August 6, 2025

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Mr. Stephen Astle
Director, Defense Industrial Base Division
Office of Strategic Industries and Economic Security, Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Ave NW
Washington, DC 20230

Re: Commercial Drone Alliance Comments on the Bureau of Industry and Security, U.S. Department of Commerce Notice of Request for Public Comments on Section 232 National Security Investigation of Imports of Unmanned Aircraft Systems (UAS) and Their Parts and Components [Docket No. BIS-2025-0059; XRIN 0694-XC130]

Dear Director Astle:

The Commercial Drone Alliance ("CDA") appreciates the opportunity to comment on the Bureau of Industry and Security ("BIS"), U.S. Department of Commerce ("DOC") "Notice of Request for Public Comments on Section 232 National Security Investigation of Imports of Unmanned Aircraft Systems (UAS) and Their Parts and Components," which was published in the Federal Register on July 16, 2025.[1]

The CDA is an independent non-profit organization composed of leading members of the U.S. commercial drone industry, including companies that design, manufacture, and operate UAS and the associated technology for autonomous capabilities. We bring together commercial drone operators and end-users, manufacturers, service providers, advanced air mobility companies, drone security companies, and vertical markets including oil and gas, precision agriculture, construction, security, communications technology, infrastructure, newsgathering, filmmaking, and more.[2] We

[1] Notice of Request for Public Comments on Section 232 National Security Investigation of Imports of Unmanned Aircraft Systems (UAS) and Their Parts and Components, 90 Fed. Reg. 31958 (Jul. 16, 2025).

[2] Learn more at www.commercialdronealliance.org.

advise and educate all levels of government and the public on policies essential for the industry's growth and on the benefits arising from the safe and responsible use of commercial drones.

The CDA supports BIS's effort to evaluate whether certain drone imports, including their components, pose a risk to national security. Moreover, the CDA shares BIS's interest in fostering a robust, secure supply chain for the domestic drone industry. Our key objective is to ensure that the United States is the global leader in an industry that will be key to unleashing economic potential for a number of existing industries and that is essential to U.S. national security. To that end, we view bolstering domestic drone manufacturing capabilities and facilitating a robust domestic and allied drone supply chain as critical to achieving those goals. Accordingly, with respect to trade policy, our position is to ensure the United States has access to such components and technologies that are necessary to ensure the growth of the U.S. UAS industry, until such time that the United States has adequate domestic supply of the same, with respect to both quantity and quality. *A policy that prematurely imposes tariffs on components for which there is no adequate domestic supply or which the United States lacks the current technological and industrial capacity to produce will undermine the growth of the UAS industry in the United States.* A far more effective approach to ensure the growth of a self-reliant American UAS industry will be, as detailed below, an approach consistent with President Trump's recent Executive Order titled "Unleashing American Drone Dominance" and providing appropriate economic incentives to assist firms focused on nascent technology and manufacturing.

I. Expanding and Enabling the UAS Industry Unlocks Significant Benefits For All Americans

Expansion of commercial UAS could provide extraordinary benefits to the American public—enhancing worker and public safety, fighting wildfires, strengthening border security, promoting infrastructure resilience, expanding equitable and efficient access to critical supplies, securing our homeland, facilitating emergency response, supporting the U.S. economy, creating jobs, and generating tremendous economic value—all while ensuring America's global leadership in advanced aviation.

If the regulatory framework in the United States can keep pace with this rapidly evolving industry, UAS will unlock billions of dollars in economic growth over the next few years. Drone Industry Insights projects an increase in global market size to $57.8 billion by 2030, though regulatory burdens have significantly dampened domestic market expansion.[3]

In addition to the growth of the drone marketplace itself, there exists significant potential for broad economic savings as a result of enterprise UAS operations. For example, the cost savings from using drones to inspect energy utility infrastructure would exceed $920 million annually.[4]

[3] Kay Wackwitz, *Understanding the Drone Market Growth in 2025 and Beyond*, Drone Industry Insights (Apr. 7, 2025), https://droneii.com/drone-market-growth-in-2025-and-beyond.

