



SUMMARY OF THE NATIONAL SECURITY COMMISSION ON ARTIFICIAL INTELLIGENCE'S (NSCAI) SECOND QUARTER RECOMMENDATIONS

TAB 1 — Accelerate Artificial Intelligence Research and Development (R&D) Across the Department of Defense (DoD) Research Enterprise

Summary: The DoD research enterprise encompasses a powerful and unique array of resources. However, outdated processes, funding policies, and organizational cultures limit the ability of these institutions to innovate at the pace of today's technological advances. To harness the potential of this enterprise to build and integrate the technologies that could transform U.S. forces and underpin their future competitive advantage, DoD must responsibly prioritize speed and agility, balancing incremental and disruptive research efforts. It must foster a culture of innovation that brings new capabilities to warfighters and their support organizations more rapidly, and involves end users in prototyping, experimentation, and adaptation.

Objective: Improve DoD's ability to accelerate internal research, development, and fielding of AI-enabled capabilities by: 1) Equipping the enterprise with necessary resources, tools and infrastructure to support AI R&D; 2) Investing in test and evaluation, verification, and validation capabilities to responsibly accelerate development of robust capabilities; 3) Optimizing transition of breakthroughs from the laboratories to the field; and 4) Unlocking innovation at the defense laboratories through partnerships.

Issue 1: Equipping the Enterprise for AI R&D

Recommendation 1: Create an AI software repository to support AI R&D. DoD should create an AI software repository to provide access to tools (both open source and licensed from vendors) that support cloud-based research collaboration, science workflows and AI-driven experimentation, and test and evaluation.

Recommendation 2: Promote Authorization to Operate (ATO) reciprocity as the default practice within and among programs, Services, and other DoD agencies to enable sharing of software platforms, components, infrastructure, and data for rapid deployment of new capabilities. DoD should make reciprocity the default practice, and promote maximum use of infrastructure as code and automation of security controls to enable continuous ATO. In addition,

DoD Chief Information Officer should expedite and scale efforts toward a single, enterprise repository for ATO artifacts that supports data across classification levels and is complete with tools and access rules that enable Components to discover existing and continuous ATOs.

Recommendation 3: Create a DoD-wide AI data catalog to enable data discoverability for AI R&D. DoD Chief Data Officer should build and manage a secure, online DoD-wide AI data catalog that would enable DoD AI researchers and developers to identify data resources that could fuel new research and development opportunities for a range of AI approaches, including machine learning, model-based, and symbolic.

Recommendation 4: Expand Section 219 Laboratory Initiated Research Authority funding to support AI infrastructure and software investments at DoD laboratories. Congress should raise the authorized cap for DoD laboratory infrastructure investments, currently set at \$6 million, in order to provide laboratories the ability to invest in equipment and testbed infrastructure necessary for robust AI research, prototyping, and testing. Furthermore, Congress could mandate that laboratories use the full four percent service charge to support the innovation funds.

Issue 2: Establishing AI Test and Evaluation, Verification, Validation Capabilities

Recommendation 5: Establish an AI testing framework. DoD should establish a foundational and adaptable AI testing framework to provide necessary assurance, guidance, and capabilities to the enterprise—overcoming a critical barrier to fielding AI capabilities at the speed of relevance. The Secretary of Defense should appoint and resource a lead entity to develop and formalize (within six months of tasking) a joint, common framework for AI Test and Evaluation, Verification and Validation (TEVV).

Recommendation 6: Expedite the development of tools to create tailored AI test beds supported by both virtual and blended environments. The Secretary of Defense should appoint and resource a lead entity to develop a roadmap and implementation plan and oversee its execution to build an enterprise-wide set of tools and resources for AI TEVV.

Recommendation 7: Create test beds to focus on evaluation of commercially available AI solutions that could serve DoD missions. The Department of Defense should fund the creation of AI test bed capabilities at Federally Funded Research and Development Centers (FFRDCs) and University Affiliated Research Centers (UARCs), or other contracted entities to accelerate an ability to identify new military and national security capabilities that are immediately realizable using commercially available or academically viable AI solutions.

Issue 3: Accelerating the Transition of Technology Breakthroughs

Recommendation 8: Support the DoD software and digital technologies budget activity pilot and its expansion to include an science and technology (S&T) development effort. Congress should appropriate funds to support the BA 8 pilot program for Fiscal Year (FY) 2021, in order to begin to test the construct as a mechanism to fund the full life cycle of development,

procurement, deployment, assurance, modifications, and continuous improvement for digital technologies. In FY 2022, the Department should expand the pilot to include a program that explicitly supports an AI S&T development effort.

