

November 8, 2021

SUBMITTED ELECTRONICALLY VIA REGULATIONS.GOV

Dylan Boylan  
Office of Technology Evaluation  
Bureau of Industry and Security  
14<sup>th</sup> St. and Constitution Ave, NW  
Washington, DC 20230

**Re: Docket Number BIS 2021-0036**

Dear Mr. Boylan:

The Alliance for Automotive Innovation (“Auto Innovators”)<sup>1</sup> appreciates this opportunity to provide input to the Bureau of Industry and Security (BIS) in response to docket number BIS-2021-0036 to assist the federal government’s efforts to improve the transparency and resilience of supply chains for critical semiconductors.

Auto Innovators was formed nearly two years ago to serve as the singular, authoritative, and respected voice of the automotive industry in the United States. Our members include auto manufacturers producing nearly 99 percent of the cars and light trucks sold in the U.S., along with original equipment suppliers, technology companies, and other automotive-related value chain partners. In total, our industry supports roughly 10 million jobs in America, accounts for approximately 5.5 percent of our country’s gross domestic product and represents our country’s largest manufacturing sector.

**Background on Semiconductors in Automotive Applications:**

At a time that demand for semiconductors has and will continue to increase across all sectors, the auto industry represents one of the fastest and most substantial growth sectors for the semiconductor industry. At present, semiconductors are used in a wide and growing variety of automotive electronic components that perform vehicle control, safety, emissions, driver information, and other critical functions. In addition, there are many innovations underway in the automotive space that will define

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<sup>1</sup> The Alliance for Automotive Innovation represents the manufacturers producing nearly 99 percent of cars and light trucks sold in the U.S. along with original equipment suppliers, technology companies, and other automotive-related value chain partners. Its members are listed as follows: Aisin Group, Autoliv, APTIV, Argo AI, BMW Group, Bosch, Byton, Cruise, DENSO, Ferrari, Ford, GM, HARMAN, Honda, Hyundai, Infineon, Intel, Isuzu, Jaguar Land Rover, Karma, Kia, Luminar, Mazda, Mercedes-Benz, Mitsubishi Motors, Nissan, NXP, Panasonic, Porsche, RV Industry Association, Sirius XM, Stellantis, Subaru, Suzuki, Texas Instruments, Toyota, Volkswagen Group of America and Volvo.

the future of safety and mobility – including electrification, automation, and connectivity – that are highly dependent on semiconductors. The transformations underway across the auto industry are driving increased demand in the number and variety of semiconductors necessary for automotive production.

The chips that are generally used in vehicles are not the same chips used in consumer electronics devices. As with many defense and industrial control users, auto manufacturing relies on a wide range of chips, including a substantial number of mainstream, also known as mature and lagging-edge, nodes. Further, the chips used in many automotive applications must be more robust and reliable than the advanced node chips that are used in consumer electronics devices because they must withstand challenging internal and external environments for the useful life of the vehicle. These dynamics are reflected in the below chart from the USITC.<sup>2</sup>

**Figure 3. Different Requirements of Consumer and Automotive Semiconductor End Use Markets**

Semiconductor Feature	Consumer Electronics	Automobile Electronics
Process Technology	28 → 7 nanometers	180 → 7 nanometers
Temperature Range	32 – 100 Degrees Fahrenheit	-40 – 300 Degrees Fahrenheit
Operating Lifetime	3 – 5 Years	15 Years
Tolerated Failure Rate	<1,000 parts per million	Zero parts per billion
Long Term Supply Needed?	No	Yes, up to 30 years' worth

### **Impacts of Supply Constraints:**

The auto industry is currently facing substantial production losses stemming from capacity challenges across the semiconductor supply chain. This shortage of semiconductors is an outgrowth of a confluence of factors: an unexpected and unprecedented 8-week shutdown of vehicle production across all of North America (and similar closures across the globe); a rapid increase in demand for consumer products as the global population adjusted life in response to the COVID-19 public health emergency; disruptions to semiconductor manufacturing and packaging around the world due to public health restrictions, natural disasters and a major plant fire; a resurgence in demand for personal transportation; and changes in consumer discretionary spending, among other factors.

