wheelchair. A provision in the surface transportation reauthorization bill directing the Secretary of Transportation to conduct this specific research will yield tremendous benefits.

The additional research will not only aid more flexible passenger configurations for wheelchair accessible AV design and development, but it will also help usher in more seamless transportation between transportation modes. That seamlessness for wheelchair users will also quickly translate into time savings for transit and paratransit services. The time savings between tying down four straps versus independent automated wheelchair securement will be significant.

Enacting a Federal AV framework will not only improve mobility access for people with disabilities but it will also strengthen U.S. leadership amid growing global competition. We respectfully urge the Committee to act now. We look forward to working with you on both the research provision and the AV framework accessibility provisions.

For more information, please contact Kent Keyser, United Spinal's Policy Fellow at: kkeyser@unitedspinal.org.

Sincerely,

STEPHEN LIEBERMAN,
Senior Director, Advocacy and Policy,
www.unitedspinal.org

The CHAIRMAN. Who's next? Senator Kim.

**STATEMENT OF HON. ANDY KIM,
U.S. SENATOR FROM NEW JERSEY**

Senator KIM. Thank you, Chairman. Thank you to all of you for coming out for this really important conversation.

Before I even came into Congress, I spent years and years working on cybersecurity, national security-related issues. So, as we're talking through safety and control, I guess I just wanted to get a sense from you just where we're at when it comes to the capacity to protect ourselves from cybersecurity attacks? As we are worried

² See: <https://unitedspinal.org/secureride/>

³ See: <https://wc-transportation-safety.umtri.umich.edu/udig-universal-docking-interface-geometry/>

about the growing number of devices that we have that are connected to the internet, I have to say, at the top of the list, you know, I do have concerns just about autonomous vehicles, and I wanted to just get a sense from you what's true and what's not. So, maybe—Dr. Peña, maybe we can just start with you. Just what levels of concern have you had, and what steps are you all taking to try to prevent the ability for someone else to be able to access data as well as take control of controls and features of the vehicles?

Dr. PEÑA. Yes. Cybersecurity is a very important part of our safety framework. It is something that we take very seriously, and we take a number of measures to identify vulnerabilities, perform risk assessments, and then mitigate those vulnerabilities. One example is, by design, our safety critical systems in the vehicle are protected from external connections, so you cannot actually hack into it, connect to it, and drive it remotely. And so, we do design, we do testing, so we do a pretty extensive evaluation of cybersecurity and mitigations.

Senator KIM. So, with your—with your company and with your fleet, have you had any instances where someone was able to access data or features or control of any of the vehicles?

Dr. PEÑA. Not that I'm aware of, Senator.

Senator KIM. Dr. Moravy, I guess I wanted to ask you just similar questions. Just, you know, how are you able to protect your consumers, your drivers, from cyberattacks, and have you had any instances of cyberattacks upon vehicles that were able to access data, features, or gain control?

Mr. MORAVY. Yes. Thanks, Senator Kim, for the question. You know, I guess I'll quote our CEO here from over 10 years ago when we started on this endeavor. He said one of his biggest fears was the possibility that someone could do as you described—

Senator KIM. Yes.

Mr. MORAVY—take over an autonomous vehicle and do something nefarious. Since that day, we've been committed to making sure that never happens. We have many layers of security within our system, and similar to what Dr. Peña said, our driving controls—go, stop, steer—are in a core embedded central layer that cannot be accessed from outside the vehicle. In addition, our security protocols ensure that no firmware can be downloaded to the vehicle without what is the modern-day equivalent of a two-man rule. In order to sign such a firmware, two people have to sign it off with individual keys to make sure that that encrypted firmware can be uploaded to that vehicle safely. You know, and to answer your question very bluntly about has anyone ever been able to take over control of our vehicles, the answer is quite simply no. And to make sure that that happens, we actively participate in hacking events, trying—paying people to try to get into our vehicles, and we are the only automotive manufacturer that does it.

Senator KIM. Yes. Mr. Farrah, just from an industry side, I mean, I think we all are in agreement here, we want to make sure that answer continues to be “no” in terms of ability to be able to access. Just what are—what are you seeing in terms of across the industry as well as what we should be thinking about here in terms of setting standards to be able to ensure that we can look

the American people in the eye and say, you know, this is not a scenario that can happen, and you don't have to worry about this?

Mr. FARRAH. Senator Kim, I appreciate the question, and I think what Mr. Peña described is very much industry standard. There's a thought of this as being a closed universe that the company controls, and that is a natural way of keeping out certain cybersecurity intrusions. I'll also just note here that, from our perspective, we want Americans to understand that these vehicles are safe. We want Americans to trust these vehicles and understand that this is—this is a huge priority of each of the companies that are there. If we don't have that trust, the technology doesn't get developed and it doesn't get deployed, and that's obviously not something that we want to see. And so, there's a massive incentive on the part of the companies to do everything they can to address cybersecurity intrusions, and that's, I think, why we have the track record that we do.

Senator KIM. Yes. Dr. Peña, one last quick question for you on a different topic. You know, I'm from New Jersey, very densely populated area. Just as I'm talking to people in my state, how do you explain deployment to a densely populated area? What types of markers, what types of metrics you need before you can say, you know, this is safe now to deploy in these different areas?

Dr. PEÑA. Yes. Before we enter any market, we do an extensive evaluation and test of the different driving features, different road types. We do analysis simulations, and we also perform testing with our vehicles, what we call autonomous driving specialists, behind the wheel prior to us removing the human driver. So, we take our time. We do it very methodically, and we have a very strong safety framework. And all of that—those arguments, that evidence needs to be presented to a safety board, of which I'm a part of, and we approve that deployment with the sufficient evidence that the system has been demonstrated to perform safely in that city.

Senator KIM. OK. Thank you so much, and I'll yield back, Chairman.

The CHAIRMAN. Thank you. Senator Moreno.

**STATEMENT OF HON. BERNIE MORENO,
U.S. SENATOR FROM OHIO**

Senator MORENO. Mr. Moravy, if a Tesla robotaxi is in an accident and there is a question about liability and it turns out that it was a software error, it's possible hardware error, who would accept liability?

Mr. MORAVY. Yes. Thanks for the question, Senator Moreno. Of course, if, in the unlikely event that a software error occurred in our autonomous driving system, we would take liability for that event, much in the same way that a driver takes liability in our current legal system if they make an error.

Senator MORENO. Right. So, it'd be no different. Dr. Peña, how about at Waymo?

Dr. PEÑA. Likewise.

Senator MORENO. So, you would be—you would take that liability, and you wouldn't look to skirt the types of protections that we have now, which is, obviously, some sort of terms and conditions that nobody reads that's 17 pages long that you just hit "accept."

In other words, a driver does not have binding arbitration against somebody that they hit, so you would not be in favor of that, correct?

Dr. PEÑA. Senator, that's, again, not my area of expertise, so I would have to discuss with my team, and I can get back to you.

Senator MORENO. OK. I mean, that's not a great answer.

Are you familiar that seven years ago, President Trump issued a national emergency around foreign adversaries accessing our critical infrastructure and put in place something that we call the Connected Vehicle Rule? Are you familiar with that?

Dr. PEÑA. Yes, I am.

Senator MORENO. OK. And Mr. Moravy, are you familiar with that as well?

Mr. MORAVY. Yes, sir.

Senator MORENO. OK. And you're fully—Mr. Moravy, are you in favor of the Connected Vehicle Rule? Do you think that was good policy?

Mr. MORAVY. I think any policy that, you know, regulates and promotes U.S. security and manufacturing is a good policy.

Senator MORENO. And how much of your vehicle, again for the record, is made in America?

Mr. MORAVY. Over 95 percent of our vehicles are made with North American parts. All of our cars are made in the U.S. that are sold in the U.S., and we're working toward making that a hundred percent.

Senator MORENO. So, you get to the point soon with these robotaxis they're a hundred U.S. content?

Mr. MORAVY. That's correct.

Senator MORENO. So, the Connected Vehicle Rule would have no impact on you whatsoever because, obviously, all the telecommunications infrastructure connections would be U.S.-based, correct?

Mr. MORAVY. Yes, sir.

Senator MORENO. And, Dr. Peña, how about you?

Dr. PEÑA. Our autonomous driving system is designed and built in the U.S., and we install onto several different platforms. We are in support of the Connected Vehicle Rule.

Senator MORENO. But how is that possible given that you're—you said in your testimony that we're locked in a race with China, but it seems like you're getting in bed with China. The cars that you're looking to bring into the United States are Chinese automobiles owned by Chinese auto companies, are they not?

Dr. PEÑA. We use a variety of platforms. They are—

Senator MORENO. Right now, you use a Jaguar that's made in Graz, Austria, and the car that you're looking at doing is a car by a subsidiary of Geely, which is a Chinese company. Is that not accurate?

Dr. PEÑA. Yes, and we—

Senator MORENO. So then, how would—how would advancing the U.S. interests over China be met by having a company allow Chinese-made automobiles to enter the U.S. market, which are currently not allowed to enter the market? It seems like a very back-door way of bypassing the Connected Vehicle Rule.

Dr. PEÑA. Those Chinese vehicles, the Geely vehicles, have no smarts, no connectivity. What we do is we install our autonomous

driving system right here in America, and we don't share any information whatsoever. And so, I feel that having a stable auto supply is actually enable us to scale more quickly and more efficiently, which is, in fact, helping us retain our lead over China and even extend it.

Senator MORENO. So, giving a natural market to a Chinese company to ship us cars is making us better and creating more jobs for Americans? That's completely ridiculous. Let me ask you another question. When you operate in the cities that you do, what's the price difference between Waymo and Uber? Like, if I were to go and pick an Uber and then I go and pick a Waymo, what's the price difference?

Dr. PEÑA. Senator, it really varies——

Senator MORENO. More or less.

Dr. PEÑA—by market.

Senator MORENO. One percent, a hundred percent?

Dr. PEÑA. It varies so much that I probably can't give you an accurate answer.

Senator MORENO. Well, I'll give you the answer. It's almost exactly identical, so what you're really doing is really taking the labor cost out of your—out of your business model. So, just be—let's just be clear, which is—by the way, I'm a capitalist. I'm not—but don't—we need to frame this as, hey, look, we figured out a way to save a ton of money, which is to get rid of the human driver in the vehicle so we could make more profit, but let me ask you another question. You're owned by Google, correct?

Dr. PEÑA. Alphabet is our parent company, amongst others.

Senator MORENO. Are you going to be using disaggregated data to target advertising toward your users?

Dr. PEÑA. No, that's not our plan.

Senator MORENO. That's not your plan. So, that would not be any kind of situation where you'd serve up different ads, people could use the service, and then get that data that allow them to target ads toward——

Dr. PEÑA. Yes——

Senator MORENO.—toward your users?

Dr. PEÑA. That's not the plan.

Senator MORENO. Is that plan subject to change?

Dr. PEÑA. Oh, I'm not privy to that.

Senator MORENO. OK. All right. Thank you. I'm out of time.

The CHAIRMAN. Thank you. Senator Luján.

**STATEMENT OF HON. BEN RAY LUJÁN,
U.S. SENATOR FROM NEW MEXICO**

Senator LUJÁN. Thank you, Mr. Chairman. Many of you may be aware of some legislation that I was proud to work on years ago with some of my Republican colleagues, and we got together and we came up with some legislation that would require technology and vehicles that would prevent drunk driving deaths. I remind my colleagues that when I was in my early 20s, I was hit on by a drunk driver. Thank God, I'm here today. As many as 10,000 people, 11,000–12,000 people lose their lives every year because of this.

Now, one of the questions that I have in this particular space is around the many types of anti-drunk driving technology that already exists. There's even a recent announcement from a company that will provide a Japanese OEM with a driver monitoring system that includes alcohol impairment detection. The current NHTSA Administrator, Jonathan Morrison, recently warned, "There's a very major difference between an advanced driver assistance system and an automated driving system. The system you can buy in your vehicle today, with very rare exception, is a driver assist system. If you have an extra cocktail or two, and you get behind the wheel and put it in, 'hands-free mode,' you're a drunk driver. I want you to be pulled over, and I want you to be removed from the road." That's what Jonathan Morrison, the current NHTSA Director recently said.

Mr. Smith, can you explain why self-driving features in cars requires a person to be alert and able to safely take over the vehicle's operations?

Dr. SMITH. Thank you, Senator, for the question, but particularly for your work on the HALT Drunk Driving Act. That is—that is incredible to be able to do something that will eventually save tens of thousands of lives every single year, and what you're describing is the fact that we have technologies that can do that. We have technologies that can drive a vehicle. Some of the same ones and other ones are able to detect if a human is actually capable of safely driving the vehicle. And as you point out, certain applications of driving automation envision that a human might still be able to or even need to drive for a portion of the trip, not the kind of robotaxis that we might talk about, but features on production vehicles often.

And as part of the safe design of the system, the manufacturer needs to know that when the system says, hey, human drive, that the human is in a position to do so, that they're not sleeping, that they're not drunk, that they're able to reengage. And so, a lot of that is the ability to understand, directly or indirectly, if a human is able to drive.

Senator LUJÁN. Mr. Moravy, what technology does Tesla leverage to ensure that a driver is alert, in other words, not impaired, drunk, distracted, or fatigued, and ready to take over the vehicle at a moment's notice? For your self-driving or autopilot technology to work correctly, isn't it necessary to determine that the driver can safely take over the vehicle?

Mr. MORAVY. Thank you, Senator Luján. Currently, for our full self-driving supervised system that is deployed in our consumer products, it is an L2 system, to your point, and it requires driver supervision. In those vehicles, we use a variety of detections to ensure that the driver is attentive, including eye monitoring, hands-on detection, and other bits of information to ensure that they're being attentive.

Senator LUJÁN. So, when NHTSA completes its rule and sets standards to passively detect drunk or impaired driving, with the HALT Act, do you believe Tesla will be able to implement this technology in the near future?

Mr. MORAVY. Senator Luján, we have a good relationship with NHTSA, and we work closely with them on all regulations and

abide by them. And should they pass a new regulation to the description that you just mentioned, we would gladly ensure that we comply with it.

Senator LUJÁN. Appreciate it. Dr. Peña, do you support implementation of the HALT Drunk Driving Act, and how can your company help advance this life-saving initiative?

Dr. PEÑA. This is, you know, one of my goals as well, to eliminate impaired driving, and so we support it, and this is one of the benefits of our vehicle. We never drive drunk, never distracted.

Senator LUJÁN. Dr. Peña, your systems—you're a systems engineer by trade, correct?

Dr. PEÑA. Yes, I am.

Senator LUJÁN. Can you explain the role of redundant systems and safety critical systems?

Dr. PEÑA. Oh, absolutely. Having redundancy allows you to have higher reliability and higher levels of safety. You always have to plan for the unexpected, so if some of your systems malfunction, you want a backup system to be able to come into play and allow you to continue to travel safely.

Senator LUJÁN. One of those tools is sensor fusion, if I'm not mistaken, and I'd ask if we could just get that entered into the record and we'll get the definition.

As my time is expired here, Mr. Moravy, can you explain to me why Tesla has decided to limit redundancy for its sensing systems by removing radar and relying solely on cameras?

Mr. MORAVY. Yes. Thank you, Senator Luján. Just a quick answer here. Our human roads are designed to be operated by pure vision, and I reject the notion that we don't have redundancy. We have nine cameras, and each of them is independently wired to our central control, so in that sense, we have redundancy across the vision system that you mentioned.

Senator LUJÁN. I mean, would you say that when Elon said—Elon Musk, your CEO, that LiDAR and radar reduce safety due to sensor, you agree with that?

Mr. MORAVY. Senator Luján—

Senator LUJÁN. If you don't want to answer, you don't have to because I don't want to compromise you with whatever your next endeavor is.

Mr. MORAVY. We believe strongly that we can—you know, we can solve all of the self-driving needs with vision alone.

Senator LUJÁN. All right. Well, Mr. Chairman, I know that when we talk about these self-driving things, there seems to be unanimous agreement—Democrats, Republicans, everyone involved—that LiDAR, cameras, all of this stuff works to keep everybody safe, and so I'm hoping we can get—drill in more. One question that I didn't have time to ask today, Mr. Chairman, is as we talk about all of these rules around self-driving cars, before you can get to full self-driving, Congress has to take action.

Mr. Moravy, will you commit that Tesla—I don't want to call them salespeople, but the people that are at your facilities where people go pick up the cars that they order, to stop telling people that are purchasing Teslas that they can order a little hand weight from Amazon to trick the vehicle? Will you commit to sending an

order out and saying please stop that, or not “please,” but demand that it stops?

Mr. MORAVY. Senator—

Senator LUJÁN. If you—if you—if you don’t know what’s going on, I can tell you, and if you want to see a video, I’ll show you one.

Mr. MORAVY. Yes. Senator Luján, I’m not aware of the specific instances you have, but we do inform our staff to educate our customers on the features of full self-driving supervise and the functionality during all sales events.

Senator LUJÁN. Mr. Chairman, I’ll follow up with you on this one. I think we can get this one done. You don’t have to do something publicly, but to teach people how to trick the rules, to put a little weight—and if you do a search on Amazon, you can get one right now. They’re like 10 bucks. You strap the sucker on the wheel, and then it tricks the vehicle like your hands are on it. Tell them to stop doing that, and I just hope that we can—we can work on that one, Mr. Chairman. It doesn’t have to be a big thing. Just tell them to stop it. Thanks, Mr. Chairman.

The CHAIRMAN. Senator Schmitt.

**STATEMENT OF HON. ERIC SCHMITT,
U.S. SENATOR FROM MISSOURI**

Senator SCHMITT. Thank you, Mr. Chairman. These kinds of hearings I think are fascinating because I—and I try to bring the perspective of the folks back home and what they really want to understand because this is emerging. It’s not going away. I think Missouri is kind of going through its own process right now of figuring out what sort of rules of the road, for lack of a better term, that they want to have in place. And one of the things that I think is most exciting about it, and I know that we have some advocates here, is the opportunities that it provides for individuals with disabilities to get to more places and have that kind of connectivity that, in many ways, they don’t have right now or it’s much more challenging for them. So, I think there’s a lot of opportunity, but I suppose the nature of the questions I get from back home, which I want to pose to you guys now, is related to safety. As you can kind of tell, there’s—obviously it’s a new technology. People, they have concerns, or questions, I guess, is a better way to put it.

Mr. Moravy, in your testimony, you make the argument that Tesla’s full self-driving, the FSD supervised system, already performs significantly better than the U.S. average, driving 5.1 million miles before a major collision. What in that analysis, or that study, or that data, what sort of independent validation do you guys rely on for those results?

Mr. MORAVY. Yes. Thank you, Senator Schmitt. So, you know, we publish all of our data, regarding vehicle safety in particular, yearly in a safety report, in our impact report and online on our safety page to show the number of miles we’ve driven and the incidents that have occurred. And we regularly meet with our regulators, such as NHTSA, to review incidents that do occur.

Senator SCHMITT. OK. Dr. Peña, I want to ask you, there was—in December 2025, pretty recently, there was a powder—power outage in San Francisco—I’m sure you’re well aware of this—where traffic lights went down, and the vehicles—your vehicles there were

just sort of frozen. What changes are you making to the software that you guys use that would—and the decision-making logic to ensure that those kinds of situations, like dark signals or whatever, are not a problem, because this is the kind of stuff that people, they get concerned about, right?

Dr. PEÑA. Yes. It was a widespread power outage with many traffic lights, as you said, disabled. And I think it was the sheer number of traffic lights that created a challenge for us in terms of delays in traversing intersections. In a way, we had tuned the system to be very conservative, and what we're doing is we are updating our software—we've already done it—to provide more context about a regional power outage so that we can more confidently traverse those lights. And we're also, you know, updating our incident procedures and, you know, working with law enforcement to ensure that we're communicating, that we're collaborating.

Senator SCHMITT. OK. Mr. Moravy, I want to ask you, from your perspective, and I think that when we talk about so many things are happening in this country, bringing back manufacturing in this country, not relying on other places for the things that we need that are critical, whether it's iPhones or F-15s, and certainly the auto industry in this country has been the gold standard for a very, very long time. From your perspective, what's at stake in this competition with China for autonomous vehicles, and what happens if we lose?

Mr. MORAVY. Yes. Thanks, Senator Schmitt. You know, as you mentioned, Tesla is committed to U.S. manufacturing, and we have been for many, many years. You know, we are in a sort of precipice and in a competition with China to develop, you know, autonomous vehicles. And I think we have the leaders here in the world today that are actually making the best autonomous vehicles that are on the market. We need to maintain that leadership in order to really, hopefully, transition autonomous vehicles into a state where the FAA has, with Boeing, and become the gold standard of the future of aviation, you know, some 70, 80 years ago. If we—if we take that same leadership now and we put forth, you know, an AV framework that Congress instructs NHTSA to enact, we will have that leadership where, you know, the best American companies will make the most AVs for the—for the world to follow.

Senator SCHMITT. And to put a finer point on it, it matters not just for here, but you see what China does worldwide with their—with their EVs, right? They effectively subsidize them. They dump them in a market. They take over a whole continent because they wipe out an entire industry, and then all you're left with are Chinese EVs. If you think about the data that can be gathered from having AVs all around the world as sort of roving sensors for our chief adversary, I think that that is a sort of an underrated aspect of this competition.

And then, finally, with the 4 seconds I have remaining, I just want to ask between you guys, if you want to weigh in, how should—we're talking about this Federal framework, you've got all this kind of patchwork of the states, but how should the Federal framework account for local differences? I mean, there are going to be differences, and what are those—how do you minimize it? What's important? How do you guys see it?

Mr. FARRAH. Senator Schmitt, I'll just briefly say this is an opportunity for federalism. We have states that are passing AV deployment statutes. They need to be involved in all this. At the same time, the Federal Government needs to step up with regard to vehicle design, vehicle construction, and vehicle performance. There's an opportunity for both states and the Federal Government to be involved together to make sure that we are winning this race.

Senator SCHMITT. OK. Thank you, sir.

The CHAIRMAN. Thank you, and I will say the last point Senator Schmitt raised about the dangers of Chinese surveillance in EVs and Chinese-manufactured cars are very real concerns and one that I think all of us need to take very seriously. Senator Markey.

**STATEMENT OF HON. EDWARD MARKEY,
U.S. SENATOR FROM MASSACHUSETTS**

Senator MARKEY. Yes. Thank you, Mr. Chairman. I want to start with a little-known fact about autonomous vehicles. When an AV, such as a Waymo, encounters a situation on the road that it doesn't know how to handle, the Waymo phones a human friend for help. The autonomous vehicle communities then communicate with a so-called remote assistance operator, human being, who is located remotely and guides the self-driving car through the difficult driving environment. And despite the crucial role these operators play in autonomous vehicle safety, the public knows almost nothing about those people, those human beings. And that is why yesterday, I opened an investigation into all of the major autonomous vehicle companies demanding answers about their remote assistance operators.

Mr. Peña, let's learn more about Waymo's remote assistance operation. I understand that Waymo calls these people "live agents" and "rider agents," these human beings. Yes or no, does Waymo employ humans located remotely to help its vehicles navigate difficult driving scenarios?

Dr. PEÑA. Senator, they provide guidance. They do not remotely drive the vehicles. As you stated, Waymo asks for guidance in certain situations and gets an input, but the Waymo vehicle is always in charge of the dynamic driving task, so that is just one additional input—

Senator MARKEY. But the human being—the human being helps the vehicle to navigate those difficult driving scenarios. Is that correct?

