Statement of

Laura Chace
President and CEO

*On Behalf of*

The Intelligent Transportation Society of America (ITS America)

# "The Need for Speed:
# How Technological Advances are Driving Transportation Innovation"

Senate Committee on Commerce, Science, & Transportation
Subcommittee on Surface Transportation, Freight, Pipelines, and Safety

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Chairman Young, Ranking Member Peters, full committee Chairman Cruz, Ranking Member Cantwell, and members of the subcommittee, thank you for the opportunity to speak today and highlight how technology is transforming and improving our nation's transportation system. This hearing is particularly relevant given the backdrop of the current surface transportation reauthorization process and expiring authorities in September, and on behalf of our members, I appreciate the opportunity to share our perspective.

My name is Laura Chace, and I serve as the President and CEO of the Intelligent Transportation Society of America (ITS America).

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 initially founded in 1991 as an advisory council to U.S. DOT on technology innovation and emerging transportation technologies. ITS America, now a nonprofit organization, is the only one 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 Safe, Smart, and Connected. Our membership includes state and city departments of transportation, transit agencies, metropolitan planning organizations, automotive manufacturers, technology companies, engineering firms, automotive suppliers, telecommunications providers and research and academic universities.

Our work balances policy with innovation, accelerating the deployment of technology that saves lives on the road, makes travel more efficient, connects people to mobility options, improves transportation network operations, and increases return on investment for our infrastructure projects. ITS America's work focuses on connected and automated vehicle technologies, smart and digital infrastructure, artificial intelligence, tools that improve system efficiency and resiliency, and other technologies that support vulnerable road users, freight, public transportation, on-demand services, and advanced air mobility.

## I. The Transformative Power of Technology in Transportation

Our transportation system is evolving from one largely defined by concrete, asphalt, and steel to one that today includes sensors, software, data, and algorithms. Today's digital networks provide tools to link physical transportation assets with a digital intelligence layer, allowing us to gather, transmit, store, analyze, and communicate information in real time, and to use that information to increase safety, reduce congestion, and enhance mobility for every transportation user. Transportation digital infrastructure helps us gather information about our transportation system and infrastructure, providing agencies with crucial tools to make planning decisions, enact safety countermeasures, build and operate their system more effectively and at lower costs, and provide real time information to drivers and road users.

This is no longer a theoretical, high-tech future. Technology solutions deployed today across our nation's transportation system are delivering real outcomes. Tools like artificial intelligence (AI), vehicle connectivity, automated vehicles (AVs), digital twinning, advanced air mobility, and many other intelligent transportation systems (ITS) technologies are transforming the way people and goods move; how we plan, build, and operate transportation systems; and how we think about the future. Technology is now a core, essential element of our transportation system.

These technologies are helping us solve some of our most pressing transportation challenges that cannot be solved by physical improvements alone. Solutions that allow agencies to proactively identify and address dangerous stretches of roadways, react in real-time to reduce congestion, provide advance warning of severe weather to mitigate impacts, and provide faster emergency response are just some of the tools that make up this essential digital layer. As the pace of technology innovation continues to accelerate, we can leverage these tools to address the many challenges facing the U.S. transportation system today.

It is well known that far too many people are injured or die on our nation's roads each year. In 2025, the National Highway Traffic Safety Administration (NHTSA) estimates that there were 36,640 deaths on American roads.[1] While this is positive progress from a few years ago, we still have much more work to do. Technology, both in the vehicle and infrastructure, provides an added safety layer that can help us change course and save more American lives.

Traffic congestion is a key driver of economic harm and commuter misery. According to the U.S. Department of Transportation, the average auto commuter lost 63 hours stuck in traffic in 2024, costing nearly $1,500 each. This represents $269 billion in lost productivity and fuel costs. Advanced traffic management systems and AI-enabled systems can keep traffic moving efficiently across rural highways and urban streets.

Infrastructure projects over the years have become more costly to complete and often run the risk of not being completed on time. According to research from Texas A&M University, just one month of delay can lead to over $4 million dollars for large projects.[2] This remains a challenge if we want to operate and build a world-class transportation system that serves everyone from the urban streets of New York or Dallas to rural highways in Wyoming or Wisconsin. Fortunately, we have digital tools available today that can streamline project delivery, increase accuracy, and reduce time to completion.

Providing timely and safe access to transportation options remains a challenge in many communities. Research shows that millions of medical appointments are missed annually due to inadequate transportation options.[3] Additionally, many people in both rural and urban areas rely

[1] National Highway Traffic Safety Administration
[2] State of Texas
[3] Ruderman Foundation

upon on-time and safe public or on-demand transportation to reach critical goods and services, or just simply to see loved ones. Technology plays a critical role in ensuring not just the safety of these modes of transport, but also up-to-date information on service delays, payment options, and booking rides.