As result of these supply chain constraints, numerous automakers have been forced to halt production and cancel shifts in the United States, with serious consequences for their workers and the communities in which they operate. Unfortunately, production forecasts in the U.S. continue to be downwardly adjusted. In February, industry was predicting that production would fall by 1% due to the

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<sup>2</sup> USITC, *The Automotive Semiconductor Market – Key Determinants of U.S. Firm Competitiveness* (May 2019), available at [https://www.usitc.gov/publications/332/executive\\_briefings/ebot\\_amanda\\_lawrence\\_john\\_verwey\\_the\\_automotive\\_semiconductor\\_market\\_pdf.pdf](https://www.usitc.gov/publications/332/executive_briefings/ebot_amanda_lawrence_john_verwey_the_automotive_semiconductor_market_pdf.pdf)

chip shortage. By May, production forecasts had fallen by 5%. Now, in October, production forecasts have fallen by 20% for the year.<sup>3</sup>

At present, estimates suggest motor vehicle production losses in North America of more than 3 million vehicles for 2021.<sup>4</sup> Based on anonymized surveys of our member companies, we project this includes approximately 1.3 million vehicles in lost production from the U.S. alone. While there is no consensus among our member companies on how long the shortage will continue to impact production, public reports suggest at least some companies expect to see impacts through – and potentially beyond – 2022.

Further, data compiled by industry analysts suggests that North American production is being disproportionately impacted relative to other global markets. For example, North America, which historically produces around 17 million vehicles annually, has lost more than 3 million units, to date, in 2021. In contrast, China, which historically produces more than 24 million vehicles, has announced production losses of 1.8 million vehicles.<sup>5</sup>

These production shortfalls come at a time when sales inventory of vehicles in the U.S. is at an all-time low. In fact, in the month of September, light vehicle inventory fell below 1 million units for the first time in decades. This is a 64% drop in inventory from the prior year. Likewise, days supply dropped to 24, compared to 50 days in September 2020 and traditional average of 60+ days in September.<sup>6</sup>

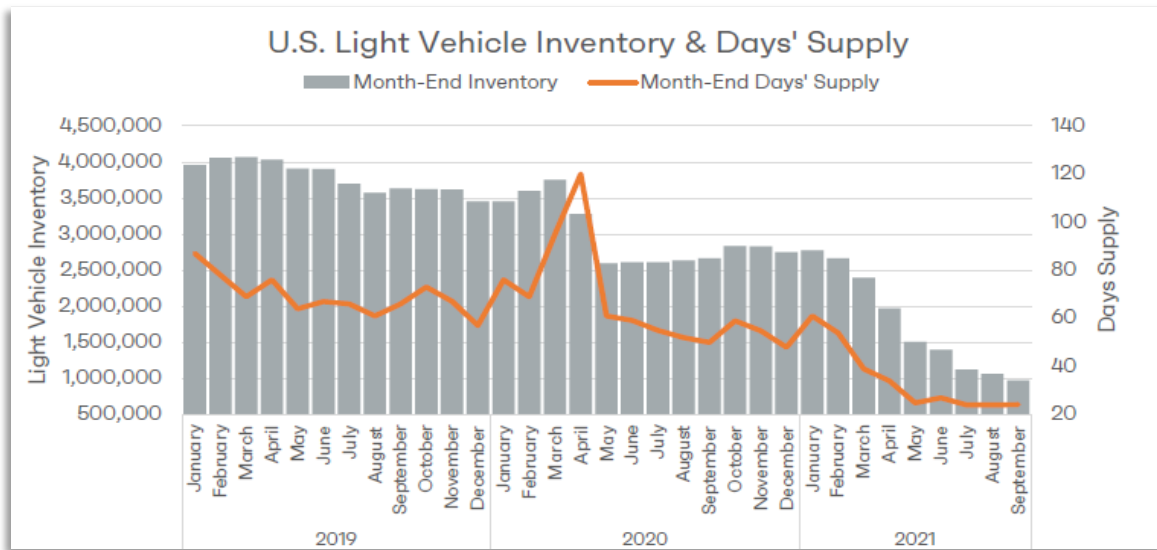
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<sup>3</sup> IHS Market, emails, “IHS Markit Monthly Automotive Update - February 2021,” 2/16/2021 and “IHS Markit Monthly Automotive Update - October 2021, 10/15/21

