February 15, 2022

VIA ELECTRONIC FILING

Charles H. Romine
Director
Information Technology Laboratory
National Institute of Standards and Technology
100 Bureau Drive
Gaithersburg, MD 20899

Re: Request for Information on a *Study to Advance a More Productive Tech Economy*

Dear Director Romine:

The Alliance for Automotive Innovation ("Auto Innovators") welcomes this opportunity to provide input to the National Institute of Standards and Technology ("NIST") in response to its Request for Information ("RFI") on a *Study to Advance a More Productive Tech Economy*. We appreciate NIST's focus on creating a forward-thinking approach that supports emerging technology to foster economic growth and competitiveness.

Auto Innovators is the singular, authoritative and respected voice of the automotive industry. Focused on creating a cleaner, safer, and smarter transportation future, Auto Innovators represents the manufacturers producing nearly 99 percent of cars and light trucks sold in the United States. Members of Auto Innovators include motor vehicle manufacturers, automotive suppliers, and technology companies within the automotive ecosystem. As you may know, the auto industry is the nation's largest manufacturing sector and contributes $1.1 trillion to the United States economy, representing 5.5 percent of the country's GDP. As a significant engine for our nation's economy, the auto sector is responsible for 10.3 million jobs and $650 billion in paychecks each year.

Utilization of Emerging Technologies by the Auto Industry

The automotive industry is undergoing an unprecedented transformation. Our member companies are at the forefront of innovations that will redefine the future of mobility – including electrification, automation, and connectivity. A number of the innovations that are being integrated into consumer vehicles as part of this transformation rely on or otherwise leverage emerging technologies identified in the RFI, including artificial intelligence and the Internet of Things.

For example, auto companies are increasingly integrating artificial intelligence systems into their vehicles to support automated driving systems, including those that facilitate unmanned delivery services, and next-generation crash avoidance features that can improve safety and reduce traffic fatalities. Artificial intelligence may also be used to improve occupant safety, including by helping to detect children that have been inadvertently left unattended in a vehicle or to help ensure that drivers remain engaged in the driving task. Voice assistants that help drivers keep their eyes on the road or features that adjust music, lighting, or other conditions to meet the unique needs of drivers and passengers may be powered by artificial intelligence. Artificial intelligence may also be incorporated into systems that help drivers find the optimal route to a destination or more safely and efficiently navigate complex traffic situations, help direct drivers of electric vehicles to the nearest available charging station, or even monitor vehicle systems to help detect and address potential problems before they occur.

In addition, many of the innovative features that are being integrated into vehicles to facilitate the transformation to a cleaner, safer, and smarter future are enabled or enhanced through connectivity and related Internet of Things capabilities. For example, Wi-Fi and Bluetooth technologies allow consumers in vehicles to stay connected as they travel. Cellular technologies enable in-vehicle services that provide important information and safety services to drivers and passengers. Radiofrequency transmitters allow for tire pressure monitoring and support remote keyless entry and ignition systems. Radar technologies underpin cutting-edge advanced driver assistance technologies and are being integrated into vehicles to support new occupant safety features. And vehicle-to-everything, or V2X, technology is poised to enable next-generation cooperative crash avoidance systems by allowing vehicles to share real-time safety critical information with each other, roadway infrastructure, and other road users.

Fostering the Adoption of Emerging Technologies by the Auto Industry

Although the auto industry has made significant and meaningful progress in the research, development, and pilot deployment of these technologies, the industry continues to face a number of significant challenges in the deployment of some of these emerging technologies at scale in the United States. These challenges include regulatory uncertainty, constraints in the semiconductor supply chain, and a shortage of trained and qualified workers for these emerging technologies. The federal government has an undeniably important role to play in helping to address these challenges.

Regulatory Uncertainty

One of the most promising uses of artificial intelligence in the automotive space is for automated driving. Automated driving systems have the potential to significantly improve roadway safety, increase equitable access to mobility, help the environment, and maintain global competitiveness. Automated driving is also essential to enabling unmanned delivery services, which were separately identified within the RFI.

Unfortunately, the United States currently lacks a comprehensive regulatory framework that allows for this technology and the benefits that it can deliver to be realized. Auto companies have invested billions of dollars into the research, development, and pilot deployment of this transformational technology. As companies develop and implement plans and make critical decisions about where and when to build and deploy this technology, they need to know that policies are in place here in the United States that will support those plans and those decisions.

At present, the only pathway to deployment of many vehicles with automated driving systems, particularly those with novel vehicle designs, is through the temporary exemption process under 49 U.S.C. §30113. Unfortunately, the length and uncertainty of this process makes it difficult for companies to rely on temporary exemptions as part of their deployment strategy. In addition, by statute, any exemptions granted are limited in both number and duration. The result is that temporary exemptions cannot practically support deployment at scale, impeding innovation and limiting the amount of data that is available to federal safety regulators to inform ongoing efforts to modernize federal safety standards. For this reason, a comprehensive regulatory framework that supports deployment of automated driving systems at scale is needed.

To this end, Auto Innovators released a comprehensive AV Roadmap ("Roadmap") in December of 2020.[1] The Roadmap sets out fourteen specific recommendations of actions that policymakers can take in the near-term to advance the testing and deployment of automated vehicles at scale in the United States. The Roadmap is intended to help policymakers guide and prioritize policy development in this area and addresses the need to reform regulations; harmonize federal, state and international policies; and lay the foundation to achieve longer-term regulatory objectives.