[4] Levitate Capital White Paper, Enterprise Market 2020, at 6.

Economic benefits also can flow to local small businesses participating in UAS delivery programs. One study of UAS local delivery programs found that local participating retailers could each experience more than $200,000 a year in increased business opportunities, and local restaurants could generate up to $284,000 in additional sales by expanding the footprint of serviceable customers.[5]

Although these and other efforts are promising, the vast benefits of UAS have not yet begun to be realized here in the United States. Asia continues to lead the world in the number of drone flights with 6.3 million flights in 2024 compared to the U.S.'s 3.9 million, and Europe is rapidly expanding its markets, with a 34% increase in flights in 2024 compared to the U.S.'s 14% increase.[6] That is because here in the United States, regulatory uncertainty and the application of legacy crewed aviation rules prevent scalable UAS operations and limit the integration of UAS into the National Airspace System (NAS). Despite the best efforts of relevant offices at the Federal Aviation Administration (FAA) and across the Administration, the UAS industry continues to be held back by the application of incongruous regulations designed for crewed aircraft. There is no reason to believe domestic demand in an innovative market like the United States is any less appealing than in China or other parts of Asia. However, more must be done to unlock the market conditions which spur demand for the level of production and subsequent investment that enable the U.S. to restore its global leadership in this technology.

II. The Current Regulatory Environment Artificially Dampens Domestic Demand

Put plainly, a strong domestic supply chain requires a strong U.S. market. Just as trains need tracks or cars need roads to have a viable market, UAS need pathways that allow them to be put into actual use and fully integrated into the NAS. If regulatory agencies continue to place significant limitations on the use of drones or require the inapposite regulatory architecture applicable to traditional manned flight, then the U.S. market for drones will continue to lag behind other countries.

Thus, one of the most important ways the U.S. Government can bolster the domestic UAS supply chain and mitigate risks of reliance on foreign adversary technologies is to create a flexible, performance-based regulatory framework for UAS use that incentivizes domestic and allied development and production of UAS technologies. There are multiple ways that the current regulatory environment impedes domestic manufacturing and market expansion. This section of our comments will focus on two aspects that we hope will change in the next two to three years: the first is the lack of a clear path to operational scalability, and the second is the lack of clear aircraft requirements for more advanced operations.

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[5] Sarah Lyon-Hill, et. al., *Measuring the Effects of Drone Delivery in the United States*, Virginia Tech Office of Economic Development and the Grado Department of Industrial & Systems Engineering, vi (Sept. 2020), https://cece.vt.edu/content/dam/econdev_vt_edu/projects/technology/Virginia%20Tech%20%20Measuring%20the%20Effects%20of%20Drone%20Delivery%20in%20the%20United%20States_September%202020.pdf.

[6] Wackwitz, *supra* note 3.

As both commercial and defense applications of drone technology demonstrate, the true benefits of drone technology come from efficiently flying more than one highly automated or autonomous drone beyond the operator's visual line-of-sight (BVLOS) at a time. Unfortunately, the current approval process for BVLOS operations is costly, lengthy, and requires case-by-case approval from the FAA. This has a chilling effect on the entire industry because domestic drone operators are not able to scale operations in a timely, predictable way. Without the ability to expand operations on predictable timelines, operators cannot invest significantly in platforms and components for their operations.

Even companies that build and fly their own drones face problems with scaling. Once approved, the current process for a company to make changes to its own drone design—usually to enhance safety, reliability, or efficiency—can be an onerous process with the FAA, primarily because the existing regulatory basis to do so was designed to manage the risk of changing much larger aircraft carrying people.

This lack of a standardized path to operational scalability disrupts the supply and demand pipeline between operators and manufacturers, thus impeding the ability of domestic manufacturers to produce drones at a consistent and scalable level. This dynamic in turn erodes domestic manufacturers' ability to benefit from lower per-unit costs of purchasing components at scale, which raises production costs that get passed on to operators in a supply and demand 'doom loop.'

