

CRS Report for Congress

Received through the CRS Web

Homeland Security Research and Development Funding, Organization, and Oversight

Genevieve J. Knezo
Specialist in Science and Technology Policy
Resources, Science, and Industry Division

Summary

P.L. 107-296, the Homeland Security Act, consolidated some R&D in the Department of Homeland Security (DHS), whose S&T Directorate's FY2006 R&D budget, according to OMB, is almost \$1.4 billion, almost 20% more than FY2005, enacted. This is the largest percentage increase for any federal agency R&D mission. (The increase is less, about 3%, if funding for TSA, FY2005, is included in the calculation.) DHS is mandated to coordinate total federal agency homeland security R&D, which was requested at \$4.0 billion. Policy issues include priority-setting within DHS and other agencies, performance monitoring, and interagency coordination. This report will be updated.

Funding for Homeland Security R&D. According to the latest data available from the Office of Management and Budget (OMB), federal agency homeland security R&D was requested at \$4.0 billion for FY2006, double the FY2003 amount.^{1 2} DHS will manage about one-third of this budget.³ Other agencies, exclusive of the Department of Health and Human Services (DHHS) and the Department of Defense (DOD) have requested about \$662 million for homeland security R&D for FY2006. See **Table 1**. The American Association for the Advancement of Science (AAAS) estimates that an additional \$0.6 billion will be spent on homeland security R&D facilities and equipment, especially in the Department of Agriculture (USDA), Department of Commerce (DOC), Department of Energy (DOE), Environmental Protection Agency (EPA), and National

¹ See Table 1 in this report. For historical information see the OMB annual series, *Report to Congress on Combating Terrorism*. Problems with data are explained in CRS Report RL32482, *Federal Homeland Security Research and Development Funding: Issues of Data Quality*.

² OMB, *2003 Report to Congress on Combating Terrorism*, Sept. 2003, p. 1.

³ For additional information, see CRS Report RL31914, *Research and Development in the Department of Homeland Security*, and CRS Report RS21542, *Department of Homeland Security: Issues Concerning the Establishment of Federally Funded Research and Development Centers (FFRDCs)*. See also CRS Report RL31354, *Possible Impacts of Major Counter Terrorism Security Actions on Research, Development, and Education*.

Aeronautics and Space Administration (NASA). *DHHS*, with almost 50% of total homeland security R&D funding, manages most of the federal civilian effort against bioterrorism. *DHS* R&D, at one-third of the total, focuses largely on technology-oriented projects funded by the Science and Technology (S&T) Directorate. *DOD*, is the next largest supporter. Its budget includes the Defense Advanced Research Projects Agency (DARPA) and the *Technical Support Working Group (TSWG)*, a State Department/DOD group, that coordinates interagency R&D on new technologies to combat terrorism. (DHS manages some of its own R&D contract solicitations and also participates in TSWG solicitations.) The next largest supporter of homeland security R&D is the *National Science Foundation (NSF)*, for basic research, followed by the *Department of Justice*. *USDA* R&D focuses on plant and animal diseases. *EPA* focuses on toxic materials research. In the *DOC*, R&D at the National Institute of Standards and Technology (NIST) deals with protecting information systems. In the past, the *DOE's* counterterrorism R&D included work on security, materials, detection of toxic agents, genomic sequencing, DNA-based diagnostics, and microfabrication technologies.⁴

Table 1. Non-published OMB Data on Homeland Security (HS)R&D Funding by Agency, Budget Authority, Dollars in Millions

Agency	2003 Enacted	2003 Supplemental	2004 Estimate	2005 Estimate	2006 Request
Agriculture	\$12	—	\$22	\$31	\$67
Commerce	16	—	17	59	62
Defense	212	—	267	362	394
Energy	19	—	19	32	52
Health/Human Services	834	—	1,643	1,608	1,766
Homeland Security	619	—	816	1,017	1,227
Justice	161	25	49	61	109
Transportation	4	—	—	0	1
Treasury	—	—	3	3	3
EPA	53	—	30	25	40
NSF	269	—	318	324	328
Total R&D	2,198	25	3,185	3,522	4,048
Total Non-defense HS R&D	\$1,986	\$25	\$2,918	\$3,160	\$3,654

Note: Totals may not add due to rounding. Based on individual agency data provided by OMB. FY2003 data provided Jan. 2004; other years' data provided Feb. 2005. In 2004, OMB characterized these data as "discretionary budgetary resources," which, according to OMB staff, is "budget authority." Data exclude facilities and construction and overseas combating terrorism R&D funding.

