



What Every Candidate Should Know About the National Airspace System & NextGen

Our nation's civil aviation infrastructure is the most complex in world and is critically important for our gross domestic product (GDP), productivity, and quality of life. The U.S. operates the largest, most complex and safest aviation system in the world, is the leading innovator in new operational procedures, and is the home to the world's largest manufacturers of air traffic equipment. However, the Federal Aviation Administration's (FAA) air traffic control infrastructure is technologically obsolete and its facilities are outdated. To address these issues and accommodate future growth in the system, the FAA has begun a multi-year infrastructure transformation called NextGen. Modern hardware and software, satellite-based navigation and surveillance systems, and better weather information will allow both pilots and controllers to achieve unparalleled situational awareness improving our airspace's efficiency and safety.

Since the end of World War II, U.S. investments in our air traffic control infrastructure have been critical to our nation and positioned the U.S. as the global leader in aerospace. Currently, civil aviation:

- accounts for 5.4% of our GDP;
- contributes \$1.5 trillion in total economic activity; and
- Supports 11.8 million jobs.

Further, aviation continues to be the nation's top net exporter within the manufacturing sector, providing tens of thousands of jobs to American workers through tremendous success in a highly competitive global marketplace.

We must protect U. S. leadership and grow aviation sector by:

- > **Recognizing the critical importance of a Modern Air Traffic Control System (ATC) for the U. S. Economy is important to long-term budgeting, planning and cost-effective management of complex infrastructure programs like NextGen.**
- > **Encourage Processes Allowing Long-Term Capital Planning and Budgetary Flexibility at the FAA**
- > **Protect Today's Aviation Financing System for General and Business Aviation**
- > **Accelerate Reasonable Rules That Foster the Safe Integration of Unmanned Aircraft and Commercial Spacecraft into our National Airspace**

Key Facts about the United States and NextGen

Our ATC system serves not only passengers who use it directly, but countless others who never leave the ground.

Tourism, package delivery, and just-in-time logistics are just two examples of how our ATC system positively affects Americans each day. However, there are distinct user groups that are critically dependent on this infrastructure.

Commercial Aviation includes airlines carrying both passengers and cargo. U.S. air carriers:

- operate more than 30,000 daily flights in the U.S.;
- drive nearly \$1.5 trillion annually in U.S. economic activity;
- directly employ more than 580, 000 people and have created nearly 11.3 million U.S. jobs; and
- are responsible for \$807.1 billion (or 5.1%) of the U.S. Gross Domestic Product (GDP).

General and Business Aviation includes recreational and private pilots, corporate aircraft, and other non-scheduled operations. General aviation (GA) operations in the U.S.:

- contributed \$109 billion to the U.S GDP; and
- support more than 1.1 million domestic jobs, producing \$69.1 billion in labor income in the U.S. economy.

Continued progress on NextGen will allow private and business pilots safer and more efficient flight planning, in urban as well as rural areas. This segment of the aviation system knits America's small businesses and communities into the fabric of our nation, keeping them connected with the larger cities and hubs of our economy.

National Defense and Law Enforcement includes military and other government users of our airspace system. In addition to Department of Defense operations, these include law enforcement, homeland security, immigration, and other critical functions. NextGen will provide these users increased safety through better situational awareness, more efficient flight paths, and more flexible use of the airspace for military training exercises and operations.

Emerging airspace users include:

Unmanned Aircraft Systems (UAS) technology is the fastest emerging technology that aviation has seen in decades and is leading policymakers and the general public to rethink and reimagine aviation's potential for societal benefits. The U.S. is currently the global leader in UAS technology. The FAA projects that roughly 7,500 larger, more complex unmanned systems will be operational in the United States within five years. The advanced avionics on these aircraft will depend on NextGen infrastructure to deliver many of the benefits they promise

Commercial Space regulation falls under FAA and comprises those private enterprises that own or operate space capabilities, such as satellites and ground systems to provide products or services including satellite broadcasting and a wide range of telecommunications. It also includes the launching of spacecraft on a commercial basis. There is an increasing amount of entrepreneurial activity, investment and new business creation in this sector. The capabilities that NextGen is bringing into use will more easily allow commercial space operations, which transit through the NAS between launch/landing and orbit, to safely and efficiently share airspace with current users.

U.S. Leadership in Air Transportation Systems is at Risk

Despite the benefits civil aviation has given our nation, maintaining our aviation leadership will be challenging in the face of increasing global competition:

- Although civil aircraft manufacturing continues to be a top net exporter with a positive trade balance of \$54.3 billion, foreign competitors are developing more sophisticated aircraft with an eye on markets currently dominated by the United States.
- NASA and DOD have been FAA's partners in research and development (R&D) for NextGen, UAS, and other efforts that will enhance the nation's air transport infrastructure. However, U.S. government R&D as a percentage of our GDP has fallen by 60 percent since 1964. In particular, after adjusting for inflation, NASA's purchasing power is below what it was in the early 1990s. By contrast, other nations including China are raising their R&D investment much faster than the United States.

What is needed?