Dr. PEÑA. Yes.

Senator MARKEY. OK. So, are all of these human operators located in the United States? Are they all here?

Dr. PEÑA. No, we have some in the U.S. and some abroad.

Senator MARKEY. So, how does that break down? What percent are abroad?

Dr. PEÑA. Senator, I don't have that number for you. We can get back to you.

[The information referred to follows:]

[COMMITTEE INSERT]

Senator MARKEY. Is it a majority are abroad?

Dr. PEÑA. I just don't have that number.

Senator MARKEY. Well, that's very curious that someone who's running the program has no idea how that workforce breaks down. It just seems kind of curious that you don't know that answer, but are some of these operators located outside the United States?

Dr. PEÑA. Yes, some are located abroad.

Senator MARKEY. Yes. And so, for me, that's fairly shocking. Waymo has critical safety employees who may need to intervene in a split second if a Waymo encounters an unknown, dangerous situation located in the United States, but they are outside the United States. In what countries are these employees located?

Dr. PEÑA. The Philippines.

Senator MARKEY. Excuse me?

Dr. PEÑA. The Philippines.

Senator MARKEY. So, they're in the Philippines.

Dr. PEÑA. Yes.

Senator MARKEY. Mr. Peña, that is completely unacceptable, and here's why. Having people overseas influencing American vehicles is a safety issue. The information the operators receive could be out of date. It could introduce tremendous cybersecurity vulnerabilities. We don't know if these people have U.S. driver's licenses. And let's not forget, Waymo is trying to replace the jobs of hardworking taxi and rideshare drivers, and now you're saying that of the human beings, the human jobs that remain in the system, you're shipping those jobs overseas. It's one thing when a taxi is replaced by an Uber or a Lyft. It's another thing when the jobs just go completely overseas, which is what we're talking about because no one likes a backseat driver, but a transatlantic backseat driver is downright dangerous in our country.

Now, I want to turn to another autonomous vehicle issue. When designing an autonomous or partially autonomous vehicle, engineers define where and when the system is safe to drive. This operational limit is known as the Operational Design Domain. Virtually every automaker, with one notable exception, restricts their driving systems to these domains. Mr. Peña, yes or no, does Waymo restrict its vehicles to safe, pre-mapped operational design domains?

Dr. PEÑA. Senator, we do. We have a very well-defined Operational Design Domain—different road types, weather, different conditions—and so we ensure that our vehicles are capable of performing.

Senator MARKEY. Well, that's good. Thank you. So, just to be clear, Waymo vehicles include technological safeguards to prevent them from operating on certain roads. Yes. Let's turn to Tesla. Mr. Moravy, yes or no, does Tesla restrict its partially autonomous driving systems, such as full self-drive and autopilot, to safe, pre-mapped Operational Design Domains?

Mr. MORAVY. Senator Markey, our driver's assistance system that you mentioned, full self-driving, supervised in our vehicles is—can be operated on a generalized solution in—on all public roads. On the other hand, our fully autonomous solution that is in operation in Austin is geofenced and mapped to a limited area.

Senator MARKEY. So, what Tesla is doing, unlike Waymo, unlike Waymo—Teslas do not have technology that prevents drivers from triggering the full self-drive and autopilot in unsafe conditions. So, from my perspective, that's outrageous because autopilot and full

self-drive have already been involved in dozens of deaths because in part, Tesla drivers can enable these driving systems on any road, under any conditions. And by failing to follow the best practices of every other AV company, Tesla is putting American lives at risk, and that is unconscionable.

And it's why in December, I introduced the Stay in Your Lane Act, which requires automakers to define where and when their driving systems are safe, and restrict the driving systems to those conditions only. Tesla does not do that. Tesla's vehicles say full self-drive, but, really, they are only partial full self-drive for the driver. That's very misleading to call something full self-drive when you cannot, in fact, meaningfully use that technology without increasing the danger. We need to ensure that they are supervised by human drivers when they are using full self-drive. So, that's my message to Tesla. You got to do that. Other companies do it. You have to do it as well, or else we're going to continue to see recurrence of these accidents on the streets of our country. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you. Senator Lummis.

**STATEMENT OF HON. CYNTHIA LUMMIS,
U.S. SENATOR FROM WYOMING**

Senator LUMMIS. Thank you, Mr. Chairman. Among the things that have come up as I've listened in this hearing, is the human factor behind the wheel. So, Mr. Moravy, you've spent your career involved in designing systems for automobiles, both with drivers and without drivers. Am I correct?

Mr. MORAVY. Yes, Senator, that's correct.

Senator LUMMIS. Could you tell me what things that you've worked on designing over your career have reduced deaths in automobiles—in passenger automobiles?

Mr. MORAVY. Yes, Senator. The list is quite long, so I'll try not to belabor everyone here, but I've worked on systems related to crash safety, occupant restraints, autonomous driving systems, driver's assistance systems, automatic emergency braking, and all of them have had some impact on saving lives.

Senator LUMMIS. But then didn't it drop to a point where it kind of plateaued?

Mr. MORAVY. Yes. If you follow the number of deaths on American roads, we've made great strides as an industry since the 1970s up until about 2005, where we've sort of leveled off between 35,000 and 40,000 deaths a year, and it's really tragic, to be honest. It's like, as a safety engineer, it's, like, hard to not see that number go down, and my team, and I, we work every day to try and figure out ways to reduce it.

Senator LUMMIS. And what has—what made it plateau?

Mr. MORAVY. Well, Senator, there are a number of causes, I'm sure, in any dataset. But, you know, in the early 2000s, there have been a number of studies that point to the advent of the smartphone and the amount of distraction that that causes within a driving scenario that have made it difficult for safety engineers like ourselves to—

Senator LUMMIS. Yes, so text—

Mr. MORAVY.—to further reduce that number.

Senator LUMMIS. So, texting and driving. So, it sounds to me like efforts have been made to help humans not kill themselves in cars, but it reached a plateau because texting and driving, and distracted driving is something that you can't correct for in a way that continues the decline of automobile deaths. Am I correct?

Mr. MORAVY. I think that's a fair assessment, Senator Lummis.

Senator LUMMIS. Well, so one of the things that makes me excited about autonomous vehicles is it does provide another leap in our ability to prevent human error in automobile deaths. Am I correct?

Mr. MORAVY. I would say that I believe it is the next giant step we can take as an industry.

Senator LUMMIS. So, here's why I think it's so important that we work with NHTSA, that we have some national standards for autonomous vehicles. I think everybody here in this room, unless you're really young, knows somebody who was driving drunk and died, who fell asleep at the wheel and died, who slipped on black ice because they were driving too fast and died, who were texting and got in an accident. These are so common in my state of Wyoming, where we're driving long distances alone. I was once asked what is the most important factor for running for political office in Wyoming, and I've always said it's the ability to drive long distances alone without falling asleep because we're campaigning one day in Meeteetse, and the next day in Rock Springs, and the next day in Cody, and the next day in Cheyenne. And so, you're driving because it's retail politics. You have to get around.

And I am so excited about autonomous vehicles for a couple reasons. I have three grandsons. They're all under the age of seven. Autonomous vehicles provides an avenue for them to get home at night when they have exercised poor judgment as human beings, and I hope they don't exercise poor judgment, but they're boys, and they might.

[Laughter.]

Senator LUMMIS. It also protects people who have driven and fallen asleep in Wyoming because they're pushing themselves too far. And this texting and driving thing is not something that plagues me, but it terrifies us as parents. So, the last thing that makes me excited is I'm quickly entering the era when I might be a little old lady who wants the freedom to still be able to drive when maybe she should not. And I just want a button in a car that, if I don't know where I am or I'm not as sharp as I was behind the wheel, that I can push a button in the car that says, "grocery store" and another button that says "home," take me home. And the freedom that will give elderly people is such a comfort to me as I become an elderly people.

And, Mr. Chairman, the work you're doing on this, I join you in being excited about it. You know, I got to drive—ride in a Waymo out in San Francisco, and there were two interesting things to me. One is how safe I felt. The other was when we pulled into their yard, how many jobs there were for people that were working on the cars. They're different jobs in the same industry. And what Tesla's talking about doing with automobiles, where all the parts are made in America and they're using, like, U.S. lithium and

other raw materials to make these cars, that's transformative. That's a game changer for personal passenger vehicles.

So, I just want to compliment the people that are testifying today. I think that the opportunities provided for human safety are unparalleled, and that the jobs that will be created within the same industry are a little different than the jobs that we have today in that industry, but they're jobs nonetheless, and they're going to be good jobs. So, I'm excited about this technology. I can't wait because if I ever get dementia, man, I want that little take me home button on a car. It's freedom for old people, and it's safety for young people, and so I want to thank you all for what you're doing to advance the opportunity for those of us who want to get home safely.

And, Mr. Chairman, you know, count me in on your efforts to create a Federal standard below which you cannot fall, but that has the criteria NHTSA needs to move forward and help this industry embed and grow in the United States. Thank you, Mr. Chairman.

The CHAIRMAN. Well, and I will say, at least for the next year, you're in a good place for dementia. You're in the U.S. Senate.

[Laughter.]

The CHAIRMAN. I also want to encourage people to listen to Senator Lummis' excellent description of being a parent or a grandparent and concern for the safety of young people, and I think—I think you're exactly right that AVs are a total game changer. I say this as the father of two teenage girls. I am very concerned. I will not let my daughters go in an Uber. In my hometown of Houston, four Uber drivers were just indicted for sexually assaulting teenage girls in their car. And I am thrilled for the day that I can send an AV to take my girls where they need to go, and I don't have to worry about a man in the front seat who might do something violent. And I think there are a lot of parents who share exactly the concern that I have, and I think that's an enormous safety improvement as well. Senator Duckworth.

**STATEMENT OF HON. TAMMY DUCKWORTH,
U.S. SENATOR FROM ILLINOIS**

Senator DUCKWORTH. Thank you, Mr. Chairman. I, too, am excited about the future of autonomous vehicles, especially for those in the disability community. Unfortunately, we as a Nation have become collectively numb to the tens of thousands of lives lost on our roads every year. But the Federal Government and the automotive industry's shared failure to significantly reduce traffic fatalities must never be weaponized as an excuse to rush out AV designs that are merely as deadly, or perhaps slightly less deadly, than the status quo. So, let's not kid ourselves. While self-driving technology is exciting, it has a long way to go, and our regulatory system is even further behind.

And so, I want to bring the panel's focus to where self-driving cars have been massively hyped, but inadequately prioritized: helping Americans with disabilities lead more independent lives. Senator Lummis touched on this a little bit. Everybody, hopefully, will live long enough to develop disabilities, but I got to tell you, I'm somewhat skeptical because no matter how much lip service is paid

to accessibility by so-called “autonomous driving technology companies”, the reality is that all of you are dependent on traditional OEMs. Let’s be real. The auto industry has not exactly been a proactive leader in designing, building, and testing vehicles that embrace universal design principles as a default. They treat it as a luxury. Wheelchair users often pay nearly double the price of the vehicle because of necessary aftermarket modifications.

Mr. Moravy, I understand that Tesla offers no model that is wheelchair-accessible right out of the factory. Is that correct? Just a “yes” or “no.”

Mr. MORAVY. First of all, Ms. Duckworth, I’d just like to thank you for your service. Like, I know you bring a point of accessibility which is extremely important to us at Tesla. If I may, certain regulations that are adopted by NHTSA in order for us to produce our vehicles somewhat limit the ability for us to provide accessible vehicles, and I think we’re here today to talk about—

Senator DUCKWORTH. So, you don’t have a single vehicle right now that is wheelchair accessible out of the factory, right?

Mr. MORAVY. No, ma’am.

Senator DUCKWORTH. OK. So, given your broad ambitions, indeed, existential necessity when you consider how much of Tesla’s valuation is tied to future promises of widespread full self-driving, I am deeply disappointed that not only does Tesla not provide a wheelchair-accessible model, but the leading aftermarket conversion company, BraunAbility, does not even list Tesla among its common conversion platform. So, for example, I have a Toyota minivan, but I could actually purchase a—an accessible wheelchair platform from the factory when I purchased my car—actually, when the VA purchased my car. Mr. Moravy, is Tesla currently working with BraunAbility or any other mobility modifier to develop a specific common conversion platform for electric vehicles?

Mr. MORAVY. Yes. Thank you, Ms. Duckworth. I will say we’ve had conversations in the past with the companies you mentioned about converting many of our vehicles to fully accessible. I cannot speak for the decisions of those companies in terms of their financial goals or benefits, and what they choose to adopt, but we are committed to, with our future products and our robotaxis, provide accessible transportation to everyone.

Senator DUCKWORTH. OK. Dr. Peña, while Waymo appears to be far ahead of Tesla when it comes to actually deploying a limited robotaxi service, at least when it comes to wheelchair users, I’m afraid that Waymo doesn’t seem that far ahead of your competitors sitting next to you. What percentage of Waymo’s current fleet is wheelchair accessible?

Dr. PEÑA. We do provide a wheelchair-accessible option. It is not fully autonomous, but I don’t have a percentage for you, but we can get back to you with the specific number.

[The information referred to follows:]

[COMMITTEE INSERT]

Senator DUCKWORTH. OK. How many of those wheelchair-accessible Waymo rides can be used by a passenger in a wheelchair without human assistance?

Dr. PEÑA. Currently, we don’t have—

Senator DUCKWORTH. So none.

Dr. PEÑA.—a fully autonomous service.

Senator DUCKWORTH. OK. As you know, beginning in 2020, the Department of Transportation began an inclusive design challenge to spur the invention of innovative design solutions, and Waymo was a semifinalist in that competition, so congratulations on that. As a member of the Secure Ride Coalition, I trust that Waymo is actively seeking to incorporate automated wheelchair securement systems to its fleet so that you can actually get to that fully autonomous option in the future.

Dr. PEÑA. Yes, and we're not a vehicle manufacturer, so we are looking for an OEM who's able to meet our requirements to have safe wheelchair accessibility fully autonomously, but it has to meet our safety requirements first.

Senator DUCKWORTH. So, what time-frame is that? If you're working—if you're looking for somebody now, I mean, by what date would a wheelchair user be able to request a Waymo ride featuring a universal securement system, such as the automated wheelchair tie-down and occupant restraint system that was designed by researchers at University of Michigan?

Dr. PEÑA. Senator, I don't have a timeline for you. We have not found an OEM that provides a vehicle that would meet our safety requirements yet.

Senator DUCKWORTH. OK.

Dr. PEÑA. So, I don't have a specific timeline for you.

Senator DUCKWORTH. This is my point. Yes, we need to prioritize making sure its AV—autonomous vehicles move forward. I fully support it, but I need to make sure that, as you're moving forward, that there are options available for people with disabilities, and that whatever the—for example, wheelchair securement standard is applied across personal vehicles, public transits, rails, and airplane, and I think this happens during the development phase. As you're looking for an OEM, you need to find the most effective and efficient system, cost-effective, but also, we need to try to make it more universal. Will Waymo commit to working with other developers in this space, including the team at Purdue University and BraunAbility? I'm hyping Indiana here, to my colleague on the other end of the dais. They've developed life-size operational demonstration platforms known as the Easy Rider, who need more support to bring these products to market.

Dr. PEÑA. We definitely would like to explore those partnerships.

Senator DUCKWORTH. Thank you. I just want to make sure that—I want to emphasize how important this function is for persons with disabilities, but it is also an opportunity for profitability for each and every one of you. As my colleague from Wyoming mentioned, baby boomers are aging. They have a car culture from the time they were teenagers. They want their cars. They want to keep their cars well beyond the time when they can personally drive them. So, this is—the demand is going to be there. We just need to make sure that we can meet that demand in a safe way, and that we do it in a way that also allows those same baby boomers, who are going to develop disabilities, access to these vehicles. Whether it's somebody who is vision impaired, whether it's somebody who is hearing impaired, cognitively impaired, whether it's in a wheelchair, this is a market that has spending power, and I urge

you to keep them in mind as you move forward with your developments. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you. Senator Young.

**STATEMENT OF HON. TODD YOUNG,
U.S. SENATOR FROM INDIANA**

Senator YOUNG. Well, thank you, Chairman, and I want to thank our witnesses for being here today. I share the excitement and enthusiasm that many of my colleagues do for autonomous vehicles and their potential deployment.

I visited with a number of you and so many other stakeholders, really over recent years, and consistently tried to elicit from you what regulatory constraints there are to safely deploying different technologies that are already available, highly vetted, and seem very sophisticated, and then to learn how Surface Transportation reauthorization, which is coming up here in Congress, could serve as a vehicle to address these sorts of regulatory roadblocks. I continue, and I know—as does the Chairman of the Committee, I continue to have this desire to work with you on this, and I think it's essential that we seize this moment of opportunity. I'll be chairing for the remainder of the year the Surface Transportation Subcommittee. And this reauthorization is something that's very important to me, and I think it's our one opportunity for this Congress to make some serious headway for the benefits of safety, mobility, and economic benefits that have been highlighted here.

Mr. Farrah, if you could just very quickly, once again, summarize what you believe are the components we should be focusing on as part of a Federal framework to deploy AVs so that we can enjoy all of these value propositions.

Mr. FARRAH. Senator Young, I'd be glad to. I'll give you just a few items. I would say, first of all, we need to make sure that Congress is directing the Department of Transportation to require a safety case and also to establish certain driving competencies. Second, we need to create a national AV safety data repository that allows for incident data to be housed at NHTSA and shared out with State regulatory partners. And then third, but certainly not finally, we need to evolve some of the standards that apply to human-driven vehicles. A lot of the accessibility challenges that Senator Duckworth was talking about, these are ones because we are trying to adapt to rules and regulations that were written when it was only contemplated that a human would be the one driving the vehicle. That's no longer the case. Now that an autonomous vehicle can do the driving, we need to evolve a lot of those standards.

Senator YOUNG. Fantastic, and because of the different design of our autonomous vehicles, there'll probably be a whole lot of solutions to the that problem set of how you can accommodate someone in a wheelchair, right? So, we need to, if not loosen up the regulations, fundamentally rework them to accommodate this new era. Is that accurate?

Mr. FARRAH. We can have safety but also innovation at the same time.

Senator YOUNG. Yes.

Mr. FARRAH. We can have a situation where vehicles can look fundamentally different. When we all get into our cars and drive home today——

Senator YOUNG. Yes.

Mr. FARRAH.—look around you. The things around you, they're placed there, by and large, because you're a human. You're the one that's driving the vehicle. When that's not the case, you would design the vehicles in a better way. You can make them more accessible.

Senator YOUNG. Dr. Peña, thank you for our recent visit. I'd like to sort of pull on a thread that was mentioned by Mr. Farrah, which is the safety case. You've indicated this is the backbone of our—of your operations at Waymo. What does the safety case look like in practice, and how does this framework allow you to identify and mitigate risks in real time before they ever manifest in the real world?

Dr. PEÑA. Thank you, Senator. The safety case is really an aggregation, a combination of the assessment that is done to ensure that the system is safe to deploy, that includes analysis, tests, simulation, and is put together in a logical argumentation that determines safety with evidence. So, you have to show evidence that backs it up.

Senator YOUNG. Well, very good. Very good, and we think that if we can get the regulatory atmosphere right, again, that will have immeasurable safety benefits to consumers.

In my very limited time, I have not yet heard a lot of emphasis on the economic case, which is also pretty compelling, our need to stay ahead of not just the innovation curve, but also the deployment curve in this country so that we'll continue to have the right incentives so that our workers and our industry can benefit from the economics of this. What are the economic benefits—Mr. Moravy, I'll ask you—to the United States that we'll see if we can establish the right regulatory framework, and what happens if China wins this competition?

Mr. MORAVY. Yes. Thank you, Senator Young. Appreciate the question. You know, as I mentioned before, but I'll say it again, you know, Tesla is committed to building all of the vehicles we sell in the U.S. in the U.S. And, you know, our factories in Texas that are already ready to deploy purpose-filled AVs offer the opportunity of up to 5,000 jobs locally, plus an extension into the supply base that could be 10 times that. In addition, you know, there's a—as some of the other Senators mentioned, there's an opportunity here to create a better quality of life for those workers as we shift the industry from a disparate, you know, driver industry where they spend many hours away from the home, to a much more localized solution where they can work in factories at high-paying, highly skilled jobs, or in other areas of the business, such as service and operations.

Senator YOUNG. Mr. Farrah, do you have anything to add about the economic benefits to the United States generally, and paint a brief picture of what happens if our chief national security adversary wins this economic competition?

Mr. FARRAH. Senator, I'll briefly state that what's really special about job creation in the AV sector——

Senator YOUNG. Yes.

Mr. FARRAH.—is that you get all the jobs involved in building vehicles, but then you get all these other additive jobs involved in the technology development, involved in the servicing, involved in the fleet management, and so on and so forth. So, this is really an economic boon to the United States.

Senator YOUNG. Thank you. Thank you, Chair.

The CHAIRMAN. Thank you. Senator Rosen.

**STATEMENT OF HON. JACKY ROSEN,
U.S. SENATOR FROM NEVADA**

Senator ROSEN. Thank you, Chairman Cruz. Appreciate you and all the witnesses for being here, for testifying today, and for the work that you're doing.

You know, Nevada's been at the forefront of autonomous vehicle testing and deployment, I'm proud to say, and I'm proud also to say our state is really helping to pave that way for this technology. AVs offer enormous potential to improve safety, reduce congestion, expand mobility for seniors and people with disabilities. I want to associate myself with Senator Duckworth's remarks. This is going to be critical for the future incorporation of AVs into all of our lives as we go from being, well, a young person into a—into hopefully—we all live to 105, right? But that promise of this is going to depend on robust safety standards. So, Nevada allows fully driverless operations in certain limited areas, and autonomous vehicle companies have been operating in my hometown for some time. And we're also hopeful that Waymo's autonomous ride hailing service will begin in Las Vegas this summer after phase testing and local approvals, bringing another major player into our AVs' ecosystem.

So, Mr. Peña, you've been talking about the datasets and all the things that you've been learning. So, can you describe how the safety data that has emerged from what you've been doing—your testbeds, your deployment so far—how does that data inform your approach to remote intervention protocols, because we think about when something happens, you mentioned all the multitude of stop lights going out in a—well, maybe an emergency, a flood, a hurricane, whatever that is. And so, could you talk about how that is informing your remote intervention protocols?

Dr. PEÑA. Yes, Senator. We evaluate our system very thoroughly and methodically before we go into any particular area. And in the event that the vehicle faces uncertainty, we have been conservative in terms of asking for guidance. And as we evaluate those situations, we determine whether we can tune the vehicle or provide an update so that it can more confidently handle that scenario so that, eventually, that need to ask for guidance will be further reduced.

Senator ROSEN. Well, and that leads me to calibration standards, I guess, as we reevaluate, reapply on the data that we learn because Nevada's, again, been—long been a leader on testing and deployment of AVs and emphasis on real-world performance. What you really learn out there, hopefully it's going to be shared with everyone because it's to the benefit of all of our safety, public safety, and they continue to evolve on our roadways and their reliability. Ensuring that is critical, again, for the incorporation of this technology in our lives.

So, Waymo vehicles rely on a suite of sensors, radar, LiDAR, cameras. They come together for automated driving system. They allow the vehicle to perceive, respond to the environment just like all the vehicles do. I do believe that you need more than cameras for redundancy, just for the record. These same types of sensors are also used in advanced driving assistance systems, increasingly common in vehicles today. They enable safety features like emergency braking, lane keeping assistance now. And so, we know that proper sensor calibration is really essential for these systems to function right. Research shows that even a 0.2-degree misalignment, just a little bit, in a camera at just 25 miles an hour can be the difference between a timely response and an untimely system activation that could result in, well, devastating consequences, whether the vehicle avoids collision, in particular.

