

Statement of

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On Behalf of
The Intelligent Transportation Society of America

“Examining the Roadway Safety Crisis and Highlighting Community Solutions”

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Chairman Peters, Ranking Member Young, full committee Chairwoman Cantwell, Ranking Member Cruz, and members of the subcommittee, thank you for the opportunity to speak today on the important topic of roadway safety.

My name is Laura Chace, and I serve as the President and CEO of the Intelligent Transportation Society of America (ITS America). In addition to that role, I currently serve as an advisor on the United States Department of Transportation's (USDOT) Transforming Transportation Advisory Committee (TTAC) to help the Department navigate how to incorporate advanced technology safely and responsibly into our transportation system. Importantly for this conversation, I am also a mother of three children, including two teenage drivers, so the topic of transportation safety is something I think about every day and is near to my heart. In every facet of my life – as the leader of a transportation technology organization, as a mother, and as a user of the transportation system – I see opportunities to make transportation safer so that kids get to school safely, parents get home safely, and a trip to the grocery store or to visit relatives doesn't end in tragedy.

ITS America is the nation's leading advocate for the technological modernization of our transportation system by focusing on advancing research and deployment of intelligent transportation technology. ITS America was founded in 1991 as an advisory council to USDOT on technology innovation and emerging transportation technologies. ITS America is the only organization in the country that represents all sectors – public, private, research and academia, – to advance transportation technology in support of societal goals. Our vision is one of a better future transformed by transportation technology and innovation. One that is Safer, Greener, and Smarter for all. Our membership includes state and city departments of transportation, transit agencies, metropolitan planning organizations, automotive manufacturers, technology companies, engineering firms, automotive suppliers, and research and academic universities.

Our work accelerates the deployment of technology that saves lives, promotes sustainability, and advances more efficient and equitable transportation of people and goods. ITS America's work focuses on connected and automated technologies, smart and digital infrastructure, artificial intelligence, technologies that improve sustainability and resiliency, and other technologies that support on demand mobility, integrated multimodal transportation, public transportation, and freight.

I. The Status Quo Approach to Safety is Not Working

It is well known that far too many people are injured or die on our nation's roads each year. In 2023, the National Highway Traffic Safety Administration (NHTSA) estimated that there were 40,990 deaths on American roads.¹ This number continues to outpace pre-pandemic road deaths

¹ National Highway Traffic Safety Administration <https://www.nhtsa.gov/press-releases/2022-traffic-deaths-2023-early-estimates>

and we must take significant action to make our roadways safer. Vulnerable road users (VRUs), such as pedestrians and bicyclists, are particularly at risk of injury and death in traffic collisions. NHTSA estimated that in 2022, 8,952 vulnerable road users were killed in crashes, an increase from the previous year.² Pedestrians and bicyclists are also increasingly vulnerable to serious injury on our roadways.

In addition, roadway fatalities disproportionately impact people of color. According to research from the Governors Highway Safety Association (GHSA), African Americans were killed in traffic crashes at a rate almost 25% higher than Caucasian pedestrians in recent years, and African American pedestrians were killed at a rate twice as high.³ These numbers demonstrate the scale of the problem, but we know that this is not just a number. Each of these fatalities causes a tragic impact on the lives of the family members and friends who knew the victims. Even in my own neighborhood in Bethesda, Maryland, two teenage cyclists and an elementary school aged child waiting at a bus stop have been killed in the past few years. This does not even count the near misses and injuries that we do not see, and I am sure my fellow witnesses and members of this subcommittee have their own personal story when it comes to tragedies on our roads.

It is appropriate that these tragedies have garnered attention and generated a response, and we are grateful for this Subcommittee's attention to the issue. But I am tired of seeing the same outcomes: even with reductions in roadway fatalities in the past few years, the numbers are still too high. Furthermore, these numbers do not capture the millions of Americans that are injured on our roads every year, nor the estimated \$800 billion in financial costs that such crashes cost our country annually. These numbers demonstrate the scale of the problem and the need for a multi-pronged solution.

The status quo approach to addressing transportation safety is insufficient, and innovative solutions are required. In any other industry, we would not accept the sheer number of injuries and deaths that we see in the transportation sector, particularly caused by vehicle crashes. These road fatality rates are far from inevitable – we only have to look at our Canadian and European partners to see countries with road fatalities decreasing across the board. From 2010 to 2020, deaths on American roads rose 19% per capita, and Canada's rate fell at twice the pace.⁴ In 2021, France's number of deaths per capita from vehicle crashes was three times lower than the U.S.⁵

² National Highway Traffic Safety Administration
<https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813560>

³ Governors Highway Safety Association. [ghsa.org/sites/default/files/2021-06/An Analysis of Traffic Fatalities by Race and Ethnicity.pdf](https://ghsa.org/sites/default/files/2021-06/An%20Analysis%20of%20Traffic%20Fatalities%20by%20Race%20and%20Ethnicity.pdf)

⁴ Why Canada Isn't Having a Traffic Safety Crisis, Bloomberg. <https://www.bloomberg.com/news/articles/2022-07-01/why-canada-isn-t-having-a-traffic-safety-crisis>

⁵ <https://data.oecd.org/transport/road-accidents.htm>

It is clear that the U.S. needs a mindset shift on how we address transportation fatalities, and we need to embrace a comprehensive, all-of-the-above approach to improving safety on our roadways.

