

2021 AIAA KEY ISSUES AND RECOMMENDATIONS

The U.S. aerospace and defense (A&D) industry is a multi-trillion-dollar enterprise that supports millions of direct and indirect jobs nationally and many more globally. The coronavirus pandemic has had a huge economic impact on A&D. It is critical that substantial action be taken in a timely manner to address the needs of the industry during this uncertain time and to return us to some version of normalcy. Failure to act will likely lead to economic decline and emboldened international threats. Consequently, to protect A&D, the following Key Issues are focused on recovery and sustainment, including leveraging A&D as a catalyst to lead other segments of the economy back to health and growth in the coming years.¹

The industry has and will continue to directly address critical issues facing our nation. This includes stepping up in response to the crisis by rapidly producing and transporting needed Personal Protective Equipment, developing and delivering critical ventilators, and now distributing the COVID-19 vaccines. The sector is critical for addressing climate change by developing the necessary new technologies that reduce aviation carbon emissions and provide for a more sustainable future. In addition, the sector provides significant opportunity for young people of all races and economic conditions to tackle the complex challenges of defending our way of life and consistently improving our society.

Actions taken (or missed) now for the A&D sector will affect the nation for many years to come. The American Institute of Aeronautics and Astronautics (AIAA) – the world’s largest aerospace professional society—urges decision makers to enact and support policies that will allow sustainment of this vital industry during these difficult times and result in a robust and world-leading A&D sector. More specifically, the Institute recommends:

- › Providing stable and sustained **funding for the entire A&D sector** (DOD, NASA, FAA, other applied research and development, small businesses) to ensure the United States emerges from the pandemic with its global leadership in this area intact.¹
- › Supporting initiatives for national and global cooperation to enable the **commercial aviation market** to return to full operation – such as standardized health management measures and tasking the FAA to lead the harmonization of regulations and policy.²
- › Continuing to invest in **A&D research and development** – this is the source of new technologies and products that will ensure future job growth, address climate change, provide needed opportunities for young people of all backgrounds, address evolving threats, and global leadership.^{3, 4}
- › Developing **public/private partnerships** at national, state, and local levels to dramatically improve (in quality and quantity) the STEM pipeline – our future workforce.⁵

Papers can be found and downloaded at aiaa.org/advocacy/Policy-Papers

1 Addressing COVID-19 Challenges to U.S. Aerospace and Defense (2020)
 2 Aircraft Certification: Accelerating Innovation in Civil Aviation (2018)
 3 Aeronautics R&D Policy Platform Paper (2020)
 4 Aeronautics R&D: A Key to Economic Prosperity (2018)
 5 STEM Pipeline (2019)

A&D INDUSTRY OVERVIEW



2.19M jobs,
58% attributed
to supply chain



Nearly
\$909B
in sales
revenues



Salaries **46%**
higher than
the national
average



Positive trade
balance of
\$79B



\$46B
contributed in
federal tax
revenue

FUNDING STABILITY AND COMPETITIVENESS

The A&D sector has experienced growth in recent years because of a strong commercial market and increased government investment, but major challenges have emerged that have been compounded by the pandemic. These challenges include mounting budget deficits, trade policy uncertainties, supply chain disruptions, and global competitors investing heavily in military modernization, commercial development, and scientific research.

Moreover, the current unpredictable fiscal and political environment creates short-term uncertainties, which increase the risk of delays of new aerospace initiatives and the curtailment or termination of important programs. A predictable funding environment and long-term authorizations ensure stability and are foundational for successful research and development. The technologies and products developed for A&D applications have been at the heart of the American technology boom and will continue to be at the forefront of rebuilding and growing the economy while providing security from global economic, military, and health threats. Maintaining near-term business health, coupled with a long-term perspective, will drive the difficult choices needed so the nation can best plan for and execute initiatives critical to a secure and economically robust future.

RECOMMENDATIONS

- Provide stable and sustained funding for the A&D sector, including:
 - DOD, at a level that supports critical technology developments to address evolving threats and efficient, effective **multi-year acquisitions and operations**.⁶
 - NASA directorates in a balanced and predictable manner, maintaining “constancy of purpose” to meet **near- and long-term program and mission requirements**,^{7,8} so necessary to address climate change by furthering our knowledge of the Earth and the solar system.
 - FAA at a level to support **safe ongoing operations**, to aid our valuable public health care network during the pandemic and long-term civil aviation growth, to incorporate **vital technology advancements to lessen climate change**, and to lead **collaboration with global civil aviation regulatory authorities**.⁹
- **Foundational and applied research in federal laboratories and universities, especially minority-serving institutions**, at levels consistent with maximizing economic growth, dramatically increase inspirational opportunities, and technological leadership.⁴
- Streamlining the **certification and defense acquisition processes** by tailoring oversight requirements to risk.²
- Accelerating the establishment of policies for advancing the **development, commercialization, and integration of new aerospace technologies**, often by small businesses, into A&D supply chains and into larger society.
- Examining **A&D current and planned product supply chains** to identify policy initiatives to address potential global threats and disruption weaknesses, such as access to rare Earth elements essential for weapons systems.¹
- Continuing to review and roll back **restrictive export controls**.

