

## Projected Impact of Proposed Federal R&D Spending on Connecticut

By: John Rappa, Chief Analyst  
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### Issue

Describe how the Trump Administration's proposed federal fiscal year (FFY) 18 research and development (R&D) funding priorities could affect federal R&D spending in Connecticut. (The FFY runs from October 1 to September 30.) Also, summarize the administration's FFY 19 R&D funding priorities.

### Summary

It is difficult to determine from available documents how the Trump Administration's R&D funding priorities will affect Connecticut. Released in April 2017, the Office of Management and Budget's (OMB) [America First: A Budget Blueprint to Make America Great Again](#) (i.e., the blueprint) previews the proposed FFY 18 budget, but provides little information about changes for specific R&D programs and how those changes could affect Connecticut or other states. Contributing to the uncertainty is the fact that Congress has not yet enacted the final budget for FFY 18, which began October 1, 2017. OMB's August 17, 2017 [memorandum](#) outlining the administration's FFY 19 R&D budget priorities provides no details about how they could affect specific programs.

The OMB documents' lack of information about funding for specific R&D programs and the uncertainty about how Congress might change the administration's priorities make it difficult to estimate changes in the level and type of federal funding for R&D. However, the broad areas the blueprint targets for R&D spending suggest areas where Connecticut could expect more R&D funding and other areas where it could expect less. By comparing these areas with those that have received R&D funds in the past, we can estimate how the blueprint could potentially affect federal R&D spending in Connecticut, which totaled \$2.3 billion in FFY 15.

The blueprint's proposed \$54 billion increase in overall defense spending could mean more funds for helicopters, jet engines, submarines, and other military hardware manufactured in Connecticut. But the blueprint says little about funds for defense-related R&D, which, according to the National Science Foundation (NSF), accounted for 70% of all federal FFY 15 R&D obligations in Connecticut. Arguably, more money for military hardware does not necessarily mean more money for researching and developing new military technologies.

However, the fact that the blueprint proposes to offset the increase in defense spending by cutting spending in many other areas could reduce the flow of R&D dollars for non-defense purposes, including health- and bioscience-related R&D. For example, the blueprint discusses major cuts and programmatic changes to the National Institutes for Health (NIH). These changes could affect federal health-related R&D funding in Connecticut. According to NSF, health-related R&D funding accounted for 20% of all federal FFY 15 R&D obligations in the state.

Military and homeland security continue to top the administration's FY 19 R&D priority list, but OMB's August 2017 memorandum also signals a shift from later-stage R&D to testing and refining basic and early-stage R&D. Such early-stage funding, "supplemented by private sector financing of later-stage R&D, can result in the development of transformative commercial products and services," the memorandum states. The memorandum also requires agencies to fund R&D to help develop science and math-related skills and to maximize the use of existing R&D facilities through collaborative partnerships among agencies, businesses, colleges, and universities.

Given recent federal budgetary practices, the actual impact of federal FFYs 18 and 19 R&D spending may become apparent only over time, given Congress's tendency to fund agencies through continuing resolutions instead of adopting a final budget before a fiscal year begins. As the Congressional Research Service (CRS) [noted](#), this tendency affects "agencies' execution of the R&D budgets, including the delay or cancellation of planned R&D activities and the acquisition of R&D-related equipment" (*Federal Research and Development Funding: FY 18*, August 14, 2017).

## **FFY 18**

### ***Federally Funded R&D in Connecticut***

We assessed how the blueprint could affect federal R&D funding in Connecticut by comparing its R&D funding priorities with [NSF](#) data on federal FFY 15 R&D spending by state. NSF is an independent federal agency that annually tracks the amount of funds federal agencies allocate or spend in each state on different types of activities and the types of entities receiving these funds.

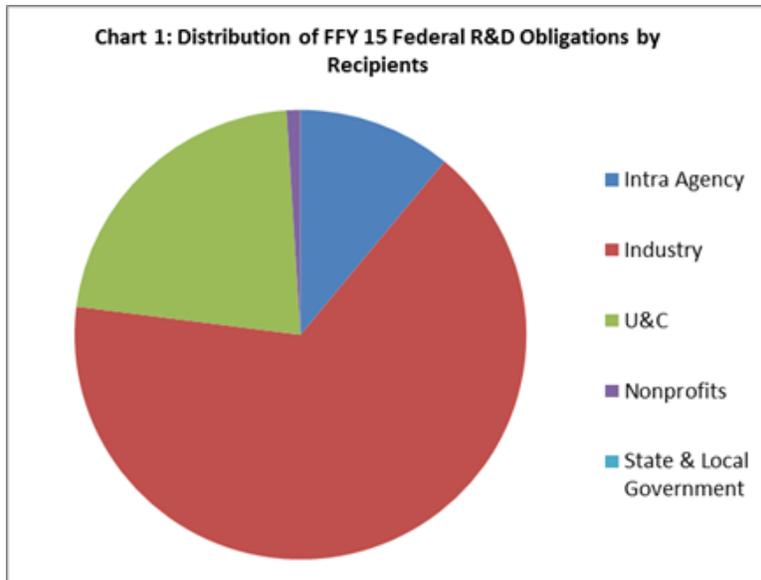
In FFY 15, the last year for which comprehensive and consistent NSF data is available, federal agencies obligated about \$2.3 billion for R&D in Connecticut. As Table 1 shows, the Defense and Health and Human Services departments accounted for 91% of total FFY 15 federal R&D obligations in the state.