Recommendation 9: Encourage Services to build AI development models that integrate AI experts, domain experts, acquisition experts, and end users. The Secretary of Defense should issue guidance to the Services to adopt AI development models that integrate AI experts, domain experts, acquisition experts, and end users. This approach should become the default, rather than the exception.

Issue 4: Innovation across DoD Laboratories

Recommendation 10: Direct the Services to adopt open innovation models through the Service labs. The Secretary of Defense should direct and incentivize the Services to replicate innovation models such as the Army Research Lab’s Open Campus to overcome barriers between the military research community and the wider research environment.

Recommendation 11: Create a DoD research and development database. The Secretary of Defense should task the Office of the Undersecretary of Defense for Research and Engineering to build a research and development database as an enterprise resource to enable greater return on investment and collaboration across the DoD R&D ecosystem and provide a tool for assessment and data-informed decision-making around research portfolio management.

TAB 2 — Accelerate AI Applications for National Security and Defense

Summary: To maintain a national security advantage, DoD and the Intelligence Community (IC) must have enduring means to jointly identify, prioritize, and resource the AI-enabled applications necessary to fight and win faster and more effectively than its competitors. They also must adapt their traditional approach and promote greater institutional agility in order to effectively integrate these technologies into emerging warfighting concepts and operations.

Objective: Establish a strategic approach for identifying, resourcing, and ultimately fielding AI-enabled applications that address clear operational challenges; create mechanisms for tactical experimentation to ensure technical capabilities meet mission and operator needs; and provide paths to accelerate adoption of business AI applications essential to institutional agility.

Issue 1: A Strategic Approach for Technology Identification and Integration

Recommendation 1: As part of the National Defense Strategy (NDS), DoD, with support from the Office of the Director of National Intelligence, should produce a classified technology annex that outlines a clear plan for pursuing disruptive technologies and applications that address the operational challenges identified in the NDS. The main objective of the annex should be to chart a clear course for identifying, developing,

fielding, and sustaining those critical emerging and enabling technologies, and to speed their transition into operational capability. Doing so will advance NDS implementation by connecting strategic vision to priority investments, and ensure technological advances are integrated into future concept development.

Recommendation 2: The Tri-Chaired Steering Committee on Emerging Technology NSCAI recommended in March 2020 should steward the implementation of the technology annex described above. The Commission proposed a Steering Committee tri-chaired by the Deputy Secretary of Defense, the Vice Chairman of the Joint Chiefs of Staff, and the Principal Deputy Director of National Intelligence to drive innovation and action on emerging technologies. Drafting and implementing the NDS technology annex will require significant policy and investment decisions.

Issue 2: Integrating AI-Enabled Applications into Military Operations and Tactics

Recommendation 3: DoD should integrate AI-enabled applications into all major Joint and Service exercises and, as appropriate, into other existing exercises, wargames, and table-top exercises. To accelerate experimentation and learning, DoD should direct that existing exercises, wargames, and table-top exercises develop plans to integrate AI-enabled applications. This includes large-scale joint exercises and smaller, more frequent events at all echelons. Such exercises align with DoD's development of a Joint Warfighting Concept and Joint All Domain Command and Control.

Recommendation 4: DoD should incentivize experimentation with AI-enabled applications through the Warfighting Lab Innovation Fund, with oversight from the Tri-Chaired Steering Committee. DoD should incentivize experimentation with AI applications across the Department at every level possible. This process will give the Tri-Chaired Steering Committee greater visibility on innovation across the force, informing policy and resourcing decisions.

Issue 3: Business Applications

Recommendation 5: DoD should develop a prioritized list of core administrative functions that can be performed with robotic process automation and AI-enabled analysis and take specific steps to enable implementation. The NSCAI's Interim Report noted that DoD is not adequately leveraging basic commercial AI to improve business practices and save taxpayer dollars. Robotic process automation and AI-enabled analysis can generate significant labor and cost savings, speed administrative actions, and inform decision-making with superior insights into core DoD business processes.

Recommendation 6: DoD should incentivize deployment of commercial AI applications across the organization for knowledge management, business analytics, and robotic process automation. In addition to the top-down business AI initiatives described above, DoD should create opportunities for bottom-up development of AI business use cases by incentivizing entities across the organization to deploy proven commercial applications tailored to their specific requirements. This bottom-up approach is useful for AI application areas in which the

heterogeneity of defense agency, Service, and Component missions and workforces are likely to require bespoke software tools vice DoD-wide solutions.