> Recognize the Critical Importance of a Modern Air Traffic Control System for the U. S. Economy

Long-term budgeting, planning and cost-effective management of complex infrastructure programs like NextGen are severely hampered by future funding levels under the Budget Control Act of 2011. The cloud of uncertainty caused by potential sequestration of FAA resources undermines critical investments, and impacts private sector investment

> Encourage Processes Allowing Long-Term Capital Planning and Budgetary Flexibility at the FAA

> Protect Today's Aviation Financing System for General and Business Aviation

> Accelerate Reasonable Rules That Foster the Safe Integration of Unmanned Aircraft and Commercial Spacecraft into our National Airspace



What Every Candidate Should Know About the Aerospace Workforce and STEM

A highly skilled and robust defense and aerospace workforce is essential to our nation's security and economic prosperity, and today that workforce is at risk. Our industry faces a wave of impending baby boomer retirements along with a shortage of trained technical graduates, while work and skills requirements become increasingly advanced. The situation is challenging today and forecast to worsen in the next decade. At issue is a nationwide shortage of workers for jobs requiring skills in science, technology, engineering and mathematics (STEM). These workers form the backbone of an aerospace and defense industrial base that is counted on to provide sustained innovation, economic growth, global competitiveness and security for the United States and its allies. AIA and our member companies are committed to working with government at all levels and other stakeholders to ensure the availability of a well-educated and trained, globally competitive workforce.

Benefits of the American Aerospace and Defense Industry

- > **National Security:** The strength of the aerospace and defense industry helps keep our nation safe and secure while assuring that our men and women in uniform are successful on the battlefield.
- > **Economic Strength:** The industry consists of more than 1 million Americans across 50 states and is one of the largest contributors to annual GDP.
- > **U.S. Global Competitiveness:** The U.S. aerospace sector achieved a record \$66.7 billion trade surplus in 2015.

Innovation: The aerospace industry is at the forefront of new technologies including virtual prototyping for jet and rocket parts and 3D printing on the International Space Station and for advanced aircraft materials and design. High visibility innovation in the aerospace industry attracts students to a variety of STEM careers, both in aerospace and other sector.

Key Facts about the Aerospace Skills Gap

- > The skills gap is real and positions are going unfilled; 39 percent of aerospace companies predict an "extreme" impact on their business growth caused by the STEM labor shortage. Among U.S. manufacturers, talent shortages cost an estimated \$14,000 per unfilled position.
- > The skills gap is expected to increase further, as current aerospace employees retire. In 2015, 18 percent of all U.S. aerospace engineers and 24 percent of all aerospace manufacturing employees were eligible for retirement. It is predicted that 41 percent of skilled tradesmen in the aerospace industry will retire by 2017. At the same time, only 1.5 percent of the nation's 25- to 34-year-olds has a science degree, putting the U.S. at the bottom third of all countries in the Organization for Economic Cooperation and Development.
- > AIA member companies are engaged in a number of best practices to develop their workforce including: employer-driven training partnerships, (where employers communicate the skills they needs to area schools, and help develop curriculum); work-based learning, including internships, mentorships, apprenticeships (registered and non-registered), on-the-job training, job shadowing and simulated work environments; engagement with other stakeholders through programs like the White House's "Change the Equation" initiative and the Business Higher Education Forum; support for a variety of STEM contests and challenges targeting students from primary school through post-secondary education.
- > Since 2010, AIA and the National Defense Industrial Association have collaborated to host regional STEM forums in 16 states and the District of Columbia to develop state STEM networks and share best practices to coordinate collaborative action to produce systemic impact on STEM education and workforce development.

Actions needed to build a 21st Century STEM Workforce

Support legislation and regulatory actions to create and expand access to STEM careers: AIA urges candidates to support long-term policies that help create access to STEM education, training and employment opportunities for students and professionals nationwide. These include measures to make college education affordable, lower student debt, align education resources to workforce needs and engage employers.

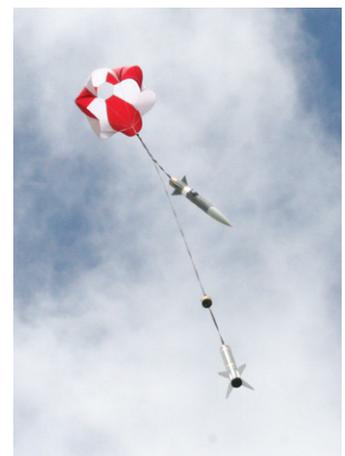
Stabilize funding for government innovation: Federal agencies such as the Department of Defense, Federal Aviation Administration and the National Aeronautics and Space Administration help launch the careers of thousands of STEM professionals while benefitting from an ability to attract top talent for some of the country's most important defense, exploration and safety missions. However, their work is threatened by policies such as sequestration, as well as short-term funding measures and program cancellations that limit their ability to act as incubators serving national priorities. Funding threats also undermine the ability of government researchers to convert technologies for use in non-military markets, which has long been a boost to the economy and a spark for commercial and consumer innovation. Stable, long-term funding for research and development among these agencies must remain a priority.