The deficient commercial regulatory environment also has significant downstream implications for our domestic military industrial base, which affects our national security. Current defense production continues at low volumes, which generally means high per-unit costs. Additionally, the current regulatory landscape significantly stunts testing for defense products. Innovators need to be able to design, iterate, and test in non-defense environments, which is currently very expensive and difficult to do legally. Many manufacturers have made the decision to test their products abroad because it is quicker, easier, and cheaper to work in countries with less bureaucratic red tape to maneuver around. Those countries subsequently have a competitive advantage when it comes to attracting innovation talent and manufacturing investment.

Notably, many of the components and technology required for defense drone production mirror those needed for commercial products. From a supply chain standpoint, therefore, fixing regulatory stagnation in order to incite strong demand for commercial products will help lower costs for both civil and defense products.

<u>Recommendations</u>: The domestic UAS industry is currently reviewing a regulatory proposal from the federal government to enable routine commercial BVLOS operations, which has the potential to unlock vast benefits and scalable use cases for domestic technology use, thereby driving dramatic increases in domestic demand and production. However, it will likely be another two to

three years before manufacturing and operations will be fully scaled under this new paradigm. The CDA therefore encourages BIS to consider the timeline for any actions taken as a result of this investigation in the context of the changes and uncertainty domestic drone manufacturers and operators are likely to be subject to over the next two to three years. Reducing financial uncertainty as companies navigate short-term change will ultimately build the long-term scalable sustainability needed to support both commercial and defense markets.

III. Domestic Supply Chain Limitations

Achieving efficiencies in the manufacturing process is critical for the drone industry's ability to scale successfully, but domestic manufacturers have been challenged to find domestically manufactured components at costs that align with projections for the industry. Even the more established drone companies do not yet have the scale to purchase in large quantities. CDA's members report that it is nearly impossible to find domestic companies willing to set up fabrication lines and manufacture components on the smaller scale that the drone sector requires in comparison to the size/scale of other consumer electronics marketplaces such as the cell phone and computer industries. For component producers outside the People's Republic of China (PRC), production quantities are so low that cost/price points are very high compared to PRC-produced components. Meanwhile, because of the sheer volume and the cost of available labor, Chinese producers can offer a lower prices for equivalent parts made in the United States or Europe and have built up manufacturing expertise over the course of decades that will take time for the U.S. to regain at large scale. As a result, American-made drones are more expensive and are sold in smaller quantities than their Chinese competitors. Additionally, consumer and commercial drones have different cost models than defense-related and federal procurement applications where the U.S. government is willing to pay a premium for a domestic supply chain.

Simply raising the price of Chinese origin components through tariff action is unlikely to stimulate domestic production of components. The reason is two-fold. First, there is no/very limited production for many of these components (e.g., lithium batteries). By way of contrast, consider for example, the situation before the Department of Commerce when it was considering tariff actions pursuant to Section 232 for steel. With respect to steel, there was already a significant existing U.S. industry that had potential to improve capacity utilization. In 2015, the U.S. steel industry produced 78.8 million metric tons (MMT) of steel, compared to 88.2 MMT the year before, and there was still excess capacity then. As reflected in the various antidumping and countervailing duty orders, a significant cause of material injury to the U.S. steel industry and its underutilization was an expansion in steel imports. A tariff action could improve the price differential to bring U.S. capacity back online. The situation with production of drone components is not comparable as there never have been major U.S. manufacturers that could help supplant foreign supply.

Second, as noted above, the U.S. regulatory regime inhibits the growth of UAS in the United States. Potential manufacturers are not going to enter the market if they remain uncertain that there will be sufficient demand for drones in the United States; instead, they will focus on products and model lines tailored to other sectors. With regulatory reform, economic incentives, and the establishment of U.S. UAS manufacturers at scale, then component manufacturers will enter the market.