So, Mr. Peña, I'm going to ask you again with that in mind, can you speak to the importance of sensor calibration for Waymo's vehicles? How often are your vehicles calibrated, checked? How often do you make sure that they remain aligned over time and appreciate that? And then, if the others want to join in, if they want to talk about that after.

Dr. PEÑA. Yes, and we do use a variety of sensors, so we use LiDAR, which is a laser sensor, radar, and cameras as well, and we're continuously checking their performance and their data, so this happens continuously. As we drive, we check that they're performing to our expectations.

Senator ROSEN. But if I'm the end user, how often are you going to calibrate my car—the soft updates? Are you going to be checking—like, how does this happen? Do I take it just for maintenance in between? I mean, I can see that this 0.2 misalignment causing a collision. If it's in between, my regular maintenance, that seems a little bit of a hole there.

Dr. PEÑA. Yes, real time, we're able to detect whether our sensors are misbehaving, and then because we have a variety of them, they're complementary, we're able to correct for that real time as we drive.

Senator ROSEN. Real time as we drive. Does anyone else want to talk about calibrating of the sensors in real time or notifying the owner of the car that the sensors have been recalibrated, take it to the next—like, you know, some little emergency light, go to your service station, wherever that is, service department?

Dr. SMITH. Yes. Thank you, Senator Rosen. Yes, so much of the Federal regulatory regime is on—is on what does the vehicle look like when it's manufactured.

Senator ROSEN. Right—

Dr. SMITH. And what we're talking about is the life of the vehicle.

Senator ROSEN. Right.

Dr. SMITH. And the average passenger car in the U.S. is some 13 years old.

Senator ROSEN. Get that little check engine light, right?

Dr. SMITH. And so, yes, we're shifting from a what does the vehicle look like when manufactured to a much more comprehensive, every second that a system is engaged, is it safe, whether today,

or in a year, or 10 years, and that's an essential shift of our regulatory mindset.

Senator ROSEN. And I know I'm the last person, but I think this is incredibly important as the cars are going to—well, if you're out here driving on the ice and snowmageddon over here, that could maybe bump a sensor, change things, whatever that is. And I think this constant calibration is really important, Mr. Chairman, for us to think about the safety for your daughters, my daughter, all of our kids, grandkids, even ourselves. Anyone else before we close out? Oh, I think Senator Fetterman is here.

The CHAIRMAN. Senator Fetterman.

**STATEMENT OF HON. JOHN FETTERMAN,
U.S. SENATOR FROM PENNSYLVANIA**

Senator FETTERMAN. Thank you, Chairman Cruz, and I trust you enjoyed your Primantis.

[Laughter.]

The CHAIRMAN. It was absolutely delicious, and I have to say, you look damn handsome with that Texan's bling.

[Laughter.]

Senator FETTERMAN [presiding]. Yes. Thank you. OK. So, hi. I'm proud to represent Pennsylvania. Now, Pennsylvania has the fifth most truck drivers in the Nation. Clearly, it's a very, very critical piece of our economy. And now that's not an interesting story, but back in 1994, I worked with UPS drivers there, and I was proud to work with Teamsters then—back then, and now I also realized how difficult their way of life is, but I also think that is something necessary that we need to protect. And now, I am not going to bash AV or any of these things, nor am I not a Luddite or anything, and I see it's a necessary part of the future moving forward. So, that's—I want to get that established. And I also want to acknowledge that Pittsburgh played a significant part of the history of developing AV, that is, as well, too. So, that means that we have—you know, two things must be true. Now, for me, I'm going to be—I'm going to be the voice for the 90,000 drivers here, and I'm going to be the Teamsters' voice here, so I don't ever, ever let them be left behind. So, I think it's really these—those union members are very critical in this economy.

So, I mean, Mr. Farrah, what is your organization's proposal to deal with the workers, like the—those 90,000 truckers here in my state? And now they—of course, they're concerned about losing their job because of the technology. If they were going to replace senators with chatbots, you know, we'd be pretty concerned here, too, and I assure you as well, too. So for me, it's an honest question, not anything—it's, like, why shouldn't trucks and other AVs be supervised by qualified operators in the roads and our highways? I mean, it's a—it's a sincere question.

Mr. FARRAH. Senator, I appreciate the question. And I'll first thank you for acknowledging the role that Pennsylvania has played in autonomous vehicle development, both includes the companies itself, but also institutions like Carnegie Mellon. I want to be very clear in terms of the impact on truck driver jobs here. If someone is a truck driver today and they want to retire a truck driver, they absolutely will have the opportunity to do that.

Autonomous vehicles are not out to replace truck drivers. Truck drivers are an indispensable, critical aspect of our supply chain. They are the backbone of the American economy. I think people take for granted how many of their goods are brought to them by truck drivers in this country. The goal of the industry here is to coexist with autonomous trucks. We see roles for human truck drivers and autonomous trucks doing different types of functions. And when I talk to people that are involved in autonomous vehicle deployment, they see a hybrid network where certain functions are done by autonomous vehicles, others by human drivers, and that is something that is fundamental to the industry.

And I will just say to conclude, that we've had an incredible dialogue with many different entities within labor, and we're very, very sensitive to a lot of those concerns. We want opportunities to get out and talk to your constituents to describe how it is that we see a lot of this unfolding and make sure that we really answer any misconceptions that might be out there.

Senator FETTERMAN. Yes. No, I mean, so for me, absolutely, your technology are part of the future, but I also have to be clear that I'm going to be—make sure that the Teamsters are in their future as well now, too. I'm not sure how many people would be comfortable getting in an AV jet, you know? I mean, I don't—I don't know. I mean, I do think it's entirely appropriate to have a human, you know, part of the equation. Anyway, moving—now, I've heard that Waymo is bringing AV to Pennsylvania, you know.

Dr. PEÑA. Yes, we are. We're excited to serve your constituency.

Senator FETTERMAN. Yes. And now we've had some constituents reach out, and now there are different kinds of—what's the word I'm looking for? A lot of people in Pittsburgh and Philadelphia reached out, and it's different kinds of places with different streets and different kind of circumstances that are very unique there now, too. And now a lot of people brought that to me where, especially after that super storm. You know, Pittsburgh, we got 16 hours of snow, and Philadelphia got a lot now, too. So, now my question is, how does your technology account for these kinds of different drivers and the cultures in different communities across, you know, my state and the country? You know, questionably, are Waymo going to respect the parking chair?

[Laughter.]

Dr. PEÑA. Before we go into any territory, we do a very methodical approach. We first send our vehicles with the human driver to make sure that we understand the different street types, the topology, we understand the unique rhythms of the city. And then, we systematically and slowly then provide a little more autonomy still with a human behind the wheel, just learning the city, and we do that evaluation over time. And when we are—feel we're ready, we go through a safety board that evaluates, hey, are we really ready to deploy for that particular environment? And we do a very thorough review before we fully take the human out of—out of the equation, which is what we're doing in your state.

Senator FETTERMAN. Yes. Well, I would—I would strongly encourage Waymo to incorporate that, to respect the parking chair. When you see examples of people that don't, it doesn't really end very well for folks like that, so regardless, so thank you.

Now, after all the questions are now complete, Chairman Cruz will bring this hearing to a close. Thank you for all the witnesses for all of their important testimony today.

Senators have until close of business on Wednesday, February 11, to submit questions to the record. The witnesses will have close of business, until Wednesday, February 25, to respond to any of those questions.

This concludes today's hearing, and the Committee stands adjourned.

[Whereupon, at 12:14 p.m., the Committee was adjourned.]

A P P E N D I X

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. AMY KLOBUCHAR TO LARS MORAVY

Each winter, we see preventable crashes due to severe weather and inadequate preparation for snow and ice conditions. Vehicles must be prepared for cold weather conditions before they are on the road, which is why testing done at facilities like TRS Minnesota in Baudette, Minnesota—North America’s largest cold weather vehicle testing facility—is so crucial.

Question 1. What steps is your company taking to ensure vehicles can safely operate in cold weather conditions?

Answer. Tesla vehicles are engineered to be among the safest cars in the world, and the safety of our vehicles in all conditions is our top priority. Our safety features come standard in every vehicle we produce, and our passive, active, and advanced driver assistance systems set the standard for vehicle safety worldwide. We conduct comprehensive, real-world testing of our vehicles in all operating conditions, including severe cold and extreme weather. Tesla vehicles are tested in cold weather conditions at TRC Minnesota, and in Alaska and New Zealand. All Tesla vehicles offer optimal winter driving performance due to equal weight distribution, highly responsive motor control, and dynamic traction control. Every year, we deploy vehicles into many unique locations of varying temperature, humidity, and precipitation type to ensure we validate vehicle safety and performance across all possible operational design domains. We also proactively analyze and evaluate the impact of roadway snow and ice treatments that can vary greatly by location, vehicle dynamics, and operational safety. Additionally, Tesla vehicles are designed to automatically defog or defrost whenever fogging or frosting conditions are detected. Tesla vehicles also have tire mu slip detection that adjusts automatic braking system calibrations for cold weather environments. We provide Tesla *Cold Weather Best Practices* for owners on our website, intended to ensure the best ownership experience possible in harsh cold weather conditions.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. TAMMY BALDWIN TO LARS MORAVY

Question 1. Do you have any testing results done by a third party which show the rate at which your products are able to successfully detect vulnerable road users, such as pedestrians, cyclists, and motorcyclists?

Answer. Tesla vehicles are subject to extensive independent testing by multiple third-party safety rating organizations, such as NHTSA and the Insurance Institute for Highway Safety (IIHS), and they are among the highest-rated vehicles, having received numerous awards, including IIHS’s Top Safety Pick Safety+ and the European New Car Assessment Programme’s Best-in-Class awards. Organizations such as these conduct standardized, scenario-based testing of crashworthiness and active safety systems, including response to vulnerable road users. Safety is our top priority, and we publish a public *vehicle safety report* to transparently share Tesla’s safety performance and practices.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. TAMMY DUCKWORTH TO LARS MORAVY

Wheelchair Securement

Question 1. Please provide in detail how much Tesla has invested in bringing a universal wheelchair securement system to its vehicles.

A. With whom did you partner? Over what period of time?

B. Did you engage with members of the disability community? If so, with whom?

Answer. Accessibility is a foundational component of our AV development program, and we will continue to expand the suite of features and products to unlock accessibility for all, including how our Robotaxi vehicles can be accessible to wheelchair users. Active engagement with national, regional, and local disability groups is an important component of our product development process. We have a library of direct feedback from the disabled community that is used to inform vehicle ergonomic design and engineering of wheelchair securement systems.

Tesla has engaged with third-party mobility securement companies on retrofit systems in addition to ground up new product design. Our Robotaxi vehicles are already designed to support various accessibility needs including space for service animals and storage for some wheelchairs and other assistive devices. Tesla currently refers to its Bay Area and Austin customers requiring wheelchair accessible vehicles (WAVs) to local third-party WAV providers. As we expand our service to new markets and products, we will continue to collaborate with members of local disability communities to understand their unique barriers to transportation.

Question 2. Will you partner with researchers and engineers, such as those at the University of Michigan and Purdue University, who have designed universal wheelchair securement systems and need the funding the resources to bring them to market?

A. Please provide information on your timeline for deployment of such a system.

B. When can riders who use wheelchairs expect to be able to request a fully autonomous ride with Tesla?

C. Will your next line of AVs be wheelchair accessible?

a. Do you plan to make a certain portion, all or none of these vehicles, wheelchair accessible?

Answer. As we expand the product line-up in Robotaxi, we will ensure the supply of wheelchair accessible vehicles meets the demand of the community. Tesla is actively evaluating engineering concepts for wheelchair securement across many sources and will expand access for wheelchair users progressively. We believe a safe and seamless experience for wheelchair users entering, securing, and exiting our Robotaxi products is critical to unlocking accessibility and increasing utilization of AVs. We will continue to launch products that expand access and provide an inclusive experience for those with mobility challenges. In the coming years, we expect to incorporate purpose-built wheelchair accessible vehicles into our Robotaxi fleet.

Question 3. Do you support Federal rulemaking that would provide national standards for automated wheelchair securement?

Answer. Tesla supports performance-based, technology-neutral Federal standards for the regulation of AVs. Uniform Federal guidelines can help eliminate inconsistencies across states, accelerate the deployment of safe automated securement technologies, and ensure wheelchair users can independently and securely travel without compromising crash protection or usability.

Universal Design

Question 4. How do you ensure your technology and AVs are able to detect and appropriately respond to people with a wide range of disabilities, including those who use mobility devices, such as wheelchairs, or those who use service animals?

A. Would you support rulemaking to establish standards to ensure the detection of and response to people with disabilities?

Answer. Tesla supports performance-based, technology-neutral Federal standards for the regulation of AVs. Tesla Robotaxi is designed to safely respond to vulnerable road users at varying speeds including those using assistive devices or accompanied by service animals. The vehicle's neural network processes visual data to identify humans, animals, and objects, enabling appropriate response actions like slowing, stopping, yielding, or rerouting to maintain safety.

Question 5. Please explain in detail how Tesla incorporates universal design principles in its designing, testing and deployment of its AVs and associated software.

B. Are your AVs and associated software accessible to people with sensory disabilities (e.g., hearing and visual impairments)?

a. People with intellectual or developmental disabilities?

b. People with a variety of mobility impairments?

C. With whom did you partner? Over what period of time?

D. Did you engage with members of the disability community? If so, with whom?

Answer. Robotaxi accessibility features have been heavily crafted with our disability partners' input. Our partnerships with the disability community have been critical in the development of screen reading functionality as well as other user ex-

perience improvements in our app and vehicle-user interface including voice commands, screen visualization, wayfinding assistance, and braille for in-vehicle controls. We are also developing opt-in accessibility user profiles in the Tesla Robotaxi app that allow customers to select their in-vehicle accessibility needs prior to ride pick-up.

Requesting Rides and Ensuring Safety

Question 1. For travelers with disabilities to safely utilize, enter and exit an AV the surrounding infrastructure must be accessible.

A. Do you collect data and map to ensure pick-up and drop-off locations are accessible and safe for people with disabilities, including wheelchair users?

B. How do you plan to work with local, State and Federal officials in ensuring people with disabilities, including wheelchair users, can safely enter and exit the vehicle?

Answer. Our top priority is to provide a safe and accessible service, including thoughtful pick-up and drop-off locations, for all riders. We continuously gather and analyze real-world data through our fleet to improve the safety and usability of our AVs. Testing and validating the functional performance of a new feature with the disabled community before releasing to the wider public is, and will continue to be, our design and release protocol. Recently, we released screen reader functionality for Robotaxi with key feedback integrated from targeted user testing.

Enhancement of the rider experience will come from the synergy of community engagement both before and after feature release, as well as our advanced vehicle technology which we will craft to create a personalized experience. We actively engage with local, state, and Federal stakeholders, to ensure our vehicles and services align with all applicable accessibility requirements and standards.

What is your company doing to extend AV service to rural America?

C. Will your AVs be able to navigate backroads and long, rural driveways so passengers with disabilities are picked up and dropped off at their doors?

Answer. Tesla's goal is to make AVs accessible to all Americans, including those in rural communities. We rigorously test our vehicles in a range of geographies. Our AVs are designed to handle a wide variety of roadways and conditions including residential streets, country roads, narrow winding routes and complex scenarios using our vision-based, end-to-end neural network system that is trained on billions of miles of real-world driving data. This broad testing approach ensures that the system learns and improves continuously in various operational design domains.

Consumer Protection

Question 1. Current proposed legislation allows AV providers to require forced arbitration, which would deny disabled users from filing claims in court if their right under the Americans with Disabilities Act (ADA) were violated or they or their devices are injured.

A. What responsibility does Tesla have to ensure the civil rights of people with disabilities are upheld?

B. Do you support legislation that would ban forced arbitration clauses for Americans with disabilities who seek recourse due to violations of the ADA?

Answer. We are deeply committed to ensuring that our Robotaxi service promotes safety, accessibility, and equal access. Tesla engages constructively with policymakers to help shape frameworks that balance safety, innovation, and consumer protection. We believe that all customers deserve to have their disputes resolved fairly, particularly in cases involving civil rights protections like those under the ADA. Riders benefit from expeditious resolutions to their disputes and on the whole, arbitration is more efficient, flexible, and faster than courts. Nevertheless, Tesla does not employ forced arbitration clauses for its Robotaxi customers, as all customers have the right to opt out of the arbitration provision in their customer agreement.

Question 2. What steps is your company taking to protect passengers' data privacy?

A. What specific steps are you taking to ensure passengers' health, disability status and locations visited are not shared or used for commercial or tracking purposes without the permission of the individual?

Answer. We are committed to protecting our customers anytime they enter a Tesla vehicle. That commitment extends to data privacy. Tesla has developed a robust privacy program to ensure privacy protections are embedded in each product, service, and feature by design. By default, Robotaxi vehicle data is either in a form that is not associated with your Tesla account, is stored in an encrypted format that

Tesla cannot decrypt, or remains inaccessible unless a specific event is triggered: (a) safety critical event—such as collision, airbag deployment or emergency stop event, (b) if you provide your consent, or (c) another legal basis is applicable.

Tesla does not request or require information about passengers' health conditions or disability for Robotaxi rides, by default. We do not collect information beyond what is minimally needed for accessibility accommodations, such as noting the presence of a service animal in accordance our Robotaxi Service Animal Policy, or requesting wheelchair accessible vehicle (WAV) rides via the mobile app. Precise location data is collected only as needed and is used for routing, fare calculation, pickup and drop off coordination, and receipt generation. Further, cabin camera and microphone are off by default (until needed) and through the Robotaxi app, a customer can manage their privacy settings, including opting in or out of features like sharing cabin camera analytics or sound detection data with Tesla to help improve related features/services.

In addition to limiting the data we collect, we also limit how and with whom we share personal data. Data is used only for purposes such as fulfilling rides, ensuring safety, processing payments, fraud prevention, and complying with applicable laws and regulations. In our Robotaxi Privacy Notice, we explicitly state: "We do not sell your personal data to anyone for any purpose, period."

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. AMY KLOBUCHAR TO
DR. MAURICIO PEÑA

Winter Driving. Each winter, we see preventable crashes due to severe weather and inadequate preparation for snow and ice conditions. Vehicles must be prepared for cold weather conditions before they are on the road, which is why testing done at facilities like TRS Minnesota in Baudette, Minnesota—North America's largest cold weather vehicle testing facility—is so crucial.

Question 1. What steps is your company taking to ensure vehicles can safely operate in cold weather conditions?

Answer.

- For years, we've been developing the Waymo Driver to safely and effectively operate in winter weather. Across three generations of the Waymo Driver, we've tested our system in some of the most severe cold and snow conditions across the country—regularly driving in Upstate New York, Michigan's Upper Peninsula, and the Sierra Nevada Mountain Range.
- For the past 9 years, we've had a continuous test presence in the Detroit area, and with our growing operations in snowy cities like Minneapolis, Boston, Denver, Philadelphia, Pittsburgh, and Washington, D.C., in addition to visits to other areas, we're deepening our understanding of winter weather conditions and validating our capabilities.
- Waymo has conducted testing at Baudette, Minnesota over the years related to motion control on snow and ice road surfaces.
- We've amassed tens of thousands of miles in diverse, snowy conditions. This has allowed the Waymo Driver's AI to learn from real driving experience and train to navigate a wide range of winter weather. We validate our generalizable system through real-world, supervised driving, closed-course testing, and large-scale simulation. At closed-course testing facilities, we push the system to its limits in controlled environments, teaching it to recognize and respond to extreme scenarios like losing traction on ice. Then, we expand our learning year-round through simulation, long after the snow has melted, so the Waymo Driver is prepared for rare and unusual events. In accordance with Waymo's safety framework and processes, we will only launch driverless operations in winter conditions when our safety bar is met.
- Whether it's dense urban cores or snowy winters, we are committed to bringing the safety benefits of the Waymo Driver to diverse communities across America. At the same time, we are committed to safely operating within the parameters of our technology's capabilities. If there are weather conditions that are out of scope for our automated driving system, we will not drive in them.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. TAMMY BALDWIN TO
DR. MAURICIO PEÑA

Question 1. Do you have any testing results done by a third party which show the rate at which your products are able to successfully detect vulnerable road users, such as pedestrians, cyclists, and motorcyclists?

Answer. Waymo is committed to transparency and works with external partners to validate the safety performance of our technology. We partnered with **Swiss Re**, a global reinsurance company, to analyze our first 25 million fully autonomous miles. This *analysis* determined that the Waymo Driver demonstrated superior safety performance compared to human-driven vehicles, reducing property damage claims by 88 percent and bodily injury claims by 92 percent.

Furthermore, based on 127 million rider-only miles, our peer reviewed data shows substantial reductions in injury-causing crashes involving vulnerable road users compared to human benchmarks:

- *Pedestrians*: 92 percent reduction.
- *Cyclists*: 83 percent reduction.
- *Motorcyclists*: 80 percent reduction.

Our Autonomous Driving System (ADS) is designed to identify and distinguish between all road users—cyclists, scooterists, pedestrians, and other road users—an essential capability we have been designing and refining since our *earliest days*. Finally, our safety case approach has been independently audited by **TUV SUD**, which confirmed that our program adheres to international ISO 15026 standards and industry best practices.

Question 2. Recent shutdowns of Waymo robotaxis—including well publicized incidents that created significant traffic congestion—raise serious concerns about the vulnerability of automated fleets to disruption. If similar systems were operated by companies with ties to the Chinese government, the risks could be far greater.

a) What assurances can you provide that the Chinese government could not remotely disable or interfere with vehicles using your technology?

Answer. Cybersecurity is core to Waymo's design and our safety mission. We consider comprehensive cyber threats in advance, and the safety of our Autonomous Driving System (ADS) is protected by its design: it is independently in control of the vehicle and can refuse any guidance it deems unsafe.

Our server side tools are protected by sophisticated cybersecurity measures which use hardware backed multi-factor authentication. Access to Waymo fleet management tools occurs on devices that use cryptographic authentication to access corporate networks and are managed and monitored for cybersecurity. Waymo also encrypts all communications between its vehicles and offboard support systems, including Remote Assistance, over a mutually authenticated connection. This connection is initiated by the ADS to the Waymo servers, to protect against the ADS accepting connection attempts from malicious sources. This strategy also includes removing the factory telematics from the base vehicle to prevent the base vehicle from communicating with the vehicle manufacturer's backend systems.

As an analogy, this would be similar to a human driver with a special cell phone that can only call out one-way, to one trusted party for directions, and both parties have to exchange a secret password before communicating.

Our ADS is designed and manufactured in the U.S. and includes our perception sensor suite, compute, and telematics systems. The AV-ready base vehicle platforms being provided to Waymo from countries outside of the U.S. have no driving automation or telematics capabilities built into them. Waymo maintains complete software control over our vehicles. Our ADS does not rely on code, cloud infrastructure, software, or other connected technology developed outside of the U.S. Waymo strongly supports the *Department of Commerce's BIS Connected-Vehicle Rule*, which addresses national security risks from foreign AV technology, including both software and hardware. Our vehicles contain no Chinese-linked ADS or vehicle connectivity software, and our fleet is compliant with BIS's Connected Vehicle Rule.