Promote STEM education policies and retention of U.S. educated workers: AIA supports a commonsense STEM immigration policy and encourages candidates to take action to retain foreign borne U.S. educated STEM talent within the American workforce.

AIA's Signature STEM Program: Team America Rocketry Challenge



Each year, AIA and the National Association of Rocketry organize the world's largest student rocketry competition, the Team America Rocketry Challenge (TARC). The competition is designed to provide participating middle and high school students with firsthand engineering experience and expose them to careers in aerospace and STEM. Students participate as teams and are tasked with designing, building and flying model rockets to meet specific targets for maximum altitude, flight duration and payload. More than 60,000 students have participated since the contest began in 2002. In 2015, 700 teams representing 48 states, the U.S. Virgin Islands, Puerto Rico and Washington, D.C., participated in TARC's qualifying rounds. A student team from Alabama beat teams from the United Kingdom and France at the Paris Air Show to take home the international title



What Every Candidate Should Know About Defense



Maintaining the security of the United States and her citizens is the President's most important responsibility. America's current military advantage against any potential military foe is hard won—if we are to continue to have the finest equipped and best trained military force, the President must ensure that:

- > threats are well-understood and clearly communicated to Congress and the American people;
- > defense spending is adequate to meet our current and future national security needs, and is consistent from year to year so that programs can be managed efficiently; and
- > the Pentagon's acquisition system encourages efficiency and innovation.

Growing Threats Require Greater Defense Spending: 'Four Percent'

Five years ago, the President and Congress sought to address America's unsustainable debt by setting arbitrary 10-year limits on discretionary spending, including both domestic and defense accounts. While the more draconian effects of the Budget Control Act of 2011 (BCA) have been avoided by successive bipartisan agreements, military budgets still are inadequate for the challenges our nation faces. The next Commander in Chief must recognize that the world has become considerably more dangerous since the BCA was passed. Today the Pentagon faces widespread global terrorism, Russian aggression on NATO's doorstep, provocation by Iran and North Korea, and an increasingly capable and assertive China. Our most capable potential adversaries have made huge strides in their offensive and defensive capabilities, from submarines to cyberspace.

Under these circumstances, future defense budgets must be based on realistic judgments about threats and the military capabilities and capacity needed to meet them, not on arbitrary spending reduction targets.

Cuts to defense, or other discretionary accounts—which together represent only 40 percent of federal spending cannot resolve the fundamental imbalance between revenue and spending so long as the entitlements actually driving our budget deficit remain untouched.

History shows that American military strength has a vital role in keeping the world prosperous and stable. The next President must seriously consider where U.S. power and presence are necessary; encourage military leaders to propose the capabilities they require; and then lead Congress and the American people to make needed investments. Our armed forces must be large and capable enough to meet multiple threats in multiple environments and they must have the most modern weapons and technology we can provide.

From 1980 through 2014, defense spending averaged 4.4% of U.S. gross domestic product (GDP). Last year, it was 3.2%, and according to DOD budget projections, spending on defense will amount to only 2.6% of GDP in 2020. Analysts generally agree that a defense budget at or near 4% of GDP is an appropriate level of investment in our military capability—the next President must set a goal of 'Four Percent' or risk having forces that are under-equipped, lacking vital technology, and stretched dangerously thin.

Defense Budgets Must Be Stable

Stable funding of defense programs is just as important as their funding level. For several years, the Department of Defense has had to adapt its defense programs to arbitrary limits (budget caps, called 'sequestration'); delayed appropriations and continuing resolutions; and the Overseas Contingency Operations (OCO) funding category. In this uncertain and unpredictable context, procurement and modernization programs have been started, stopped, delayed and restructured too frequently, wasting funds and slowing an already cumbersome acquisition process. It is vitally important that the next President work with Congress to make defense budgeting more rational. Consistent and timely action on authorization and appropriations bills, and the hundreds of line item decisions that they make, allow the executive branch and industry to prudently plan in order to maximize economic performance, foster stable employment, and equip a modern force.

Defense Spending Must Be Balanced

Military power is a combination of size, capability, and presence; a large enough force, either in (or able to get quickly to) the right places, and armed with the best possible weapons and equipment. As the new President seeks larger and more stable defense budgets, those funds also must be allocated appropriately between current readiness—primarily in the Operations and Maintenance (O&M) and Personnel accounts—and investment for the future force, primarily in the Procurement and Research and Development (R&D) accounts.

There are many trades to be made in this calculation. For example, technology—though expensive—saves lives and reduces the size of the force required. Similarly, the force must be large enough; regardless of how well-equipped they are, our troops cannot be in two places at once. There is growing concern among defense analysts that, even if defense budgets increase to the 'Four Percent' level, growth in personnel and dependent costs could erode the Pentagon's ability to invest in future systems and better capabilities.

While providing for the readiness and care of troops today, defense leaders—starting in the White House—must look to the medium and long-term needs of the force. Since 1980, procurement of weapons and equipment has ranged from 14 to 29% of total defense spending; research and development funding has ranged from eight to 13%. The next President must establish a goal of 35% as the combined proportion of defense spending devoted to the investment accounts.

