Melissa Orme, PhD
Vice President
Boeing Additive Manufacturing

The Boeing Company
900 N Pacific Coast Highway
El Segundo, CA 90245

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Applied Science & Technology Research
Organization of America (ASTRO America)
6701 Democracy Blvd., Suite 300
Bethesda, MD 20817

Re: AM Forward

Boeing is pleased to join ASTRO America and the Biden-Harris Administration in implementing AM Forward— a voluntary compact aimed at strengthening supply chains in the United States by supporting the adoption and deployment of additive manufacturing (AM), or industrial 3D printing capabilities, by U.S.-based manufacturers.

AM has demonstrated production-readiness for a variety of applications, including mission critical aerospace applications. The use of AM has enabled new levels of product and system performance by considering: multi-functionality, part consolidation, and enabling geometries not producible using conventional manufacturing methods. AM has broad utility across a wide range of applications, including space, aviation and defense, with accelerated adoption observed on legacy and new platforms.

The demand growth for qualified, U.S.-based AM suppliers has resulted in the need to expand, develop and qualify a larger supply base and establish a resilient supply chain that is able to respond to accelerated lead times and reduced cost targets, at scale. The U.S. supply base- especially small and medium suppliers- will need considerable support to respond to these growing market needs and unprecedented levels of AM demand.

Boeing will take action to support multiple U.S.-based suppliers so that in 12 to 24 months each will have increased their ability and capacity to additively produce qualified parts, targeting a 30% increase in qualified AM supply base capacity. This engagement includes the required supplier training/guidance and workforce development required to achieve a repeatable and reliable supply chain in a qualified, production-level environment. We appreciate the Biden Administration's support of these efforts through U.S. government financing programs, capacity building, and workforce development initiatives.

Boeing has been uniquely positioned to lead the industrialization of additive manufacturing in both the commercial aviation industry and the defense industry. Boeing has accumulated decades of experience with applying polymer and metal additive manufacturing, with over 70,000 qualified flight AM parts manufactured across the U.S. supply base. Our commitment to AM is further strengthened by the continuous and significant investment

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into material development, digital thread development and integration, qualification of additional small and medium sized suppliers and cybersecurity for the scale and quality of AM across our supply base.
Specifically, Boeing will support the goals of AM Forward by committing to:

- Targeting an increase of Boeing qualified small and medium sized supplier capacity by 30% and providing technical guidance to meet Boeing and industry qualification requirements including delta qualifications.
- Targeting small/medium sized suppliers to compete on request for quote (RFQ) packages sent out for products utilizing additive manufacturing technologies.
- Integrating small/medium sized suppliers into a digitally enabled Boeing AM supply network for rapid deployment of qualified AM capabilities to Boeing customers and U.S. government customers.
- Continued leadership in the development and release of AM industrial standards in collaboration with Standard Development Organizations (SDOs), including SAE AMS and ASTM.
- Partnering with suppliers to conduct research to improve AM techniques specifically focused on data-driven quality assurance of AM across the supply chain.
- Exploring common AM training with industrial and academic partners for additive workforce development and adoption of AM across the industry base, including continued collaboration with America Makes and the Manufacturing USA institutes.
- Collaborating with other OEMs and the U.S. government to explore establishing an AM material consortium or leveraging existing materials data groups such as the Metallic Materials Properties Development and Standardization (MMPDS) to develop and share AM material properties.

Boeing is committed to collaborating with the other participants in AM Forward, as well as U.S. government agencies to achieve the collective goals established by the compact. This activity will require engagement at both a working level and a senior executive-level along with government officials and other industry peers to support a range of industry, government, and non-profit activity. We understand that as an AM Forward participant, we will be supported with staff coordination from 501(c)(3) nonprofit organizations including the Applied Science & Technology Research Organization of America (ASTRO America) and Gettysburg College's Eisenhower Institute.

Boeing will also support efforts by its suppliers to take part in key U.S. government programs associated with AM Forward. Federal agencies can play an important role in accelerating small and medium supplier's access to necessary capital, workforce training, technical assistance, and technology transition support. For this reason, we will work with the relevant federal government agencies, as well as nonprofit organizer ASTRO America to encourage participation in AM Forward workshops and, as appropriate, support proposals for assistance associated with government programs.

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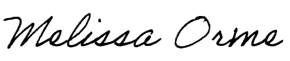
We know the competitiveness of the U.S. industrial base, including Boeing, relies on the capability of a wide spectrum of suppliers producing and post-processing critical aerospace parts. However, we recognize over the last several decades many suppliers have lacked access to resources to upgrade technologies that catalyze productivity gains. Through AM Forward, we are confident we can collaboratively accelerate AM adoption at scale; increase the agility, capacity, and resiliency of U.S. supply chains; and support and expand good-paying jobs across the U.S.

Thank you for your leadership on this important initiative.

Respectfully,

Melissa E Orme, PhD



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