All autonomous hardware and software are designed in-house by Waymo in the United States. The ADS is added to base vehicles at Waymo's factory in Mesa, Arizona.

Crucially, our vehicles have no ability to directly receive over-the-air updates from base vehicle manufacturers (OEMs). All firmware updates are provided to Waymo first, allowing us to conduct penetration testing and control the deployment timing. We also isolate safety-critical systems, such as steering and braking, from outside wireless communications.

b) What are the risks to the U.S. if key allies and economic partners allow widespread deployment of Chinese built robotaxis in their own transportation networks?

Answer. The U.S. is locked in a global race with Chinese AV companies for the future of autonomous vehicles, a trillion-dollar economic opportunity. If Chinese companies dominate allies' networks, they, rather than the U.S., will set the global technical and safety standards for the industry and drive the future of transportation around the world. Autonomous driving is considered a strategically important advanced technology comparable to flight and space travel. Ceding this market to Chinese AV companies would mean losing a major engine for American innovation and job creation. American leadership in this sector is a prerequisite for a projected surge in national GDP, as domestic AV integration will revolutionize mobility and reclaim billions of hours of human productivity currently lost to driving.

Furthermore, Chinese-developed AV technology operating globally poses national security risks through the potential for remote access and unauthorized data collection. Widespread deployment of foreign technology in transportation networks poses potential risks to critical infrastructure, which is why Waymo supports Federal efforts like the Department of Commerce's connected vehicle rule to ban Chinese AV software which went into effect March 17, 2025.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JACKY ROSEN TO
DR. MAURICIO PEÑA

Remote Intervention in AV Operations:

Nevada has been at the forefront of autonomous vehicle testing and deployment, and I'm proud our state is helping to pave the way for this technology. AVs offer enormous potential to improve safety, reduce congestion, and expand mobility for seniors and people with disabilities—but that promise depends on robust safety standards.

Nevada allows fully driverless operations in certain limited areas, and autonomous vehicle companies have been operating here for some time. We're also hopeful that Waymo's autonomous ride hailing service will begin in Las Vegas this summer after phased testing and local approvals, bringing another major player into our state's AV ecosystem.

Question 1. Dr. Peña, can you describe what safety data has emerged from Waymo's AV deployments so far, and how that data informs your approach to remote intervention protocols?

Answer. *Data* from our first 127 million fully autonomous miles shows that the Waymo Driver is significantly safer than human drivers. We saw a tenfold reduction in serious injury or worse crashes and were 12 times less likely to be involved in injury-causing pedestrian crashes compared to human drivers.

This data informs our Remote Assistance (RA) approach. Unlike "remote driving," the Waymo Driver is responsible for all of the Dynamic Driving Task. Our ongoing evaluation helps inform how we continuously improve the ADS and reduce its requests for supplemental context from an RA agent, such as when encountering an ambiguous road closure, while ensuring the onboard system handles all immediate, safety-critical actions. The ADS can also reject RA suggestions if it deems it appropriate. This distinction is fundamental to our safety model, ensuring the vehicle's onboard system remains the primary, real-time authority for safe operation. By nature, RA requests aren't designed to help the AV with real-time collision avoidance—the ADS handles real-time driving, including evasive actions, braking or other behavior needed to avoid collisions.

Question 2. Even highly automated vehicles encounter situations they cannot handle on their own. How do companies determine when a remote human should take control, what training do those remote operators receive, and how many vehicles are they typically responsible for?

Answer. Waymo deploys its Autonomous Driving System (ADS), consisting of redundant compute, sensors, and software, to safely and fully autonomously navigate public roads. Waymo uses Remote Assistance (RA) agents, who provide advice only when requested by the ADS on an *event-driven* basis. *Waymo's RA agents provide advice and support to the Waymo Driver but do not directly control, steer, or drive the vehicle.*¹

¹For more information about the distinctions between Remote Assistance and remote driving, see Automated Vehicle Safety Consortium. 2023. AVSC Best Practice for ADS Remote Assistance Use Case. SAE Industry Technologies Consortia, available at <https://avsc.sae-itc.com/>; SAE J3016 Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles (2021), especially sections 3.23 and 3.24.

Additionally, Remote Assistance agents are not passively monitoring a vehicle or group of vehicles with the expectation to identify when intervention is needed. *Rather, the ADS reaches out to Remote Assistance when the vehicle encounters an ambiguous situation in which it may benefit from more context, even if the ADS can confidently proceed*—a helpful safety redundancy. The ADS will only be matched with an available agent who is trained and certified for the specific request.

Waymo has not used remote driving or “tele-operations” where a human performs the Dynamic Driving Task. As mentioned above, we do not have humans passively monitoring the AVs as if they are engaging in normal driving, nor are there humans who are able to start driving an AV remotely.

Waymo has developed a tool that is reserved as an additional safeguard for a rare set of potential situations to assist a stopped AV fully onto the shoulder from the adjacent lane on a high-speed road. In such situations, a specially trained, U.S.-based, agent could prompt the AV to move forward at 2 mph for a short distance at fixed steering angles to exit the travel lane. *To date, this functionality has never been used outside of training.*

Our Remote Assistance program, which has been *independently audited*, is designed to match the level of training to the complexity of the scenarios the vehicle might encounter.

The training program includes knowledge and skill-based education, guided observation, simulations, hands-on practice, supervised time on the live tools, and evaluation by an experienced Remote Assistance Instructor for each level. Agents must demonstrate mastery through certification testing for each specific request type before handling live requests. In addition to training at the time of hire, agents also regularly attend recurrent training as part of continuous quality improvement efforts. Additionally, training material itself is regularly audited. Training includes academic-style lectures on ADS concepts and capabilities, shadowing operators, knowledge assessments, and multiple types of skills assessment including hands-on simulation training using playback of real recorded events.

Calibration Standards Question

Nevada has long been a national leader in the testing and deployment of autonomous vehicles, with an emphasis on real-world performance and public safety. As these technologies continue to evolve and operate on Nevada’s roadways, ensuring their reliability is critical.

Waymo vehicles rely on a suite of sensors, radar, LiDAR, and cameras that together form the automated driving system and allow the vehicle to perceive and respond to its environment. These same types of sensors are also used in advanced driver-assistance systems that are increasingly common in vehicles today, enabling safety features like automatic emergency braking and lane-keeping assistance.

We know that proper sensor calibration is essential for these systems to function as intended. Research shows that even a 0.2-degree misalignment in a camera, at just 25 miles per hour, can be the difference between timely and untimely system activation—and ultimately whether a vehicle avoids a collision.

Question 1. Dr. Peña, with that in mind, can you speak about the importance of sensor calibration for Waymo’s vehicles? And how often are your vehicles recalibrated—or at least checked—to ensure those sensors remain properly aligned over time, particularly as vehicles experience normal wear and tear?

Answer. Sensor calibration is fundamental to our system’s safety, as the Waymo Driver relies on a fusion of lidar, radar, and cameras to build a 360-degree view of the world. We design, assemble, and test key parts of our proprietary sensor suite in California to ensure high performance. This process begins with high-precision initial calibration during assembly and testing, but our driverless ecosystem is designed to manage calibration dynamically throughout the vehicle’s entire lifecycle. Rather than relying on static schedules, we use a continuous validation model that monitors the vehicle’s health both on the road and in the cloud. This allows us to account for wear and tear, thermal expansion, or sudden physical impacts in real time.

Onboard: Real-time introspection

The vehicle is constantly “self-diagnosing” its own calibration health while driving. This onboard system allows the Waymo Driver to react immediately to sudden changes, such as sensors being bumped or shifting due to road conditions. If the alignment no longer conforms to our strict specifications, the system can trigger immediate safety fallbacks.

Offboard: Fleet-Wide Validation

Our offboard servers analyze vast amounts of collected driving data to detect and correct subtle drifts that may not be visible to the onboard system alone. This approach uses a much larger context to proactively issue new calibration updates before a minor misalignment ever becomes a safety issue.

Automated Safety Protocols

We maintain a wide safety margin; vehicles are often updated or flagged for minor deviations long before they reach a “failure” state.

- *Proactive Refinement:* Most calibration drifts are corrected via calibration updates pushed to the vehicle, preventing any loss of service.
- *Service Suspension:* If a vehicle’s calibration fails our stringent validation and cannot be corrected remotely, the vehicle is automatically blocked from being put into driverless operations until the issue is resolved.
- *Manual Inspection:* These flagged vehicles are immediately removed from the fleet and routed to our dedicated technicians for physical inspection and re-calibration.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. LISA BLUNT ROCHESTER TO
DR. MAURICIO PEÑA

Child Safety:

Question 1. Autonomous vehicles may be a solution for roadway safety issues; however, I still see reports of safety incidents with existing AVs, including some with Waymo that now have Federal investigators looking into the incidents.

a) In response to the incidents, what has Waymo done to prevent similar incidents from occurring?

Answer. Improving road safety is our top priority. Following incidents involving school buses in Austin in which a Waymo vehicle may initially stop or slow for a school bus but then ends up proceeding, we implemented software updates that materially improved our ability to detect specific visual cues like extended stop arms and flashing red lights. We also partnered with the Austin Independent School District to collect data on various different light patterns to further refine our performance. This is part of our commitment and culture of continuous improvement.

b) I recognize Waymo previously committed to fully cooperating with the NHTSA investigation. Will Waymo continue to honor this commitment, and will it extend to the ongoing NTSB investigations?

Answer. Yes. Waymo is fully cooperating with NHTSA’s preliminary evaluations and has officially joined the NTSB as a party to their investigations. We intend to remain transparent and provide all necessary data and analysis throughout these processes.

c) Can Waymo commit to providing relevant and reasonably unredacted vehicle safety data regarding these events?

Answer. Waymo already provides detailed, voluntarily unredacted narratives in collision reports submitted to NHTSA. We are committed to sharing safety data through these official channels and our public Safety Impact reports. The NTSB handles the release of public information on events it investigates. Any information about events Waymo is investigating with the NTSB will, therefore, be released by the NTSB.

d) Can Waymo commit to releasing at the appropriate time the relevant and reasonably unredacted vehicle safety data to the public?

Answer. Waymo is an industry leader in transparency and already publishes extensive safety data, including collision rates and impact analyses—on our public website, waymo.com/safety/impact, in addition to voluntarily forgoing opportunities to redact the narratives of our vehicle crash reports. We provide safety data in a format that allows for third-party researchers to check and challenge our methods and inferences.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. TAMMY DUCKWORTH TO
DR. MAURICIO PEÑA

Wheelchair Securement

Question 1. Please provide in detail how much Waymo has invested in bringing a universal wheelchair securement system to its vehicles.

A. With whom did you partner? Over what period of time?

Answer. Since 2019, Waymo has partnered with the United Spinal Association to engage in meaningful, ongoing conversations about the future of accessible transportation and to better understand the diverse needs of wheelchair users, including both manual and power chair users.

Together, we've collaborated in a variety of ways including:

- Waymo became an inaugural member of *United Spinal Association's Secure Ride Coalition*, funding the research and design of a potential universal securement system that would benefit many industries (air travel, bus travel, train travel, AVs).
- Recruiting wheelchair users to participate in paid, in-person user experience (UXR) research to inform potential future vehicle and service designs.
- Supporting and providing funding for essential United Spinal programs.
- Providing disability etiquette trainings for Waymo's Rider Support agents to best communicate with riders with disabilities.
- Inviting local wheelchair users to be early riders of our human-driven, on-demand WAV service in Waymo markets, available through the Waymo app.
- Partnering on public education campaigns to raise awareness about accessible mobility.

These partnerships have reinforced that accessibility requires holistic solutions. For example, while developing a universal securement system is a critical step, it is just one of many challenges that must be addressed to ensure companies can safely and reliably offer autonomous vehicle rides to power chair users.

Lastly, it's important to note that to date Waymo relies on OEMs to build vehicles to upfit with our Automated Driving System (ADS), thus a significant challenge in this space is that OEMs do not currently offer base vehicle models that are factory-equipped for wheelchair accessibility, and vehicle dimensions (especially for battery electric vehicles) are not conducive to these modifications.

B. Did you engage with members of the disability community? If so, with whom?

Answer. Engagement with the disability community has been a foundational part of our mission since Waymo began as the Google Self-Driving Car Project in 2009. Our dedicated *Waymo Accessibility Network* has been in place for years, providing ongoing guidance as we scale our operations.

Waymo supports over 120 disability organizations across the United States, at both the local and national level. Every day, Waymo's service is being used by people with visual, physical, cognitive and sensory disabilities.

While we engage in direct partnerships with disability organizations, we also have a forum where we bring together voices from around the country through our *Waymo Accessibility Network*, which meets quarterly to have direct communication with Waymo's Product, User Experience, Public Affairs, and Policy teams. People who attend this meeting receive confidential updates about future product releases and provide feedback and insights on how Waymo can best meet the needs of people with disabilities. Many of the accessibility features that are publicly available for riders today were inspired by recommendations directly from our disability partners.

We work with partners in a variety of ways to meet the needs of each organization—examples below:

- *San Francisco, California*
 - In July 2023, Waymo launched a charitable delivery program in partnership with the *SF-Marin Food Bank* and *Openhouse* to deliver fresh groceries to homebound seniors who are experiencing food insecurity, and are unable to pick up their own groceries. Waymo conducts these deliveries every Wednesday supporting an average of 30 households in San Francisco each week.
 - Waymo provides free ride promo codes on an ongoing basis to *Curry Senior Center* so they can run their *Joy Ride* program for LGBTQIA+ seniors. This program involves seniors taking Waymo rides to activities around San Francisco, keep active and avoid isolation.
 - Waymo provides free ride promo codes on an ongoing basis to *Homeless Prenatal Program (HPP)*, to eliminate barriers to transportation HPP clients face during critical moments, including prenatal and postpartum appointments, urgent care visits, and time-sensitive housing appointments.
 - Waymo provides free ride promo codes on an ongoing basis to *The Arc San Francisco*, to support adults who live with intellectual and developmental disabilities get to and from work, social programs and access essential services.

- *Los Angeles, California*

- Waymo has provided outreach and educational sessions for several organizations serving people with disabilities, including a Spanish-language presentation with *Integrated Community Collaborative*: we've provided free rides to unhoused and expectant mothers through *Harvest Home*, and several older-adult-serving organizations, including the *Fairfax Senior Center*, *St Barnabas Senior Services*, *Wise & Healthy Aging*, and *Bridge the Divide*. Through these partnerships, we provide in-person presentations about how to use Waymo, paired with in-kind ride credits, and sponsorship of their events and programming. We additionally partner closely with the *San Diego Seniors Community Foundation* that advocates for seniors statewide.

- *Arizona*

- Since 2017, Waymo has engaged with accessibility organizations including the *Foundation for Senior Living*, now called *AllThrive365*, and the *Foundation for Blind Children*. Engagement over the years has evolved as our service has expanded in Metro Phoenix. We've trained adults who are new to vision loss on how to use Waymo, volunteered for mock job interviews with young adults entering employment, or educated and provided free rides to older adults living in affordable housing communities who do not have reliable modes of transportation.
- We have created several public education campaigns in partnership with disability-serving organizations to raise awareness about how people with epilepsy, autism or other neurodivergent diagnoses, blinded veterans, cerebral palsy, older adults and blindness can use Waymo for safely commuting, accessing opportunity and healthcare, and connecting to their community to combat loneliness.
- Waymo has frequently used its service to assist organizations that serve people with disabilities, often collaborating on free or discounted ride pilots to help people with intellectual or developmental disabilities and physical disabilities. During the pandemic, we also helped many senior-serving organizations move and receive PPE.

- *Texas*

- In April 2023, Waymo hosted a presentation at the *Texas School for the Blind's* staff, students and members of the public from numerous disability organizations. This pre-launch event was an opportunity for the community to learn from and ask questions about autonomous vehicles, and for us to learn about Austinites' expectations of us and our service.
- Waymo provides early access to its services, prior to a fully public launch, to disability organizations' leaders or advocates. This allows for meaningful engagement on how the service is being rolled out and how to thoughtfully address concerns from members of the public with a unique perspective on AVs and our mobility offering. In San Antonio, Houston, Dallas and Austin, we've provided early access and free rides to affiliates of *Best Buddies*, *Epilepsy Foundation*, *National Federation of the Blind*, *American Council of the Blind*, *The Senior Source* and several other organizations serving a diverse Texan community.

- *Atlanta, Georgia*

- Waymo partnered with *TechSmart for Seniors* to supplement their ride-hailing curriculum with specific instructions on how to download the Uber app, opt-in for fully autonomous rides, and provide tips about the unique safety features available during a Waymo ride.
- In November 2025, Waymo hosted a live demonstration at *Calvin Court*, an affordable senior living complex, to educate community members about Waymo technology and the Atlanta service, and answer questions.

Question 2. Will you partner with researchers and engineers, such as those at the University of Michigan and Purdue University, who have designed universal wheelchair securement systems and need the funding and resources to bring them to market?

Answer. Waymo maintains a deep and longstanding commitment to the principle of universal design, and we consistently seek opportunities to learn from the brightest minds in academia and the research community. Our approach to accessibility is rooted in collaboration, as seen through our *Waymo Accessibility Network*, where we engage with numerous advocacy and technical organizations to understand the

evolving landscape of assistive technology. We are certainly encouraged by the innovative work being done at institutions like Purdue University regarding automated securement. As we continue to refine the Waymo Driver, we remain open to exploring how such emerging research might eventually align with the technical specifications of the base vehicle platforms provided by the OEMs, ensuring that any future integration meets our rigorous safety and operational standards.

A. Please provide information on your timeline for deployment of such a system.

Answer. The deployment of advanced, automated accessibility features is a journey we are navigating with a focus on safety. Because the Waymo Driver technology is designed to be integrated into vehicles manufactured by OEMs, our timelines are necessarily influenced by the development cycles and hardware capabilities of those base vehicles. Currently, no major OEM produces a factory-ready, ADA-compliant base vehicle for scale. While a specific timeline for the broad availability of universal automated securement remains fluid, there is an encouraging and ongoing dialogue within the larger automotive and accessibility ecosystems. We remain optimistic that as the industry continues to evolve, these collective efforts will eventually mature into solutions that offer a seamless and safe experience for all riders.

Waymo is actively engaged in developing new solutions through initiatives like the USDOT's Inclusive Design Challenge, where we were selected as a semifinalist. This challenge sought to elicit new solutions for people with disabilities to use autonomous vehicles to access transportation needs.

B. When can riders who use wheelchairs expect to be able to request a fully autonomous ride with Waymo?

Answer. Our vision is centered on the belief that the future of mobility should be inclusive, and we are proud to currently facilitate Wheelchair-Accessible Vehicle (WAV) service. As the landscape of autonomous driving continues to mature, the realization of a fully independent request experience remains part of a broader, industry-wide journey involving many stakeholders. Because the integration of advanced accessibility features is often dependent on the natural progression of base vehicles and the surrounding hardware ecosystem, we are focused on participating in the collective dialogue required to bring these complex solutions to the forefront.

C. Will your next line of AVs, the Waymo Ojai, be wheelchair accessible?

Answer. The Waymo Ojai represents a step in the ongoing evolution of our fleet. Developed in coordination with the OEM, the vehicle features an interior architecture that prioritizes cabin flexibility and passenger comfort. While this base vehicle is not wheelchair accessible, this spacious design is highly adaptable; for instance, the generous proportions provide ample room for stowable wheelchairs or other mobility aids to be stored within the cabin or the trunk, depending on the specific needs of the journey. To further enhance accessibility, the vehicle's wide door opening and lower step make for significantly easier ingress and egress for passengers. Additionally, we have incorporated inclusive tactile elements, such as Braille labeling on interior buttons, to assist passengers with visual impairments.

D. Do you plan to make a certain portion, all or none of these vehicles, wheelchair accessible?

Answer. Our mission is to improve everyone's access to mobility. We continue to evaluate our fleet mix and work toward a future where our service can accommodate the diverse needs of all riders, including those requiring wheelchair-accessible solutions. In the immediate term, we plan to continue supporting manual wheelchair accessible alternatives.

Question 3. Do you support Federal rulemaking that would provide national standards for automated wheelchair securement?

Answer. Waymo supports a Federal rulemaking that would provide national standards for automated wheelchair securement and hopes that doing so would support an active market of wheelchair accessible vehicles appropriate for ride-hailing.

This commitment to universal design is also why Waymo supports the bipartisan *H.R. 4419 AV Accessibility Act*, which seeks to improve the ability of people with disabilities to find, access, and use ride-hail AVs by:

- *Removing Licensing Barriers:* Prohibiting states from requiring a motor vehicle operator's license for qualified individuals with disabilities when riding as passengers in fully autonomous (Level 4 or 5) vehicles.
- *Improving Infrastructure:* Requiring a Department of Transportation study to determine best practices for modifying public transportation infrastructure to better accommodate people with disabilities during pickup and drop-off.
- *Fostering Independence:* Ensuring that Americans with disabilities can use ride-hail ADS-equipped vehicles with confidence and independence.

By establishing national standards for securement and passing the AV Accessibility Act, which is supported by a coalition including the National Federation of the Blind and the Blind Veterans Association, the Federal government can help ensure that autonomous vehicles fulfill their promise of expanding mobility for every American.

Universal Design

Question 1. How do you ensure your technology and AVs are able to detect and appropriately respond to people with a wide range of disabilities, including those who use mobility devices, such as wheelchairs, or those who use service animals?

Answer. The Waymo Driver is designed to be a safe, diligent, and always attentive driver that utilizes a sensor suite with 360-degree vision up to three football fields away. This technology is specifically trained to detect and respond safely to vulnerable road users, including pedestrians, cyclists, and people using mobility devices.

Our system has been trained and tested on cases including pedestrians who are using manual wheelchairs, power chairs, motorized mobility scooters, walkers, and other mobility aids. Some of our technology, like *pedestrian keypoints*, help the system to better understand and predict the actions of mobility aid users specifically, allowing the Waymo Driver to create more safe and courteous interactions with these pedestrians.

A. Would you support rulemaking to establish standards to ensure the detection of and response to people with disabilities?

Answer. Yes, Waymo supports Federal rulemaking that would establish an ADS driving competency standard, ensuring all autonomous systems can sufficiently detect and respond safely to all road users, including those with disabilities.

Question 2. Please explain in detail how Waymo incorporates universal design principles in its designing, testing and deployment of its AVs and associated software.

A. Are your AVs and associated software accessible to people with sensory disabilities (e.g., hearing and visual impairments)?

Answer. Yes, our ride-hailing service integrates features such as turn-by-turn walking navigation and in-ride audio support to assist riders with visual or hearing impairments. During the trip, riders who have selected “descriptive audio” in their app settings will receive audio updates about key intersections and certain vehicle behaviors such as “Yielding for pedestrians”. In addition to turn-by-turn walking navigation, we offer a wayfinding feature that plays a musical melody or honks a vehicle’s horn to assist people who are blind or have low vision in locating their vehicle. To help riders visually distinguish which car is theirs at pickup, we also enable riders to customize initials and color of the rooftop display. Further, we empower our Support agents to assist all riders. For example, people who are Deaf or hard of hearing can chat in-app with rider support, and our in-car screen shows text notifications aligned with in-car audio announcements. We also display the rider’s location relative to the Waymo vehicle, enabling support agents to provide more personalized instructions at pickup.

We incorporate inclusive design practices through extensive user research and by gathering feedback from internal riders who have disabilities. This process identifies opportunities for improvement that we then incorporate into our development roadmap.

a. People with intellectual or developmental disabilities?