Third-party market analysis supports these observations. The MIT Technology Review states the U.S. and NATO allies have developed a "missing middle" in technology investment—namely "insufficient funding for commercial production."[7] Specifically, the Review observes that "investment in scaling manufacturing technologies…and maturing of emerging technologies to contribute to a next-generation [U.S.] industrial base, is too often absent." In contrast, "China has built strong supply chains and other domestic capabilities that confer both economic security and significant geopolitical leverage." The Review goes on to highlight seven critical subsystems of the drones being used on battlefields today and gives a concerning breakdown of the lack of source diversity for these components.[8]

Battery availability is an oft-cited example of domestic production vulnerability. Many CDA members highlight trouble with sourcing battery cells and components capable of meeting technical requirements and able to function in a wide range of environments. Our members report that they find low-to-mid-volume companies, such as most of those in the commercial drone industry, are generally ignored by the larger battery manufacturers. This forces them to buy from Chinese suppliers. Although larger, EV-size batteries have begun to be produced domestically, smaller, consumer-scale batteries that power commercial drones have not followed suit. This is not only a matter of cost—there is simply no domestic supply capable of supporting the industry. Analysis by the Review supports this claim:

> [Y]ou would be hard pressed to find a [lithium polymer] battery that was not manufactured in China. The experienced workforce behind these companies has contributed to learning curves that have led to a 97% drop in the cost of lithium-ion batteries and a simultaneous 300%-plus increase in battery energy density over the past three decades.[9]

It bears emphasis that tariff action on components may be counter-productive to goals shared by the U.S. UAS industry and the Trump Administration. To develop the U.S. industry, manufacturers will need to develop production expertise, which will require, at least in the near term, access to components that allow the domestic industry to develop expertise in assembling and then eventually design. A point made by Vice President Vance is salient here:

> …it turns out the geographies that do the manufacturing get awfully good at the designing of things. There are network effects, as you all well understand. The firms

[7] *See* Edlyn V. Levine and Fiona Murray, *How the U.S. and its Allies can Rebuild Economic Security*, MIT Technology Review (Jul. 30, 2024), https://www.technologyreview.com/2024/07/30/1095439/usa-economic-security-competitiveness/.

[8] *See id.*

[9] *See* Levine and Murray, *supra* note 7.

> that design products work with firms that manufacture. They share intellectual property. They share best practices.[10]

The uncomfortable, but critical to understand distinction is that other countries are ahead in some respects regarding the manufacturing of UAS. Allowing the flow of non-U.S. components to U.S. drone manufacturers is key to ensuring that the United States develops technological and manufacturing expertise—by going from assembling initially to eventually developing greater control over the entire production process.

Recommendations: The U.S. Government should provide financial incentives, such as tax credits, direct grants, and accelerated depreciation measures, to spur more engagement between drone industry leaders and larger component producers to encourage and focus resources needed for the drone industry. Most of the UAS industry's supply chain challenges are not unique to the drone industry, and thus the drone industry is competing with the broader electronics industry for components. The CDA therefore strongly urges BIS to consider any actions taken as a result of this investigation in the context of the broader consumer electronics supply chain. As the Review notes, "[the] shift to Chinese dominance in the underlying electronics for FPV drones coincides with the period beginning in 2000, when Shenzhen started to emerge as a global hub for low-cost electronics. This trend was amplified by US corporations . . . which . . . sought low-cost approaches to maintain the competitive edge of [their] products."

The CDA supports government incentives to encourage domestic production of drone sub-components. We believe a growth boom can happen quickly if government incentives are well designed and timely; however, allowing adequate time to enable manufacturers to transition will be critical for the survival of a still nascent domestic industry.

Additionally, the U.S. Government should consider incentives for not only on-shoring, but also friend-shoring components, and should tailor its actions accordingly. Other allied countries are already ahead of the U.S. in ramping up production of critical components. Intermediate policies that support friend-shoring would both a) support U.S. companies in transitioning away from reliance on Chinese products, and b) dilute China's global market dominance. The CDA recommends focusing first on critical components such as batteries and motors.