TAB 3 — Improve the United States Government’s Digital Workforce

Summary: Currently, there is a severe shortage of AI knowledge in DoD and other parts of government. Current initiatives are helpful, but only work around the edges, and will not recruit AI and science, technology, engineering, and mathematics (STEM) talent at the scale the government requires. Bolder steps are needed. The United States Government must fundamentally re-imagine the way the Federal Government recruits and builds a digital workforce. The Commission envisions a government-wide effort to build a digital workforce through a National Reserve Digital Corps (NRDC), United States Digital Service Academy (USDSA), and an expansion of scholarship for service programs.

Objective: Given the United States Government’s general shortage of digital talent, the Commission recommends multiple avenues for addressing that need: reduce the challenge of part-time government service by creating a NRDC, train the next generation by building a USDSA, and expand current scholarship-for-service programs. Combined, the recommendations will increase the government’s digital literacy by expanding and creating pathways for technical experts to serve in government as part-time or full-time employees.

Issue 1: Providing AI Practitioners with Part-time Options for Government Service

Recommendation 1: Create a NRDC. The United States Government should establish a civilian NRDC modeled after the military reserves’ service commitments and incentive structure. Members of the NRDC would become civilian special government employees, and work at least 38 days each year as short-term advisors, instructors, or developers across the Federal Government.

Issue 2: Scaling Digital Talent Across the Government Workforce

Recommendation 2: Expand Scholarship for Service Programs. The Office of Personnel Management and the National Science Foundation (NSF) should expand CyberCorps: Scholarship for Service by an additional 85 scholarships per year. The DoD should expand the Science, Mathematics, and Research for Transformation Defense Scholarship: Scholarship-for-Service to award an additional 100 scholarships per year.

Recommendation 3: Create a USDSA. The United States Government should create a USDSA, which would be an accredited, degree-granting university that receives government funding, an independent entity within the Federal Government, and have the mission to help meet the Federal Government’s needs for digital expertise. It would be advised by an interagency board that would be assisted by a federal advisory committee composed of commercial and academic leaders in emerging technology.

TAB 4 — Improve Export Controls and Foreign Investment Screening

Summary: In the Second Quarter, the Commission’s recommendations focus on policies for adapting export controls and investment screening to AI in the context of great power competition. The Commission proposes that the President issue an Executive Order that outlines four principles to inform U.S. technology protection policies, enhances the capacity of U.S. regulatory agencies in analyzing emerging technologies, and expedites the implementation of recent export control and investment screening reform legislation. Additionally, the Commission recommends prioritizing the application of export controls to hardware over other areas of AI-related technology. Finally, the Commission recommends focusing the Committee on Foreign Investment in the United States (CFIUS) on preventing the transfer of technologies that create national security risks by increasing CFIUS’ authority to require filings for investments from key U.S. competitors in certain sensitive technologies, and fast-tracking investment from allies and partners.

Objective: Protect the national security sensitive elements of AI and other critical emerging technologies from foreign competitors, while ensuring that such efforts do not undercut U.S. investment and innovation.

Issue 1: Agencies should endorse and adopt Principles for a Strategic Approach to Technology Protection.

Technology protection policies within the United States government must be more strategic, coordinated, and analytically rigorous. The Commission proposes four principles which it believes should guide technology protection policies going forward for dual-use emerging technologies, including AI:

Principle 1: Controls cannot supplant investment and innovation.

Principle 2: U.S. strategies to promote and protect must be integrated.

Principle 3: Export controls must be targeted, strategic, and coordinated with allies.

Principle 4: The United States should pursue a more discerning approach to export controls while broadening investment screening.

Issue 2: Enhancing Capacity to Carry Out Effective Technology Protection Policies

Recommendation 1: Mandate that the Department of Commerce coordinate new rules with existing technical advisory groups that include outside experts. The United States Government needs to leverage additional, outside technical expertise to maximize the effectiveness and minimize the risk to U.S. businesses of new export controls on emerging technologies. The Commission recommends that the White House issue an executive order

requiring the Department of Commerce to solicit and receive feedback on any proposed controls on emerging or foundational technologies, to include proposed rules and regulations, from the existing Emerging Technology Technical Advisory Committee before putting them into effect or sharing them with the public.

Recommendation 2: Designate a network of FFRDCs and UARCs to serve as a shared technical resource on export controls and help automate review processes. The Department of Commerce should establish a network within existing FFRDCs and UARCS to provide technical expertise to all departments and agencies for issues relating to export controls on emerging technologies. As an initial step, the Department of Commerce should identify the FFRDCs and UARCs with existing expertise in emerging technologies under consideration for export controls and then expand, as needed, by requesting funding in the FY 2022 President’s Budget.