Answer. Our features are designed for a diverse range of needs, including a clean and consistent ride experience and the option to contact Rider Support for assistance through in-car consoles or the app at any time. Riders can control the vehicle’s temperature, leg room, and audio environment—including selecting music and specifying the frequency of audio announcements. These choices put riders in control to build a familiar routine and accommodate their own sensory needs. Riders can also send their trip details to a trusted contact, who can then follow along. Riders (or a friend, family member, or caregiver) can specify and create a custom name for favorite locations (e.g., Home, Work, School) to make trip planning in the app as familiar and easy as possible, without having to enter a street address.

b. People with a variety of mobility impairments?

Answer. We offer features such as requesting to minimize walking time when ordering a trip to assist those with mobility impairments. Prior to pickup, riders can adjust the amount of leg room, creating a more comfortable ride for passengers with limited leg flexibility or range of motion. If feasible for the rider, the trunk has ample space for mobility aids and folding wheelchairs.

B. With whom did you partner? Over what period of time?

Answer. We have worked for years with members of the *Waymo Accessibility Network*, which includes groups such as the National Federation of the Blind, Deaf Equality, United Cerebral Palsy, United Spinal Association, The Autism Society and the Epilepsy Foundation, to ensure our technology meets the needs of these communities.

C. Did you engage with members of the disability community? If so, with whom?

Answer. As stated above, we're proud to partner with members of the *Waymo Accessibility Network* including, but not limited to:

- AllThrive365, formerly Foundation for Senior Living
- United Cerebral Palsy
- Blinded Veterans Association
- National Federation of the Blind
- American Council of the Blind
- Easterseals
- The Arc
- The Autism Society
- Deaf Equality
- United Spinal Association

Requesting Rides and Ensuring Safety

Question 1. Many cities like New York City, Chicago and San Francisco have taken the lead in requiring rideshare and taxi companies to ensure people with disabilities, including wheelchair users, are able to use their services without unreasonable wait times.

A. For the past 12 months, what is the minimum, median and maximum wait time for a wheelchair accessible vehicle (WAV) requested through the Waymo app?

Answer. While specific wait-time data for individual vehicle types is not publicly available, we are continually working to improve our service and take into account feedback from our riders to ensure a positive, timely, and safe experience.

B. How many WAVs were requested? How many such requests were fulfilled?

Answer. The number of WAVs requested is not publicly available.

C. What percentage of your fleet are WAVs? What percentage of Waymo requests are for WAVs?

Answer. Our autonomous fleet does not include WAV vehicles, however riders can order manually driven WAVs through our app or by contacting rider support.

D. How do you plan to work with local, State and Federal officials in ensuring people with disabilities, including wheelchair users, do not experience unreasonable wait times?

Answer. We work closely with local, state, and Federal officials to ensure we are accommodating local needs. We have also partnered with regional transit authorities, such as Valley Metro in Phoenix, to explore mobility solutions for groups traditionally underserved by public transit.

Question 2. For travelers with disabilities to safely utilize, enter and exit an AV the surrounding infrastructure must be accessible.

A. Do you collect data and map to ensure pick-up and drop-off locations are accessible and safe for people with disabilities, including wheelchair users?

Answer. The Waymo app includes features to minimize walking time and provide turn-by-turn walking navigation to help riders safely reach and exit the vehicle. Riders can also adjust their pickup or drop off location if desired.

B. How do you plan to work with local, State and Federal officials in ensuring people with disabilities, including wheelchair users, can safely enter and exit the vehicle?

Answer. Waymo views city and state leadership as critical partners. We work closely with them to ensure our service complements existing transit networks and addresses local infrastructure challenges.

Question 3. What is your company doing to extend AV service to rural America?

Answer. While our current commercial focus is on major metropolitan areas, we recognize the potential for AVs to improve transportation equity in rural communities. We believe AVs can play an important role in addressing last-mile challenges and expanding mobility options for rural populations.

A. Will your AVs be able to navigate backroads and long, rural driveways so passengers with disabilities are picked up and dropped off at their doors?

Answer. Yes, we are continually testing the Waymo Driver in a number of different environments to ensure its ability to handle all types of terrain and situations to best serve our riders.

Consumer Protection

Question 1. Current proposed legislation allows AV providers to require forced arbitration, which would deny disabled users from filing claims in court if their rights under the Americans with Disabilities Act (ADA) were violated or they or their devices are injured.

A. What responsibility does Waymo have to ensure the civil rights of people with disabilities are upheld?

Answer. Serving the disability community is foundational to our mission. We prioritize the safety and well-being of our passengers.

B. Do you support legislation that would ban forced arbitration clauses for Americans with disabilities who seek recourse due to violations of the ADA?

Answer. Waymo supports existing state insurance and liability frameworks and prioritizes providing a safe, independent mobility option for underserved populations.

Question 2. What steps is your company taking to protect passengers' data privacy?

Answer. Waymo takes several comprehensive steps to protect passenger data privacy, governed by policies developed with industry-best practices regarding transparency, collection and retention limits, and user controls.

Privacy by Design: Waymo's systems are not designed to use sensor or camera data to identify individual people, and the company does not collect or keep biometric data.

Data Retention Policies: Internal cabin data is generally retained for only a short period. Longer retention is limited to specific exceptions, such as training machine learning models or addressing safety incidents like vehicle damage or passenger injury.

Independent Governance: Since 2016, Waymo has operated as a separate company from Google, with its own internal and external privacy policies and a dedicated Privacy Officer who reviews all data requests from government entities. Personal data is only shared with Google under a limited set of circumstances like when a user gives us consent and when Google is acting as a service provider. See *Waymo Services Privacy Policy* for more info.

De-identification: In cases where interior camera footage is used for service improvements (e.g., detecting if a rider is smoking or not wearing a seatbelt), the video is not linked to a specific person.

A. What specific steps are you taking to ensure passengers' health, disability status and locations visited are not be shared or used for commercial or tracking purposes without the permission of the individual?

Answer. Trust and privacy are fundamental to our success. Our privacy policy emphasizes transparency, collection and retention limits, and user controls. We limit who has access to sensor and location data and how long it is retained, and our data management is governed by independent policies separate from Google.

Waymo identifies precise geolocation and data concerning health, including disability status, as "sensitive personal information" and applies specific protections to ensure it is not misused.

Commercial Use Restrictions: Waymo does not disclose personal information to third parties for commercial or tracking purposes unless an individual provides explicit consent.

Right to Limit Use: In accordance with U.S. state law requirements, Waymo does not use or disclose sensitive personal information for any purpose other than as permitted by law without providing users the right to limit such use.

Opt-Out Options: Users have the right to opt-out of the "sale" or "sharing" of their personal information for targeted advertising purposes.

Precise Geolocation Controls: Geolocation data is collected from sensors and GPS to provide services, but users can manage their privacy and data choices through app and device settings.

Limited Disclosures: Personal data is only shared in a few limited cases, such as with service providers who perform tasks on Waymo's behalf (under strict confidentiality agreements) or for legal and safety reasons, such as complying with a governmental request or protecting the safety of customers.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. TAMMY DUCKWORTH TO
JEFF FARRAH

Wheelchair Securement

Question 1. Will you encourage your members to partner with researchers and engineers, such as those the University of Michigan and Purdue University, who have designed universal wheelchair securement systems and need the funding the resources to bring them to market?

Answer. AVIA is a partner of the SecureRide Coalition,¹ which has been organized by the United Spinal Association, and has supported providing funding for the testing and development of the Universal Docking Interface Geometry (“UDIG”) wheelchair securement standard, which helps wheelchair users automatically and safely secure their wheelchairs in a motor vehicle. For example, funding is needed to expand UDIG testing to a wide array of vehicle configurations, including autonomous vehicles (“AVs”) with nontraditional seating arrangements, to ensure wheelchair users can secure their wheelchairs across vehicle designs, greatly expanding overall accessibility.

Question 2. Would you provide support for such research and deployment of autonomous wheelchair securement systems?

Answer. We have voiced our support for UDIG research in both our recent comments to the USDOT’s Office of the Assistant Secretary for Research and Technology,² and in the written testimony provided for this hearing.

Question 3. Do you support Federal rulemaking that would provide national standards for automated wheelchair securement?

Answer. AVs offer an exciting development for mobility for wheelchair users. AVIA would like to meet with your office, researchers, regulators, and other stakeholders to discuss further how such standards would be developed and ultimately translated into regulations.

Universal Design

Question 1. Please provide in detail AVIA’s engagement with the disability community.

A. Have you engaged in listening sessions or advisory committee meetings? If so, when?

Answer. AVIA is deeply engaged with the disability community. This is a regular part of AVIA’s work and includes our membership in SecureRide. In addition, in December 2025, as part of our Autonomy Summit 25, we hosted an event with the American Association of People with Disabilities to discuss how AVs will transform mobility for Americans with disabilities.³

B. Which disabilities were represented at such meetings?

Answer. AVIA has a formal “Partners” program which includes organizations that share our desire to see the safe and effective deployment of AVs in the United States.⁴ The following organizations from the disability community are part of our Partners program:

- American Council of the Blind
- Blinded Veterans Association
- Epilepsy Foundation
- National Council on Independent Living
- National Federation of the Blind
- United Spinal Association

Question 2. How do you ensure your members develop technology that is able to detect and appropriately respond to people with a wide range of disabilities, including those who use mobility devices, such as wheelchairs, or those who use service animals?

¹See *SecureRide Coalition*, UNITED SPINAL ASS’N, <https://unitedspinal.org/secureride/> (last visited Feb. 2, 2026).

²See Comment Letter on Request for Information-Research Ideas To Support Nationwide Automated Vehicle (AV) Deployment from the Autonomous Vehicle Industry Association (Oct. 17, 2025), <https://www.regulations.gov/comment/DOT-OST-2025-1029-0026>.

³*Autonomy Summit 25: Building Momentum for America’s Autonomous Future*, AUTONOMOUS VEHICLE INDUS. ASS’N (Dec. 17, 2025), <https://www.theavindustry.org/blog/autonomy-summit-25-building-momentum-for-americas-autonomous-future>.

⁴See *Our Partners*, AUTONOMOUS VEHICLE INDUS. ASS’N, <https://www.theavindustry.org/about> (last visited Feb. 25, 2026).

Answer. AVs are designed and developed to detect and respond to all road users. AVIA members are particularly focused on ensuring that vulnerable road users (“VRUs”) are protected. An AV has a 360-degree view of the world around the vehicle and can respond to road developments, including the activities of VRUs, far quicker than human drivers. In those states that have passed AV legislation, AVs are required to obey all traffic regulations, just as human operated vehicles are. AVIA is hopeful that the state of Illinois will enact an AV deployment statute soon to bring the benefits of the technology to the citizens of your state.

A. Would you support rulemaking to establish standards to ensure the detection of and response to people with disabilities?

Answer. As noted in my written testimony, AVIA supports the codification of a safety case requirement for automated driving systems (“ADS”) that includes a requirement that ADS manufacturers explain how their ADS accurately detects and responds to relevant road users, including VRUs and emergency vehicles and personnel. This also includes people with disabilities. We encourage members of the Committee to support such an approach as the Senate considers AV-related legislation.

Question 3. Please explain in detail how AVIA helps its members incorporate universal design principles in its designing, testing and deployment of its AVs and associated software.

A. Are your AVs and associated software accessible to people with sensory disabilities (e.g., hearing and visual impairments)?

a. People with intellectual or developmental disabilities?

b. People with a variety of mobility impairments?

Answer. AVIA and its members are committed to supporting the deployment of accessible AVs that can expand access to mobility for Americans living with disabilities, and as noted above we partner with a number of major disability advocacy groups who support the further development and deployment of AVs nationwide. While our members are better positioned to answer specific questions on how their vehicles are designed, tested, and deployed, on the policy side of this discussion AVIA would highlight its support for the passage of the AV Accessibility Act.⁵ The Act would prohibit states from issuing motor vehicle operator licenses in a manner that prevents people with disabilities, or other individuals without a driver's license, from riding as a passenger in an ADS-equipped vehicle. This Act also requires the Secretary of Transportation, in collaboration with the National Academies of Sciences, Engineering, and Medicine to conduct an accessible infrastructure study to determine the best practices for public transportation to improve the ability of Americans with blindness and other disabilities to find, access, and use ride-hail AVs, including during pickup and drop off.

B. With whom did you partner? Over what period of time?

Answer. Please see above for a list of AVIA Partners working on disability-related issues.

C. Did you engage with members of the disability community? If so, with whom?

Answer. Please see above.

Requesting Rides and Ensuring Safety

Question 1. Many cities like New York City, Chicago and San Francisco have taken the lead in requiring rideshare and taxi companies to ensure people with disabilities, including wheelchair users, are able to use their services without unreasonable wait times.

A. How do you plan to work with your members, as well as local, State and Federal officials in ensuring people with disabilities, including wheelchair users, do not experience unreasonable wait times?

Answer. In order to speed the creation of accessible AVs, AVIA encourages members of the Committee to support updates to existing law and regulations that amend existing requirements for manually operated driving controls and certain indicators and telltales to clarify that such requirements are not applicable to Level 4 or Level 5 ADS-dedicated vehicles, because those requirements are intended for an in-vehicle human driver.⁶ These changes would allow for AVs to be widely available to people with disabilities across the country.

⁵Autonomous Vehicle Accessibility Act, H.R. 7126, 118th Cong. (2024) <https://www.congress.gov/bills/118/congress/house-bills/7126/text>.

⁶See *Securing American Leadership in Autonomous Vehicles*, AUTONOMOUS VEHICLE INDUS. ASS'N (Jan. 19, 2025), <https://cdn.prod.website-files.com/67ee365c25e6530594bd40c2/683d8d2>

Question 2. For travelers with disabilities to safely utilize, enter and exit an AV the surrounding infrastructure must be accessible.

A. Do you encourage your members to collect data and map to ensure pick-up and drop-off locations are accessible and safe for people with disabilities, including wheelchair users?

Answer. AVIA supports our members creating accessible vehicles, but the Federal Motor Vehicle Safety Standards constrain the industry's ability to build these vehicles, as noted above. We are eager to work with you to resolve this issue and update relevant laws and regulations to speed the deployment of accessible AVs.

A. How do you plan to work with your members, as well as local, State and Federal officials in ensuring people with disabilities, including wheelchair users, can safely enter and exit the vehicle?

Answer. As noted above, AVIA partners with a number of disability advocacy groups and is eager to work with those partners and you to address accessibility issues and speed up the deployment of accessible AVs nationwide.

Question 3. What is AVIA doing to extend AV service to rural America?

A. How do you plan to work with your members, as well as local, State and Federal officials in ensuring AVs are able to navigate backroads and long, rural drive-ways so passengers with disabilities are picked up and dropped off at their doors?

Answer. To facilitate the deployment of AVs—including in rural areas—it is imperative that Congress take action to enact a Federal policy framework. Presently, robotaxis are deploying in a variety of U.S. states and companies are progressively expanding the Operational Design Domain of robotaxi services to suburban and exurban places. This has particularly been the experience in the Bay Area of northern California and in Arizona, where deployments have been occurring for years.

Contracts

Question 1. Current proposed legislation allows AV providers to require forced arbitration, which would deny disabled users from filing claims in court if their right under the Americans with Disabilities Act (ADA) were violated or they or their devices are injured.

A. What responsibility does the vehicle manufacturer or operator have to ensure the civil rights of people with disabilities are upheld?

Answer. AV companies must comply with Federal and state law on this matter.

B. Do you support legislation that would ban forced arbitration clauses for Americans with disabilities who seek recourse due to violations of the ADA?

Answer. No.

Question 2. What steps should your members take to protect passengers' data privacy?

A. What specific steps should they take to ensure passengers' health, disability status and locations visited are not shared or used for commercial or tracking purposes without the permission of the individual?

Answer. As part of a broader Federal framework for AV policy, AVIA supports requiring AV manufacturers to develop a plan with respect to the collection, use, sharing, and storage of personal information collected by an AV and a method for providing notice to vehicle owners or occupants about the privacy policy. Such a requirement is included in our proposed Federal AV policy framework.⁷

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. AMY KLOBUCHAR TO
JEFF FARRAH

Infrastructure & Autonomous Vehicles. As the types of vehicles on our roads change, our roadways and safety systems need to keep pace.

Question 1. As more autonomous vehicles are deployed on the road, what specific infrastructure investments are most critical to improving safety?

Answer. Autonomous vehicles ("AVs") benefit from the same infrastructure investments as all other vehicles. While AVs do not need any specialized infrastructure, what is needed is a Federal policy framework for AVs, as laid out in the written testimony. AVIA strongly encourages you to support legislation to create such a framework. This year's surface transportation reauthorization presents an important opportunity for the Congress to advance a Federal policy framework on AVs

fa60ac22d542b1049_Securing%20American%20Leadership%20in%20Autonomous%20Vehicles1.pdf.

⁷See *Id.*

and AVIA encourages the Committee to seize the opportunity. In January 2025, AVIA released *Securing American Leadership in Autonomous Vehicles*,⁸ which details a comprehensive set of Federal policy recommendations that would accelerate the safe and timely deployment of AV technology and solidify the U.S. as the global leader in this transformative field. To best support the further development of the AV industry, Federal AV legislation should:

- *Require an “ADS Safety Case.”* As directed by Congress, the National Highway Traffic Safety Administration (“NHTSA”) should initiate rulemaking, informed by industry and the work of existing standards setting bodies, to require that commercially deployed autonomous driving system (“ADS”) manufacturers develop, and provide upon request, a detailed record (often described as a “safety case”)⁹ of the basis for the manufacturer’s conclusion that the design, construction, and performance of an ADS protects against an unreasonable risk to motor vehicle safety, as defined in 49 U.S.C. § 30102(a)(9). Safety cases have been used as part of safety assurance in a number of other fields, including energy,¹⁰ aviation,¹¹ and defense,¹² and have been proposed for use with AI systems.¹³ The ADS safety case would include: (1) a technical description of the ADS’s parts, capabilities, and integration into the vehicle platform, (2) explanation of how the ADS performs all elements of the driving task, (3) engineering methodologies used to design and assess the ADS’s performance and ensure the absence of unreasonable risk to motor vehicle safety, (4) a description of ADS’s safety performance, (5) evidence supporting the manufacturer’s claim for validating the ADS’s performance competencies, and (6) an explanation of how the ADS detects and responds to crashes.
- *Establish ADS Competencies.* Public trust in AVs is essential to their successful deployment. As part of the required safety case, ADS manufacturers should explain how their ADS meets a set of key competencies, including: (1) the ability to perform the entire dynamic driving task (“DDT”) within its Operational Design Domain (“ODD”) and to recognize and appropriately respond to the boundaries of its ODD; (2) accurately detecting and responding to relevant road users, including vulnerable road users and emergency vehicles and personnel; (3) transferring control back to human driver when necessary for Level 3 systems; (4) achieving a “minimal risk condition” as defined by SAE J3016 for Level 4 and 5 systems, when necessary; and (5) complying with applicable local traffic laws and laws relevant to the performance of the DDT.
- *Establish a National AV Safety Data Repository.* As directed by Congress, NHTSA should establish, implement, and maintain a National AV Safety Data Repository, to collect safety-relevant data about AV incidents and expand AV data reporting to include state-level location of AVs. This repository would provide timely information to the public and regulators to promote AV transparency and accountability. The database should include only material and relevant data and specify a meaningful minimum damage threshold for reportable crashes. NHTSA should further ensure that all information shared in the repository is subject to strict confidential business information protections.
- *Clarify and Modernize the FMVSS.* Whether by legislation or through congressionally directed action by NHTSA (by interpretation and/or regulatory changes) it should be clarified that the Federal Motor Vehicle Safety Standards (“FMVSS”) requirements for manually operated driving controls and certain indicators and telltales are not applicable to Level 4 or Level 5 ADS-dedicated ve-

⁸ See *Securing American Leadership in Autonomous Vehicles*, AUTONOMOUS VEHICLE INDUS. ASS’N (Jan. 19, 2025), https://cdn.prod.website-files.com/67ee365c25e6530594bd40c2/683d8d2fa60ac22d542b1049_Securing%20American%20Leadership%20in%20Autonomous%20Vehicles1.pdf.

⁹ See, e.g., Welcome to Safety Case 101, AURORA (Mar. 8, 2022), <https://aurora.tech/newsroom/welcome-to-safety-case-101>.

¹⁰ See, e.g., What are Safety Cases? A Historical Overview, SYNERGENOG (Dec. 12, 2024), <https://synergenog.com/what-are-safety-cases-history/> (explaining the history and the safety benefits of using safety cases when managing high-risk oil and gas energy and industrial facilities, including onshore processing plants, offshore fixed platforms, and floating vessels).

¹¹ *Safety Case Development*, VA. TECH, <https://maap.ictas.vt.edu/capabilities/safetycases.html> (last visited Feb. 25, 2026) (explaining the robust development of safety cases for aviation operations).

¹² DSA 03.OME PART 1: DEFENCE CODE OF PRACTICE (DCOP) 103, U.K. DEF. SAFETY AUTH. (Aug. 2024), https://assets.publishing.service.gov.uk/media/689f2414cc5ef8b4c5fc44b4/DSA_03_OME_Part_1_DCOP_103_-_OME_Safety_and_Environmental_Case_-_SEC.pdf (describing the extensive requirement to use safety cases for the U.K. Ministry of Defence).

¹³ Geoffrey Irving, *Safety cases at AISI*, AI SEC. INST. (Aug. 23, 2024), <https://www.aisi.gov.uk/blog/safety-cases-at-aisi>.

hicles, since they are intended for an in-vehicle human driver only. Such action would support AV innovation by avoiding imposing requirements that do not advance safety and hamper the opportunity to re-imagine what motor vehicles look like and how they are designed, paving the way for greater accessibility, safety, and societal utility.