Creation of a Department of Homeland Security and Other Laws. The Homeland Security Act of 2002, P.L. 107-296, created DHS, and, as one of its four directorates, a Directorate on S&T. The Under Secretary for Science and Technology, created by Title III, has responsibility for most of Most of DHS's research, development, test, and evaluation (RDT&E). His responsibilities are to: coordinate DHS's S&T missions; in consultation with other agencies, develop a strategic plan for federal civilian countermeasures to threats, including research; except for human health-related R&D,

⁴ See CRS Report RL32481, *Homeland Security R&D Funding and Activities in Federal Agencies: A Preliminary Inventory*, and CRS Report RS21617, *Homeland Security: Extramural R&D Funding Opportunities in Federal Agencies*.

conduct and/or coordinate DHS's intramural and extramural R&D and coordinate with other federal agencies; set national R&D priorities to prevent importation of chemical, biological, radiological, nuclear and related (CBRN) weapons and terrorist attacks; collaborate with DOE regarding using national laboratories; collaborate with the Secretaries of USDA and DHHS to identify biological "select agents"; develop guidelines for technology transfer; and support U.S. S&T leadership. If possible, DHS's research is to be unclassified.

Title III transferred to DHS DOE programs in chemical and biological security R&D; nuclear smuggling and proliferation detection; nuclear assessment and materials protection; biological and environmental research related to microbial pathogens; the Environmental Measurements Laboratory; and the advanced scientific computing research program from Lawrence Livermore National Laboratory. DHS was mandated to incorporate a newly created National Bio-Weapons Defense Analysis Center and USDA's Plum Island Animal Disease Center, but USDA may continue to conduct R&D at the facility. Coast Guard and Transportation Security Administration (TSA) R&D are now located within DHS. DHS's Secretary is to collaborate with the DHHS Secretary to set priorities for DHHS's human health-related CBRN R&D.

Title III authorized establishment of the Homeland Security Advanced Research Projects Agency (HSARPA) to support applications-oriented innovative homeland security RDT&E in industry, FFRDCs, and universities. Extramural funding is to be competitive and merit-reviewed, but distributed to as many U.S. areas as practicable. The law mandated one or more university-based centers of excellence for homeland security; the first such center, on Risk and Economic Analysis of Terrorism Events at the University of Southern California, was announced in November 2003. Two more were announced in April 2004, at the University of Minnesota and Texas A&M, dealing with agro-security. The University of Maryland won the recent award for a center to study the behavioral and sociological aspects of terrorism, funded at \$12 million. Another university center is proposed on High Consequence Event Preparedness and Response and one on microbial risk assessment to be funded by DHS and EPA. DHS also supports a university fellowship/training program.

Regarding intramural R&D, the DHS may use any federal laboratory and may establish a headquarters laboratory to "network" federal laboratories. DHS relies mostly on the following DOE laboratories: Los Alamos, Lawrence Livermore, Sandia, Pacific Northwest and Oak Ridge. A Homeland Security Institute (HSI), an FFRDC operated by Analytic Services Inc. (ANSER), funded in May 2004, is authorized to conduct risk analysis and policy research on vulnerabilities of, and security for, critical infrastructures; improve interoperability of tools for field operators and first responders; and test prototype technologies. A clearinghouse was authorized to transfer information about innovative solutions and will coordinate with TSWG. In addition, DHS created the Interagency Center for Applied Homeland Security Technology (ICAHST), which validates technical requirements and conducts evaluations for threat and vulnerability testing and assessments.

Table 2. Department of Homeland Security R&D Budget

(budget estimates in millions of dollars; figures are rounded off)