Issue 3: Applying Export Controls to AI

Recommendation 3: Prioritize hardware controls to protect U.S. national security advantages in AI, and consider future controls surrounding data. To support the Department of Commerce’s efforts to apply export controls to AI, the Commission offers its assessment of which components of the AI stack lend themselves to productive export controls. While broad controls on AI algorithms are unlikely to prove effective, controls on hardware—specifically on semiconductor manufacturing equipment, rather than on general-purpose chips—are most likely to have positive strategic effects, followed by potential future controls on key datasets.

Issue 4: Expediting Issuance of Key ECRA and FIRRMA Regulations

Recommendation 4: Issue an executive order directing the Department of Commerce to finalize identification of emerging and foundational technologies under Export Control Reform Act (ECRA). In 2018 ECRA required Commerce to identify “emerging and foundational” technologies which must be export controlled and subject to investment screening, but Commerce has yet to identify a single such technology. The Commission offered draft text for an Executive Order which would lay out clear timelines for the Department of Commerce to develop its initial lists of applicable technologies.

Issue 5: Preventing the Flow of High-End Semiconductor Manufacturing Equipment to Competitors

Recommendation 5: The United States should work with the Netherlands and Japan to restrict the export of Extreme Ultraviolet Lithography (EUV) and Argon Fluoride Laser (ArF) immersion lithography equipment to China, and take steps to increase demand for such tools among U.S. firms. The United States must work in cooperation with the Netherlands and Japan to prohibit the export of EUV and ArF Immersion lithography equipment to China in order to restrict China’s semiconductor production capability at the 45nm node and below, which the Commission assesses to be the chips most useful for advanced AI applications. The United States should also initiate a simultaneous effort to provide tax credits or subsidies to U.S.

firms that purchase semiconductor manufacturing equipment. The Commission specifically endorses the CHIPS for America Act, which would provide such a credit and take many other steps to reinvigorate the U.S. microelectronics industrial base.

Issue 6: Increasing Export Control Capacity among U.S. Allies and Partners

Recommendation 6: The Departments of State, the Treasury, and Commerce should work with allies on legal reforms that would authorize them to implement unilateral export controls and enhance investment screening procedures. The Departments of State and Commerce must urge all allies that have not already done so to pass domestic legislation to overhaul their export control regimes, increasing their internal bureaucratic capacity and providing them with the authorities to implement export controls outside of existing multilateral regimes. This recommendation also directs the Departments of State and the Treasury to build the capacity of U.S. allies and partners to implement investment screening regimes, and to share recent investment data that would highlight the nature of the threat and help allies block specific predatory investments.

Issue 7: Tailoring CFIUS Requirements to Protect AI and Related Technologies from High-Risk Investors

Recommendation 7: Grant Treasury the authority to mandate the Committee on Foreign Investment in the U.S. CFIUS filings for non-controlling investments in AI and other sensitive technologies from China, Russia, and other competitor nations. This recommendation directs CFIUS to require a mandatory disclosure when actors from countries of special concern -- specifically China, Russia, and other nations known to employ adversarial capital -- attempt to invest in U.S. companies involved with sensitive technologies, to include AI. To do so, it recommends Congress adopt a legislative proposal to Section 721(a) of the Defense Production Act of 1950 granting Treasury new authorities to set mandatory filing requirements for investments from these select countries in AI and other sensitive technologies, regardless of the technology's export control status.

Issue 8: Applying a Risk-Informed Approach to CFIUS Exemptions

Recommendation 8: Expedite Department of Treasury's CFIUS exemption standards for allies and partners and create fast tracks for exempting trusted investors. CFIUS should also adopt a more risk-adjusted approach to investors that are less likely to serve as channels for adversarial capital by fast-tracking their applications and reducing their filing burden. This recommendation requires an acceleration of exemption standards for allied nations and the creation of fast lanes for trusted investors based on track record and category.

TAB 5 — Reorient the Department of State for Great Power Competition in the Digital Age

Summary: In the Second Quarter, the Commission is focused on recommendations to empower the United States to play to its strengths and enable the Department of State to lead and learn from coalitions of free and open states. The Commission focuses on how to improve the infrastructure of the Department of State to enable the Department to effectively advance national security priorities that are centered around AI and emerging technologies and marshal global AI cooperation by forming coalitions centered on democratic values.

Objective: Identify mechanisms to enhance the ability of the United States to marshal global cooperation around AI and emerging technologies to promote common interests and values of like-minded nations and to share worldwide AI norms and use.