Technology is a key tool to solving our traffic safety problems, and it is more apparent than ever that we need to prioritize investments in technology solutions, such as Vehicle-to-Everything (V2X) communications, digital infrastructure, artificial intelligence (AI), and automation that will improve safety outcomes for all road users. The U.S. spends billions of dollars every year on transportation and infrastructure, yet we do not see real progress on meaningfully lowering traffic fatalities. While the Infrastructure Investment and Jobs Act (IIJA) included \$673 billion in spending for transportation and infrastructure, only \$800 million was dedicated specifically for technology (\$500 million for SMART and \$300 million for ATTAIN), totaling around one-tenth of one percent of total infrastructure funding. Clearly, the amount of funding currently directed towards transportation technology is inadequate relative to the outsized impact such funding can create.

II. We Need a Proactive Approach to Safety, Not a Reactive Approach

The U.S. needs a proactive approach to improving safety for all road users, rather than reacting to tragic events that could have been prevented. Too often, the standard approach has relied on making safety improvements after a traffic death has occurred. We have the tools today to be more proactive in how we address safety. We do not have to wait for a death to occur to implement needed safety improvements across our transportation system.

Historically, our transportation system has focused on physical assets, such as roads, bridges, guardrails, and speed bumps. However, in this modern era, we should also be harnessing the power of innovation, data, and technology to address the safety crisis. Roadway safety requires a layered approach of both physical and digital infrastructure assets, and fully deploying both is the only way we will be able to achieve Vision Zero.

Technology provides the opportunity to proactively address safety challenges in myriad ways. Technology can recognize and predict dangerous conditions that were previously unidentified, helping road users and transportation agencies understand and address dangerous situations ahead of time. These tools also provide drivers with more information about the hazardous conditions around them on the roadway, allowing more time to react and make better decisions that improve safety. We can have a dynamic infrastructure with technology, such as changing speed limits in the event of congestion and adverse weather or extending traffic signals when a pedestrian is in a crosswalk. Technology can take us from a reactive system whose tools are largely focused on reacting to fatalities to a proactive system that addresses issues before they result in a death or serious injury.

Today, many technologies are being deployed, and even more are emerging, that will reduce crashes and fatalities. This testimony focuses on four key technologies that will make our

transportation system safer for the traveling public: digital infrastructure, artificial intelligence, V2X technologies, and automation.

Only recently have we seen more emphasis at the Federal level on integrating technology into the nation's transportation system. Recent investments in safety-critical technology for our roads through grant funding and formula program eligibility, as well as efforts such as USDOT's draft National V2X Deployment Plan, are significant and welcome steps toward beginning to scale transportation technology on our roads.⁶ It is imperative that Congress, USDOT, and other agencies proactively support continued investments in safety-critical technology and develop strategies to advance national deployment.

Digital Infrastructure and Artificial Intelligence

Our transportation system is evolving, it is no longer just concrete, asphalt, and steel. Today, our transportation system includes sensors, software, data, and algorithms. In this new era of infrastructure, we will link the physical transportation system with a digital layer, allowing us to gather, transmit, store, analyze, communicate, and share information in real time, and to use that information to increase safety, reduce congestion, reduce emissions, and enhance mobility for every transportation user.

Digital infrastructure helps us gather information about our transportation system and infrastructure, providing agencies with crucial tools to make planning decisions, enact safety countermeasures, and monitor the status of their system. Artificial intelligence allows us to maximize the use of this information, processing and analyzing data at a speed that would be impossible without this technology, providing predictions and actionable insights from the data.

Below, we identify several solutions that are available today that capitalize on the opportunities that digital infrastructure and/or artificial intelligence can provide. Many of these technologies are already deployed in communities across the country, beginning to provide safety and other benefits to our transportation system.

Intersection Safety and AI

Each year, crashes at intersections are responsible for roughly one-quarter of all traffic fatalities and one-half of all injuries.⁷ Fortunately, there are several technologies that can be deployed now to increase safety at these intersections. A combination of radar, lidar, cameras, along with edge computing, including mobile edge computing (MEC) with AI capabilities, and connectivity can provide broad opportunities for transportation systems while greatly improving safety for all road users, but particularly VRUs. As USDOT recognized in its Intersection Safety Challenge, by leveraging these solutions, we can both improve VRU safety in intersections specifically, as well

⁶ https://www.its.dot.gov/research_areas/emerging_tech/pdf/Accelerate_V2X_Deployment.pdf

⁷ Federal Highway Administration <https://highways.dot.gov/safety/intersection-safety/about>

as take the next step in improving the functionality and safety of the nation's transportation system across the board.⁸

Rather than reacting to crashes, changing signals or intersection design proactively based on near miss data can improve safety outcomes before another injury or fatality takes place. In one example, ITS America member Rekor helped the Regional Transportation Commission of Southern Nevada (RTC/SV) identify near miss hotspots by showing the agency data that they did not know existed about wrong way driving and dangerous pedestrian crossings. This allowed the agency to make improvements to physical infrastructure to immediately enhance safety. Additionally, Rekor's AI tools detect crashes well in advance of the traditional method of receiving a 9-1-1 call, automatically alerting first responders. This has allowed EMS crash response to respond to incidents by an average of 9 to 10 minutes faster. As recognized in USDOT's National Roadway Safety Strategy (NRSS), the timing of the arrival of ambulances and emergency responders is a major factor in whether an injured person survives a crash. Responding to and clearing incidents faster has also reduced secondary crashes, which make up 20% of overall crashes.

In Florida, Osceola County is diagnosing safety issues and implementing mitigation measures through an AI platform from the company Derq. By analyzing video data from traffic cameras installed at intersections, the county can identify near-misses and other dangerous pre-crash scenarios. These predictive analytics platforms provide insights that help agencies address safety proactively and inform future infrastructure planning.