- *Revise the “Make Inoperative” Prohibition.* Existing Federal law prevents manufacturers, dealers, distributors, and repair businesses from disabling any safety-related device or design element required by an FMVSS in a vehicle for any purpose after its first sale. To ensure that innovative safety and technical features can be adopted, AV legislation should clarify that making a vehicle’s manual controls inaccessible or altering their functionality for safety reasons during autonomous operation does not run afoul of the “make inoperative” provision of the Motor Vehicle Safety Act (49 U.S.C. § 30122).
- *Expand the FAST Act Testing Exception.* An exemption included in the FAST Act (49 U.S.C. § 30112(b)(10)) permits only qualifying original equipment manufacturers to test and evaluate vehicles that do not conform to the FMVSS. AV legislation should further include a means for AV developers to conduct commercial operations, including the carrying of members of the public as passengers and transporting freight as part of that testing or evaluation.
- *Move Forward with an AV Demonstration Program.* Congress should direct NHTSA to move forward with a voluntary AV demonstration program that offers uniform Federal rules that provide oversight for the safe design, construction, and deployment on public roads for ADS-equipped vehicles manufactured and operated by participants admitted into the program. Such a program would benefit AV developers seeking to demonstrate innovative vehicle designs while also providing NHTSA with additional data on AV operations beyond the safety data collected under the National AV Safety Data Repository proposed above.
- *Advance AV Cybersecurity and Privacy.* Congress should include in its comprehensive AV legislation language requiring AV manufacturers to develop cybersecurity and privacy plans for their technologies. Cybersecurity plans should include a written cybersecurity policy describing the manufacturer’s practices for detecting and responding to cyberattacks, unauthorized intrusions, and false and spurious messages or vehicle control commands. For privacy, AV manufacturers should be required to develop a plan with respect to the collection, use, sharing, and storage of personal information collected by an AV and a method for providing notice to vehicle owners or occupants about the privacy policy.
- *Promote AV Accessibility.* Congress should support access to AVs for people with disabilities by passing the AV Accessibility Act.¹⁴ The Act would prohibit states from issuing motor vehicle operator licenses in a manner that prevents people with disabilities, or other individuals without a driver’s license, from riding as a passenger in an ADS-equipped vehicle. This Act also requires the Secretary of Transportation, in collaboration with the National Academies of Science, to conduct an accessible infrastructure study to determine the best practices for public transportation to improve the ability of Americans with blindness and other disabilities to find, access, and use ride-hail autonomous vehicles, including during pickup and drop off.
- *Support the Wider Deployment of ADS-Equipped Commercial Motor Vehicles.* To ensure uniform, national rules for operating autonomous commercial motor vehicles (“CMVs”) in interstate commerce, AVIA recommends codifying the USDOT’s 2018 interpretation that the Federal Motor Carrier Safety Regulations (“FMCSRs”) do not assume that a CMV driver is always a human or that a human is necessarily present onboard a CMV, and that when a CMV does not require a human operator, none of the human-specific FMCSRs (*i.e.*, drug testing, hours-of-service, commercial driver’s licenses, and physical qualification requirements) apply.¹⁵ Further, to reduce barriers to interstate commerce, AV legislation should include a provision that when operating in interstate commerce, a CMV equipped with a Level 4 or Level 5 ADS is expressly allowed to operate without a human driver on board.
- *Streamline and Update Regulations to Accommodate the Integration of ADS into CMVs.* This includes updating vehicle width limits to provide flexibility for the placement of sensors and other key safety technologies. This also includes up-

¹⁴ Autonomous Vehicle Accessibility Act, H.R. 7126, 118th Cong. (2024).

¹⁵ U.S. Dep’t of Transp., Preparing for the Future of Transportation: Automated Vehicles 3.0 (AV 3.0) 9 (2018), <https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/320711/preparing-future-transportation-automated-vehicle-30.pdf>.

dating regulations to allow for the use of cab-mounted beacons as a warning device, which would update antiquated regulations and improve safety for both autonomous CMVs and human drivers. In October 2025, the Federal Motor Carrier Safety Administration issued a waiver that allows ADS-equipped CMVs to use cab-mounted beacons on their vehicles rather than physically place warning devices on the roadway.¹⁶ That waiver should be codified to ensure its benefits are available permanently.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. LISA BLUNT ROCHESTER TO
JEFF FARRAH

Federal Safety Standards for Autonomous Vehicles:

Question 1. As one of the key regulators for Federal roadway safety, the National Highway Traffic Safety Administration (NHTSA) has emphasized the importance of Federal Motor Vehicle Safety Standards (FMVSS) and their role in ensuring all vehicles on our Nation's roadways meet the proper requirements. However, cars equipped with various levels of automated driving systems (ADS), for which there are no FMVSS, have been involved in serious crashes.

Answer. It is critical to underscore that all motor vehicles sold or imported into the United States must be FMVSS compliant. Autonomous vehicles ("AVs") are certainly no different. This means, other than a select subset of AVs that have received exemptions from NHTSA, the vehicles being used in AV fleets today are built to meet all applicable FMVSS. It is the case that there are currently no FMVSS that apply directly to the design or performance of an ADS. AVIA supports a Federal framework for AV policy that would address this issue and establish FMVSS that directly address considerations for a vehicle's ADS, as laid out in my written testimony and in *Securing American Leadership in Autonomous Vehicles*.¹⁷

a. Should a Federal autonomous vehicle framework include FMVSS that address safety concerns that have already been observed with AVs?

Answer. AVIA has long advocated for updates to the FMVSS that specifically address the needs of AVs, as laid out in *Securing American Leadership in Autonomous Vehicles*,¹⁸ and discussed above and in my written testimony. Congress has the opportunity to create a Federal AV policy framework that instructs NHTSA to undertake updates to existing FMVSS and create new standards where needed, while also giving the agency any additional resources it may need to do so.

b. If not, what assurances can the public and regulators have that AVs will address relevant safety concerns and operate with the highest safety standards?

Answer. N/A

Question 2. As vehicles become more software-driven and connected, cybersecurity failures can quickly turn into real-world safety risks, from remote exploitation to compromised over-the-air updates and unsafe interactions with vehicle-to-everything (V2X) systems. While the National Highway Traffic Safety Administration sets baseline safety expectations through the Federal Motor Vehicle Safety Standards, there is still no clear, enforceable Federal cybersecurity standard tailored to automated vehicles and advanced driver assistance systems.

a. Should a Federal autonomous vehicle framework include enforceable cybersecurity requirements (for example: secure software development, vulnerability testing, patch timelines, incident reporting, and supply-chain controls) as a condition of deployment?

Answer. AVIA supports the creation of a Federal policy framework for AVs that includes a requirement for AV manufacturers to develop cybersecurity and privacy plans for their technologies. These cybersecurity plans should include a written cybersecurity policy describing the manufacturer's practices for detecting and responding to cyberattacks, unauthorized intrusions, and false and spurious messages or vehicle control commands. We would be pleased to discuss with your office how AVs should fit into broader cybersecurity regulations.

¹⁶See Letter from Fed. Motor Carrier Safety Admin. To Aurora Operations, Inc. (Oct. 10, 2025), <https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/2025-10/Letter%20to%20Aurora%20Operations%2C%20Inc.%20-Waiver%20of%20Warning%20Device%20Requirements%20Terms%20and%20Conditions.pdf>.

¹⁷See *Securing American Leadership in Autonomous Vehicles*, AUTONOMOUS VEHICLE INDUS. ASS'N (Jan. 19, 2025), https://cdn.prod.website-files.com/67ee365c25e6530594bd40c2/683d8d2fa60ac22d542b1049_Securing%20American%20Leadership%20in%20Autonomous%20Vehicles1.pdf.

¹⁸*Id.*

b. If not, what specific, verifiable protections should the Federal government require to ensure that AV cybersecurity risks are addressed before deployment, and that companies remain accountable as threats evolve over a vehicle's lifetime?
 Answer. N/A

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. TIM SHEEHY TO
 JEFF FARRAH

Question 1. Montana's leadership in photonics and autonomous systems is driving innovation in autonomous vehicles. In Bozeman, Aurora's FirstLight gives vehicles the ability to detect obstacles at long distances, providing crucial reaction time. How can surface transportation reauthorization support these advancements and encourage continued innovation in technologies like those being developed in Bozeman?

Answer. Aurora's FirstLight is an example of how the benefits of autonomous vehicles ("AVs") can flow to communities across the country—not only by increasing access to transportation, but also by helping grow innovative new companies that can bring jobs to cities and towns nationwide. This year's surface transportation reauthorization presents an important opportunity for the Congress to advance a Federal policy framework on AVs and we encourage this Committee to seize that opportunity. In January 2025, AVIA released *Securing American Leadership in Autonomous Vehicles*,¹⁹ which details a comprehensive set of Federal policy recommendations that would accelerate the safe and timely deployment of AV technology and solidify the U.S. as the global leader in this transformative field. To best support the further development of the AV industry, Federal AV legislation should:

- *Require an "ADS Safety Case."* As directed by Congress, the National Highway Traffic Safety Administration ("NHTSA") should initiate rulemaking, informed by industry and the work of existing standards setting bodies, to require that commercially deployed autonomous driving system ("ADS") manufacturers develop, and provide upon request, a detailed record (often described as a "safety case")²⁰ of the basis for the manufacturer's conclusion that the design, construction, and performance of an ADS protects against an unreasonable risk to motor vehicle safety, as defined in 49 U.S.C. § 30102(a)(9). Safety cases have been used as part of safety assurance in a number of other fields, including energy,²¹ aviation,²² and defense,²³ and have been proposed for use with AI systems.²⁴ The ADS safety case would include: (1) a technical description of the ADS's parts, capabilities, and integration into the vehicle platform, (2) explanation of how the ADS performs all elements of the driving task, (3) engineering methodologies used to design and assess the ADS's performance and ensure the absence of unreasonable risk to motor vehicle safety, (4) a description of ADS's safety performance, (5) evidence supporting the manufacturer's claim for validating the ADS's performance competencies, and (6) an explanation of how the ADS detects and responds to crashes.
- *Establish ADS Competencies.* Public trust in AVs is essential to their successful deployment. As part of the required safety case, ADS manufacturers should explain how their ADS meets a set of key competencies, including: (1) the ability to perform the entire dynamic driving task ("DDT") within its Operational Design Domain ("ODD") and to recognize and appropriately respond to the boundaries of its ODD; (2) accurately detecting and responding to relevant road users,

¹⁹See *Securing American Leadership in Autonomous Vehicles*, AUTONOMOUS VEHICLE INDUS. ASS'N (Jan. 19, 2025), https://cdn.prod.website-files.com/67ee365c25e6530594bd40c2/683d8d2fa60ac22d542b1049_Securing%20American%20Leadership%20in%20Autonomous%20Vehicles1.pdf.

²⁰See, e.g., Welcome to Safety Case 101, AURORA (Mar. 8, 2022), <https://aurora.tech/newsroom/welcome-to-safety-case-101>.

²¹See, e.g., What are Safety Cases? A Historical Overview, SYNERGENOG (Dec. 12, 2024), <https://synergenog.com/what-are-safety-cases-history/> (explaining the history and the safety benefits of using safety cases when managing high-risk oil and gas energy and industrial facilities, including onshore processing plants, offshore fixed platforms, and floating vessels).

²²*Safety Case Development*, VA. TECH, <https://maap.ictas.vt.edu/capabilities/safetycases.html> (last visited Feb. 2, 2026) (explaining the robust development of safety cases for aviation operations).

²³DSA 03.OME PART 1: DEFENCE CODE OF PRACTICE (DCOP) 103, U.K. DEF. SAFETY AUTH. (Aug. 2024), https://assets.publishing.service.gov.uk/media/689f2414cc5ef8b4c5fc44b4/DSA_03_OME_Part_1_DCOP_103_-_OME_Safety_and_Environmental_Case_-_SEC.pdf (describing the extensive requirement to use safety cases for the U.K. Ministry of Defence).

²⁴Geoffrey Irving, *Safety cases at AISI*, AI SEC. INST. (Aug. 23, 2024), <https://www.aisi.gov.uk/blog/safety-cases-at-aisi>.

including vulnerable road users and emergency vehicles and personnel; (3) transferring control back to human driver when necessary for Level 3 systems; (4) achieving a “minimal risk condition” as defined by SAE J3016 for Level 4 and 5 systems, when necessary; and (5) complying with applicable local traffic laws and laws relevant to the performance of the DDT.

- *Establish a National AV Safety Data Repository.* As directed by Congress, NHTSA should establish, implement, and maintain a National AV Safety Data Repository, to collect safety-relevant data about AV incidents and expand AV data reporting to include state-level location of AVs. This repository would provide timely information to the public and regulators to promote AV transparency and accountability. The database should include only material and relevant data and specify a meaningful minimum damage threshold for reportable crashes. NHTSA should further ensure that all information shared in the repository is subject to strict confidential business information protections.
- *Clarify and Modernize the FMVSS.* Whether by legislation or through congressionally directed action by NHTSA (by interpretation and/or regulatory changes) it should be clarified that the Federal Motor Vehicle Safety Standard’s (“FMVSS”) requirements for manually operated driving controls and certain indicators and telltales are not applicable to Level 4 or Level 5 ADS-dedicated vehicles, since they are intended for an in-vehicle human driver only. Such action would support AV innovation by avoiding imposing requirements that do not advance safety and hamper the opportunity to re-imagine what motor vehicles look like and how they are designed, paving the way for greater accessibility, safety, and societal utility.
- *Revise the “Make Inoperative” Prohibition.* Existing Federal law prevents manufacturers, dealers, distributors, and repair businesses from disabling any safety-related device or design element required by an FMVSS in a vehicle for any purpose after its first sale. To ensure that innovative safety and technical features can be adopted, AV legislation should clarify that making a vehicle’s manual controls inaccessible or altering their functionality for safety reasons during autonomous operation does not run afoul of the “make inoperative” provision of the Motor Vehicle Safety Act (49 U.S.C. § 30122).
- *Expand the FAST Act Testing Exception.* An exemption included in the FAST Act (49 U.S.C. § 30112(b)(10)) permits only qualifying original equipment manufacturers to test and evaluate vehicles that do not conform to the FMVSS. AV legislation should further include a means for AV developers to conduct commercial operations, including the carrying of members of the public as passengers and transporting freight as part of that testing or evaluation.
- *Move Forward with an AV Demonstration Program.* Congress should direct NHTSA to move forward with a voluntary AV demonstration program that offers uniform Federal rules that provide oversight for the safe design, construction, and deployment on public roads for ADS-equipped vehicles manufactured and operated by participants admitted into the program. Such a program would benefit AV developers seeking to demonstrate innovative vehicle designs while also providing NHTSA with additional data on AV operations beyond the safety data collected under the National AV Safety Data Repository proposed above.
- *Advance AV Cybersecurity and Privacy.* Congress should include in its comprehensive AV legislation language requiring AV manufacturers to develop cybersecurity and privacy plans for their technologies. Cybersecurity plans should include a written cybersecurity policy describing the manufacturer’s practices for detecting and responding to cyberattacks, unauthorized intrusions, and false and spurious messages or vehicle control commands. For privacy, AV manufacturers should be required to develop a plan with respect to the collection, use, sharing, and storage of personal information collected by an AV and a method for providing notice to vehicle owners or occupants about the privacy policy.
- *Promote AV Accessibility.* Congress should support access to AVs for people with disabilities by passing the AV Accessibility Act.²⁵ The Act would prohibit states from issuing motor vehicle operator licenses in a manner that prevents people with disabilities, or other individuals without a driver’s license, from riding as a passenger in an ADS-equipped vehicle. This Act also requires the Secretary of Transportation, in collaboration with the National Academies of Science, to conduct an accessible infrastructure study to determine the best practices for public transportation to improve the ability of Americans with blindness and

²⁵ Autonomous Vehicle Accessibility Act, H.R. 7126, 118th Cong. (2024).

other disabilities to find, access, and use ride-hail autonomous vehicles, including during pickup and drop off.

- *Support the Wider Deployment of ADS-Equipped Commercial Motor Vehicles.* To ensure uniform, national rules for operating autonomous commercial motor vehicles (“CMVs”) in interstate commerce, AVIA recommends codifying the USDOT’s 2018 interpretation that the Federal Motor Carrier Safety Regulations (“FMCSRs”) do not assume that a CMV driver is always a human or that a human is necessarily present onboard a CMV, and that when a CMV does not require a human operator, none of the human-specific FMCSRs (*i.e.*, drug testing, hours-of-service, commercial driver’s licenses, and physical qualification requirements) apply.²⁶ Further, to reduce barriers to interstate commerce, AV legislation should include a provision that when operating in interstate commerce, a CMV equipped with a Level 4 or Level 5 ADS is expressly allowed to operate without a human driver on board.
- *Streamline and Update Regulations to Accommodate the Integration of ADS into CMVs.* This includes updating vehicle width limits to provide flexibility for the placement of sensors and other key safety technologies. This also includes updating regulations to allow for the use of cab-mounted beacons as a warning device, which would update antiquated regulations and improve safety for both autonomous CMVs and human drivers. In October 2025, the Federal Motor Carrier Safety Administration issued a waiver that allows ADS-equipped CMVs to use cab-mounted beacons on their vehicles rather than physically place warning devices on the roadway.²⁷ That waiver should be codified to ensure its benefits are available permanently.

A Federal framework that includes the above elements is needed to support continued U.S. leadership in AV technologies and should be a core element of the surface transportation reauthorization. AVIA is ready to work with Sen. Sheehy and others to bring such a framework into fruition.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY DEMOCRATIC SENATORS TO
DR. BRYANT WALKER SMITH

Dear Senator Klobuchar, Senator Duckworth, and Senator Blunt Rochester,

Thank you for your thoughtful questions about automated driving. I would like to introduce my answers with three overarching points.

First, the age of the automobile involved an enormous social experiment: What happens when hundreds of millions of ordinary humans propel themselves in two-ton machines at speeds that would have been unthinkable only a century prior? We must still deal with the results, we must learn from our mistakes, and we must do better. And so, as the age of AI ushers in a new set of enormous social experiments, we must not pretend that the status quo is acceptable. Far from it: Today alone, one hundred people will die on U.S. roads. Many other countries—*Canada! Australia! Much of Europe!*—have chosen to save lives that every day we choose to sacrifice.

Second, it is important to conceive of safety in a broad sense.¹ Traffic safety is freedom from death, whether caused by a crash or by transportation pollution. It is freedom from physical injuries and from the devastating emotional injuries attendant to losing a loved one. It is freedom to travel without experiencing violence or harassment, including at the hands of government. It is freedom to easily move by foot or the equivalent, to cultivate community, and to access the people, products, services, and activities necessary for a full and meaningful life. And it is freedom of future generations to enjoy the same. When we consider automated driving, we must not ignore that our country’s transportation policy choices play a large role in

²⁶ U.S. DEPT OF TRANSP., PREPARING FOR THE FUTURE OF TRANSPORTATION: AUTOMATED VEHICLES 3.0 (AV 3.0) 9 (2018), <https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/320711/preparing-future-transportation-automated-vehicle-30.pdf>.

²⁷ See Letter from Fed. Motor Carrier Safety Admin. To Aurora Operations, Inc. (Oct. 10, 2025), <https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/2025-10/Letter%20to%20Aurora%20Operations%2C%20Inc.%20-Waiver%20of%20Warning%20Device%20Requirements%20Terms%20and%20Conditions.pdf>; see also OFF. OF SCI. & TECH. POLICY, WHITE HOUSE, TRUMP ADMINISTRATION SCIENCE & TECHNOLOGY HIGHLIGHTS: YEAR ONE 48 (2026), <https://www.whitehouse.gov/wp-content/uploads/2026/01/WHOSTP-2025-Wins.pdf>.

¹ *Road Traffic Safety*, LAW OF THE NEWLY POSSIBLE (updated Sept. 26, 2022), https://newlypossible.org/wiki/Road_traffic_safety.

melting our ice caps, acidifying our oceans, and destroying our homes. To be clear: The Earth will be fine; the people we love may not.

Third, while much of the focus of automated driving is about the roles of humans and machines, we should also pay attention to orthogonal questions about the concentration and distribution of power. If done right, automated driving could empower individuals, including those with disabilities, who are poorly served by our current system of transportation and land use. But it could also make us more vulnerable to the actions of malicious individuals who use cars and computers as their weapons of choice. And if done right, automated driving could protect people by ensuring consistent compliance with rules of the road. But it could also give vast power over our everyday lives to a handful of companies—or to the governments whose favor those companies are courting.²

In my view, automated vehicles are operated by the companies that develop and deploy them.³ These companies act through some combination of their machine agents (including the hardware and software that engineers call an “automated driving system”) and their human agents (including the remote human assistants who communicate with vehicles, passengers, and first responders). In the answers that follow, I therefore treat these companies as the “drivers” of their automated vehicles.

Senator Klobuchar, you asked about vehicle data, first responders, and preemption.

1. *Vehicle Data.* Autonomous vehicles are constantly producing and logging data. These data logs are the main eyewitness when an autonomous vehicle is involved in a collision. It’s important that law enforcement and victims can access this data and independently review it when an accident occurs. Why is ensuring victims’ access to vehicle data—and the prevention of data manipulation—important for the safe deployment of autonomous vehicle technology?

Answer. Because directly establishing the safety of any given automated driving system requires literally millions of miles of real-world experience, regulators need a realistic way to reasonably predict this performance. I believe that our best proxy for the safety of a particular technology is the trustworthiness of the companies behind it.

“A trustworthy company shares its safety philosophy by explaining what it is doing, why it believes that to be reasonably safe, and why the public can believe it.”⁴ Making its case to the public—truthfully and compellingly—requires credible data. To be credible, these data must be available and verifiable. Moreover, they must capture not only successes but also failures. After all, “The first step in solving a problem is recognizing there is one.”⁵

There is a simple word for intentionally concealing, manipulating, and misrepresenting information: Lying. Lying about safety-relevant data is a fundamental betrayal of individual victims, of an industry collectively building its reputation, of the public at large, and of the very trust upon which a society depends. Dishonest companies do not belong on our roads.

While it may be prudent to “never attribute to malice that which is adequately explained by stupidity,”⁶ the public is unlikely to be so generous. And unfortunately, some companies in this field have been, at best, sloppy with their safety-critical data. Consider two examples:

- Cruise was an automated driving company that operated robotaxis until a 2023 incident seriously injured a pedestrian. In response, the company quickly shared a video with regulators and some journalists to show that a hit-and-run human driver had first struck the pedestrian. But the company did not show, and did not mention, that its own robotaxi had subsequently dragged the victim

²For more on enforcement, see Bryant Walker Smith *et al.*, *Ideal Enforcement: How Do We Achieve Optimal Enforcement of Traffic Law as Ubiquitous Enforcement Becomes Technologically Conceivable?*, (Feb. 4, 2022), <https://papers.ssrn.com/abstract=5034907>. For more on ensuring fair competition among robotaxi providers specifically, see Bryant Walker Smith & Matthew Wansley, *Regulating Robotaxis*, 99 S. CAL. L. REV. (forthcoming 2026), <https://ssrn.com/abstract=5595951>.

³Bryant Walker Smith, *The Trustworthy Company*, 115 GEO. L.J. (forthcoming 2026).

⁴*Id.*

⁵THE NEWSROOM, *We Just Decided To*, Season 1, Episode 1 (HBO MAX).

⁶*Hanlon’s Razor*, WIKIPEDIA (last updated Feb. 13, 2026), https://en.wikipedia.org/wiki/Hanlon_percent27s_razor. (I cite Wikipedia when it is useful.)

about 20 feet. Cruise settled with her, but the terms were kept from the public. It also paid a criminal fine.⁷

- Tesla is an automaker that has deployed a driver assistance system that it hopes will eventually be capable of automated driving.⁸ In 2019, a human driver relying on this driver assistance system drove through a stop sign and hit two people on the other side, killing one and seriously injuring the other. The victims were able to sue only because they were not Tesla customers and therefore were not contractually compelled to arbitrate. For years, Tesla insisted it did not have key data about that crash. Only after an independent computer expert recovered those data from a vehicle module did Tesla acknowledge also having this “collision snapshot” on its company servers. A jury returned a verdict that included \$200 million in punitive damages against Tesla, and the judge recently concluded that the trial evidence “more than supports” that verdict.⁹

The U.S. Department of Transportation’s Transforming Transportation Advisory Committee (TTAC) made specific recommendations on the topic of automated driving and data.¹⁰ I support these recommendations, which reflect the best advice of a diverse group of experts and stakeholders.

Both data collection and data protection should advance the twin goals of human autonomy and human community. We humans have always learned and innovated by sharing information, and I hope we continue along this path. Knowledge is power.¹¹ But we must be cognizant of who wields that power, and how. Companies allow our governments to obtain information about individuals and groups that would otherwise require judicial warrants. And while automated driving companies have publicly stated that they do not automatically accede to governmental requests for information, this is a matter of corporate policy when it should instead be universal public policy.¹²

2. First Responders. Firefighters, police, and EMTs are often unsure how to interact with autonomous vehicles during emergencies. How do you recommend companies and policymakers ensure first responders are prepared for autonomous vehicle deployment—and that AVs are trained for interactions with first responders?

