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# Homeland Security Research and Development Funding, Organization, and Oversight

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## Summary

P.L. 107-296, the Homeland Security Act, consolidated some research and development (R&D) in the Department of Homeland Security (DHS), whose FY2006 R&D budget was requested at $1.368 billion, about 4% more than FY2005, enacted. The House passed H.R. 1817, an FY2006 authorization bill, which would expand DHS's R&D, and H.R. 2360, which would appropriate $1.340 billion for these activities. Senate action is pending. DHS is mandated to coordinate all federal agency homeland security R&D, which was requested at $4.0 billion. Policy issues relating to DHS's R&D include priority-setting, eliminating possible waste in technology programs, performance monitoring, and interagency coordination. This report will be updated.

**Funding for Homeland Security R&D.** According to the latest available Office of Management and Budget (OMB) data, 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 have requested about $662 million for homeland security R&D for FY2006. The other largest agency supporters are the Department of Health and Human Services (DHHS) and the Department of Defense (DOD). 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 Departments of Agriculture (USDA),

[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.*

Commerce (DOC), and Energy (DOE), and in the Environmental Protection Agency (EPA), and National 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 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 Science and Technology (S&T). The Under Secretary for S&T, created by Title III, has responsibility for 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

[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.*

countermeasures to threats, including research; except for human health-related R&D, 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 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 creation of university-based centers of excellence for homeland security. The first center, on Risk and Economic Analysis of Terrorism Events, was funded at the University of Southern California. Subsequently two centers in agro-security were announced for the University of Minnesota and Texas A&M; and the University of Maryland won the recent award for a center to study the behavioral and sociological aspects of terrorism, funded at $12 million. Proposals are being considered for a center on High Consequence Event Preparedness and Response. 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 innovations. 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.

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, is to work with the private sector to develop innovative homeland terrorism technologies. DHS issued rules for liability protection for manufacturers of anti-terrorism technologies pursuant to the Support Anti-Terrorism by Fostering Effective

## 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 | FY2006 House Appro-priations |
|---|---|---|---|---|---|
| Border & Transportation Security (BTS) Dir, including TSA | $163 | $144 | $178 | Included in consolidated items + conventional missions | |
| Emergency Preparedness and Response (EPR) Dir. | 0 | 0 | 0 | | |
| Information Analysis and Infra. Dir. | 0 | 0 | 0 | | |
| Science and Technology Dir., includes | [554] | [869] | [1,046] | [1,287] | [1,259] |
| *— Biological countermeasures, including Nat'l Biodef. Anly&Countermeasures Cntr ( NBACC) construction* | *363* | *455* | *363* | *363* | *360* |
| | | *4* | *35* | *—* | *0* |
| *— Nuclear & Radiological countermeasures* | *75* | *106* | *123* | *20* | |
| *— Domestic Nuclear Detection Office* | | | | *227* | *146* |
| *— Chemical ctrmeasures* | *—* | *23* | *53* | *102* | *90* |
| *— High Explosives ctrmeasures* | *7* | *7* | *20* | *15* | *55* |
| *— Threat & vulnerability assessment (TVTA)* | *36* | *59* | *66* | *47* | *47* |
| *— Critical Infrastructure Protection* | *—* | *12* | *27* | *21* | *36* |
| *— Cybersecurity, a new Sen. acct., was in Critical Infrastructure in FY2004 and FY2005 request* | *—* | *10* | *18* | 17 | *17* |
| *— Counter MANPADS (anti-aircraft missiles),was in Critical Infrastructure in FY2004* | *0* | *17* | *61* | *110* | *110* |
| *— Conventional missions/Support to DHS Components (BTS, EPR, USGS, Secret Service, Immigration), includes Coast Guard R&D starting in FY2005* | *—* | *21* | *55* | *94* | *80* |
| *— Rapid Prototyping /TSWG* | *33* | *68* | *76* | *21* | *30* |
| *— Standards /state and local* | *20* | *32* | *40* | *36* | *36* |
| *— Emerging threats* | *17* | *11* | *11* | *11* | *11* |
| *— University programs /HS fellowships* | *3* | *22* | *70* | *64* | *64* |
| *— Office of Interoperability and Compatibility* | *—* | *—* | *21* | *21* | 42 |
| *— SAFETY Act* | *—* | *—* | *10* | *6* | *10* |
| *— R&D Consolidation ($ from other DHS agencies/accts.)* | *—* | *—* | *—* | *117* | *117* |
| *— Unobligated balances* | *—* | *22* | *—* | *—* | *0* |
| *— Technology development and transfer* | 0 | *0* | *0* | *0* | *10* |
| *— Mngt./Adm/Salaries* | not available | *44* | *69* | *81* | *[81]* |
| **Total S&T Directorate With Mngt./Adm./Salaries** | **554** | **913** | **1,115** | **1,368** | **1,340** |
| Coast Guard | 21 | 21 | 19 | [17] | [17] |
| CBP R&D | | | 1 | -- | -- |
| **Estimate of Total DHS R&D**** | **$738** | **$1,078** | **$1, 313** | **$1,368** | **$1,340** |
| 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: Includes conduct of R&D and R&D facilities. 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.* 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. 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." **Some of the data are the author's estimates. ***Some of these data may already be counted in other rows of this table. F&E data are from OMB's *Analytical Perspectives*, *FY2006*, p. 67. See also CRS Report RL32863, on DHS appropriations.