Technology can simplify and optimize the process of retiming intersections to better manage existing traffic patterns and congestion, significantly reducing the burden this costly and time-consuming process places on public agencies across the country. There are over 350,000 traffic signals in the U.S., and data shows that it takes 70 manual hours to retime one intersection.⁹ There are tools today, such as those from Flow Labs, that can optimize traffic signal timing almost instantaneously generating optimized timing plans with a click of a button and integrating directly with traffic signal controllers for updates. Traffic signal timing that is responsive to real-time conditions can improve safety.

While these solutions may not be visible to the public, like restriping or resurfacing a road, they are transformative, cost-effective tools that improve safety in communities by providing valuable insights to local transportation authorities on how to best manage their system and target

⁸ Additional context on how ITS America recommends approaching intersection safety technologies can be found in our response to FHWA's Inter Request for Information. Available at: <https://itsa.org/wp-content/uploads/2022/11/VRU-Intersection-Safety-RFI-ITSA-Comments.pdf>

⁹ Flow Labs <https://www.flowlabs.ai/solutions/traffic-signal-operations>

investments where they are needed most. Broader deployment of these technologies would lead to measurable and meaningful safety outcomes.

Protecting Vulnerable Road Users

Pedestrians are increasingly vulnerable to injuries and fatalities, in both rural and urban environments alike, with fatalities rising at a rate of 14% since 2019.¹⁰ Common sense solutions, like pedestrian detection technology, can help stop the trend of rising pedestrian deaths in its tracks. In 2024, our infrastructure should be smart enough to detect when a person is still in the crosswalk and requires more time to finish crossing a street, allowing the infrastructure to automatically extend the light so that a person can safely complete the crossing. For example, lidar can detect slow-moving or static objects on the roadway like humans or those with increased needs, particularly at night when most pedestrian fatalities occur, and provide the opportunity to extend crossing time. The technology also does not collect biometric data, meaning cities get rich traffic data without compromising privacy. Using fixed lidar technology, adaptive signals, and AI algorithms, cities like Bellevue, Washington have demonstrated success when deploying pedestrian detection technology with the help of private sector companies like AWS and Ouster.¹¹

Additionally, data from thermal cameras, high-definition cameras, and wireless micro-radar sensors determine the presence of pedestrians and bicyclists and can be used to extend green phases for safe crossing. The insights derived from processing this data through AI algorithms can help cities across the country identify problem areas, select appropriate safety countermeasures, and invest in improvements.

Rural Community Safety

Rural communities face a disproportionately higher burden of traffic fatalities. According to NHTSA, the fatality rate per 100 million vehicle miles traveled was 1.5 times higher in rural areas than in urban areas in 2021.¹² In rural regions, the absence of essential infrastructure such as broadband internet and fiber optics impedes the deployment of advanced data collection systems. Moreover, these regions often lack the technical personnel and technologies required for effective data management, visualization, and analysis. The infrastructure disparity becomes even more stark when considering Native American populations. Native American /Alaskan

¹⁰ Governors Highway Safety Association <https://www.ghsa.org/resources/news-releases/pedestrians-preliminary24>

¹¹ City of Bellevue, WA [Passive Pedestrian Detection Real-Time Safety Application Phase Extension Pilot.pdf \(bellevuewa.gov\)](https://www.bellevuewa.gov/DocumentCenter/View/11111/Passive-Pedestrian-Detection-Real-Time-Safety-Application-Phase-Extension-Pilot-PDF)

¹² National Highway Traffic Safety Administration <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813488.pdf>

Native persons have the highest annualized, age-adjusted traffic-related pedestrian death rates of all races/ethnicities.¹³

The Yakama Nation in the state of Washington has installed AI-powered roadside units at an intersection where the highway meets a local road, as part of a pilot project to improve traffic safety on U.S. Highway 97. These devices are equipped with multi-sensing (i.e., camera, environment sensors, etc.), computing, and communication capabilities, making them ideal for monitoring traffic, detecting dangerous events, and providing real-time warning messages to road users. These devices can operate without relying on extensive infrastructure support, such as a broadband connection. Small infrastructure upgrades such as this can have tremendous impacts on rural communities with vulnerable populations who often do not have access to broadband connections.

Supporting Dynamic Infrastructure

Variable speed limits (VSL) are another digital tool that can be used to manage speed dynamically on highways in urban and rural areas alike, adjusting to real-time conditions and stabilizing traffic flow especially when crashes, work zones, or poor weather conditions are present. Virginia DOT has deployed VSL on northbound I-95 in Spotsylvania, pairing LED signs displaying variable speed limits between 40 mph and 70 mph with dynamic message boards. Data from June 2022 to February 2023 showed reduced crash rates for all types of crashes compared with the same period a year earlier, including a 22% reduction in fatal and injury crash rates and a 9% reduction in rear-end crash rates.¹⁴ Widespread deployment of VSL or similar digital tools can improve safety by adjusting speed limits to real-time conditions, reducing rear-end and secondary crashes, and inducing better driver behavior.

Predictive Maintenance

Using AI, transportation agencies can predict maintenance needs proactively for infrastructure assets and fleets.

AI tools can help agencies identify structural issues in bridges and roads early on and monitor for further wear-and-tear. Traditional methods involve manual inspection, which can be costly and time consuming for public agencies. New innovations use computer vision AI, virtual reality tools, and drones to collect images and video of roads and bridges. While the cameras continually monitor the site, software processes and analyzes the collected data, providing

¹³ Governors Highway Safety Association [An Analysis of Traffic Fatalities by Race and Ethnicity_0.pdf \(ghsa.org\)](#)

¹⁴ National Operations Center of Excellence <https://transportationops.org/case-studies/interstate-95-variable-speed-limit-system>

engineers with a safety assessment that includes information about structural changes and weaknesses, as well as immediate damage.