Our member companies are developing the innovative technology solutions that we have today, but as a country, we are not moving quickly enough to broadly scale these solutions throughout our infrastructure, vehicles, and broader transportation networks. Solving these pervasive challenges requires that we prioritize investments in technology solutions that will improve safety and mobility outcomes and remove existing barriers to deployment. The cost of not moving fast enough is not a net zero – it is measured in lives, time, and money lost. Coordinated federal leadership, through strategic direction and funding, is necessary to spur greater deployment of these tools and to incentivize greater private sector investment.

### i. Enhanced Safety

Technology provides the opportunity to proactively address safety challenges in myriad ways, such as recognizing and predicting dangerous conditions that were previously unidentified, and helping road users and transportation agencies understand and address dangerous situations to prevent crashes before they happen. 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. Technology can take us from a reactive system whose tools are largely focused on responding to fatalities to a proactive system that addresses issues before they result in a death or serious injury.

Vehicle Technologies

Motor vehicle manufacturers continue to develop and deploy advanced technologies in vehicles, including SAE Level 4 and 5 automated vehicles (AVs), Advanced Driver Assistance Systems (ADAS), and Vehicle-to-Everything (V2X) communications. These tools provide safety and convenience benefits to consumers today and will only continue to become more technologically advanced and interconnected with the broader transportation system.

Automated vehicle technology is already transforming the way people and goods move in various parts of the country. Our members are deploying automated vehicle technologies in different ways and in different geographies– including robotaxis, transit shuttle services, and heavy-freight. In Iowa, researchers have even piloted ways to deploy AV transit services on rural gravel roads with unmarked lanes to support communities that need to get goods from farms to market reliably and efficiently. Options such as Zoox's or Waymo's robotaxis or Aurora's trucks (among many other operators), have the potential to transform mobility and improve safety on the road. AVs do not get distracted, drunk, or tired, offering the potential to prevent thousands of fatalities per year. It is not a question of whether the technology will work– but rather how we

can enable safe scaling and integration with the existing transportation system through a much-needed federal framework.

ADAS technologies are already responding to driver action or inaction to correct vehicle positioning, brake for other vehicles, assist in lane-keeping, 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. The safety benefits are apparent. In some rural areas, nearly half of all crash-related fatalities over the last seven years have involved lane departure, and ADAS can help mitigate these crashes.

Vehicle-to-Everything (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, including spectrum-based, cloud-based, and cellular network solutions, can warn drivers about sudden braking, wrong way drivers, traffic queues, and other dangerous roadway scenarios beyond their line of sight, allowing them to take action to avoid vehicle pileups and other associated crash risks.

Cloud-based digital alerting tools, like those from HAAS Alert, can alert motorists inside their vehicle that an emergency vehicle is nearby or that they are entering a work zone where workers may be present. When activated, these platforms deliver real-time digital alerts over cellular networks to approaching motorists. These alerts are received through navigation apps and connected car systems already in use by hundreds of millions of drivers, including Waze and other integrated displays, and enable drivers to reduce their speed and prevent a collision.

A study in Illinois showed that digital alerting technologies increased driver reaction distance 4x more than just emergency lights, and led to reduced harsh braking compared to when there was no digital alert.[4] This translates into safer driver behavior near emergency vehicles, queuing traffic, and roadside workers – reducing the chance of a collision. In Washington, D.C., data revealed that digital alerting applications helped D.C. Fire and EMS Department apparatus operators prevent collisions with other first responders.[5]

We are encouraged by the continuous innovation in the automotive market, and these are just a few examples of how vehicle technology can improve safety.

Infrastructure Technologies

Modernizing our transportation infrastructure and treating technology as a core element of the system will help unlock numerous safety, efficiency, and mobility benefits for the traveling public. Today, states are already deploying technology within their infrastructure to help reduce

[4] Illinois Center for Transportation
[5] ITS America Use Case Library

crashes, improve transportation system operation, support vulnerable road user safety, identify incident hotspots, reduce congestion, improve emergency response, and plan safer physical infrastructure systems.

For instance, our infrastructure is 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. Technology can hold lights on red if it detects a speeding vehicle entering an intersection, preventing deadly T-bone collisions. Not only can technology work in real-time to prevent crashes, but it provides agencies with critical insights on near-misses or crash hot spots so that agencies can enact the proper safety countermeasures.