It is important to note that other countries are moving forward with comprehensive regulatory frameworks that support deployment of automated driving systems at scale. For example, last year, Germany enacted regulations to support the deployment of automated driving systems and France announced its own regulatory framework. China is expected to implement automated driving regulations this year. In fact, as noted in a recent report[2] from the Center for Strategic and International Studies ("CSIS"), although the AV sector is a "critical lynchpin to U.S. leadership in Artificial Intelligence," Beijing currently "holds the regulatory advantage" in the global AV race due to "its commitment to being a first-mover in AI and AV, giving Chinese companies more freedom to test vehicles and collect valuable data." In the report, CSIS concludes: "In order to compete with China, the United States must adopt a regulatory framework that allows space for U.S. companies to continue to gather additional data of their own that can be used to innovate and keep pace with competitors."

With respect to artificial intelligence, there is significant interest at the state level in implementing regulations, rules, and restrictions on the use of artificial intelligence and automated decision-making. It appears increasingly likely that, as we have seen with comprehensive privacy laws, a lack of proactive federal leadership and clarity in this important area of policy could result in a patchwork of inconsistent or incompatible state laws that create confusion for consumer, pose compliance challenges for companies, and impede innovation. The federal government has a unique opportunity to exercise leadership in this area by promoting and advancing the responsible deployment of artificial intelligence systems in the United States.

The industry is also facing regulatory uncertainty with respect to the deployment of V2X technology in the United States. In December of 2020, the Federal Communications Commission took the unfortunate step of significantly reducing the amount of spectrum available in the 5.9 GHz band to support

---

[1] https://www.autosinnovate.org/innovation/AVRoadmap.pdf

[2] https://www.csis.org/analysis/ai-strategies-and-autonomous-vehicles-development

the deployment of V2X technologies. There is no doubt that the decision to reduce the amount of available spectrum from 75 MHz to 30 MHz will severely limit the safety applications, including those that protect vulnerable road users and support automated driving, which can be supported in the United States. Additional spectrum is needed to support these important applications and next-generation V2X technologies that are currently under development. Since other countries have allocated or are actively working to allocate more spectrum to V2X technologies, the reduced spectrum allocation in the United States has the very real potential to sacrifice U.S. leadership and innovation in this area.

The Federal Communications Commission is also pursuing emissions limits for unlicensed operations in the lower part of the 5.9 GHz band that are likely to result in harmful interference for V2X technologies. The existence of harmful interference reduces the usability of the spectrum for critical safety applications and other applications that rely on low-latency communication. Essential safeguards must be imposed to ensure reliable access to the spectrum free from harmful interference from nearby unlicensed operations.

Finally, several federal agencies or entities may have authority, jurisdiction, or interest in the emerging technologies identified in the RFI. To avoid duplicative or inconsistent regulations or policies, we urge alignment among federal agencies with respect to these technologies. Specifically with respect to the integration of these emerging technologies in the automotive space, we encourage strong coordination and collaboration between relevant federal agencies and the National Highway Traffic Safety Administration.

Semiconductor Shortage

Semiconductors are currently used in a wide and growing variety of automotive electronic components that perform vehicle control, safety, emissions, driver information, and other functions. Many innovations that are underway in the automotive space – including those the rely on the emerging technologies identified in the RFI – are highly dependent on semiconductors. Without a sufficient and reliable supply of semiconductors, automakers may be forced to reconsider or delay integration of these emerging technologies, including those that enhance safety, into vehicles.

The current semiconductor supply chain crisis has undeniably exposed overall capacity limits in the semiconductor sector and revealed significant risks in the current automotive semiconductor supply chain. There is a clear need to expand semiconductor capacity to meet the growing demand for semiconductors in the auto industry and across the economy. Policies that can incentivize this additional capacity in the United States are essential to addressing the longer-term challenges. For this reason, Auto Innovators strongly supports full and robust funding for the programs authorized under the FY2021 National Defense Authorization Act to enhance semiconductor manufacturing capacity and resilience in the U.S. In addition, since new semiconductor fabrication plants take years to build, Auto Innovators also recommends that policies be implemented that support increase chip capacity in the mid-term. This includes enactment of a semiconductor manufacturing investment tax incentive which can help companies offset the cost of creating new lines within existing facilities or reallocating current production to meet evolving needs.

Importantly, the current semiconductor crisis has also revealed an opportunity to increase transparency within the semiconductor supply chain. Increased transparency on both the supply and

demand side can enable better and more effective business planning for semiconductor and automotive companies seeking to manage the current shortage and mitigate future shortages. We have been in extensive conversations with the Department of Commerce on ways to improve transparency in the semiconductor supply chain and look forward to further dialogue in the coming months.

Workforce Pipeline

The integration of these emerging technologies into vehicles requires auto companies to hire and maintain workers who have expertise in these technology areas. Unfortunately, it is increasingly difficult for our member companies to find qualified workers for these critical jobs. To help address the scarce supply of trained workers, government and industry should work together to strengthen the workforce pipeline for these good-paying jobs in these high-demand fields. This includes prioritizing K-12 educational curriculums, vocational training, and higher education programs, including those at community colleges, that are focused on teaching the skills that are necessary for these jobs. Resources – including access to meaningful and targeted training and lifelong learning programs – should also be provided to help those who are already in the workforce take advantage of promising opportunities in these emerging fields.

Thank you for the opportunity to provide this feedback. We look forward to continuing to work with you to support emerging technology and foster economic growth and competitiveness.

Sincerely,

Hilary M. Cain
Vice President
Technology, Innovation, and Mobility Policy