Technologies (SAFETY) Act of 2002, part of P.L. 107-296. DHS also 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*, February 20, 2004, pp. 8073-8089). Sec. 1003 of P.L. 107-296 authorized NIST to conduct R&D to improve information security. 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.

For FY2006, DHS requested an R&D budget of $1.368 billion, about 4% more than FY2005. On May 17, 2005, the House passed H.R. 2360, which would appropriate $1.340 billion for these activities. Senate action is pending. See **Table 2**. For FY2005, Congress increased funding for university programs, interoperable communications, shipping and air cargo security technologies, and biodefense. The FY2006 House bill would increase funding above the President's requested levels for R&D for explosives countermeasures, rapid prototyping, SAFETY Act, interoperable communications, critical infrastructure, and technology development and transfer. Major increases over FY2005 would be for R&D in chemical countermeasures and counter MANPADS.

**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 OSTP Director is responsible for advising the President on homeland security (Sec. 1712). The Director has chaired the National Security Council's Preparedness Against Weapons of Mass Destruction R&D Subgroup, comprised of 16 agencies. OSTP manages the interagency National Science and Technology Council (NSTC)'s 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.

**Oversight Issues.** Controversial issues about DHS R&D include assessing possible waste in technology procurement;[5] establishing performance goals and measures for the S&T Directorate; developing S&T priorities that meet responder needs and benefit

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[5] Scott Higham, et. al., "Contracting Rush for Security Led to Waste, .Abuse," *Washington Post*, May 22, 2005.

from external experts' advice; monitoring the adequacy of cybersecurity R&D;[6] clarifying EPA's and DHS's respective responsibilities for homeland security-related R&D;[7] and improving linkages between providing rapid scientific and technical expertise and decisionmaking and responding to weapons of mass destruction attacks and incidents.[8] DHS's Acting Inspector General testified that the S&T Directorate needs to better integrate threat assessment information into its work and to improve intra-agency coordination:

> ...[T]he Science and Technology Directorate (S&T) ... is required to coordinate with other executive agencies .... It is critical for ... 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 ... 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.[9]

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, 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.*

**Legislation.** The House passed H.R. 1817, a DHS authorization bill, on May 18, 2005; it was referred to the Senate Committee on Homeland Security and Governmental Affairs. In addition to authorizing funding for some R&D programs; H.R. 1817 requires establishment of the Technology Clearinghouse mandated in P.L. 107-296 and mandates establishment of a homeland security technology transfer program and a working group, including the Secretary of Defense, to advise and assist the clearinghouse in identifying relevant military technologies (Sec. 302). Sec. 303 requires identification and assessment of whether DHS procurements related to terrorism are candidates for the litigation and risk management protections of P.L. 107-296. Sec. 304 requires the Secretary to establish a university center of excellence for Border Security with its activities to be prioritized based on risk assessment. Sections 313 and 314 authorize university grant programs and other types of cybersecurity R&D. Sec. 510 authorizes DOE laboratories to participate in proposal writing and activities of university centers for homeland security.

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

[7] Caitlin Harrington, "EPA Ordered to Work Out Jurisdiction Questions With DHS," *CQ Homeland Security*, Dec. 7, 2004.

[8] 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].

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