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⁶ Hypersonics: A Game-Changing Technology (2018)

⁷ Supersonic Flight Over Land (2019)

⁸ Space Policy Platform Paper (2020)

⁹ FAA Next Gen: Modernizing our Nation's Skies (2018)



R&D AND INNOVATION

Since the dawn of aviation and through the advent of the space age, the United States has been the world leader in aerospace technologies. The federal government has played an essential role in supporting research and development (R&D) efforts by academia, industry, and government labs leading to a myriad of societal benefits, scientific discoveries, and innovations. While there has been a recent uptick in federal funding for R&D and the United States still represents nearly half of global aerospace R&D spending, our competitors continue to close the gap by investing significantly in technologies critical to aerospace and defense. Efforts seeking to reduce R&D investments with longer term paybacks must be resisted – as these new technologies and processes are at the core of future game-changing A&D products. Sufficient and sustained R&D investments are crucial to maintaining our preeminence in this sector and to creating more and better products that will grow additional jobs while providing economic and physical security.

RECOMMENDATIONS

- › Invest in A&D research and development to protect jobs now, provide opportunity for future employment, and to sustain into the future the U.S. leadership position in aerospace innovation. For example,
 - Supporting robust, **long-term federal research and technology initiatives** in aeronautics and space funded at a level that will ensure U.S. leadership in critical areas such as artificial intelligence, autonomy, cybersecurity, hypersonics, and robotics.^{6, 8}
 - Offering **incentives for research by large corporations and small businesses**, including the commercialization of that research into new products and services.
 - Streamlining the **federal government's A&D product development process** by tailoring risk acceptance to better align with potential benefits, timeliness, and lifecycle cost management.²
- › Invest in the tools and processes that support and drive innovation, advancing research into new technologies and development into new A&D products. For example,
 - Sustaining **infrastructure critical to the advancement of R&D** such as computational modeling/simulation and experimental ground and flight-testing capabilities.⁶
 - Supporting federal programs in critical areas to **accelerate innovation and technology transition** to operational applications.^{6, 7, 10, 11}
 - Re-energizing the **Small Business Innovation Research (SBIR) program** across the government by emphasizing new initiatives that address barriers in bringing SBIR/STTR technologies to the marketplace.

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¹⁰ Additive Manufacturing Revolutionizing What We Make (2018)

¹¹ UAS: Expanding Transportation and Driving Growth (2018)

WORKFORCE DEVELOPMENT AND ENHANCEMENT

The U.S. A&D sector continues to face a skills gap that threatens our future standing in the world. A sizeable percentage of the workforce is approaching retirement eligibility, and the skills gap will be exacerbated by mass layoffs and career switches as a result of the pandemic. While demand for highly skilled workers in early 2020 reached levels not seen since the 1960s, the A&D industry faces significant hiring and retention challenges. These include achieving greater workforce participation by women and ethnic minorities, retaining qualified and trained personnel because of recruitment by other industries, processing background checks without long delays for classified work,¹² loss of knowledge from early retirements, and hiring well-qualified international workers without impediment.

When it comes to early education our education system is largely not preparing students to be STEM-literate and adaptable to rapidly changing technologies; most high school graduates do not rate proficient in math or reading. At many schools, teachers receive inadequate support and there is an absence of direct mentoring in applying science and math. The coronavirus pandemic has brought new challenges even as it has forced the acceleration of new technologies to accomplish work and learning. Industry leaders, policymakers, educators, administrators, parents, mentors, and students have tackled this crisis with a true “all hands on deck approach,” but programs need to be put in place to ensure a skilled technical A&D workforce is in place when needed.⁵

RECOMMENDATIONS

- Enable a diverse and robust STEM pipeline.⁵
For example,
 - Develop **public/private partnerships** at national, state, and local levels to:
 - o Rebuild the nation’s K-12 educational process, with particular focus in underrepresented and economically disadvantaged communities – as math and reading proficiencies below 50 percent overall and much lower for minority students limit the future of many.
 - o Broadly expand and increase availability of remedial learning to help bridge the gap for those struggling in K-12 to future opportunities in tech/craft apprenticeships and at colleges/universities.
 - Pass legislation, such as the Higher Education Act, that enhances the **pipeline of STEM-competent workers** into the U.S. economy, including initiatives aimed at underrepresented communities and institutions.
 - Encourage the recruitment and professional development of **K-12 STEM teachers** through federal incentives, increased salaries, improved working conditions, and grants.
- Increase research grants to minority-serving institutions by utilizing specific targets and goals to improve capabilities and include research as direct technical support to the vital programs of federal agencies.
- Encourage support of professional societies as sources of knowledge, career growth, and organizations with direct connection to drive the above STEM-related recommendations.
- Support development of the workforce for all skill types and stages of career to advance learning commensurate with tech and product advancement.
For example,
 - Promote **training and educational initiatives** that support knowledge retention and stability for mid-career and transitioning workforce.
 - Incentivize industry to recruit **military personnel transitioning to the civilian workforce** by standardizing the process and better categorizing the military skill set.
 - Pass visa legislation that welcomes and retains **highly educated international professionals** who earn advanced STEM degrees from U.S. colleges and universities.

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¹² Security Clearance Reform (2019)

