

Policy Update: OMB and OSTP Issue Guidance for FY 2020 Administration Research and Development Budget Priorities

Lewis-Burke Associates, LLC – August 1, 2018

On July 31, 2018, the White House Office of Management and Budget (OMB) along with the White House Office of Science and Technology Policy (OSTP) issued the annual research and development (R&D) priority memorandum to federal agencies. This memo provides guidance to federal agencies on the Administration's R&D priorities as agencies develop their budget proposals for fiscal year (FY) 2020.

Consistent with President Trump's "America First" strategy, the memo highlights the importance of basic research; science, technology, engineering, and mathematics (STEM) education and workforce development; and "targeted deregulation" for U.S. job growth, prosperity, and national security. The memo includes a strong focus on emerging technology research areas, including artificial intelligence (AI), quantum computing, advanced wireless communications, digital manufacturing, advanced materials, biotechnology, space technology, and gene editing. These topics align closely with current agency priorities.

On July 31, President Trump also announced his intent to nominate Dr. Kelvin Droegemeier, a meteorologist, to be the next Director of OSTP.¹ Dr. Droegemeier is currently the Vice President for Research at the University of Oklahoma and previously served as Vice Chair of the National Science Board. Dr. Droegemeier is an expert in extreme weather events and would be the first non-physicist to hold the position. Should Dr. Droegemeier be confirmed by the Senate, OSTP's activities may broaden to include additional science issues outside of the current focus on emerging technologies and STEM education under the current de facto OSTP leader, Deputy Chief Technology Officer Michael Kratsios.

The memo includes the following R&D priority areas:

- **Security of the American People** – Based on the National Security Strategy,² the President calls for "leadership in research, technology, invention, and innovation" and investment in R&D to maintain military superiority. Specifically, the memo directs prioritized investment in "AI, autonomous systems, hypersonics, a modernized nuclear deterrent, and advanced microelectronics, computing, and cyber capabilities." Agencies are also directed to improve the security and resilience of U.S. critical infrastructure from "natural hazards, physical threats, cyber-attacks, and emerging threats from autonomous systems and biological agents." This includes a range of activities from border security to better weather prediction.
- **American Leadership in Artificial Intelligence, Quantum Information Sciences, and Strategic Computing** – The memo states that these areas are vital to U.S. national security and economic competitiveness. AI research should include "machine learning, autonomous systems, and applications at the human-technology frontier." Activities in quantum information sciences

¹ <http://www.sciencemag.org/news/2018/07/trump-s-pick-head-white-house-science-office-gets-good-reviews>

² National Security Strategy of the United States of America, December 2017: <https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf>

(QIS) should aim to develop the next generation of QIS theory, devices, and applications. The memo directs agencies to prioritize investment in research and infrastructure to “maintain U.S. leadership in strategic computing, from edge devices to high-performance computing, that accelerates delivery of low power, high performance devices; supports a national high-performance computing ecosystem; and explores novel pathways to advance computing in a post-Moore's Law era.”

- **American Connectivity and Autonomy** – Agencies should support R&D “to manage spectrum, secure networks, and increase access to high-speed internet” to support the development and deployment of advanced communications networks, including 5G wireless networks. Additional prioritization is also given to autonomous driving systems and unmanned aircraft systems (UAS).
- **American Manufacturing** – The memo highlights the importance of manufacturing technologies for job creation and to strengthen the U.S. manufacturing industrial base, including the need for agencies to work in collaboration with industry where appropriate. Priority areas highlighted in the memo include: “smart and digital manufacturing, and advanced industrial robotics, especially systems enabled by the industrial internet of things (IoT), machine learning, and AI.” The memo also highlights advanced materials and associated processing technologies; bio-based manufacturing; and semiconductor design and fabrication.
- **American Space Exploration & Commercialization** – The memo states, “Research investments should be focused on ensuring American leadership in space for long-duration spaceflight, in-space manufacturing, in-situ resource utilization, long-term cryogenic fuel storage and management, and advanced space-related power and propulsion capabilities. Agencies should prioritize demonstrations and flight tests to ensure an industrial base for commercial activity in space and on celestial bodies.” Micro-gravity research to advance biopharmaceuticals and materials science is highlighted. Additionally, agencies should support R&D in advanced materials, additive manufacturing, optical communications, and machine learning.
- **American Energy Dominance** – The memo states, “Fueling America's greatness requires access to domestic sources of clean, affordable, and reliable energy.” Agencies are directed to invest in early-stage, innovative technologies, and to rely on the private sector to support later-stage research, development, and commercialization. This is consistent with the Trump Administration’s previous attempts to cut funding for applied research programs at the Department of Energy.
- **American Medical Innovation** – Agencies are directed to focus on basic research and translation. Areas of focus include personalized medicine, disease prevention, addressing the opioid crisis, infectious disease, mental health, and other public health threats. The memo highlights the importance of R&D to support healthcare for veterans, aging adults, and those with disabilities, as well as the need for agencies to work together to manage healthcare data.
- **American Agriculture** – Agencies are directed to “prioritize R&D that enables advanced and precision agriculture and aquaculture technologies, including the use of embedded sensors, data analytics, and machine learning techniques.” Agencies are also directed to “prioritize investments in pre-competitive research regarding the safety of microorganisms, plants, and animals developed using gene editing, in order to greater leverage biotechnology products for agriculture.”

The memo also includes the following R&D priority practices:

- **Educating and Training a Workforce for the 21st Century Economy** – This priority includes technical training, apprenticeships, internships, and other employer-educator partnerships for

experiential learning. Agencies should work to ensure the STEM workforce (including computer science) includes all Americans, including those from urban and rural areas, and underrepresented groups. Other areas for prioritization include computer science education, reskilling, and exposing students to real world challenges.

- **Managing and Modernizing R&D Infrastructure** – Agencies are directed to prioritize infrastructure investments that serve a range of disciplines. Agencies should explore innovative management approaches for R&D infrastructure as well as decommissioning or divesting out-of-date facilities quickly and efficiently.
- **Maximizing Interagency Coordination and Cross-Disciplinary Collaboration** – Agencies are directed to leverage the National Science and Technology Council (NSTC) to coordinate interagency R&D plans and to support novel programs for catalyzing cross-disciplinary research.
- **Transferring Technology from Laboratory to Marketplace** – The memo directs agencies to focus on basic and early-stage applied research. “Agency budget proposals should prioritize and highlight lab-to-market initiatives, such as efforts to identify more efficient regulatory and administrative approaches to technology transfer, enhancements to small business innovation programs, entrepreneurial workforce development initiatives, and other programs that improve the transition of federally funded technologies from discovery to practical use.”
- **Partnering with Industry and Academia** – Agencies should partner with industry to align basic research with user needs and to transfer technologies more effectively. Agencies are also directed to explore options to reduce regulatory and administrative barriers, and to explore innovative partnership models with other agencies, state and local governments, the private sector, academia, and international partners to share the cost of new R&D facilities.

Sources and Additional Information

- The full OMB/OSTP R&D memorandum is available at <https://www.whitehouse.gov/wp-content/uploads/2018/07/M-18-22.pdf>.
- The White House announcement of Dr. Kelvin Droegemeier’s nomination to be the next Director of OSTP is available at <https://www.whitehouse.gov/presidential-actions/president-donald-j-trump-announces-intent-nominate-appoint-personnel-key-administration-posts-16/>.