Issue 1: Department of State’s Strategy, Organization, and Expertise for AI Competitions

Recommendation 1: The Secretary of State should establish a Strategic Innovation and Technology Council composed of the Department’s senior leadership. A department-wide leadership effort is needed to achieve sustainable impact for effective diplomatic efforts to address AI and technology-related aspects of great power competition in a digital age. This Council would be an influential, low-cost way to enhance the Secretary’s efforts to modernize and reorient the Department, champion integrating mechanisms for sustainable change, overcome an emphasis on partitioned responsibilities and opaque accountability for outcomes, and build a sense of shared-purpose and unified action.

Recommendation 2: The Department of States and Congress should expedite efforts to establish the proposed Bureau of Cyberspace Security and Emerging Technology. A Bureau of Cyberspace Security and Emerging Technology (CSET), which the Department of States has already proposed to create, is urgently needed to overcome the Department’s self-identified lack of effective diplomatic engagement and coordination on the security elements of AI and other emerging technologies. The Commission has recommended that the proposal be implemented without delay, which requires Congress to authorize existing reprogramming requests.

Recommendation 3: The Department of State should enhance its presence in major foreign and U.S. technology hubs and establish a cadre of dedicated technology officers at U.S. embassies and consulates to strengthen diplomatic advocacy, improve technology scouting, and inform policy and foreign assistance choices. The Department of State presence in major technology hubs is needed to inform policy development and conduct advocacy for emerging technology, provide access to the leading AI higher education and research institutions, and offer further educational avenues for Civil and Foreign Service Officers. A permanent presence in major U.S. and foreign technology hubs, based on the domestic bureau-overseas mission model, should be established and supported by the CSET Bureau as well as staffing, education, training, and career development foundations on par with priority according to languages, negotiation,

political and economic tradecraft. The reallocation of billets from the drawdown of legacy missions is an opportunity to enhance needed presence.

Recommendation 4: The Department of States should incorporate AI-related technology modules into key Foreign Service Institute training such as the Ambassadorial Seminar, Deputy Chiefs of Mission Course, Political and Economic Tradecraft courses and A-100 orientation training courses. The State Department should also develop a stand-alone course on emerging technologies and foreign policy. Foreign and Civil Service personnel require deeper understanding of technology in order to be effective advocates of democratic values and interests related to AI. Currently, training and educational efforts across the Department are not uniform and do not provide a sufficiently robust background in emerging technologies and their relevance to diplomatic efforts. Training modules and courses related to emerging technologies and AI should be prioritized across the core training of the Department.

Issue 2: Congressional Support and Resourcing for the Department of State

Recommendation 5: NSCAI recommends that Congress conduct hearings to assess the Department’s posture and progress in reorienting to great power and technology competitions. Congress is a critical partner to reorient the Department of State for great power competition in a digital age. Congress played a leading role during 2001-2005 and comparable efforts are appropriate to set conditions and resource the Department appropriately. Congressional hearings with testimony from distinguished experts should assess Department of State efforts, offer recommendations to accelerate sustainable implementation, inform the Department of State budget, encourage discussion about strategic and foreign policy priorities, and clarify the urgent need for a CSET Bureau. Congress should also reassess comprehensive foreign relations reauthorization legislation, which has not been passed since 2003. This is also an opportunity to understand how the Department’s efforts come together with other interagency partners such as the Departments of Defense, Commerce, and Energy as well as the United States Agency for International Development.

TAB 6 — Implement of Key Considerations as a Paradigm for Responsible Development and Fielding of AI

Summary: In the Second Quarter, the Commission recommends that the heads of Executive Branch departments and agencies critical to national security implement the “Key Considerations,” which contains 32 recommended practices across the AI lifecycle, as a paradigm for the responsible development and fielding of AI system. Implementation includes developing processes and programs aimed at adopting the paradigm’s recommended practices, monitoring their implementation, and continually refining them as best practices evolve. The Key Considerations also include areas for future action (e.g., R&D, standard, and international cooperation) that agencies should prioritize.

Objective: Recognizing that agencies need practical guidance for implementing commonly agreed upon AI principles, and a more comprehensive strategy to develop and field AI ethically

and responsibly, create a framework for the ethical and responsible development and fielding of AI where consistency should exist across agencies.

Recommendation: Heads of Executive Branch departments and agencies should implement the Key Considerations as a paradigm for the responsible development and fielding of AI systems. This includes developing processes and programs aimed at adopting the paradigm's recommended practices, monitoring their implementation, and continually refining them as best practices evolve.