Using cameras, fixed lidar technology, adaptive signals, and AI algorithms, cities like Bellevue, Washington have demonstrated success when deploying pedestrian detection technology with the help of companies like Derq, AWS, and Ouster. Some cities in the U.S. have seen a 33% reduction in crashes year-over-year after deploying AI-powered technology to detect potential conflict between pedestrians and vehicles and proactively alert agencies to adjust traffic patterns to prevent crashes.

Rural communities suffer a disproportionately higher burden of traffic fatalities and sometimes face unique challenges due to a lack of broadband infrastructure and network connectivity.[6] However, many states are deploying technology and wireless infrastructure along their rural interstates to help improve traffic management and bolster safety. States like Georgia are investing in fiber infrastructure across rural areas to support ITS, while Texas and North Carolina are deploying connected freight corridors with in-cab alerts for work zones, weather, and incidents on rural interstates. Iowa is piloting a safety alert system for motorists when slow moving agricultural equipment is on the road – this includes sensors on the roadside and on the tractors with dynamic message signs to warn motorists.

Roadway workers face daily risks from high-speed traffic and rapidly changing conditions, but technology is transforming how we protect them. Smart work zones use sensors, connected vehicle data, telematics, and AI-driven analytics to monitor safety hotspots, detect hazards, and deliver real-time alerts to both workers and approaching drivers. Intrusion detection systems can warn workers immediately when a vehicle enters a restricted area, providing critical seconds to take protective action. At the same time, digital alerting platforms can notify drivers in advance that they are approaching a work zone or roadside incident, improving reaction time and reducing sudden braking and secondary crashes.

Rekor helped Texas identify near miss hotspots by showing the transportation agency data about wrong way driving and dangerous pedestrian crossings. This allowed the agency to make

[6] National Highway Traffic Safety Administration

improvements to physical infrastructure to immediately enhance safety. Additionally, AI tools can detect crashes well in advance of the traditional method of receiving a 9-1-1 call, automatically alerting first responders. This has allowed EMS to respond to incidents by an average of 11 minutes faster, while reducing the chance of secondary crashes and maximizing public agency resources.

Wrong-way driving crashes are among the most severe events on our roadways, often resulting in high-speed, head-on collisions with devastating consequences. Many states today are deploying infrastructure-based solutions that can detect vehicles traveling in the wrong direction using radar, thermal imaging, and cameras, triggering immediate warnings through flashing signage and connected alerts to the driver and nearby vehicles. These systems can also notify traffic management centers and law enforcement in real time, allowing for rapid intervention before a crash occurs. By combining real-time detection, dynamic signage, and in-vehicle alerts, technology can actively prevent wrong-way driving incidents and alert authorities to take action before a tragedy happens.

These are just a small sample of the technologies available today to improve transportation safety, with many more applications available today and under development relating to weather-related issues, flooding, bridge heights, and natural disaster response.

### ii. Greater Efficiency

Advanced traffic management technology, such as cloud-based platforms and AI-powered tools, can help monitor traffic using real-time data and optimize traffic flow. Connected, smart traffic signals can maintain safety while promoting the efficient flow of traffic for all road users – vehicles, buses, and even cyclists. In one example, Detroit, Michigan saw a 30% decrease in travel times at major intersections after deploying advanced traffic management solutions from Miovision, while also reducing maintenance costs by 20%.[7] This solution was similarly used in eight intersections in Anne Arundel County, Maryland to eliminate 17,200 hours of road user delay annually.

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.[8] 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. In an era of constrained fiscal

[7] Detroit's Mobility Evolution | Miovision
[8] Flow Labs

budgets and growing infrastructure needs, these technologies are helping our cities make limited transportation dollars go further while improving travel for residents.

North Carolina recently announced it is installing 2,500 AI-based traffic signals – an investment that will help the state bypass costly hardware installations and improve signal timing based on real-world traffic patterns. Additionally, the Delaware Department of Transportation won a SMART grant award from USDOT in 2023 which led to successful demonstrations of infrastructure-based V2X systems that would improve safety and traffic management in the state, with Delaware now ready to deploy these tools more widely if funding becomes available.[9]

Parking for truck drivers remains a persistent problem on our nation's interstates and can cause significant safety and quality of life issues on the road. In addition to building new parking spaces for drivers, companies are deploying technology in partnership with public agencies to help maximize existing capacity and provide drivers with up-to-date real-time information on truck parking availability. New Mexico is doing exactly that – leveraging AI-enabled sensing technology to fuse data from radar with video to provide real-time availability to truck drivers and help the state manage its truck parking facilities.[10]

Additionally, innovative freight weigh station bypass technologies by PrePass have led to $12 billion in operational cost savings and 136 million driver hours saved over the lifetime of the technology.[11]

These are all critical tools that warrant further investment to support freight networks across the country so that our economy continues to thrive and we keep goods moving on time and safely.