Defense Acquisition Must Promote a Healthy, Efficient and Innovative Industrial Base

Some military procurement experts estimate that nearly thirty cents of every contract dollar goes toward compliance with government regulations. Consistent, streamlined acquisition regulations will give the U.S. aerospace and defense industry more flexibility and incentives to innovate and compete, which will preserve its dynamic role in the American economy. There have been meaningful improvements in the Pentagon's acquisition practices and processes in recent years, but the system is still too slow, inconsistent, and risk-averse. To maximize efficiency and innovation, DOD acquisition must:

- > ensure that research and development leads to meaningful procurement programs;
- > protect all companies' intellectual property (IP);
- > reduce and streamline the auditing process; and
- > adopt consistent contracting rules across all Services and programs.

U.S. Leadership in Space is at Risk

The space environment is a unique and critically important domain for our nation's vital interests. With innovative platforms and satellite systems, space is both an economic sphere and a high ground used for purposes of observation, communication, command and control, and positioning, navigation, and timing. The microgravity environment of space is critical for important research and production activities that could not be duplicated on Earth. Space also offers a frontier to explore and inspire and to ensure the survival, advancement, and expansion of our civilization and values.

For nearly sixty years, U.S. government and private sector investments in space programs have been critical to our nation and the world by:

- > Enabling a \$330 billion per year global space industry that has fundamentally improved our lives while creating employment for hundreds of thousands of American workers. These jobs are spread across the country in every state, support a highly skilled and well paid workforce, and help maintain U.S. global competitiveness.
- > Advancing knowledge, science, and the creation of new technologies, which drive countless industries that deliver tremendous economic and social benefits.
- > Revolutionizing U.S. national security capabilities from the high ground of space giving America's armed forces a significant advantage in any conflict. This has contributed to U.S. influence and soft power around the world, also aiding our allies and deterring adversaries.
- > Inspiring generations of Americans to study science, technology, engineering, and math (STEM) and pursue high-tech/high-wage careers ensuring America remains the most technically advanced nation. Many students who ultimately go into other fields are first inspired by space programs.
- > Enabling and extending global communications capabilities to every point on Earth.
- > Providing essential surveillance of landforms, the atmosphere, and oceans to produce data for agriculture, mining and drilling, urban and other planning, and for critical weather forecasts and global intelligence, saving countless lives and billions of dollars annually.

Key Facts about the United States and Space

The U.S. is well-served by its three distinct yet interrelated and complementary space portfolios. These efforts are supported by networks of academia, industry, and national laboratories, which must be enabled by the federal government in order to ensure continued U.S. leadership.

Civil Space includes the National Aeronautics and Space Administration (NASA), responsible for the exploration and development of space and advanced technologies for the expansion of knowledge and the benefit of life on Earth; the National Oceanic and Atmospheric Administration (NOAA), responsible for observing the Earth environment and understanding and forecasting planetary phenomena, like weather; the U.S. Geological Survey (USGS), which operates the Landsat Earth-observing satellites; and the Federal Aviation Administration (FAA) Office of Commercial Space Transportation (AST), which regulates commercial space launch and re-entry to ensure public safety.

Commercial Space comprises those enterprises that own and/or operate space capabilities, including satellites and ground systems that provide products or services such as Earth imagery, satellite broadcasting, and a wide range of telecommunications. It also includes the launching of satellites, cargo and soon people, to, low Earth orbit, and beyond on a competitive, commercial basis. Customers range from individuals to corporations, researchers, academia, and government agencies.

National Security Space includes all military and intelligence community uses of space-based capabilities, such as threat detection, military weather forecasting, and reconnaissance activities. The U.S. Air Force is the Defense Department's Executive Agent for Space providing and acquiring critical capabilities and services to national leadership and all branches – from secure communications to precision navigation, timing, and targeting. The National Reconnaissance Office (NRO) provides a similar function for the intelligence community. Other agencies involved include the Defense Advanced Research Projects Agency (DARPA) and the National Geospatial-Intelligence Agency (NGA).

U.S. Leadership in Space

Despite the amazing benefits space has provided our nation, maintaining our space leadership is not guaranteed. Four key issues spanning Civil, Commercial, and National Security Space threaten U.S. leadership and require immediate attention.

Budget uncertainty

- > U.S. Government research & development (R&D) as a percentage of our Gross Domestic Product (GDP) has fallen by 60 percent since 1964. Adjusted for inflation, NASA's purchasing power is below what it was in the early 1990s. By contrast, China's R&D investment is the fastest growing of all advanced countries as China seeks to counter U.S. space advantages and pull away our traditional partners. U.S. military space assets need modernization and recapitalization to keep up with peer and near-peer threats.
- > Despite its significant accomplishments, NASA's funding has fallen to historically low levels (adjusted for inflation) – below where it was during the mid-1990s – squeezing the agency's ability to develop new missions for human exploration, astronomy, planetary science, Earth science, heliophysics, technology development, and aeronautics research and leading to cost and schedule inefficiencies for ongoing programs and missions.
- > The Federal Aviation Administration (FAA) Commercial Spaceflight Office (AST) plays a critical role in providing timely review and approval of launch permits, licenses, and spaceport licenses for the commercial space industry and its budget will constrain its ability to fulfill these responsibilities. For this growing sector to continue on its current trajectory, it is critical that FAA AST have the authority to regulate and resources it needs to work with the industry in a manner that will continue to promote growth and ensure public safety.