Directorate (Dir.) or Program	FY2003 actual	FY2004 actual	FY2005 Enacted	FY2006, Request
Border & Transportation Security (BTS) Dir, includes TSA R&D	\$163	\$144	\$178	Included in consoli- dated items + conventional missions
Emergency Preparedness and Response (EPR) Dir.	0	0	0	
Information Analysis and Infra. Dir.	0	0	0	
Science and Technology Dir., includes				
— <i>Biological countermeasures, including Nat'l Biodef. Anly&Countermeasures Cntr (NBACC) construction</i>	363	455	363	363
— <i>Nuclear & Radiological countermeasures</i>	75	106	123	20
— <i>Domestic Nuclear Detection Office</i>				227
— <i>Chemical ctrmeasures</i>	—	23	53	102
— <i>High Explosives ctrmeasures</i>	7	7	20	15
— <i>Threat & vulnerability assessment (TVTA)</i>	36	59	66	47
— <i>Critical Infrastructure Protection</i>	—	12	27	21
— <i>Cybersecurity, a new Sen. acct., was in Critical Infrastructure in FY2004 and FY2005 request</i>	—	10	18	17
— <i>Counter MANPADS (anti-aircraft missiles),was in Critical Infrastructure in FY2004</i>	0	17	61	110
— <i>Conventional missions/Support to DHS Components (BTS, EPR, USGS, Secret Service, Immigration), includes Coast Guard R&D starting in FY2005</i>	—	21	55	94
— <i>Rapid Prototyping /TSWG</i>	33	68	76	21
— <i>Standards /state and local</i>	20	32	40	36
— <i>Emerging threats</i>	17	11	11	11
— <i>University programs /HS fellowships</i>	3	22	70	64
— <i>Office of Interoperability and Compatibility</i>	—	—	21	21
— <i>SAFETY Act</i>	—	—	10	6
— <i>R&D Consolidation (\$ from other DHS agencies/accts.)</i>	—	—	—	117
— <i>Unobligated balances</i>	—	22	—	—
— <i>Mngt./Adm./Salaries</i>	not available	44	69	81
Total S&T Directorate With Mngt./Adm./Salaries	554	913	1,115	1,368
Coast Guard	21	21	[19]	[17]
Estimate of Total DHS R&D**	\$738	\$1,078	\$1, 293	\$1,368
OMB data on R&D facilities and equipment (F&E)***	-	[257]	[155]	[210]
Total OMB estimate for DHS R&D, including F&E	-	\$1,097	\$1,185	\$1,467

Sources and notes: Totals may not add due to rounding. Based data in FY2006 OMB budget request; DHS Science and Technology Congressional Budget Justification, FY2006, and Table 16, in AAAS, *Congressional Action on Research and Development in the FY 2005 Budget, 200*. The term “estimate,” that AAAS uses is the agency estimate of appropriations and allocations that will be used. Data in [] are non-additive, for comparison only. Data are based on OMB R&D data and supplemental agency budget data. The FY2004 homeland security appropriations conference report (H.Rept. 108-280) expressed concern about the potential for duplication, waste, and inadequate management oversight, and directed DHS to “consolidate all Departmental research and development funding within the science and technology programs in the FY2005 budget request.” **Author’s estimates. ***Some of these data may already be counted in other lines in the rows of this table. F&E data are from *Analytical Perspectives*, p. 67. These data may be overstated because they may include disaster mitigation grant funding, which is not usually characterized as R&D.

P.L. 107-296 gave the DHS Secretary special acquisitions authority for basic, applied, and advanced R&D (Sec. 833). The Special Assistant to the Secretary, created by Sec. 102 of the law works with the private sector to develop innovative technologies for homeland security. On October 10, 2003, DHS issued rules for liability protection for manufacturers of anti-terrorism technologies pursuant to the Support Anti-Terrorism by Fostering Effective Technologies (SAFETY) Act of 2002, part of P.L. 107-296. DHS issued a rule and procedures to handle critical infrastructure information that is voluntarily submitted to the government in good faith that will not be subject to disclosure under the Freedom of Information Act (*Federal Register*, Feb. 20, 2004, pp. 8073-8089). Sec. 1003 of P.L. 107-296 authorized NIST to conduct R&D on improving information security. The OSTP Director is responsible for advising the President on homeland security (Sec. 1712). P.L. 107-305, "The Cyber Security Research and Development Act," authorized \$903 million over five years for R&D and training programs by NSF and NIST to prevent and combat terrorist attacks on private and government computers.

DHS requested an estimated \$1.4 billion for R&D for FY2006, with \$1.3 billion for the S&T directorate, which, according to OMB, is almost 20% more than the FY2005 enacted amount. See **Table 2**. (The increase is less, about 3%, if funding for TSA, FY2005, is included in the calculation.) About 35% of DHS's R&D funding would be for basic and applied research, up from 30% for FY2004. The rest would go largely for development, facilities, and equipment. For FY2005, Congress increased funding for university programs, interoperable communications, shipping and air cargo security technologies, and biodefense.