With machine learning capabilities, we can now identify and predict vehicle and fleet maintenance with precision, improving not only vehicle performance but also maintenance operations and costs. New York City's MTA is using AI technology to predict bus breakdowns and maintenance needs, which has increased maintenance productivity and lowered material costs.¹⁵

Maintenance through software-enabled assets is a key area where USDOT should focus, bringing more cutting-edge AI tools to monitor our transportation system's physical assets and improve safety outcomes.

V2X Technologies

V2X technologies enable vehicles and infrastructure to exchange messages wirelessly and very quickly with other vehicles, roadside infrastructure, and vulnerable road users – like bicyclists and pedestrians. Sharing key information between the various parties in the transportation network allows responses that can improve safety, prevent crashes, optimize system performance, and reduce congestion. Specifically, NHTSA has estimated that these technologies have the potential to eliminate or mitigate up to 80% of non-impaired crashes.¹⁶

The National Transportation Safety Board (NTSB) has long recognized the impact these technologies could have if deployed in vehicles at scale, having first identified the potential of V2X to save lives in 1995.¹⁷ NTSB first recommended in 2013 that NHTSA require V2X in new vehicles after identifying additional fatal crashes that could have been prevented by these technologies and has continued to call for the technology's inclusion in new vehicles.¹⁸

State DOTs understand the safety benefits of V2X, and many are deploying this technology in their transportation networks. Georgia DOT has deployed the largest network of V2X technologies, covering 1,200 signalized intersections. Georgia is now deploying fiber, V2X roadside units, cameras, and traffic sensors across their interstate system.

Many V2X applications are enabled by cellular vehicle-to-everything (C-V2X) devices, a communications method which utilizes dedicated spectrum to reliably deliver instant alerts to drivers from other vehicles, infrastructure, and other road users. These messages contain key

¹⁵ NYC Transit Presentation to MTA Finance Committee new.mta.info/document/115371

¹⁶ NHTSA NPRM on V2V Communications, 2016

¹⁷ Multiple Vehicle Collision With Fire During Fog Near Milepost 118 on Interstate 40, Menifee, Arkansas, January 9, 1995, and Special Investigation of Collision Warning Technology, <https://www.nts.gov/investigations/AccidentReports/Reports/HAR9503.pdf>

¹⁸ NTSB Safety Recommendation H-13-031 <https://data.nts.gov/carol-main-public/sr-details/H-13-031>

information about the location, direction, and speed of vehicles and other travelers, traffic conditions – including the state of traffic signals – and prevailing roadway conditions – such as weather, pavement conditions, work zones, and other disruptions.

Additionally, contemporary solutions already in deployment across the country are demonstrating how communities can effectively deploy certain V2X use cases through diverse means beyond dedicated spectrum, such as cloud-based V2X solutions over cellular networks and localized mobile edge computing.

These methods are not mutually exclusive and, in fact, serve as complementary avenues for transportation ecosystem stakeholders to extend the reach, reliability, and resilience of V2X applications.

Preventing Vehicle Crashes

Once deployed in vehicles at scale, V2X technologies will provide numerous safety benefits with the potential to eliminate or mitigate most crashes.

While on-board sensors have improved the safety capabilities of vehicles, V2X addresses a key limitation in those capabilities – they are limited to line of sight. V2X technology can play a greater role by providing drivers and other road users with critical information and improved awareness about roadway, traffic, and weather conditions before a user encounters them through the deployment of connected vehicles and infrastructure. The information exchange enabled by V2X communications can warn drivers about sudden braking, wrong way drivers, and other dangerous roadway scenarios, allowing them to take action to avoid vehicle pileups and other associated crash risks.

Protecting Vulnerable Road Users

V2X technologies alert drivers about road conditions, road users, or pre-crash scenarios in real-time, these technologies are particularly poised to reduce the likelihood of pedestrian and cyclist crashes. By alerting drivers to the presence of pedestrians and cyclists outside of their line of sight but inside their intended travel path, drivers can take action to avoid a potential collision. Similarly, V2X alerts can warn cyclists about the presence of oncoming vehicles, providing critical safety warnings to help cyclists take action to avoid collisions. Because of these opportunities to improve cyclist safety, ITS America is proud to be a member of the Cyclist Safety Coalition, joining with numerous private sector and transportation safety organizations (including the League of American Bicyclists, People for Bikes, and GHSA) to rapidly deploy V2X solutions in order to mitigate the nearly 1,000 fatalities and 130,000 injuries suffered by cyclists on American roads each year.¹⁹ The ITS sector has moved quickly to develop and deploy

¹⁹ Center for Disease Control, Pedestrian, Bicycle, and Motorcycle Safety. Available at: <https://www.cdc.gov/pedestrian-bike-safety/about/bicycle-safety.html>

V2X applications specific to this use case, with Spoke, Audi, Commsignia, and Qualcomm partnering to provide V2X devices directly intended for cyclist use, establishing an additional digital layer of safety support for cyclists in a V2X-enabled environment.

Protecting Emergency Responders

HAAS Alert's collision prevention service Safety Cloud enhances emergency alerting on the road by alerting nearby motorists inside their vehicle that an emergency vehicle is nearby. When activated, Safety Cloud delivers real-time digital alerts over cellular networks to nearby approaching motorists. These alerts, called R2V (Responder-to-Vehicle) alerts, are received through navigation apps and connected car systems already in use by hundreds of millions of drivers, including Waze. In addition to alerting drivers, Safety Cloud could also alert other responders about potential crash scenarios. When Safety Cloud detects a likely or imminent intersection collision between two equipped emergency vehicles, the system provides the vehicle operator with early warning of the potential conflict so that they can reduce speed and prevent a collision.