Answer. The U.S. Department of Transportation’s Transforming Transportation Advisory Committee (TTAC) recommended developing and implementing a workplan for automated vehicle (AV) interactions with first responders.¹³ Experts and stakeholders who experienced the problems you described wrote this detailed recommendation, and I fully support it.

First responders understand that every emergency is unique. To respond effectively, they integrate their systematic training with their human creativity. But automated vehicles may struggle in the edge cases in which first responders can excel. AVs may stop when they should move or move when they should stop. They may respond in ways that are counterintuitive to any human, or they may not respond at all.

Given this, AVs should be as recognizable, consistent, predictable, and controllable as possible for first responders. Emergency guides are necessary, but they are not sufficient. This is because first responders may not have time to find and con-

⁷Press Release, Cruise Admits to Submitting a False Report to Influence a Federal Investigation and Agrees to Pay \$500,000, U.S. ATT’Y’S OFF. N. DIST. CAL. (Nov. 14, 2024), <https://www.justice.gov/usao-ndca/pr/cruise-admits-submitting-false-report-influence-federal-investigation-and-agrees-pay>.

⁸See generally, Bryant Walker Smith, “Self-Driving” Means Self-Driving, 74 DRAKE L. REV. (forthcoming 2026), <https://ssrn.com/abstract=5631391>.

⁹Trisha Thadani & Faiz Siddiqui, *Tesla Said It Didn’t Have Key Data in a Fatal Crash. Then a Hacker Found It.*, WASH. POST (updated Aug. 29, 2025), <https://www.washingtonpost.com/technology/2025/08/29/tesla-autopilot-crashes-evidence-testimony-wrongful-death/>; Jonathan Stempel, *US Judge Upholds \$243 Million Verdict Against Tesla over Fatal Autopilot Crash*, REUTERS (Feb. 20, 2026), <https://www.reuters.com/world/us-judge-upholds-243-million-verdict-against-tesla-over-fatal-autopilot-crash-2026-02-20/>.

¹⁰TTAC TRANSFORMING TRANSP. ADVISORY COMM., FORMAL RECOMMENDATIONS OF THE TRANSFORMING TRANSPORTATION ADVISORY COMMITTEE TO THE U.S. DEPARTMENT OF TRANSPORTATION ON ARTIFICIAL INTELLIGENCE, AUTOMATED DRIVING, PROJECT DELIVERY, AND INNOVATION FOR SAFETY 54–59 (Dec. 13, 2024), <https://www.transportation.gov/sites/dot.gov/files/2025-01/TTAC%202024%20Report.pdf>; see also Walker Smith & Wansley, *supra* note 2.

¹¹*Scientia Potentia Est*, WIKIPEDIA (updated Feb. 25, 2026), https://en.wikipedia.org/wiki/Scientia_potentia_est.

¹²Walker Smith *et al.*, *supra* note 2; Walker Smith & Wansley, *supra* note 2.

¹³TTAC, *supra* note 10, at 54–59.

sult each developer's bespoke instructions. Consider that, for *electric* vehicles, NHTSA maintains a growing database of 636 different emergency response guides.¹⁴

Similarly, remote agents need positional authority, situational awareness, relevant training, and technical means to effectively assist first responders. Even then, remote agents are not a panacea: Firefighters often wear bulky gloves that may prevent them from using cell phones, and the noise of an emergency scene may prevent them from hearing an AV's remote human agent through the AV's speakers.

Accordingly, it is also important that remote assistants be able, with appropriate safeguards, to access primary or supplemental manual controls that would allow them to operate an AV directly. And yet a bill under consideration in the House would prohibit states from requiring backup physical controls of some kind.¹⁵

More broadly, AV developers need to be proactive and imaginative. After the Cruise incident that I described above, I assumed that every company would redesign its systems to be able to directly or indirectly see and hear under their vehicles. And yet Waymo recently killed a cat and then a dog under circumstances that suggest I was wrong. Next time, those beloved pets could be human children. Or they could be bombs in the undercarriage.

Another example illustrates this lack of imagination in the context of emergencies. In December 2025, Waymo's AVs contributed to gridlock in San Francisco because the company's remote agents were overwhelmed by requests for assistance at intersections with nonfunctional traffic signals. And yet, *a full year earlier*, TTAC had warned about AVs "[f]ailing to navigate intersections effectively where traffic signals are not functioning properly and making unexpected stops in hazardous locations where a power outage or high cellular demand has slowed communications between driverless AVs and human advisors."¹⁶

Waymo, to its credit, publicly responded to the December incident with an explanation of what happened and the steps it was taking in response. It had designed for individualized signal failures, hadn't considered the effect of somewhat wider failures, and was now doing so.¹⁷ But in describing a power outage that affected only *one part of one city* in which only a *couple thousand* AVs were operating, the company used phrases such as "widespread PG&E outage," "scale and sheer number of disabled traffic lights," "situation was severe enough that," and "an event of this magnitude." A regional power outage, regional cell outage, large earthquake, mass evacuation, or combination of these events would be *many orders of magnitude* worse. And it could happen at a time when AVs are much more common on our roads and much more essential in our daily lives.

To be credible, an automated driving developer's safety case must realistically plan for a wide range of failures, disasters, attacks, and other emergencies.¹⁸

3. *Preemption.* Without a Federal framework to meaningfully regulate AI and autonomous vehicles, states across the country have stepped up to protect people. What are the risks of Federal preemption of state laws, particularly while almost no Federal guardrails on autonomous vehicles are in place?

Answer. Preempting state laws with respect to automated driving is at best premature and at worst dangerously counterproductive. We must empower, not disempower, our communities. As I noted in my written testimony:

Preempting state and local authority would be profoundly short-sighted—and I say this as someone who believes in the potential of automated driving.

Many states very much want the Federal government to lead on AV policy. But great leaders lead. They actually do the work. They don't just order others to stop working. Telling U.S. DOT what to do (and providing the resources needed to do it) would be far more helpful than telling states what not to do.

Preemption would not necessarily create certainty. Rather, it could lead to years of litigation over what the relevant statutory language means and therefore what states can still do and therefore what companies can actually do. Over the years, I have read many versions of potential preemption language. In every

¹⁴Emergency Response Guides, NHTSA, <https://www.nhtsa.gov/emergency-response-guides> (last visited Feb. 25, 2026).

¹⁵The SELF DRIVE Act under consideration in the House could prevent states from requiring these AVs to have some kind of manual controls for emergencies. H.R. 7390, 119th Cong. 2d Sess. (2026), <https://www.congress.gov/bills/119th-congress/house-bill/7390>; see also *infra*.

¹⁶TTAC, *supra* note 10.

¹⁷The Waymo Team, *Autonomously Navigating the Real World: Lessons from the PG&E Outage*, WAYPOINT (Dec. 23, 2025), <https://waymo.com/blog/2025/12/autonomously-navigating-the-real-world>; see also Bryant Walker Smith, *On Waymo's Traffic Jams*, CIS CTR. INTERNET & SOC'Y (Dec. 21, 2025), <https://cyberlaw.stanford.edu/on-waymos-traffic-jams/>.

¹⁸For more, see Walker Smith & Wansley, *supra* note 2.

case, the preemptive effect and even the preemptive intent of that language have been unclear to me.

Preemption would not necessarily improve safety. Again: It is states that can order unsafe vehicles and unsafe drivers—human or otherwise—off the roads. And it is states whose juries tell manufacturers to keep up with new technologies when Federal standards fall behind. Automakers don't like to be sued. But they know how to manage, and the best ones take seriously their responsibility to fairly compensate victims.

Preemption would not necessarily improve global competitiveness. Our AV industry is flourishing today because of the foundational research that the Federal government supported decades ago. And while Brand America does have a serious credibility problem abroad, this has nothing to do with our commitment to federalism at home.

In fact, this federalism offers choice to U.S. and foreign companies. Some companies have embraced California for the certainty they believe it offers, and some have embraced Texas for the flexibility they believe it offers. Waymo has done both and now has activity in multiple states and even countries.

Finally, there is a fundamental issue that discussions about preemption often seem to overlook.

We find ourselves in a time of profound change. Change often involves a loss of control, whether actual or perceived. That can be scary and destabilizing both for individuals and for societies.

The ability of communities to set their own rules—and yes, even restrictions—on AVs acts as a steam release valve on a boiler. It keeps pressure from building up, and that in turn reduces the risk of catastrophic explosion.¹⁹

In case this letter reaches readers beyond the capable senators to whom it is addressed, I should pause to introduce the incredibly complex topic of Federal preemption of state law.

The U.S. Constitution's Supremacy Clause says that when a valid Federal law fights with a state law (including local law), the Federal law wins. This is called preemption:

- Express preemption occurs when Federal law explicitly tells states what they cannot do.
- Implied preemption is more nuanced. Comprehensive Federal law in a particular field may indicate an intent to displace all state law in the same field. Federal law may conflict with state law in a way that makes complying with both impossible. Or, even if compliance is possible, following state law may nonetheless frustrate Federal law.
- Congress can use a “savings clause” to specify that it does *not* intend to preempt state law in whole or in part.

Preemption can set a floor or a ceiling for state action. For example, Federal law may permit states to set higher but not lower standards—or to set lower but not higher standards. Because state law is generally what allows individuals to sue companies for injuring them, Federal preemption may also limit the discretion of judges and juries in deciding whether a company's relevant conduct or product was reasonably safe.

The National Traffic and Motor Vehicle Safety Act of 1966—a monumental safety accomplishment—illustrates all of this:

- Federal motor vehicle safety standards (FMVSS) are an example of express preemption, because Federal law says that, in general, a state “may prescribe or continue in effect a standard applicable to the same aspect of performance of a motor vehicle or motor vehicle equipment only if the [state] standard is identical to the FMVSS.”²⁰

¹⁹ Written Testimony of Professor Bryant Walker Smith for the U.S. Senate Commerce Committee's Hearing on Automated Driving (Feb. 4, 2026), <https://www.commerce.senate.gov/services/files/05C131FA-5011-406D-A9A1-C64BE8E81CE4>; see also Bryant Walker Smith, *Opening Statement of Professor Bryant Walker Smith for the U.S. Senate Commerce Committee's Hearing on Automated Driving*, CIS CTR. INTERNET & SOC'Y (Feb. 4, 2026), <https://cyberlaw.stanford.edu/blog/2026/02/opening-statement-of-professor-bryant-walker-smith-for-the-u-s-senate-commerce-committees-hearing-on-automated-driving-february-4-2026-2/> [hereinafter Walker Smith, *Opening Statement*].

²⁰ 49 U.S.C. § 30103(b)(1).

- The Act includes a savings clause specifying that state or local government may set a higher standard for the vehicles it purchases for its own use.²¹
- The Act includes another savings clause specifying that a manufacturer can be held liable for an injury caused by its product even if that product met all FMVSS.²²
- The U.S. Supreme Court has nonetheless held that this savings clause does not prevent all implied preemption. In one case, the Supreme Court decided that a crash victim *could not* win a lawsuit against an automaker for not having an airbag when the FMVSS offered automakers a choice between an airbag or an automatic seatbelt.²³
- And yet, in another case, the Supreme Court decided that a crash victim *could* win a lawsuit against an automaker for not having a lap-and-shoulder belt when the FMVSS offered automakers a choice between lap-only belts and lap-and-shoulder belts.²⁴

This is all really complicated—even though the preemption provisions of the National Traffic and Motor Vehicle Safety Act seem, on their face, to be straightforward. And yet it still took decades for courts to find (or arguably invent) many of the devils in the details.²⁵

Adding even more preemption to this picture will not bring clarity. Instead, it will bring more complexity, more uncertainty, and more litigation. To see what I mean, consider the lengthy preemption language in the SELF DRIVE Act of 2026 currently under consideration in the U.S. House of Representatives.²⁶ Here are just *some* of the genuine questions that it raises:

1. The bill focuses almost entirely on “manufacturers of automated driving systems and manufacturers of ADS-equipped vehicles.” But which companies would be manufacturers, and which would not?²⁷ If the term is interpreted narrowly, then AVs could conceivably reach public roads without ever having a “manufacturer” subject to the bill’s framework. But if the term is interpreted broadly, then the bill could preempt state authority over many actors associated with AV development and deployment.
2. States generally have authority over driving licenses. One approach to regulating automated vehicles is to require automated driving companies, their automated driving systems, or their vehicles to have the equivalent of a driving license. Would that approach be preempted?
3. Could a state require that every vehicle operated on public roads be constantly supervised by an attentive human driver as subsection (C)(i) seems to suggest?
4. In some states, a vehicle that is not roadworthy cannot be registered, cannot be passed during a safety inspection, or cannot be lawfully operated on public roads. Could a state restrict entire makes or models of AVs on any of these bases as subsection (C) seems to suggest?
5. Some states require automakers to register with the state (for the purpose of legal service). Is this a “generally applicable consumer protection law”? What if a state specifically required companies that are developing or deploying AVs to register?
6. It appears that proposed section 30130(c) could prohibit NHTSA from requiring a “manufacturer” of an ADS-dedicated vehicle (*e.g.*, a robotaxi) to have even basic manual controls that would allow a first responder to carefully

²¹ *Id.*

²² 49 U.S.C. § 30103(e).

²³ *Geier v. Am. Honda Motor Co.*, 529 U.S. 861 (2000).

²⁴ *Williamson v. Mazda Motor of Am.*, 562 U.S. 323 (2011).

²⁵ The National Traffic and Motor Vehicle Safety Act is not even the only Federal law relevant to a discussion of preemption in the context of motor vehicle safety. The U.S. Supreme Court has repeatedly interpreted the Federal Arbitration Act to preempt state law—even a state’s determination that a class-action waiver was unenforceable for being “unconscionable.” See *AT&T Mobility LLC v. Concepcion*, 563 U.S. 333 (2011); *see also infra* (discussing forced arbitration).

²⁶ SELF DRIVE Act of 2026, H.R. 7390, 119th Cong. (2026), <https://www.congress.gov/bills/119th-congress/house-bill/7390>. If enacted, the section on “FEDERAL PREEMPTION FOR AUTOMATED DRIVING SYSTEMS AND ADS-EQUIPPED VEHICLES” would presumably be codified as 49 U.S.C. § 30103(b)(3).

²⁷ 49 U.S.C. § 30102(a)(6) defines “manufacturer” as “a person (A) manufacturing or assembling motor vehicles or motor vehicle equipment; or (B) importing motor vehicles or motor vehicle equipment for resale.” But this definition is much less clear in the new and potentially diverse world of automated driving.

move the vehicle when it is disabled. Could a city or state nonetheless require such controls?

7. If a “manufacturer” seeks to operate its own robotaxi or delivery service with its own vehicles, does the state have any regulatory authority? State regulation of ridehailing, for example, could “prohibit[] in whole or in part a manufacturer from . . . introducing . . . into interstate commerce” its robotaxis.
8. How is subsection (A) (“a State . . . may not . . . prohibit[] . . . a manufacturer from . . . offering [an AV] for sale. . . .”) to be reconciled with subsection (D) (“Nothing in this paragraph may be construed to prohibit a State . . . from . . . enforcing . . . any law . . . relating to the sale . . . of [AVs]”)?
9. Why is there no explicit reference to regulation of an AV’s “operation”? Is this within or beyond the initial scope of preemption (“introducing or delivering for introduction into interstate commerce”)? If so, is this within or beyond the scope of the carve-outs?
10. Would the general preemption provision prevent states from requiring that robotaxi vehicles or services be accessible to persons with disabilities—particularly when the absence of a human driver adds accessibility challenges?
11. Why does the savings clause about “liability at common law” reference compliance with proposed section 30130(b)(1)(B), with which only the U.S. Department of Transportation can comply? And, by referencing only some provisions in existing and proposed law, does it imply that compliance with *other* provisions *could* exempt a company from this liability?
12. Federal motor vehicle safety standards generally apply to the sale of “new” (or newly imported) motor vehicles and equipment. The language about safety cases could be similarly interpreted to refer only to what a manufacturer must demonstrate at that time zero. How does the framework that this bill envisions work after a year or ten years? Are states precluded from requiring that “manufacturers” (or other companies) update their safety cases?

I’ll stop at a dozen. Again, these are just *some* of the questions raised just by this bill’s preemption language. If the bill becomes law, many additional questions will arise as automated driving expands and diversifies.²⁸ Moreover, even if the drafters understand what their language means and even if they succeed in explaining their understanding to others, courts faced with interpreting this sprawling text might well reach very different understandings.²⁹ And I doubt that Congress will be eager to attempt a sequel.

At this point, legislation to preemptively preempt state authority over automated driving is a problem in search of a problem. The far better approach is simply for Congress to provide direction and resources for the Federal government to carefully, holistically, and proactively regulate automated driving in a way that gives states and cities confidence. Many of these other governments will happily defer. Others may fill in the gaps. Their approaches may evolve, especially as new issues invariably arise down the road. We can embrace technical innovation on our roads as well as regulatory innovation in our “laboratories of democracy.”³⁰

Finally, because your question is about preemption, please allow me an aside: I did not understand why, during the relevant Senate hearing, preemption was discussed by others in connection with the People’s Republic of China. While Congress can preempt some U.S. state law, it cannot preempt the domestic law of China or, for that matter, any other sovereign country. And under current Chinese law, a company must negotiate with *each individual city* in which it seeks to deploy automated vehicles without a safety driver.

²⁸This field will almost certainly continue to see novel “technologies, applications of those technologies, business cases for those applications, and participants in those business cases.” UNIF. L. COMM’N, UNIFORM AUTOMATED OPERATION OF VEHICLES ACT (2019), <https://www.uniformlaws.org/viewdocument/final-act-29>.

²⁹To wit: The Federal Arbitration Act, which I discuss below, “was intended to narrowly apply to disputes between merchants, not between a business and its consumers or workers”—and yet, decades later, “the Supreme Court drastically expanded” its application “to arbitration clauses in everyday contracts.” H.R. Rep. No. 117–234 (2022), <https://www.congress.gov/117/crpt/hrpt234/CRPT-117hrpt234.pdf>.

³⁰*Laboratories of Democracy*, WIKIPEDIA (last updated Dec. 20, 2025), https://en.wikipedia.org/wiki/Laboratories_of_democracy.

Senator Duckworth, you asked about accessibility.

Question 1. Would you be concerned about Federal legislation preempting State and local laws adopting accessibility requirements for the benefit of people with disabilities?

Answer. I am very concerned about this possibility. Even if preemption language is not *intended* to interfere with state and local efforts toward accessibility, that could nonetheless be the *effect*. I discuss preemption more extensively in my answer to Senator Klobuchar above.

Question 2. What would be the effect of forced arbitration agreements imposed on AV users on mobility and safety for the disabled community?

Answer. In my view, a “*trustworthy*” company might still arbitrate—but in a way that is accessible, transparent, voluntary, reviewable, and genuinely remedial. An *untrustworthy* company designs and implements a system that undermines these very principles.”³¹ Forced arbitration is the quintessential example of the latter. It is a betrayal of the public’s trust.

Forced arbitration privileges the powerful over the powerless. It is not a serious remedy, and it therefore denies the seriousness of the rights and harms subject to it. Because clauses mandating arbitration are so ubiquitous in ordinary consumer contracts, individuals have no real power to avoid it. And because of how the Federal Arbitration Act is interpreted, states have no real power to protect their own residents from it.

When used by powerful providers of mobility services (including ridesharing as well as robotaxis), forced arbitration can be especially pernicious for people with disabilities.

Forcing arbitration on people with disabilities may mean coercing those with the fewest alternatives. If I don’t like a ridehailing company’s terms of service, I can choose to drive myself in my used car.³² But someone who is blind or otherwise cannot drive does not have this same choice. In other words, those for whom automated driving is supposed to offer the most freedom are also the ones most captive to the companies promising that freedom.

Conventional ridehailing shows how people already experience this vulnerability. Ridehailing drivers routinely strand blind passengers with guide dogs at the curb—speeding away without a word, locking their doors, or shouting “no dogs allowed.”³³ In one survey of the blind and low-vision community, 60 percent of those who primarily used ridehailing reported discrimination in these services.³⁴ A wheelchair user denied a ride faces a similar predicament—often unable to drive or reach another mode of transit and dependent on the next driver who may refuse to serve them as well. And nearly 40 percent of rideshare passengers who use wheelchairs have reported ridehailing service denial.³⁵

Disability-based discrimination is often systemic, and the Americans with Disabilities Act was designed to create systemic accountability. And yet forced arbitration is intentionally designed to prevent systemic claims. Arbitration clauses often include class-action waivers, and the U.S. Supreme Court has interpreted the Federal Arbitration Act to preempt states from prohibiting these waivers.³⁶ The result is systemic failures atomized into individual disputes too small to pursue or lacking the pattern evidence that may be necessary to win.³⁷

In these ways, forced arbitration can also prevent the public from learning about pervasive problems with a product, service, company, or industry. It makes victims invisible. It conflates good companies with bad companies. And it wrests from judges and juries their important role in expressing community values. Forced arbitration on individuals is like preemptive preemption on states: They each silence the voices we most need to hear at the times we most need to hear them.³⁸

Congress can correct how the Federal Arbitration Act is interpreted and thereby return to states that power to protect their own residents. Congress can also protect people directly:

³¹ Walker Smith, *supra* note 3.

³² While my car was manufactured by a company that has no contractual relationship with me, forced arbitration is also a problem in the automotive context.

³³ Sylvia A. Brady *et al.*, *Transportation, Ride-Hailing and Discrimination Among the Blind and Low Vision Community*, 36 *Transp. Rsch. Interdisc. Persp.* 101837, at 6 (2026), <https://www.sciencedirect.com/science/article/pii/S2590198226000023>.

³⁴ *Id.*

³⁵ Mahtot Gebresselassie, *Wheelchair Users’ Perspective on Transportation Service Hailed Through Uber and Lyft Apps*, 2677 *Transp. Rsch. Rec.* 1164 (2023), <https://journals.sagepub.com/doi/pdf/10.1177/03611981221140369>.

³⁶ *AT&T Mobility LLC v. Concepcion*, 563 U.S. 333 (2011); *see also supra* note 25.

³⁷ *See, e.g., supra* (discussing vehicle-level and fleet-level approaches to accessibility).

³⁸ Please see my discussion of preemption, *supra*.

In 2022, it *overwhelmingly* passed the Ending Forced Arbitration of Sexual Assault and Sexual Harassment Act to let victims of sexual assault and harassment turn to the courts.³⁹

A final note: In writing this answer, I was reminded of how, in 1838, one judge described the tremendous potential of railroads. Their promise of “such noble ends,” he continued, was the very reason why “we must engraft the railroad system in the affections, as well as the interest of the people; and the parents of so much enterprise, wealth, and national good, must not be justified wrong, else they might become the tyrants of the day.”⁴⁰

Question 3. Are there unique safety and operational considerations with respect to AVs and people with disabilities that policymakers should take into account as we consider AV legislation?