Interagency Coordination Mechanisms. OSTP is a statutory office in the Executive Office of the President; its Director advises the President and recommends federal R&D budgets. The Director has chaired the National Security Council's Preparedness Against Weapons of Mass Destruction R&D Subgroup (comprised of 16 agencies), which helps plan R&D relating to chemical, biological, nuclear, and radiological threats. OSTP provides technical support to DHS and manages the interagency National Science and Technology Council (NSTC), which created a Committee on Homeland and National Security to set help set R&D priorities in eight functional areas. OSTP's interagency work has focused on such topics as anthrax, regulations to restrict access to research using biological "select agents," access to "sensitive but unclassified" scientific information, policy for foreign student visas, access to "sensitive" courses, and advanced technology for border control. Pursuant to Executive Order 13231, OSTP worked with the interagency President's Critical Infrastructure Board to recommend priorities and budgets for information security R&D. The working group on bioterrorism prevention, preparedness, and response, established by Sec. 108 of P.L. 107- 188, the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, consists of the DHHS and DOD Secretaries and other agency heads. The Homeland Security Council (HSC), created by P.L. 107-296, provides policy and interagency guidance. A HSC Policy Coordination Committee on R&D was created pursuant to Executive Order 13228. Dr. McQueary testified that, by the fall of 2004, all U.S. government R&D "relevant to fulfilling the Department's mission will have been identified and co-ordinated as appropriate." He inventoried DHS's many informal and formal R&D-related interagency activities in testimony before the House Committee on Science, February 16, 2005. Effectiveness in coordinating this R&D may be an issue of continuing concern.

Oversight Issues. Controversial issues about DHS R&D include the following. (1) Monitoring the establishment and accomplishments of performance goals and metrics for the S&T Directorate's programs and portfolios. (2) Adequacy of use of non-governmental experts to identify program priorities, including for internal R&D, HSARPA, the university center(s), and laboratories. (3) Utilization of the statutorily mandated external 20-member Homeland Security Science and Technology Advisory Committee, comprised of representatives of emergency first-responders, experts in research, engineering, business, and management authorized to advise and recommend research. Other issues include criticisms that cybersecurity R&D may be inadequate;⁵ that EPA and DHS may need to clarify respective responsibilities for homeland security-related R&D;⁶ and that improvements may be needed in DHS to better link the provision of rapid scientific and technical expertise and decisionmaking to responses to weapons of mass destruction attacks and incidents.⁷

Executive Order 13311 transferred to DHS the President's responsibilities to define and design procedures to protect sensitive unclassified homeland security information (Sec. 892 of P.L. 107-296). DHS issued guidance for its own information control procedures (DHS Management Directive System MD Number: 11042 Issue Date: 5/11/2004), but has not yet released agency-wide guidance on this complex subject; its work may raise controversy. See CRS Report RL31845, *Sensitive But Unclassified and Other Federal Security Controls on Scientific and Technical Information*.

DHS's Acting Inspector General testified that the S&T Directorate needs to better integrate threat assessment information to its work and to improve intra-agency coordination:

...[T]he Science and Technology Directorate (S&T) ... is required to coordinate with other executive agencies, particularly those within DHS, to (1) develop an integrated national policy and strategic plan for identifying and procuring new technologies, (2) reduce duplication and identify unmet needs, and (3) support IAIP in assessing and testing homeland security vulnerabilities and possible threats. TSA, the Coast Guard, and IAIP have developed risk assessment tools and performed analyses of critical infrastructure. It is critical for the S&T to have a clear understanding of the terrorist threat picture facing the nation and the current technical capabilities and ongoing research and development initiatives of other DHS elements. To be effective, it must be able to prioritize its investment decisions, and avoid duplicating technology initiatives by other DHS components, especially in the area of risk assessment. To that end, the extent that the new Secretary oversees these efforts and makes intra-agency coordination a reality, will determine his effectiveness in ensuring that DHS' investments are adequately matched to risk.⁸

⁵ Andrea L. Foster, "Panel of Researchers Urges Government to Step Up Spending on Study of Cybersecurity," *Chronicle of Higher Education*, Jan. 18, 2005.

⁶ Caitlin Harrington, "EPA Ordered to work Out jurisdiction Questions With DHS," *CQ Homeland Security*, Dec. 7, 2004.

⁷ James Jay Carafano and David Heyman, *DHS 2.0: Rethinking the Department of Homeland Security*, Special Report 02, The Heritage Foundation, Dec. 2004 [<http://www.heritage.org/Research/HomelandDefense/sr02.cfm>].

⁸ Statement of Richard L. Skinner, Before the Senate Committee on Homeland Security and Governmental Affairs, Jan. 26, 2005, p. 15.