### iii. Smarter System Management

Digital tools can help agencies identify and prevent issues in their system, manage assets smarter, and improve project delivery times.

Technology can detect 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 inventions use computer vision AI, virtual reality tools, sensors, and drones to proactively collect images and videos of defects in roads and bridges that humans may not be able to see. While cameras continually monitor the asset, software processes and analyzes the collected data, providing engineers with a safety assessment that includes information about structural changes and weaknesses, as well as immediate damage.

[9] Future-Ready Delaware: SMART Technology Enhancements for Safe, Resilient Intersections
[10] Omnisight - New Mexico
[11] PrePass

New technologies can help public agencies monitor the health of bridges and detect issues before a disaster happens. Structural health monitoring using sensors provides real-time data to allow engineers to detect stress, movement, or structural damage on bridges and roads – giving workers more tools to investigate and remedy infrastructure deficiencies. Through the U.S. DOT's SMART grant program, West Virginia is deploying this technology on the Gunner Gatski Bridge to help manage infrastructure in a smarter, safer way.[12] Many other places, including the cities of Denver and Seattle are using digital twins and sensor technology to monitor bridge health. Texas DOT is using drones to monitor bridges and inspect aerial structures, gathering critical data for contractors and engineers.

Innovative technologies can also significantly improve roadway management. State and local governments oversee hundreds or even thousands of miles of roadway, making asset management costly and cumbersome. Tools such as dashcam footage and machine learning models combine to analyze roads for striping visibility, guardrail detection, damage, debris, and pavement conditions – often identifying issues beyond what the human eye can detect. Hawaii has utilized these tools from Blyncsy to save over $900,000 in maintenance costs per year, reducing the need for cumbersome manual surveys by nearly 95% and reducing emissions from work vehicles that now have to travel less often.[13]

We know that project delivery challenges, whether for highways, transit, rail, or otherwise, can be a serious roadblock to improving transportation systems in the United States. Digital twinning technology now exists that aids and accelerates infrastructure planning, design, and construction, giving engineers digital 3D and 4D models that improve contractor workflows, simplify public communications, and identify issues before construction. This represents a generational shift from traditional paper-based planning to model-centric frameworks where digital models become the primary deliverable. Modern infrastructure development increasingly requires integrating previously disconnected data sources – such as lidar, imagery, inspection records, sensor data, and asset inventories – into a digital ecosystem. Real-time asset management requires the most up-to-date data, making digital twinning technology and digital construction tools vital to project delivery.

These innovations are transforming the way public agencies plan, design, build, operate and maintain the transportation systems American rely on, bringing critical data and intelligence into every aspect of the project lifecycle. With such innovative tools at our fingertips, we should ensure that their use is incentivized and encouraged by state and local agencies nationwide.

[12] West Virginia Daily News
[13] Blyncsy

## II. Scaling Faster: Technology is a Core Element of the Transportation System

### i. National Approach to National Challenges

Transportation challenges in one area of the country impact all of us. Roads and bridges cross state lines, but so do people, vehicles, goods, and data. To help scale technologies in transportation, national leadership is required. In addition to setting common goals, national leadership helps de-risk technology investment for the public sector and encourages broader investment in core technology tools.

A national vision for our transportation digital infrastructure would set a gold standard for U.S. transportation innovation and signal to not only public agencies but also the private market that these technologies should be accelerated. It would bring together a network of successful, but currently fragmented, projects across 50 states toward shared common goals. That fragmentation limits the impact of innovation, constrains market growth, and ultimately leaves safety and mobility gains on the table. The Office of Research and Technology at U.S. DOT is already undertaking some of these efforts, but Congress should work hand in hand with its agency partners to set a national approach and implementation plan to make this a reality.

Much like digital infrastructure, automated vehicles are a key part of reducing traffic fatalities and improving access to mobility. In recent years, states have set the pace on AV policy, but it is important for the federal government to establish a federal framework that supports safe and responsible AV deployment across the entire country. This includes establishing federal guidelines on safety cases and crash data reporting, and modifying existing vehicle safety standards to allow for the use of AVs with innovative designs (i.e., without manual driving controls or purpose-built transit vehicles). In the freight sector, this also means allowing for the use of innovative warning beacons and other safety technologies, instead of requiring manually placed warning triangles on the side of the road when a truck becomes disabled.