Answer. Yes. It is important that innovation and inclusion go hand in hand. As the U.S. Department of Transportation’s Transforming Transportation Advisory Committee (TTAC) wrote:

[I]nnovation is about more than just new technologies. It’s also about new approaches, policies, and frameworks. The Safe System Approach embraces redundancy so that death is not the inevitable result of failure. The Americans with Disabilities Act (ADA) boldly envisions a society just as open to those with mobility issues and other disabilities as to those without. Of course, we are still far from these goals. And yet every day, to take just one example, hundreds of millions of ADA-required curb cuts provide equal access to people in wheelchairs—and benefit parents who are pushing strollers, travelers who are pulling suitcases, and people who might otherwise stumble on a step.⁴¹

But as you correctly caution, the relationship between technology and accessibility is complex. Automated driving could improve quality of life for many people who cannot drive today or who may be unable to drive tomorrow. It could offer better options for travel as well as better alternatives to that travel. At the same time, automated driving could create technological challenges for people who currently rely on the assistance that human drivers provide. And it could shift some transportation services away from a conventional transit model and thereby *potentially* away from *some* associated federal, state, and local requirements for accessibility.

Congress should first do no harm. But, as I described above, preemption that is broad or even just clumsy could disempower the state and local governments that may seek to prioritize accessibility. This would be harmful.

Beyond that, Congress should reinvigorate, direct, and support prior accessibility initiatives at the Federal level, including an advisory committee on transportation equity,⁴² NHTSA’s report to Congress on AV accessibility,⁴³ USDOT’s Inclusive Design Challenge,⁴⁴ and the U.S. Access Board’s work on AVs.⁴⁵ These efforts should also draw on outside expertise, including relevant work by the Consortium for Con-

³⁹Ending Forced Arbitration of Sexual Assault and Sexual Harassment Act of 2021, Pub. L. No. 117–90, 136 Stat. 26 (2022) (codified at 9 U.S.C. §§ 401–402), <https://www.congress.gov/bills/117/congress/house-bill/4445/text>. The Act passed the House 335–97 and the Senate by voice vote.

⁴⁰State v. Tupper, 23 S.C.L. 135, 141 (S.C. App. L. 1838).

⁴¹TTAC, *supra* note 10.

⁴²Transportation Equity Act, H.R. 2167, 119th Cong. 2d Sess. (2026), <https://www.congress.gov/bills/119th-congress/house-bill/2167>.

⁴³NHTSA, RESEARCH ON THE ACCESSIBILITY OF AUTOMATED VEHICLES REPORT (Dec. 2022), https://www.nhtsa.gov/sites/nhtsa.gov/files/2022-12/Report-to-Congress-Research-on-the-Accessibility-of-Automated-Vehicles-tag_0.pdf.

⁴⁴Inclusive Design Challenge, U.S. DEP’T OF TRANSP. (last updated Apr. 25, 2024), <https://www.transportation.gov/accessibility/inclusivedesign>.

⁴⁵Inclusive Design of Autonomous Vehicles, U.S. ACCESS BD. (July 2021), <https://www.access-board.gov/av/>.

stituents with Disabilities (CCD) Transportation Task Force,⁴⁶ the American Association of People with Disabilities,⁴⁷ SAE International,⁴⁸ and others.⁴⁹

If Congress passes legislation to specifically and explicitly regulate automated driving, it could:

- Direct NHTSA to prioritize FMVSS exemption requests for vehicles that incorporate inclusive design.⁵⁰
- Specify that an automated driving company required to develop a safety case must address interaction with and access for persons with disabilities.⁵¹
- Clarify how the Americans with Disabilities Act (ADA) applies to the various companies involved in the provision of on-demand rides (regardless of whether those rides are in conventional or automated vehicles).⁵²

Unfortunately, the accessibility of automated vehicles and services is a contentious issue—even more so at a time when the rights of people with disabilities are under attack. I can at most offer a few thoughts:

First, it is important to regulate automated driving in a way that does not unfairly advantage conventional driving, and it is important to regulate shared vehicles in a way that does not unfairly advantage personal vehicles.⁵³ But if travel shifts from either personal vehicles or conventional public transit to robotaxis, then specifically ensuring the accessibility of these robotaxis will become essential. (So too for local delivery robots.)

Second, it is often said that automated driving blurs the distinction between driver and vehicle. This matters for the regulation of both safety and accessibility. Whether officially or unofficially, professional drivers often provide specific assistance to riders with disabilities, such as securing a rider's wheelchair.⁵⁴ Automating

⁴⁶ Letter from Consortium for Constituents with Disabilities Transp. Task Force to Ted Cruz, Chairman, & Maria Cantwell, Ranking Member, S. Comm. on Com., Sci. & Transp. (Feb. 4, 2026), <https://dredf.org/wp-content/uploads/2026/02/2026.02.04-Commerce-AV-Hearing-Disability-Letter-for-the-Record-Access-Pass.pdf>.

⁴⁷ *We Will Ride*, AAPD (2022), <https://www.aapd.com/we-will-ride>.

⁴⁸ SAE International (formerly the Society of Automotive Engineers) has developed several standards on vehicle accessibility, including two on robotaxis specifically. See *Vehicle Accessibility*, SAE INT'L, <https://www.sae.org/taxonomies/vehicle-accessibility> (last visited Feb. 26, 2026); SAE J3171: *Identifying Automated Driving Systems-Dedicated Vehicles (ADS-DVs) Passenger Issues for Persons with Disabilities*, SAE INT'L (Sept. 24, 2025), <https://www.sae.org/standards/j3171-202509-identifying-automated-driving-systems-dedicated-vehicles-ads-dvs-passenger-issues-persons-disabilities>; SAE J3261: *Resources for Accommodating the Needs of Persons with Disabilities Using ADS-DVs*, SAE INT'L (forthcoming 2026), <https://www.sae.org/standards/j3261-resources-accommodating-needs-persons-disabilities-using-ads-dvs>. J3261 acknowledges that the document itself is not accessible to persons using screen readers. I hope and expect that this will be remedied in the next version.

⁴⁹ See, e.g., Fahimeh Golbabaie *et al.*, *Enabling Mobility and Inclusion: Designing Accessible Autonomous Vehicles for People with Disabilities*, 154 CITIES 105333 (Nov. 2024), <https://www.sciencedirect.com/science/article/pii/S026427512400547X>.

⁵⁰ Walker Smith & Wansley, *supra* note 2. Some past bills would have increased the number of vehicles per manufacturer per year that NHTSA can exempt from a Federal Motor Vehicle Safety Standard. But while NHTSA is limited in its ability to grant exemptions to those standards, the agency has the authority to change those standards in a way that obviates the need for those exemptions. See Bryant Walker Smith, *Here's Where Federal Automated Driving Law Stands Near the End of the Biden Administration*, CIS CTR. INTERNET & SOC'Y (Nov. 18, 2024), <https://cyberlaw.stanford.edu/blog/2024/11/heres-where-federal-automated-driving-law-stands-near-the-end-of-the-biden-administration>.

⁵¹ The current draft of the SELF DRIVE Act of 2026 under consideration in the U.S. House would require "manufacturers" to develop safety cases but does not explicitly include accessibility in them. See *supra* note 27. To reiterate what I emphasized in my opening statement at the hearing: "Safety is a marriage, not a wedding. Safety is a lifelong commitment that continues as long as an AV is on the road. It's not just a one-time test or certification or checklist. A credible safety case must be a living document that is clearly supported, robustly interrogated, and routinely updated. Vehicles placed on our roads stay there for decades and therefore need oversight for decades." Walker Smith, *Opening Statement*, *supra* note 19.

⁵² For an analysis of the disputed status of companies such as Uber and Lyft under the ADA, see MAEVE MOYNIHAN & JILL L. BEZYAK, RAPID RSCH. REP., WHAT DO RIDERS AND DRIVERS NEED TO UNDERSTAND REGARDING THE ADA BEFORE RIDING WITH OR DRIVING FOR A RIDESHARE COMPANY? (2025), https://rockymountainada.org/sites/default/files/2025-07/Rideshare%20and%20the%20ADA_Final.pdf.

⁵³ See TTAC, *supra* note 10, at 91–92; Bryant Walker Smith, *Ethics of Artificial Intelligence in Transport*, in THE OXFORD HANDBOOK OF ETHICS OF AI (Markus D. Dubber *et al.*, eds., 2020), <https://ssrn.com/abstract=3463827>; Walker Smith & Wansley, *supra* note 2.

⁵⁴ Walker Smith & Wansley, *supra* note 2. Of course, some professional drivers do not provide this assistance. See, e.g., Golbabaie *et al.*, *supra* note 49.

the “dynamic driving task” does not necessarily mean automating these other tasks and, absent regulation, might therefore mean simply not performing them.

Third, there is significant disagreement—both in policy and in law—about whether and what kinds of accessibility should be at the vehicle level or the fleet level.⁵⁵ In the context of conventional transportation, unfortunately, a fleet-level approach rarely provides anything close to the “equivalent service” described by the ADA.

Fourth, a hybrid between the vehicle and fleet levels might be necessary to account for the wide range of accessibility needs. Some attributes of accessibility, such as audible and visual communications, should be universal as a basic part of safe design. Other attributes, particularly those for which automation is still no match for humans, may require a fleet approach. And here a model analogous to the corporate average fuel economy (CAFE) standards and associated credits might create more of a market for accessible services.

Fifth, California already collects a fee of five cents per Uber and Lyft trip to fund its TNC Access for All Fund, which in turn supports “businesses or nonprofits that provide transportation to people with disabilities, especially people who require” wheelchair-accessible vehicles.⁵⁶ This is laudable. But it also brings me back to my first point: Funding adequate accessibility should be the responsibility of all taxpayers or at least all road users.

I would like to see Congress go further than this, especially at a time when our growing senior population is helping to highlight the substantial unmet mobility needs of people with disabilities. The Federal Enhanced Mobility of Seniors and Individuals with Disabilities Program already directs some money from the Highway Trust Fund to specialized public transportation.⁵⁷ I would supplement this with a “Cent for Seniors”—an increase in the Federal fuel excise tax of a penny per gallon directed toward accessible mobility, including *viable* automated services.

Senator Blunt Rochester, you asked about accessibility, American competitiveness, and our workforce.

1. *Accessibility.* Autonomous vehicles (AV) have the potential to improve accessibility and mobility for individuals with disabilities. As proponents of Federal AV legislation consider potential preemption of state and local laws, I want to ensure the Federal legislation doesn’t undermine existing benefits for individuals with disabilities. What should Congress consider in federal AV legislation to ensure the needs of individuals with disabilities are taken into account?

Answer. Please see my answer to Senator Duckworth’s question above.

2. *American Competitiveness.* The U.S. is in a global race to develop and deploy emerging technologies, including AVs. To do so successfully, we must have a robust Federal workforce to ensure these technologies are developed responsibly. However, in the wake of the Trump administration’s Federal workforce cuts, the National Highway Traffic Safety Administration (NHTSA), the regulatory body for AV deployment, was significantly reduced in size. How will these cuts impact America’s ability to compete on a global scale?

Answer. NHTSA is a tiny agency. Its total headcount is roughly equivalent to that of a single Amazon warehouse, and its automated driving team would be easily outnumbered by the workers in a single McDonald’s restaurant. The inexplicable cuts to this automation team were particularly devastating in terms of capacity, expertise, institutional knowledge, and morale. These circumstances are also likely to make future recruitment more challenging.

Even before these cuts, NHTSA was struggling. European roads are far safer than American roads,⁵⁸ in part because new vehicles in the European Union must meet

⁵⁵ See, e.g., Golbabaie *et al.*, *supra* note 49; MOYNIHAN & BEZYAK, *supra* note 52.

⁵⁶ Walker Smith & Wansley, *supra* note 2; see CAL. PUB. UTIL. CODE § 5440.5(a)(1); *Transportation Network Company (TNC) Access for All Program*, CAL. PUB. UTILS. COMM’N (2024), <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/consumer-protection-and-enforcement-division/documents/tlab/accessforall/tnc-access-for-all-factsheet-2024-final.pdf>.

⁵⁷ 49 U.S.C. § 5310; see also WILLIAM J. MALLETT, CONG. RSCH. SERV., R47002, *FEDERAL PUBLIC TRANSPORTATION PROGRAM: IN BRIEF* (Apr. 18, 2025), <https://www.congress.gov/crs-product/R47002>.

⁵⁸ Int’l Transp. Forum, *Road Safety Annual Report 2025* (2025), <https://www.itf-oecd.org/sites/default/files/docs/irtad-road-safety-annual-report-2025.pdf>; U.N. Econ. Comm’n for Eur., *Statistics of Road Traffic Accidents in Europe and North America*, vol. LVII (2023), <https://w3.unece.org/roadsafety/2023>; Angie Schmitt, *Why the U.S. Leads the Developed World on Traffic Deaths*, Streetsblog USA (Dec. 13, 2018), <https://usa.streetsblog.org/2018/12/13/why-the-u-s-trails-the-developed-world-on-traffic-deaths>.

many important safety requirements that new vehicles in the United States need not.⁵⁹

For years, NHTSA has routinely missed Congressional deadlines for progress on critical safety standards⁶⁰ and declined to implement safety recommendations from the National Transportation Safety Board (NTSB). NTSB's chair has said that NHTSA's inaction "tells me you're not serious about safety,"⁶¹ and NHTSA's former deputy has described the agency as "chronically underfunded and over-politicized."⁶²

Our dangerous roads are a direct threat to our competitiveness. Every year, crashes cause some \$340 billion in economic costs⁶³—money that could otherwise be used to invest, innovate, and compete. Quality-of-life harm amounts to some \$1 trillion—an extraordinary number that still fails to capture the lifelong or even multigenerational effect of losing a partner, parent, or child. We are spending our national wealth on funerals instead of futures.

The rest of the world sees that we are not doing well. I spent most of 2025 in Asia and Europe, and I watched as attitudes toward the United States changed. To be blunt: We went from a leader to a bully. In the process, we undermined our own institutions, companies, and technologies. We taught the world to look elsewhere. And when trust no longer tips the scales, you might as well choose the Chinese car that is cheaper, cleaner, and cooler.

3. *Workforce.* With the rollout of new technologies like AVs, we have seen their integration into commercial industries, like trucking. While I anticipate that some new jobs could be created, including terminal operators and specialized maintenance positions, I am concerned that these new job opportunities will pale in quantity to the jobs lost due to these new technologies. Can these new positions sustain the potential job losses in these industries? What should we do now to prepare for these changes to the affected industries?

Answer. Your concern is justified, and I don't have good answers. In understanding this issue, I start with four premises:

1. The AI revolution might be merely the latest iteration of creative destruction; new jobs will replace old jobs.
2. The AI revolution might instead be an unprecedented shift to a state in which labor and capital are fully interchangeable; new jobs will *not* replace old jobs.
3. We don't know which of these two predictions will prove more accurate (or when).
4. *Regardless*, we do know that the transition, like those of past industrial revolutions, will be painful to the individuals and communities who are negatively impacted.

⁵⁹ See Eur. Transp. Safety Council, *Comparative Overview EU-US Vehicle Standards* (Nov. 20, 2025), <https://etsc.eu/comparative-overview-eu-us-vehicle-standards>.

⁶⁰ See, e.g., U.S. Gov't Accountability Off., GAO-22-104635, *Traffic Safety: Implementing Leading Practices Could Improve Management of Mandated Rulemakings and Reports* (Apr. 2022), <https://www.gao.gov/assets/gao-22-104635.pdf>; Nat'l Highway Traffic Safety Admin., *Rulemaking Status Report* (Dec. 2024), <https://www.nhtsa.gov/sites/nhtsa.gov/files/2024-12/report-congress-status-rulemakings-december-2024.pdf>; Letter from Rep. Debbie Dingell & Sen. Ben Ray Lujan to Jonathan Morrison, Adm'r, NHTSA (Sept. 19, 2025), https://debbie.dingell.house.gov/uploadedfiles/9.19.2025_dingell-lujan_letter_to_nhtsa_on_halt_act.pdf; Press Release, Sen. Edward J. Markey, Senators Markey, Blumenthal Urge NHTSA to Quickly Implement Life-Saving Traffic Safety Provisions (Nov. 20, 2024), <https://www.markey.senate.gov/news/press-releases/senators-markey-blumenthal-urge-nhtsa-to-quickly-implement-life-saving-traffic-safety-provisions>; Press Release, Sen. Chris Van Hollen, On Anniversary of Bipartisan Infrastructure Law, Van Hollen, Markey, Blumenthal, Colleagues Call on NHTSA to Implement Critical Safety Provisions (Nov. 15, 2022), <https://www.vanhollen.senate.gov/news/press-releases/on-anniversary-of-bipartisan-infrastructure-law-van-hollen-markey-blumenthal-colleagues-call-on-nhtsa-to-implement-critical-safety-provisions>; Press Release, Sen. Edward J. Markey, Senators Markey and Blumenthal Urge NHTSA to Finalize Vehicle Safety Rulemakings Required by Law (Apr. 12, 2018), <https://www.markey.senate.gov/news/press-releases/senators-markey-and-blumenthal-urge-nhtsa-to-finalize-vehicle-safety-rulemakings-required-by-law>.

⁶¹ Katie Krupnik, NHTSA Is over 5 Months Late in Meeting Deadline to Strengthen Car Seats, CBS News (Apr. 3, 2024), <https://www.cbsnews.com/news/nhtsa-is-over-five-months-late-in-meeting-deadline-to-strengthen-car-seats>.

⁶² Myron Levin & Eli Wolfe, *In Battle Against 'the Highway Disease,' NHTSA Attacked as Being Asleep at the Wheel*, Md. Matters (Dec. 31, 2020), <https://marylandmatters.org/2020/12/31/in-battle-against-the-highway-disease-nhtsa-attacked-as-being-asleep-at-the-wheel>.

⁶³ Lawrence Blincoe et al., Nat'l Highway Traffic Safety Admin., DOT HS 813 403, *The Economic and Societal Impact of Motor Vehicle Crashes*, 2019 (rev. Feb. 2023), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813403>.

There is valuable work on these issues, especially by the National Academies.⁶⁴ The U.S. Department of Transportation's Transforming Transportation Advisory Committee (TTAC) made several key recommendations on automated driving specifically while also recognizing "that disruptive technologies will not be limited to ADS and that workforce implications will not be limited to professional drivers."⁶⁵ I support these recommendations.

I would particularly stress the importance of "creating and maintaining early-warning systems and feedback loops that involve these diverse stakeholders, state governments, other Federal agencies, and other potential sources of near-real-time workforce information."⁶⁶ This is because effective policy will require accurate and timely understanding of changes in real-world conditions.

I would further suggest that, in developing this policy, our leaders consider a few key points: First, everyone in the United States should share in the wealth they are helping to create.

We are all contributing data and, in many cases, valuable intellectual property for the development of AI systems. Many human employees are currently training their computer replacements, whether they realize it or not. And many ordinary people are subsidizing these systems through the externalities—including resource depletion and many forms of pollution—that they are bearing, again whether they realize it or not. And while this broad sharing of wealth is ultimately in the interests of those who seek to directly profit from these technologies, collective action problems mean that it is unlikely to happen without government action.

Second, there is and will likely continue to be a tremendous need for human services of all kinds. But market failures mean that there is not a commensurate economic demand for many of these services. Childrearing, eldercare, civic participation, community engagement, friendship, mentoring, good neighborliness, emotional support, cultural development, learning, teaching, reconciliation, pro bono representation, and many other tasks are vital to our humanity—and in many cases should not be performed exclusively by computers. And yet they are often undercompensated or even uncompensated and hence underperformed. Automation and financialization may shift even more tasks onto individuals or else abdicate them entirely. It is therefore imperative that any discussion of the workforce start with a holistic and comprehensive conception of work—and look for ways to create space and even compensation for work that has true social value.⁶⁷

Third, workforce policy should promote human flourishing. Some jobs—or at least job tasks—*should* disappear. Jobs should not be dangerous, dreary, depressing, exploitative, or oppressive. They should be *livelihoods* that give the people who hold them an opportunity for control, community, and contribution. This will mean different things to different people, as it should. Both employment and automation should be tools in our individual and collective "pursuit of happiness."⁶⁸

Fourth, we should try to cultivate employment opportunities through perpetual research and development. Significant Federal research decades ago led to the automated driving industry we have today. And at least so far, this industry has created far more jobs than it has eliminated. These include highly paid researchers as well as all the other professionals who support them, from janitors to cooks to therapists. By the time automated driving significantly impacts truck and taxi drivers, we should ideally be well on our way to our next set of incredible innovations. But this requires *foundational research*: basic science that often requires enormous investments of time and money, fails to produce the desired results, and has few if any obvious paths to commercialization. Only governments are in the position to fund this research. The Chinese government is doing so. Ours, increasingly, is not.

Fifth, law has long created structures to manage scarcity, exclusivity, and control. These include early property rights (think fences), more recent intellectual property rights (think patents), concessions, common carriers, and corporations generally. The AI revolution may require similar innovations to help individuals capture the economic value of not only their labor but also their ideas and their information. Courts will be (and in some cases already are) involved in these conversations, but so too should governments more broadly.

⁶⁴ NAT'L ACADS. OF SCIS., ENG'G, & MED., ARTIFICIAL INTELLIGENCE AND THE FUTURE OF WORK (2025), <https://doi.org/10.17226/27644>.

⁶⁵ TTAC, *supra* note 10, at 59–63.

⁶⁶ *Id.*

⁶⁷ See generally Bryant Walker Smith & Ying Wang, *Role-and Task-Based Approaches to Responsible Automation* (working paper).

⁶⁸ Bryant Walker Smith, *For Humankind*, Keynote Remarks at the Inauguration of the Joint Academy on Future Humanity (June 28, 2025), https://newlypossible.org/files/presentations/2025-06-28_FutureHumanitySpeech_BryantWalkerSmith.pdf.

Sixth, it will also be important to conceive and empower new and existing collectives beyond governments and companies. Trade and labor unions are a classic example. In the future, agentic AI might even help individuals create a more level playing field with companies by automatically identifying and coordinating the collective market power of people with shared needs and values.

Seventh, international cooperation will be imperative. A race to the bottom helps no one. People around the world share many of the same hopes and fears, even if we express them differently. And increasingly, we really are all in this together.⁶⁹

To conclude:

I hope my spoken testimony showed a brevity that is admittedly lacking in these written answers—particularly since I’m also annexing two additional relevant documents. The first is my opening statement at the hearing. The second is the final report of the U.S. Department of Transportation’s Transforming Transportation Advisory Committee.

I appreciate that you have read this far and, more importantly, that you are approaching these important issues so thoughtfully. Please reach out if I can be of any assistance.

Sincerely,

BRYANT WALKER SMITH.

Annex 1: My opening statement at the Senate Committee on Commerce, Science, and Transportation’s Hearing on the Future of Self-Driving Cars.

Annex 2: The 2024 report of the U.S. Department of Transportation’s Transforming Transportation Advisory Committee (TTAC).



⁶⁹ Much of my work seeks to foster international collaboration. See, e.g., Bryant Walker Smith & Sven Beiker, *We Rode in Dozens of Driverless Robotaxis in China. Here’s What We Saw—And Our Advice for Other Curious Travelers*, BUS. INSIDER (Jan. 31, 2026), <https://www.businessinsider.com/the-ultimate-guide-for-taking-a-robotaxi-in-china-2026-2>; Bryant Walker Smith, *Initial Thoughts on “Road Safety Challenges Posed by the Use of Automated Vehicles in Traffic That an International Legal Instrument Could Adequately Address”*, GE.3–03–02, Global Forum for Road Traffic Safety (May 2022); Bryant Walker Smith *et al.*, *A Path for Cooperation Between Law Schools in China and the United States*, 11 PENN. ST. J.L. & INT’L AFF. 142 (2023), <https://insight.dickinsonlaw.psu.edu/jlia/vol11/iss2/7>. Additional publications are available at <https://newtypossible.org>.