International competition

- > Fourteen countries – including North Korea – operate their own launch vehicles and more than one hundred nations have some type of space program. The two most prolific commercial launch vehicles are operated by Europe (Ariane) and Russia (Proton). At least four countries are presently investing billions of dollars in the development of new launch systems. The U.S. is beginning to win back market share of commercial satellite launches for the first time in over a decade. Policies that promote open competition and innovation should be prioritized to maintain this positive trend, but mission assurance for national security launches must remain paramount.
- > Currently, only China and Russia are capable of launching humans into space. The U.S. now depends upon Russia to launch American astronauts to the International Space Station (ISS). Between 2012 and 2017, NASA will pay Russia over \$2.1 billion to ferry astronauts to and from the ISS.

The space operating environment

- > Space is an increasingly congested, contested, and competitive domain in which space-based assets are threatened by orbital debris as well as cyber and kinetic attacks. Moreover, there is risk introduced by both unintentional and intentional interference (jamming) of radiofrequencies by both terrestrial and space-based systems. This puts human missions at risk and threatens the safety of all space platforms.

Workforce trends

- > Although the U.S. space workforce remains one of the largest in the world, the U.S. civilian space workforce has declined more than 17 percent since 2006 due to reduced U.S. space exports, reduced government space budgets, and increased foreign competition. As an example, of the world's 25 largest commercial satellite operators, only one is based in the U.S.

Action Needed to Continue U.S. Leadership in Space

Commit to predictable budgets, fund robust investments, promote innovative partnerships, and repeal the Budget Control Act of 2011. The federal government should authorize, appropriate, promote and manage U.S. space programs for long-term viability and sustainability. In recent years, our space programs have been hampered by a lack of long-term budgeting and planning which impedes cost-effective management. Already, existing systems and programs have been delayed, curtailed, or placed on operational hiatus. The cloud of uncertainty caused by future potential sequestration of U.S. space budgets will wreak havoc on government space programs, dissuade private sector investment, and place the space industrial base and workforce at risk. The U.S. needs to promote public-private partnerships and make stronger investments in R&D to enable innovation and competitiveness. This will strengthen our industrial base, and maximize the impact of taxpayer dollars by leveraging private sector investments. Historically, healthy government investments and partnerships have also led to increased industry R&D investments, which also increase the return on taxpayer dollars.

Continue global space engagement. The ISS is the most visible example of the successful use of space programs to develop and sustain international collaborations and friendly, useful intergovernmental relationships. In many respects, the ISS is the most vibrant example of successful international public and private diplomacy, demonstrating the importance to the U.S. of space programs for achieving national purposes. The ISS is but one example; today, our international partners continue to look to the U.S. for leadership and direction. Additional examples such as the European-provided service module for NASA's Orion spacecraft, now in development, as well as European investments in the Dream Chaser ISS cargo vehicle and the continuing European interest in lunar exploration all represent further steps in international partnership for beyond low Earth orbit exploration. Likewise, the Department of Defense has a long history of successful military-to-military site visits, personnel exchanges, and various other trust-building engagements with friends, allies, and adversaries. U.S. Strategic Command and U.S. Air Force Space Command, in particular, carry out important global engagement with space peers and competitors, which also contributes to overall U.S. security.

Restore American access to space. America must regain the ability to launch its own astronauts into space and bring an end to the practice of buying astronaut seats on the Russian Soyuz spacecraft. There are two complementary, viable pathways to achieving U.S. independence in human space operations and both must be fully funded and vigorously pursued. Both systems expand safety, innovation, scientific research and technology development and strengthen our industrial base:

- > The Space Launch System (SLS) and the Orion Multipurpose Crew Vehicle are NASA's next generation human transportation systems to explore further into the Solar System than ever before. These programs have enjoyed bipartisan and bicameral support and have made significant progress toward a renewed U.S. capability to send astronauts beyond low Earth orbit for the first time in more than 40 years, opening the door to missions in cis-lunar space and eventually to Mars.
- > NASA's Commercial Crew and Cargo programs have also received bipartisan, bicameral support. Commercial Crew is the logical progression of the agency's Commercial Cargo program, enabling two commercial companies to operate cargo transportation to the ISS. Robust and commercially-based access to the ISS for cargo and the new crew vehicles that will once again launch Americans from American soil provides a new model for ISS access while strengthening the industrial base and helping to open new commercial space services markets.

Encourage the continued use of fully competitive, innovative partnerships. Encourage competitive, and innovative partnerships to enable industry to grow and create capabilities that will enhance and support government endeavors where practical. These capabilities must adhere to government regulations and standards to ensure mission assurance and safety are maintained.