As part of any federal AV framework, it is important that all stakeholders – including private industry, states, cities, organized labor, safety advocates, and others – are at the table for these critical conversations. We know the technology is ready, but we must work together to implement it in a way that integrates safely with the existing transportation system.

Finally, a national data privacy framework is essential for the continued deployment of transportation technologies in a way that fosters consumer trust, protects privacy, and applies nationally so that all may benefit. The transportation industry and its users flourish when there is certainty and reliability, and the same applies to data privacy protections for ITS and transportation technology. A patchwork of state and local data privacy laws hinders the ability to scale life-saving technology that relies on accurate data.

Companies are innovating and eager to develop and deploy technology solutions in the United States. As budgets across all sectors of the economy, especially public agencies, become tighter, we need innovative, cost-effective solutions that will help current transportation spending go further while making meaningful improvements to safety and mobility outcomes.

Coordinated federal leadership that recognizes technology solutions as core elements of our transportation system can help bridge that gap. Whether it's through setting strategic priorities and frameworks, providing financial incentives, or breaking down certain institutional barriers, the federal government has an important role to play. Strong federal leadership can unlock a scaled domestic marketplace, support American innovation, and strengthen our competitive position globally – particularly as countries like China move aggressively to integrate technology into their transportation systems as a matter of national strategy. That leadership can simultaneously provide important cybersecurity, privacy, and general policy safeguards that will help ensure that emerging technologies are deployed in a way that maximizes their public good. The private sector is ready, and the technology is ready. The question is whether federal policy will treat it with the urgency and importance it deserves.

### ii. Incentivizing Scaled Adoption

Technology deployments are often fragmented into pilots and demonstration projects that prove successful but are unable to scale beyond local areas or across state lines due to lack of interoperability, lack of dedicated long-term funding, and procurement challenges.

At the federal level, current technology funding comes primarily from discretionary grant programs, such as the SMART grant program and the Advanced Transportation Technology and Innovation (ATTAIN) grant program. Many public sector agencies, however, are looking to move beyond a pilot and demonstration approach, given that much of the technology now is maturing and has demonstrated success. Moving from pilots to true operational deployments and scaling nationwide is key to seeing even greater measurable benefits.

ITS projects are eligible under most federal formula programs administered through the Federal Highway Administration. However, many states experience a common friction point – how do we prioritize both our physical and digital infrastructure when there are limited federal dollars to go around? Because of this, many states and cities often must rely on state and local funding sources to deploy technology and build their transportation system's digital infrastructure. Funding stability and certainty are critical to deploying technology at scale in our transportation system, and U.S. DOT and Congress can help ensure that funding is prioritized when crafting policies for federal programs.

Technology projects have distinct characteristics from physical transportation projects. Unlike building a bridge or highway, technology deployments are not a single, massive project, but often a series of smaller projects that come together to deliver outsized outcomes. Since

transportation technology is not delivered all at once, it requires certainty to allow for multi-year deployment and continuous improvement as new capabilities are developed that can help agencies transform operations and improve safety.

Many of today's transportation technologies 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.

Previous surface transportation legislation from Congress laid a strong foundation for 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. Research and development, especially for high-risk, high-reward projects, is vital for the transportation sector. Without dedicated, standalone support for ITS technology deployment, however, 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. We must ensure that our country's policies keep pace with the rate of American technological innovation.

Beyond incentives, procuring technology and software as infrastructure assets can be challenging to public agencies. Current procurement methods were developed to purchase hard infrastructure through one-time purchases. Data streams, software licenses, and even cloud storage services are key to the transportation system today but were unheard of in infrastructure procurement even 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 and value over time, unlike a static physical asset.

We can ease the barriers to procuring technology by adopting outcomes and performance-driven metrics, rather than rigid technical specifications. State and local transportation agencies would benefit from additional federal guidance on standards, definitions, and best practices around technology procurement. Shifting towards an outcomes-based approach encourages wider innovation and more competition in the marketplace and unlocks greater flexibility in deploying technology solutions that fit a specific community's needs.

## III. Conclusion

Technology is a core element of how Americans move. Digital systems guide us on our daily commutes, deliver goods to our doorstep, keep us safe as we move about our communities, and ensure that the systems we rely on every day are resilient and reliable. As we build for the future,

we must include technology as an essential part of our transportation system to meet the needs of future mobility while delivering better safety and operational outcomes.

American innovation and ingenuity continue to lead the world. We currently have the opportunity to harness this American advantage in the communities where we live, work, and play to realize better transportation systems and safer streets across the country.

ITS America is grateful for this Subcommittee's desire to discuss technology applications in the surface transportation sector, and we look forward to working with you on these issues going forward.