School Bus Safety

C-V2X technologies are being deployed in school buses to provide critical alerts to both oncoming vehicles and bus drivers, adding a digital layer of safety to keep students safe getting to and from school. In the 2018-2019 school year, one study found that these illegal passings took place roughly 17 million times in the United States, and that six students were killed by illegally passing drivers over a six-day period in October 2018 alone.²⁰ With these technologies, the driver of an oncoming vehicle receives a direct message alert in the dashboard of their vehicle, providing an early notification that they are approaching a stopped school bus with its stop arm extended, even when the bus is not visible to the other driver. Additionally, the school bus driver receives an alert of the approaching vehicle during a school bus stop and a warning if a vehicle is potentially approaching too quickly to stop in time. This provides the school bus driver with critical information to make informed decisions to keep students safe. The bus driver can delay opening the door if the vehicle cannot stop or alert children outside the bus to remain on the curb and avoid the oncoming vehicle.

Mitigating Hazardous Weather

When weather adversely affects road conditions, connected vehicle technologies and supporting digital infrastructure can create a safer environment for drivers of all types of vehicles, large and small, by timely alerting drivers about upcoming hazards.

²⁰ Annual NASDPTS Survey Highlights Danger of Passing School Buses. Available at: <https://nasdpts.org/resources/Documents/2019%20NASDPTS%20Illegal%20Passing%20Results%20Press%20Release-7-24-19.pdf>

These weather alerts are already being utilized on I-80, a major freight transport corridor that runs 402 miles along southern Wyoming. This rural section of I-80 is known for severe weather conditions, including ice, snowpack, reduced visibility from blowing snow, and severe winds, along with steep grades up to 7%. These conditions, coupled with the high percentage of truck traffic, are the reason for many primary and secondary crashes with fatalities and serious injuries on I-80, as well as frequent road closures that cause safety and economic challenges for the state. Wyoming has introduced connected vehicle alerting for drivers, including the introduction of a centralized data exchange with roadside unit and onboard unit deployments. A Wyoming DOT report indicates that since the introduction of the project, the project has increased speed limit compliance on I-80, especially during severe weather conditions, and reduced the average crashes per year by up to 42% for all vehicles and up to 28% for trucks.

Other Transportation Benefits

Beyond safety, this technology also has the potential to lower transportation-related emissions, reduce congestion, and improve efficiency for all travelers. Transportation agencies are already deploying V2X solutions to enable automatic traffic signal prioritization, reducing emergency response times, increasing transit reliability, and increasing efficiency for freight.

Automation

Automation is another proactive solution in our technology toolkit for enhancing safety. Both Advanced Driver Assistance Systems (ADAS) and Highly Automated Vehicles (HAV) have the potential to significantly reduce crashes on our roadways. ITS America supports policies and regulatory frameworks that facilitate the safe testing, deployment, and integration of these technologies into the transportation system while simultaneously developing strategies to support our existing and future workforce.

While not the only factor in many fatal traffic crashes, the actions that people take directly influence safety outcomes on our roadways. ADAS technologies are already responding to driver action or inaction to correct vehicle positioning, brake for pedestrians, and more. Over the years, automakers have made significant investments in ADAS, and these tools are probably what people are most familiar with in their vehicle today. ADAS includes Lane Assist, Automatic Emergency Braking, Adaptive Cruise Control, Blind Spot Monitoring, Collision Avoidance alerts, and more. These features rely on a combination of sensors, like cameras, radars, lidar, ultrasonics, and onboard computers to perceive the surrounding environment, process data, and make informed decisions in real-time. These solutions can be particularly impactful for drivers on rural roads. For example, in Iowa, about 49% of all crash-related fatalities over the last five years involved lane departure, and ADAS can help mitigate these crashes.²¹

²¹ Iowa Department of Transportation

The continued development of HAVs and automated driving system (ADS) technologies provides an opportunity to remove driver behavior from the equation in some or all situations, and in particular to mitigate or eliminate crashes caused by distracted driving (3,308 fatalities in 2022), impaired driving (13,524 fatalities annually), and fatigue (thousands of crashes each year).²² Automated technologies do not get distracted, drunk, or tired, offering the potential to prevent thousands of fatalities each year.

ADAS falls into automation Levels 0-2 where drivers maintain responsibility for the vehicle, ranging from the driver always maintaining control to the vehicle taking control of speed and lanes in certain conditions, with drivers ready to take control quickly at any moment. The term ADS refers to Levels 3-5 of autonomy, with Levels 4 and 5 operating without the need for a human driver present. These AVs are meant to operate without human input, designed to strictly obey traffic laws, follow speed limits, and come to complete stops at red lights or stop signs. Public education regarding the capabilities, limitations, appropriate uses, and differences in driver responsibilities surrounding ADAS and ADS will enhance the safety benefit of those technologies while preventing misuse.

Autonomy has great potential for the freight industry as well, and further deployment of automated trucks is expected to lower the rate of crashes and injuries on our highways involving heavy-duty trucks. In 2021, there were close to 5,800 fatalities from large truck crashes in the U.S., a number that can be lowered through AV freight technologies.²³ Automated trucking can help alleviate distracted or drowsy driving, especially when considering the long hours drivers spend on the road. Additionally, automated freight technologies extend beyond the driver's seat, including applications that can assist with freight logistics, cargo safety, and predictive maintenance.