The U.S. government should avoid at this juncture imposing tariffs on components that go into drones in order to ensure that U.S. companies can continue to have access to key components and scale up their manufacturing. The imposition of tariffs at this critical juncture in the industry's development could also impact our global competitiveness, making it more difficult for U.S. manufacturers to compete in the global marketplace. As it becomes evident that there will be major U.S. UAS producers and policies that will support them, there can be additional opportunity to

[10] J.D. Vance, Vice President of the United States, Remarks at the American Dynamism Summit (March 18, 2025), available at https://www.presidency.ucsb.edu/documents/remarks-the-vice-president-the-american-dynamism-summit.

review whether trade policy interventions may be appropriate to stimulate new U.S. component producers.

IV. The Role of Foreign Nations in Exploiting the UAS Market and Technology Capabilities

The CDA represents a wide range of organizations within the commercial drone marketplace, which vary by size, structure, and organization. Our goal is to enable American and allied organizations to bring the benefits of drone technology to communities across the U.S. at scale. Companies and organizations in this marketplace range from small businesses with less than five employees to multinational corporations with complex international relationships. There is also significant variation in how companies build, buy, and use drones:

> For **Operators**, this variation ranges from vertically integrated manufacturers/operators to operators that buy commercial-off-the-shelf (COTS) systems and fly them right out of the box with no customization. Between these two extremes, there are myriad 'integrator' companies who leverage combinations of COTS hardware with third party sensors or software, including cloud-storage and processing and autoflight systems, or who build systems with varying degrees of customized hardware and COTS software solutions.
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> For **Manufacturers**, this variation ranges from manufacturers who build an entire UAS, complete with all associated elements, and produce thousands of systems a month for commercial and public safety customers, to manufacturers who develop and/or build various components and subcomponents of a UAS, including flight data service providers, spectrum providers, and autoflight software developers.

The CDA supports responsible efforts to mitigate national security risks posed by UAS manufactured in adversarial nations, including the PRC. As stated in our comment on the *Bureau of Industry and Security, U.S. Department of Commerce Advance Notice of Proposed Rulemaking re: Foreign Adversary ICTS Integral to UAS Technology*, the CDA believes data exfiltration and remote access control represent the two primary areas of risk associated with foreign adversary information and communications technology and services (ICTS) integral to UAS technology.[11] These risks are clearest when a UAS is both capable of operating BVLOS (automated flight and waypoint flight planning capability) and of performing some form of intelligence, surveillance, and reconnaissance (ISR).

In considering the various risks from components supplied by foreign nations, CDA encourages BIS to evaluate the specific components carefully. Many of the components in UAS do not present any security risk because they are not linked to the digital elements that handle processing, data management, or autonomous capabilities for drones. In many cases, imported

[11] *See* Commercial Drone Alliance, Comment Letter on Bureau of Industry and Security, U.S. Department of Commerce Advance Notice of Proposed Rulemaking re: Foreign Adversary ICTS Integral to UAS Technology (Mar. 5, 2025), https://www.regulations.gov/comment/BIS-2024-0058-0598/.

components are fasteners, bolts, wiring, or basic motors. U.S. manufacturers need a stable supply of such components until U.S. production for them ramps up if they are going to scale up quickly.

Recommendations: A majority of CDA members urge BIS to consider that there are multiple methods of mitigating the risks associated with foreign adversary-produced UAS and components. Any BIS action based on drone capability should clearly identify such risks and provide flexibility for companies to mitigate those risks in a performance-based way. For example, compartmentalization (a practice long proven to work for securing information) is one type of mitigation a manufacturer can use to protect against third party interference with UAS operations whereby the entities supplying distinct hardware components do not have access to the software running the aircraft itself. Other mitigation measures, such as software development validation and configuration and manifest enforcement, can also be effective means of ensuring that only trusted software interacts with drone hardware.

While not the prevailing CDA view, some members believe there to be unique risks associated with UAS that are wholly built by a company subject to foreign adversarial control, meaning hardware, software, and all integration thereof is designed and built by the foreign adversary-owned company. These stakeholders would urge BIS to consider restrictions on entire platforms, rather than using third party software, cybersecurity standards, component restrictions, or other methods to mitigate risk.