Maintain, strengthen, and grow the domestic industrial base. The U.S. space industrial base has been the foundation of our nation's continued success in space. Declining budgets and reduced space initiatives have combined to create increased pressure on the industrial base with increasing difficulties for the smaller suppliers. In response, the U.S. Government is exploring acquisition reform and efficiencies, and has begun to transition traditional responsibilities for well-established capabilities to the private sector, allowing funds to be redirected to ground breaking capabilities. As space systems continue to mature, the government should continue to consider future transition of those capabilities to the private sector. The U.S. Government should also strive to protect American industry from international non-market economy competitors.

Commit to a robust national security space program that maintains America's dominance of the high ground in space. Provide increased resources for national security space and launch programs, including the use of innovative partnerships that support, enable, protect, our national leaders, our warfighters, and our allies. Ensure that these programs enable unmatched global capability to counter nation state and non-state threats and are able to operate effectively in an increasingly contested space environment.

Maintain and expand internationally harmonized spectrum access for space. Commercial, Civil, and Military Space all require access to spectrum in order to deliver their services, operate safely, and meet their mission requirements. Given the significant infrastructure development and investment, it is critical to have predictable and stable regulatory access to spectrum.

Define and commit to new missions to expand the frontiers of science. Through American space leadership and international cooperation, we will continue to dramatically increase our understanding of our Solar System and the universe and gain a better understanding of the complex oceanic and atmospheric phenomena that impact life on Earth.

Promote STEM education and retention of U.S.-educated workers. Scientists and engineers are essential to U.S. innovation and growth. The federal government must continue to promote policies that enhance the pipeline of STEM-educated workers into the U.S. economy and that permit the retention of highly skilled foreign-born workers who have been educated at U.S. colleges and universities.

Further reduce barriers to international trade whenever possible. Increased international sales bolster the economy, assert U.S. technological advancements, and reduce the need for the U.S. Government to sustain the U.S. space industrial base.

Support for America's space programs and industry means support for our nation's economy, security, leadership, and high-quality American jobs and businesses.

This paper was developed and approved by the following space organizations; it was released on March 4, 2016 at the National Space Club in Washington, DC. (<http://www.spacefoundation.org/programs/research-and-analysis/whitepapers-and-analysis/ensuring-us-leadership-in-space>)



What Every Candidate Should Know About Security Cooperation



U.S. security cooperation and defense trade are critical components of U.S. national security strategy. U.S. defense exports provide the foundation for advancing U.S. security cooperation objectives, support the projection of U.S. power and encourage sharing of global security responsibilities by supplying full-spectrum capabilities to our allies and partners. U.S. national security policy emphasizes building partner capacity to meet global security challenges and sustain a peaceful and cooperative international order. Indeed, the security cooperation effects of a single sale of a U.S. defense capability can reenergize a strategic relationship with an ally, build the foundation for an emerging regional partnership or provide a critical deterrent to military conflict.

U.S. security cooperation and defense trade play a key role in U.S. economic security. Every dollar spent by other countries on U.S. defense systems helps fund innovation and lowers unit costs for the U.S. military. In addition, our foreign allies and partners become more capable of advancing our common security objectives in conjunction with U.S. forces or on their own. In fact, domestic budgetary pressures will continue to compel increased international cooperation to achieve national security objectives and financially sustain and bolster innovation in the U.S. defense industrial base.

U.S. security cooperation and building partner capacity capabilities are under stress. Industry appreciates and supports the checks and balances in the U.S. security cooperation system that ensure transfers of defense articles and technologies do not adversely impact our warfighters' technological edge and are consistent with U.S. foreign policy objectives. At the same time, the U.S. Foreign Military Sales (FMS) system managed \$47 billion in sales in 2015, has been hitting historical highs in dollar value in recent years and has to address 140 new security cooperation requests a month. It is clear the increase in tempo and scale of security cooperation activity in the current global security environment is straining interagency coordination, resources and training in an otherwise sound system.

In the current global security environment, we must do better to grow our security, political and economic influence on our allies and partners even as our competitors race to supplant our leadership.

While the U.S. has historically fared well in overseas sales campaigns, foreign competitors are aggressively trying to overtake American industry. France recently announced it had doubled its annual defense exports from 2014 to a record figure of \$17.5 billion in 2015. In addition, countries like Russia and China are aggressively expanding their defense export activity to help bolster their influence around the world. For instance, on January 13, the Chinese Foreign Ministry issued a policy document on their efforts to develop deeper defense and anti-terrorism ties with the Arab world, including joint exercises, intelligence sharing and training.

America must protect and grow its global security, political and economic influence through security cooperation. The next President must establish a clearly articulated doctrine that elevates and prioritizes security cooperation and building partner capacity. Our country ultimately needs a comprehensive National Security Cooperation Strategy supported with sufficient interagency coordination, resources and training as well as appropriate collaboration and communication with U.S. industry.