III. Integrating Technology: A Modern Approach to Infrastructure

IJA was an historic investment in our nation's infrastructure, providing much needed funding to upgrade infrastructure to improve safety, decrease congestion, improve physical bridge and road conditions, promote climate resiliency, and increase connectivity between communities. However, there is still much more to be done to bring U.S. infrastructure into the 21st century and modernize it in a way that improves safety outcomes for all transportation modes and users.

Historically, our transportation policy and programs have focused on building or maintaining physical infrastructure such as roads, bridges, railways, and transit systems. Now, we have the opportunity to add a digital layer to the physical infrastructure, which will allow us to realize transformative safety benefits, maximize the benefits and usability of our existing infrastructure, reduce the cost of maintaining that infrastructure, and show us how and where new or modified

²² National Highway Traffic Safety Administration

²³ Federal Motor Carrier Safety Administration <https://www.fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus-crash-facts-2021>

physical infrastructure will have the most impact. While some work has been done to encourage the development and deployment of transportation technology, more must be done now and in the future to harness the power to innovation and technology to achieve our shared transportation priorities, increasing safety and addressing the fatality crisis, enhancing resiliency, increasing efficiency while reducing environmental impact, making limited investment dollars go farther, and expanding mobility, access, and opportunity.

IIJA was a visionary national commitment to ensuring that the United States remains the international leader in the research and development of transportation technologies – this commitment is evidenced through programs like ARPA-I, investment in our University Transportation Centers, and continued support for research into innovative transportation technology solutions. Still, while IIJA contains some deployment opportunities, namely through the SMART grant program, we must ensure that the attention that we pay to development of these solutions is matched in our resolve to deploy these technologies. Without dedicated support for ITS technology deployment, we risk a situation where the United States develops innovative transportation tools, only to see our global competitors out-produce and out-deploy those same tools. Chief among those competitors is China, who has already demonstrated a strong resolve to focus significant national funding on re-envisioning their transportation network from the top-down with technology improvements. It is critical that we continue to robustly invest in ITS solutions to ensure that these innovative safety and mobility products and solutions are deployed right here at home to improve safety for all road users in the United States.

The good news is that there are steps that can be taken today, under existing programs, to advance technology in a more strategic and comprehensive way, allowing all communities to take advantage of IIJA funding to deploy technology on their systems. This includes work that is ongoing at USDOT to create a National V2X Deployment Plan; updates to the National Roadway Safety Strategy, the New Car Assessment Program (NCAP), and Complete Streets; opportunities for NHTSA to advance ADAS and ADS in a safe manner; and prioritizing technology deployment under other discretionary grant programs such as Safe Streets and Roads for All (SS4A) and the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) programs.

Congress also has an opportunity to reimagine the future of transportation technology when it reauthorizes surface transportation programs in 2026. This provides the opportunity to incorporate technology at every step in the infrastructure program process, from planning to construction to operations, but requires us to rethink how we approach technology in our transportation system from policy to funding to procurement.

Integrating Technology into Existing Transportation Programs

Historically, our transportation system has favored developing physical infrastructure, and our existing transportation programs reflect this focus. IIJA made considerable progress in recognizing the potential impact of technology and innovation, establishing the new Strengthening Mobility and Revolutionizing Transportation (SMART) grant program, expanding

eligibility for technology projects across several discretionary and formula programs, and infusing much-needed funding support for transportation agencies during COVID-related budget constraints. However, more can be done to advance technology under the existing programs governed by IIJA.

V2X Technologies

As discussed above, V2X technologies will have a significant impact on the safety of our transportation system. While many of our members are at the forefront of deploying these tools in communities across the country, continued Federal leadership is necessary to guide and support V2X deployment efforts at a national scale. We commend the Federal Highway Administration and the ITS Joint Program Office (JPO) for its work on a draft National V2X Deployment Plan and we encourage USDOT to issue a final plan, which will provide crucial guidance to V2X stakeholders in the public and private sectors. We also encourage USDOT to advance awards under the V2X Accelerator Grant Program, which will show the benefits of V2X and help deploy this lifesaving technology at speed and at scale.

However, more work is needed to advance V2X and provide the regulatory certainty necessary to spur public and private sector investment. The transportation community continues to wait for the Federal Communications Commission (FCC) to issue a Second Report and Order governing the rules for V2X technologies in the 5.9 GHz band. It is critical that the FCC issue this Second Report and Order before the end of this year to provide regulatory certainty to OEMs and IOOs looking to deploy V2X devices, and that the FCC take the steps that USDOT has been clearly articulating in order to protect these safety messages from harmful interference from unlicensed devices and limit the use of adjacent spectrum in the U-NII-4 and U-NII-5 bands until the potential impacts of such use are fully understood. We would encourage the FCC, NTIA, and other Federal policymakers to ensure that V2X technologies are provided the regulatory certainty and unencumbered spectrum necessary to realize the full promise that these technologies can deliver – foremost among them being a significant reduction of fatalities on American roads.

Another area where regulatory action is needed to support V2X deployment relates to NCAP. As the motor vehicle safety regulator, NHTSA is uniquely positioned to provide leadership in the deployment of these technologies in vehicles, and the inclusion of recognition within NCAP for V2X would be a clear way in which NHTSA could signal support to automakers for the inclusion of V2X in new vehicle models. The necessity of V2X inclusion in NCAP is already accepted in Euro NCAP, which “recognizes the safety potential of V2V and V2X technologies, for car occupants, vulnerable road users and powered two wheelers.”²⁴ They stated that to “support the availability of technology on the vehicle side, new incentives will be introduced in the rating scheme for V2X technology that support and enhance important safety functions.”²⁵ China is also set to incorporate V2X into its own C-NCAP, and global automakers have already begun incorporating V2X into their vehicles sold in the Chinese market. The data on these technologies

²⁴ Euro NCAP 2025 Roadmap. Available at: <https://cdn.euroncap.com/media/30700/euroncap-roadmap-2025-v4.pdf>

²⁵ Euro NCAP 2025 Roadmap.

is clear enough for global regulators, and the benefits associated with V2X deployment are not new to NHTSA. It is time that NHTSA fully signal their support for V2X deployment by including these technologies in NCAP.