<sup>4</sup> Automotive News, *The latest numbers of the microchip shortage: N.A. plants take bulk of the chip hit*, November 1, 2021, available at <https://www.autonews.com/manufacturing/latest-numbers-automotive-microchip-shortage-8> (Data supplied by Autoforecast Solutions, Inc.)

<sup>5</sup> Id.

<sup>6</sup> Haig Stoddard, “Supply-Chain Crisis Worsens and U.S. Light-Vehicle Inventory Falls Again in September,” WardsIntelligence, 10/4/21



Automakers and supply chain partners are working diligently to navigate the current supply chain challenges. For example, OEMs are employing a range of strategies to manage available supplies, including shifting chip supply to more important and profitable products, reducing content in production vehicles, partially manufacturing vehicles and parking them for later completion, and other measures to manage the near-term supply constraints. At the same time, semiconductor production capacity is at all-time high, with more units shipped – across all sectors - in Q3 2021 than any quarter in history.<sup>7</sup> In addition, there is increased collaboration and engagement between OEMs and suppliers as companies seek to improve long-term planning within the semiconductor supply chain.

Despite these efforts, production challenges across the auto industry remain and the drop in inventory continues to take a toll on sales. September represented a fifth consecutive month of declining sales of new vehicles, despite high consumer demand for key vehicle segments (trucks, SUVs, and crossover vehicles).<sup>8</sup> The intersection of high demand, production constraints and declining inventory has driven up prices for both new and used vehicles.<sup>9</sup>

### **Conclusion:**

The near-term supply constraints impacting auto production foreshadow long-term challenges for the industry absent an increase in semiconductor production. Automotive is one of the rapidly growing markets for semiconductors because the technologies and innovations that are redefining the future of

<sup>7</sup> <https://www.semiconductors.org/q3-global-semiconductor-sales-increase-27-6-year-to-year/>

<sup>8</sup> Haig Stoddard, "U.S. Light-Vehicle Sales Bottom-Out Again in September," *Wards Intelligence*, 10/1/21

<sup>9</sup> [https://www.washingtonpost.com/business/inflation-rises-54percent-from-year-ago-matching-13-year-high/2021/10/13/f32e99f8-2c22-11ec-b17d-985c186de338\\_story.html](https://www.washingtonpost.com/business/inflation-rises-54percent-from-year-ago-matching-13-year-high/2021/10/13/f32e99f8-2c22-11ec-b17d-985c186de338_story.html)

the automotive industry all rely heavily on semiconductors. Whether it is electric-drive vehicles that will foster a cleaner future, advanced safety systems – including driver assistance technologies, as well as automation - that have the potential to reduce crashes and save lives, or connected technologies and services, semiconductors are vital to the future of automotive innovation.

The current shortage has exposed overall capacity limits in the semiconductor sector and revealed significant risks in the current automotive semiconductor supply chain, which impacts tens of thousands of auto workers across the country and has a negative impact on consumers when it comes to vehicle affordability and inventory. There is undeniably a need to expand semiconductor manufacturing capacity to meet the growing demand for semiconductors in the auto industry, as well as other sectors across the economy. This requires a significant investment in, and sustained commitment to, building additional domestic semiconductor capacity that meets the future needs of the auto industry in the United States. For this reason, Auto Innovators strongly supports full and robust funding for the programs authorized under the *CHIPS for America Act* as well as enactment of a semiconductor manufacturing investment tax incentive.

We appreciate your focus and attention to this critical issue and look forward to continuing to work with you to ensure that the United States remains a global leader in automotive innovation and the realization of a cleaner, safer, and smarter transportation future.

Sincerely,

A handwritten signature in black ink, appearing to read "John Bozzella".

John Bozzella  
President and CEO  
Alliance for Automotive Innovation