The Dynamics of the Current Global Defense Marketplace

Many of our international partners and allies do not possess an effective strategy development process for their security needs, a deliberate budget cycle, a professional acquisition corps or a systems life-cycle manager. Their security cooperation requests are growing in complexity, number and urgency. Therefore timeliness in meeting their needs matters a great deal. Their demands are putting an already under-resourced and over-burdened U.S. security cooperation system under greater strain.

In addition, foreign governments are increasingly more reliant on defense export opportunities to ensure the survivability of their domestic manufacturing base. For defense exports, foreign governments employ a “whole of nation” approach that reaches to the highest levels of their political leadership to capture market share and influence. Their efforts represent a direct challenge to American security cooperation objectives and sustaining the technological edge of the U.S. defense industrial base.

The Case for Reform

The U.S. security cooperation system was designed prior to the adoption of modern building partner capacity objectives. It relies on multiple agencies and departments to guide the review, approval, contracting, delivering and sustaining of U.S. defense transfers in a timely fashion. The deliberation among government agencies ensures that appropriate transfers are executed in support of U.S. foreign policy objectives. However, the absence of clear doctrine to guide these interagency efforts, combined with an under-resourced system and aggressive foreign competition, stresses the system and makes strategic prioritization difficult. Urgent operational requirements are flowed through the system in a timely fashion, but only by exception when world events require focused and immediate attention.

As a consequence, U.S. industry lacks predictability from U.S. government guidance to propel the right strategic investment and business development activities to support priority security cooperation objectives. For U.S. partners and allies, this confluence of circumstances creates frustration about predictability of approvals or timely discussion of alternative solutions.

Numerous studies and proposals and reforms have made and are currently making commendable improvements in discrete parts of the system and in interagency coordination and communication. However, there is agreement across the Security Cooperation Enterprise that more can and must be done to ensure the security cooperation process results in the right decisions and actions completed at the right time.

What is needed?

The next President should launch a Security Cooperation Enterprise Reform effort that considers the FMS process as well as Direct Commercial Sales and hybrid cases that advance American interests. This initiative should clearly establish the doctrine that will drive the right policies and processes that support our partners and allies and govern the transfer of defense systems. In addition, this initiative should sustain and expand on current efforts to ensure there are sufficient resources, training and coordination across the interagency and with industry to produce a National Security Cooperation Strategy that:

- > **Identifies Priority Partners and Programs to Build Partner Capacity as a Component of U.S. National Security Strategy:** Support the U.S. national security strategy by identifying and expediting the transfer of defense systems and platforms necessary to achieve stated strategic objectives in designated priority countries and regions.
- > **Aligns U.S. Industry Programs and Technology Development with Strategic Security Cooperation Priorities:** Expand consultation and cooperation with U.S. manufacturers and suppliers to ensure industry priorities and capabilities are aligned with established U.S. strategy.
- > **Streamlines the Technology Review and Approval Process for Priority Security Cooperation Transactions:** The U.S. military and the U.S. defense industrial base are poised to benefit substantially with greater clarity in the policies and processes for technology security and foreign disclosure reviews and the application of licensing caseload management techniques to items on the U.S. Munitions List.
- > **Promotes the Competitiveness of American Defense and Security Technologies in Priority Regions:** Support and expand U.S. policies, procedures and engagement that effectively make U.S. defense companies competitive in priority foreign markets.

FOREIGN TRADE IN U.S. AEROSPACE & DEFENSE: SUPPORTING AMERICA'S MANUFACTURING BASE



\$142 BILLION
IN EXPORTS IN 2015

The U.S. Aerospace & Defense industry generated a record \$142 billion worth of exports in 2015, which is an increase of 62% over the past five years.



**SUPPLY CHAIN
SHARE OF
EXPORTS**

51%

Exports of supply chain products, specifically civil engines and parts, accounted for 51% or \$69 billion of total U.S. A&D exports in 2014.



9%
OF U.S. EXPORTS

Aerospace & Defense accounted for 9% of all U.S. exports in domestic goods and is the nation's 3rd largest exporting industry.



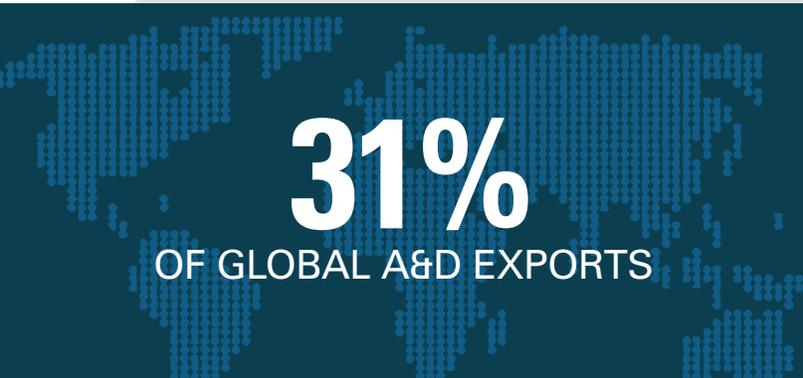
\$81B IN NET EXPORTS

Aerospace & Defense is the nation's leading net exporting industry and generated a record trade surplus of \$81 billion in 2015.