We commend Chair Peters, Ranking Member Young, and members of the Senate Commerce Committee who have advocated for the advancement of V2X and encourage this Committee to urge USDOT and the FCC to provide the Federal leadership needed to make national scale deployment of V2X a reality.

Discretionary Grant Programs

USDOT grants provided under the SMART and ATTAIN grant programs are a major tool to spur technology deployment by piloting new technologies, helping others learn lessons and best practices, and developing key insights for new research and policy. ITS America proudly supports these discretionary grant programs and many of our members have obtained funding through these programs to deploy transportation technology such cloud-based V2X technology, open data standards for rural transit needs, wrong way driving countermeasures, and audio warnings at intersections for pedestrians.

However, there are several other discretionary grant programs in which technology is an eligible activity, but USDOT could do more to inform the public sector about the opportunity to use technology under these programs and prioritize the selection of projects which have considered or incorporated technology.

For example, Congress provided \$5 billion over five years for the SS4A grant program, which seeks to fund projects to prevent roadway deaths and serious injuries. While IIJA directed that Comprehensive Safety Action Plans (Vision Zero Plans) under the program may include “a data-driven approach... such as those involving... new vehicle or other transportation-related technologies” and that USDOT should consider the extent to which an applicant “seeks to adopt innovative technologies or strategies to promote safety”,²⁶ ITS America had to encourage USDOT to be explicit in its Notices of Funding Opportunity about the opportunities to incorporate technology into these projects and more could be done to prioritize the selection of projects that incorporate technology.

Similarly, technology is eligible under the RAISE program and Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) grant programs, in which USDOT could prioritize the selection of projects which incorporate technology.

USDOT Policies and Guidance

ITS America is grateful for USDOT’s leadership in incorporating references to technology in the updated NRSS, but more can be done to prioritize the inclusion of technology into the Safe Systems Approach, Complete Streets, and other USDOT policies and guidance. USDOT can also

²⁶ Infrastructure Investment and Jobs Act, Pub. L. 117-58 § 24112 135 Stat 429 (2021)

support technology deployment by the continued development of best practices and technical assistance to aid states and local governments in understanding how best to deploy technology.

In the NRSS, USDOT adopted a Safe System Approach as the guiding paradigm to address roadway safety, acknowledging both human mistakes and human vulnerability, while designing a redundant system to protect everyone. Specifically, the NRSS identifies a Safe System Approach that incorporates six principles: (1) death and serious injuries are unacceptable, (2) humans make mistakes, (3) humans are vulnerable, (4) responsibility is shared, (5) safety is proactive, and (6) redundancy is crucial. Some of these principles state obvious facts that we can all agree on, including crashes involving deaths and serious injuries should be eliminated, that a transportation system should be designed to accommodate human vulnerabilities, and that all stakeholders share in the responsibility of advancing safety.

To address the other three principles – humans make mistakes, safety is proactive, and redundancy is crucial – transportation technology must be incorporated. Technology provides the opportunity to prevent or mitigate human mistakes by providing more complete information to drivers or taking corrective action when crashes are imminent. Technology is proactive and can be used to identify and address safety concerns before they arise, such as with digital twinning technologies and the use of artificial intelligence. Finally, technology can fill the critical need of redundancy as a fallback protection should education, roadway design, traffic regulation, and enforcement fail. Transportation technology is the digital layer of protection that provides first level and redundant safety benefits by preventing and mitigating crashes, fatalities, and injuries, all while making our transportation system more equitable and sustainable.

USDOT identified five complementary objectives within its NRSS: (1) Safer People, (2) Safer Roads, (3) Safer Vehicles, (4) Safer Speeds, and (5) Post-Crash Care. Transportation technology can contribute to enhancing safety within each of these five objectives. ITS America developed a resource identifying this in our *National Roadway Safety Strategy – ITS America Response*.²⁷

Complete Streets is an approach that requires streets to be planned, designed, operated and maintained to enable safe, convenient and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation. Given the importance and applicability to road user safety, technology must be included and prioritized in Complete Streets projects. In 2024, it is time we modernize the Complete Streets concept to include technology as an integral part of the safety layer. Specifically, ITS America recommends the inclusion of five distinct technology elements into how Complete Streets is currently defined: (1) integration of smart/digital infrastructure, (2) access to charging stations and electric vehicle (EV) infrastructure, (3) data-driven decision-making, (4) consideration of shared mobility options, and (5) emphasizing multimodal connectivity.²⁸

²⁷ National Roadway Safety Strategy, ITS America Response. Available at: <https://itsa.org/wp-content/uploads/2022/05/ITS-America-National-Roadway-Safety-Strategy-Response-5-19-22.pdf>

²⁸ ITS America: Incorporating Technology into Complete Streets. Available at: <https://itsa.org/wp-content/uploads/2024/03/ITSA-Complete-Streets-with-Tech.pdf>

Technology plays a crucial role in achieving the vision of Complete Streets and should be specifically called out under eligible activities, particularly to improve the safety of bicyclists and pedestrians. Smart traffic management systems, for instance, utilize real-time data and sensors to monitor traffic flow and adjust signal timings accordingly. This reduces congestion, enhances traffic efficiency, and improves safety by minimizing interactions between vehicles and vulnerable road users. Moreover, digital tools and mapping applications allow for the integration of accurate and up-to-date information on pedestrian and cyclist infrastructure, enabling users to plan their routes with confidence. Furthermore, connected vehicles (CVs) and V2X technologies hold immense potential to create safer and more efficient Complete Streets. With their ability to communicate with each other and with infrastructure, CVs can enhance safety and reduce congestion.