V. Building Domestic UAS Capacity

Primarily due to regulatory stagnation, few domestic UAS companies, both operators and manufacturers, have yet reached a level of scalability to cover their operating costs. The reality is that U.S. Government procurement alone is not enough to sustain a domestic industrial base for small, low-cost drones, and the industry saw a dramatic 73% decline in venture capital funding from 2022-2024.[12] Commercial demand for U.S.-and allied-manufactured drones will be critical to build and sustain a defense industrial base for this technology. It is no secret that PRC-based companies capture a dominant market share of the consumer and commercial drone marketplace—estimates vary but generally range from 75-90% of market share, both in the U.S. and globally.

Building and maintaining a strong domestic UAS industry promotes competitiveness and protects national security. For this reason, the CDA has long advocated for enhanced support for domestic UAS manufacturing capabilities and supported efforts to ensure a robust and secure UAS supply chain. The federal government's actions must not only be punitive; the government must also take positive steps to support the domestic drone marketplace. The CDA also urges BIS to recognize the realities of global supply chains, the complexity of transitioning sourcing strategies, and the need to ensure that any regulatory framework allows for the continued growth and competitiveness of the U.S. commercial drone operations industry and drone and component

[12] *See* Wackwitz, *supra* note 3.

manufacturing. We urge any BIS action to balance these priorities and concerns in a way that strengthens national security without stifling domestic innovation. This will help avoid unintended consequences for American and allied UAS companies by imposing additional regulatory and policy hurdles that prevent scalable, safe, and secure commercial UAS operations in the United States.

Ultimately, the U.S. cannot have a strong defense industrial base if economic policies disable our commercial drone market. The CDA therefore urges the federal government to develop, communicate, and adhere to a coherent economic policy across its various departments. The operating margins within this industry mean companies will not survive if they must simultaneously absorb (1) tariffs on component parts coming into the U.S.; (2) substantially increased prices for non-PRC platforms and components; and (3) higher costs for domestic manufacturing. An incoherent policy with no prioritized objectives may, for example, encourage U.S.-based companies to outsource production to avoid paying component tariffs from allied countries, or at worst, put companies out of business, especially small innovative technology companies. As the MIT Technology Review summarizes:

> While the absence of the high-tech industrial capacity needed for economic security is easy to label, it is not simple to address. Doing so requires several interrelated elements, among them designing and incentivizing appropriate capital investments, creating and matching demand for a talented technology workforce, building robust industrial infrastructure, ensuring visibility into supply chains, and providing favorable financial and regulatory environments for on- and friend-shoring of production. This is a project that cannot be done by the public or the private sector alone. Nor is the US likely to accomplish it absent carefully crafted shared partnerships with allies and partners across both the Atlantic and the Pacific.[13]

<u>Recommendations</u>: The U.S. Government should develop a whole-of-government robotics framework with a coherent economic policy that addresses supply chain vulnerability and prioritizes and incentivizes friend-shoring as a near- to medium-term policy. This could also include "Assembled in the U.S." tax incentives and incentives/tax credits as a percentage of the BOM increase related to sourcing from non-PRC content. In addition, many of CDA's members express a desire for clear guidance around future risks to the supply chain from U.S.-China decoupling.

VI. Conclusion

The CDA appreciates this opportunity to comment on the Section 232 National Security Investigation of Imports of Unmanned Aircraft Systems (UAS) and Their Parts and Components. We share the BIS's interest in ensuring national security and fostering an environment where the U.S. can regain its role as the global leader in advanced aviation. The CDA looks forward to

[13] *See* Levine and Murray, *supra* note 7.

continuing to work with the BIS to ensure a safe and secure supply chain while simultaneously working to accelerate the safe and secure integration of commercial drones into the NAS, which will unlock the benefits of commercial drone operations for the American people.

Respectfully submitted,

Commercial Drone Alliance