**LARGEST EXPORT MARKET
ASIA-PACIFIC**

The Asia-Pacific Region accounted for 37% of total U.S. A&D exports in 2015. Exports to the region have grown by 77% since 2010.



31%
OF GLOBAL A&D EXPORTS

The U.S. share of global A&D exports was 31% in 2014. However, since 2009, this share has not increased due to the aggressive growth of global competitors supported by foreign governments.

For more information, visit:
www.aia-aerospace.org

AIA
AEROSPACE INDUSTRIES
ASSOCIATION

What Every Candidate Should Know About Fostering Innovation in the A&D Industry



Regulation of the Aerospace and Defense Industry Must not be Overly Burdensome

Regulations often exist for good reasons. We want our products to be well constructed, safe and environmentally friendly. But we do not need regulations that are overly complex, burdensome and costly that inhibit the innovation and efficiencies that enable aerospace and defense companies, large, medium and small, to develop new systems that strengthen our national security and grow our economy.

Examples of regulations that place an undue burden on American aerospace and defense companies include:

- > The satellite industry proposed needed changes for the way imaging systems are addressed in the new satellite technology export regulations two years ago and have yet to see an announced decision or change to the rules. The government should move forward more expeditiously with rulemaking that enhances American economic competitiveness in the global satellite market.
- > The Administration's Executive Order requiring companies to disclose past violations of federal and state labor and employment laws that is duplicative of other reporting requirements, and would subject employers and workers to corrective action even if the alleged 'violations' are unproven or not fully adjudicated. The burden of this Executive Order is extremely hard on small businesses. We commend efforts to greatly reduce this requirement in the Fiscal Year 2017 National Defense Authorization Act.
- > Other Administration Executive Orders on paid sick leave and combating trafficking in persons, while well meaning, lead to added onerous burdens on companies and their supply chains.

We do not need regulations that are overly complex, burdensome and costly that inhibit the innovation and efficiencies that enable aerospace and defense companies, large, medium and small, to develop new systems that strengthen our national security and grow our economy.

A New Path to Reasonable Regulation

American aerospace and defense manufacturers support commonsense regulatory reforms that achieve the following benefits:

- > Ensure that the true costs of regulations do not exceed their benefits
- > Reduce small company burdens in meeting regulatory mandates
- > Clearly set out performance goals without unduly prescribing the path for companies to achieve them
- > Remove barriers to innovation

Actions Needed to Improve Regulation of Aerospace and Defense

Civil Aviation. In a regulation success story, the federal government and industry struck an excellent balance in ensuring aviation safety through cooperation as opposed to prescriptive regulation. The Federal Aviation Administration's Organizational Designation Authorization (ODA) allows authorized organizations to perform inspections of aircraft and aircraft systems to ensure compliance with regulations, without direct FAA oversight. The ODA paradigm can be further expanded to allow maximum use of delegation to take full advantage of industry expertise and increase the collaboration and partnership that leads to improved aviation safety.

Industry and the FAA have helped streamline the process by which new airplanes, products and systems are certified. However, American aircraft manufacturers currently have to go through multiple certification processes with foreign aviation authorities to assure the safety of U.S.-built aircraft sold and operated outside of our borders. The cost of such efforts can exceed several million dollars, and is a significant and unnecessary burden on U.S. manufacturers. The FAA should be authorized to take a more proactive stance with international partners to improve the certification of FAA approved products overseas, as they represent the gold standard for aviation safety.

National Security. For the first time since the 1940s, acquisition reform is not just about saving money – it's about removing barriers to innovation and eliminating unnecessary bureaucracy, so that we can stay ahead of threats and provide faster solutions to our fighting forces. The U.S. can no longer count on overwhelming technological advantages in conflict as rival nations are getting better capabilities, faster, all the time. As global technology development accelerates, the Defense Department's acquisition system is slowed at every stage by unnecessary and overly prescriptive regulations and guidance.

Defense Department acquisition practices should be improved to encourage greater Independent Research and Development expenditures, speed up the contracting process, guarantee protection of intellectual property developed at private expense streamline the use of commercial products in defense systems, and increase our willingness to take risks to make rapid breakthroughs in technology and capability.

Export Controls. The export control regulatory system designed to manage the risks of diversion of technologies to our adversaries can be inconsistent with global technology trends, commercial opportunities and foreign partner requirements. Efforts in recent years to make the International Traffic in Arms Regulations and the Export Administration Regulations more predictable, efficient, and transparent have been valuable, but more needs to be done. We must establish expedited procedures for review and approval of exports of defense and security technology that support U.S. government, military and intelligence interests abroad. Also, government and industry must review and revise emerging technology export control measures like the Missile Technology Control Regime which governs Unmanned Aircraft System exports in order to allow American companies to compete for sales in new growth markets without harming our national security interests.

As global technology development accelerates, the Defense Department's acquisition system is slowed at every stage by unnecessary and overly prescriptive regulations and guidance.