The concept of Complete Streets is centered on prioritizing the safety and accessibility of all road users. Technology plays a pivotal role in realizing this vision by integrating real-time data, digital tools, and emerging technologies, ultimately creating a transportation system that is more efficient, equitable, and sustains the wellbeing of all community members. ITS America encourages USDOT to expand their efforts to assist state and local transportation agencies in identifying ways to incorporate these technology solutions as part of their Complete Streets efforts, including by building off ITS JPO's Smart Community Resource Center (SCRC).

The SCRC serves as a compilation of resources that can be used by practitioners to advance ITS and smart community transportation projects. The ITS JPO developed the SCRC to provide states, tribal governments, and localities with resources to help develop smart community transportation projects and programs nationwide. The website provides information and tools about smart communities and ITS technologies, deployment support, and links to USDOT funding opportunities that support the development of smart communities nationwide. This resource is an excellent blueprint for providing much-needed technical resources for states and localities looking to deploy technologies.

Reimagine the Future of Transportation Technology

To fully access these benefits and realize a safer, greener, and smarter transportation system, Federal transportation policy needs to be updated and modernized to include transportation technology at every step of the process, from planning to construction to operations. Technology cannot be a “nice to have” and must be holistically incorporated into transportation budgets and operations.

This requires a fundamental shift in our approach to how we plan, fund, and procure infrastructure and technology. From the policymaker to traffic engineer to the traveling public, this calls for a different mindset on how we approach infrastructure and prioritize safety.

Policy and Planning

It is critical that decisionmakers at the Federal, state, regional, and local levels include digital infrastructure and broader technology solutions in planning and agency-wide initiatives. This means policy which incorporates technology throughout federal surface transportation programs under Title 23 and Title 49, prioritizing the inclusion of technology in USDOT initiatives, expanding eligibility for technology deployments through existing funding programs, incorporating technology into planning and asset management processes, strengthening the research and development of digital technologies, and advancing technology workforce development programs. These changes will allow investment in digital infrastructure and technology to be appropriately considered alongside physical infrastructure.

Funding

Funding stability and certainty are critical to deploying technology on our roads. Transportation technologies of today were not even contemplated when much of our country's infrastructure was constructed, and the nation's economy and the mobility needs of our country have changed considerably in recent decades and will continue to change rapidly in the coming years. ITS deployers at the state and local level need substantial and certain funding for technology, and that funding needs to be incorporated at the beginning of a project's lifecycle, not as an afterthought.

ITS America encourages Congress to reevaluate how technology is funded under Federal transportation programs, which is currently designed for physical infrastructure and does not adequately consider the procurement, maintenance, and operations needs of a technology-inclusive infrastructure system.

Current technology funding primarily comes from limited discretionary grant programs, which are insufficient to achieve the scale of deployment needed to make a measurable impact on the country's transportation system. Technology deployments under these programs are often limited in size, scope, and location, and if we are to truly reap the safety benefits of transportation technology, we must move beyond pilots and demonstrations.

We need to move beyond focusing on technology only through discretionary grant programs, ensuring that all transportation and infrastructure projects consider and incorporate technology when appropriate.

Procurement

Procuring technology and software as infrastructure assets has been a challenge to public agencies, and it is critical that the transportation industry develops updated policies and best practices for procuring new kinds of digital infrastructure. Data streams, software licenses, and even cloud storage services are key to a transportation system today but were not core parts of our infrastructure procurement thirty years ago. These solutions are distinctly unique from physical assets – they are not one-time purchases and may require annual fees or licenses, require

ongoing maintenance to ensure cybersecurity and data integrity, and can improve performance over time unlike a static physical asset.

The current transportation technology procurement process can be lengthy and onerous, especially for localities that may lack the resources and expertise, slowing down projects and threatening the efficiency of investment in technology solutions for safety. State and local transportation agencies would benefit from additional Federal guidance on standards, definitions, and best practices around transportation technology procurement.

ITS America encourages Congress to develop robust technology procurement policy, which will aim to reduce the challenges currently associated with transportation technology procurement. When considering amendments to our current procurement process, we would recommend that Congress prioritize enhancing coordination between Federal, state, and local transportation policymakers, as well as improving procurement flexibility within Federal grant opportunities.

IV. Conclusion

American innovation continues to lead the world. We have the opportunity to harness American innovation and ingenuity in the communities where we live, work, and play to realize better safety outcomes for all who use our transportation system. As a mother, I long for the day when I don't have to say to my children "call me when you get there safely". While it will take time, we can make that day a reality by leveraging technology in a more holistic way as we plan, build, and operate infrastructure.

We can be proactive rather than reactive when it comes to safety, creating a layered approach that marries physical and digital infrastructure to protect all users and meet the needs of future mobility while delivering better safety outcomes. This means reimagining Federal transportation policy to include transportation technology at every step of the process, ensuring that transportation technology operations and maintenance challenges are adequately addressed, and updating procurement methods to meet 21st century technology.

ITS America is grateful for this Subcommittee's desire to talk about safety solutions, and we look forward to working with policymakers to ensure a policy and regulatory environment that allows for scaled deployment of these safety-enhancing technologies.