**Table 1: Total Value of FFY 15 R&D Obligations in Connecticut by Agency and Types of Recipients  
(In \$ thousands)**

Agency	Total Funds & % of State Total	Recipients				
		Intra Agency	Industry	Colleges & Universities	Other Nonprofits	State & Local Government
Agriculture	\$8,037.10 (0%)	\$ 1,898.70	\$0.70	\$4,839.40	\$0	\$1,298.30
Commerce	1,968.50 (0)	0	0	1,879.50	89.00	0
Defense- Research	78,633.60 (3)	5.00	62,304.70	15,521.20	802.60	0
Defense- Development	1,550,676.40 (68)	239,986.50	1,309,709.70	980.20	0	0
Energy	30,637.40 (1)	0	17,237.30	13,400.10	0	0
Health and Human Services	451,587.00 (20)	0	13,983.50	410,412.50	19,477.80	7,713.20
Homeland Security	8,955.90 (0)	189.10	8,766.80	0	0	0
Interior	8,270.40 (0)	8,185.20	58.70	0	0	26.50
Transportation	5,105.10 (0)	0	4,902.70	175.00	0	27.40
Environmental Protection	389.80 (0)	0	389.80	0	0	0
NASA	91,568.90 (4)	40.40	88,089.60	3,438.90	0	0
NSF	56,921.10 (2)	0	1,713.50	54,577.50	630.10	0
Total	2,292,751.10 (100)	250,304.90	1,507,157.00	505,224.30	20,999.50	9,065.40

Source: National Science Foundation, *NCSSES Survey of Federal Funds for Research and Development FYs 2015-2017: [Table 104: Federal Obligations for Research and Development, by State and Other Location, Selected Agency, and Performer: FY 2015](#)*

The table also shows the distribution of federal R&D obligations by recipient type. Industry received 66% of all federal R&D obligations (approximately \$1.5 billion), most of it from the Defense Department. Colleges and universities received 22% of the total FFY 15 R&D obligations, mostly from the Health and Human Services Department. Chart 1 presents this information as a pie chart.



Source: NSF and OLR

### ***Potentially Affected R&D Funding Areas***

The president's blueprint proposes significant changes in the budgets of agencies that historically have provided most of the R&D funds spent in Connecticut, but, in most cases, does not specify the programs slated for increases or decreases. For example, the blueprint proposes more spending for military personnel and hardware, such as increasing the total number of ships in the Navy (p. 16), but is silent on defense-related R&D, which accounted for over 70% of all FFY 15 R&D obligations in Connecticut.

The blueprint is more specific about NIH, which, as part of the Department of Health and Human Services, provides significant funding for university-based R&D. It proposes a \$5.8 billion cut (19.8% below FFY 16 funding) and a "major reorganization of NIH's Institutes and Centers to help focus resources on the highest priority research and training activities," including consolidating NIH's Agency for Healthcare Research and Quality (p. 22). The combination of funding cuts and program restructuring could reduce the amount of federal dollars for health-related R&D spending.

The blueprint's proposed cuts to the U.S. Energy Department could directly affect several R&D funding programs, including the elimination of the Advanced Research Projects Agency-Energy, because, according to the blueprint, "the private sector is better positioned to finance disruptive energy research and development and commercialize innovative technologies" (pp. 39-40). The department's R&D obligations constitute about 3% of Connecticut's total federal R&D funds.

## FY 19 Administration R&D Budget Priorities

OMB's August 2017 memorandum describing the Trump Administration's FY 19 R&D budget priorities provides a framework for allocating federal R&D funds. Besides identifying the administration's priority R&D funding areas, the framework signals a shift toward funding basic and early-stage research, and using this research to address workforce and infrastructure development goals.

Basic and early-stage research "often involves greater uncertainty and may not provide the economic incentive needed to attract private sector investment," the memorandum states. Agencies should "identify existing R&D programs that could progress more efficiently through private sector R&D and consider their modification or elimination where Federal involvement is no longer needed or appropriate." The agencies must do this by coordinating their efforts, specifically through the National Science and Technology Council. The emphasis on interagency coordination could affect the relationships between Connecticut R&D recipients, how they apply for R&D funds, and the research goals they must achieve.

Basic and early-stage R&D funding should also help develop the nation's STEM workforce, ensuring that workers are available and qualified to use these technologies. The research must be conducted in a way that maximizes the use of existing R&D facilities, which, the memorandum suggests, can be done through "innovative partnership models involving other agencies, state and local governments, the private sector, academia, and international partners." Agencies proposing to construct new facilities must justify the need for them and balance it against providing sufficient funds to operate and maintain existing facilities.

Agencies also must emphasize early-stage R&D that addresses workforce and infrastructure development goals as in targeting their R&D funds at the priority funding areas, as outlined in Table 2.

**Table 2: Administration's FFY 19 R&D Priority Areas**

### American Military Superiority

- R&D that supports the future military, including missile defense technology, modern strategic deterrence, hypersonic weapons and defense, autonomous and space-based systems, trusted microelectronics, and future computing capabilities
- Programs with dual-use potential that could be leveraged for federal non-military advancements

### American Security

- R&D that increases the security and resilience of the nation's critical infrastructure from both physical threat and cyber attacks
- Technology that supports border surveillance and law enforcement capabilities that can detect and interdict illegal activity, including smuggling of contraband and radioactive materials

Table 2 (continued)

American Prosperity

- Continue and expand on funding basic research in emerging technologies, including autonomous systems, biometrics, energy storage, gene editing, machine learning, and quantum computing
- Reduce funding overlaps with industry-funded later stage, research, development, and deployment technologies

American Energy Dominance

- Invest in early-stage, innovative technologies that show promise in harnessing American energy resources safely and efficiently
- Continue to rely on privately funded later-stage research, development, and energy technology commercialization

American Health

- Give priority to biomedical programs that encourage innovation to prevent, treat, and defeat diseases

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