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CRS Report for Congress

# 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). For FY2007, Congress appropriated an R&D budget (excluding management/procurement) totaling about $1.0 billion, about 22% less than FY2006, and representing the first decline in DHS's R&D funding since the inception of DHS in 2002. DHS is mandated to coordinate all federal agency homeland security R&D, which was requested at about $5.1 billion. During the 110th Congress, contentious policy issues relating to DHS's R&D are likely to include priority-setting, management, possible waste in research and technology programs, and improving program performance results. This report will be updated.

**Funding for Homeland Security R&D.** Federal agency funding for homeland security R&D was requested at about $5.1 billion for FY2007, about the same amount as in FY2005 and FY2006. The American Association for the Advancement of Science (AAAS) reports that the top three agency supporters are the Department of Health and Human Services (DHHS), specifically the National Institutes of Health (NIH) at 40% of the total, DHS with about 23%, and the Department of Defense (DOD), with 21%.[1] See **Table 1**. Other funding agencies in descending order are the National Science Foundation (NSF), the Department of Agriculture (USDA), the Environmental Protection Agency (EPA), the National Aeronautics, and Space Administration (NASA), the Department of Energy (DOE), and the Department of Commerce (DOC). DHHS (NIH) manages most of the federal civilian effort against bioterrorism.[2] DHS R&D focuses largely on

[1] 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)*.

[2] See CRS Report RL31719, *An Overview of the U.S. Public Health System in the Context of Emergency Preparedness.*

technology-oriented projects, which for FY2007, emphasize countermeasures against weapons of mass destruction (WMD). DOD's homeland security R&D portfolio includes work on countering chemical and biological threats, emergency preparedness, and R&D supported by the Technical Support Working Group (TSWG), a State Department/DOD group that coordinates interagency R&D on new technologies to combat terrorism.[3] USDA's work includes physical protection for agricultural resources and maintaining security of the food supply. NSF's homeland security R&D focuses on protection of critical infrastructures and key assets and includes cybersecurity R&D. EPA has focused 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, DOE's counterterrorism R&D included work on materials, detection of toxic agents, genomic sequencing, DNA-based diagnostics, and microfabrication technologies.[4] NASA's homeland security R&D deals with aviation safety and remote sensing.

## Table 1. Federal Homeland Security R&D Funding by Agency

(Budget authority, dollars in millions, figures are rounded off)

| Agency | FY2002 Actual | FY2003 Actual | FY2004 Actual | FY2005 Actual | FY2006 Estimate | FY2007 Request | %Chg. FY2006 to FY2007 |
|---|---|---|---|---|---|---|---|
| USDA | $175 | $155 | $40 | $161 | $105 | $100 | -5.0% |
| DOC | 20 | 16 | 23 | 59 | 62 | 68 | 9.7% |
| DOD | 259 | 212 | 267 | 1,079 | 1,166 | 1,074 | -7.9% |
| DOE | 50 | 48 | 47 | 67 | 68 | 71 | 4.4% |
| DHHS | 177 | 2,653 | 1,724 | 1,795 | 1,899 | 2,014 | 6.0% |
| *(NIH)* | *(162)* | *(1,633)* | *(1,703)* | *(1,774)* | *(1,878)* | *(1,993)* | *(6.1%)* |
| DHS | 266 | 737 | 1,028 | 1,240 | 1,281 | 1,149 | -10.3% |
| DOT | 106 | 7 | 3 | 2 | 3 | 1 | -67.0% |
| EPA | 95 | 70 | 52 | 33 | 52 | 92 | 75.6% |
| NASA. | 73 | 73 | 88 | 89 | 93 | 83 | -9.9% |
| NSF | 229 | 271 | 321 | 326 | 329 | 371 | 12.8% |
| All Other | 48 | 47 | 32 | 42 | 41 | 47 | 12.6% |
| **Total** | **1,499** | **3,290** | **3,626** | **4,893** | **5,099** | **5,070** | **-0.6%** |
| **Total, Non-DOD** | $1,240 | $3,078 | $3,359 | $3,814 | $3,933 | $3,996 | 1.6% |

**Note:** Adapted from an AAAS table on "Federal Homeland Security R&D by Agency," available at [http://www.aaas.org/spp/rd/fy07.htm], which uses data from OMB, *2003 Report to Congress on Combating Terrorism* and *Budget of the U.S. Government FY2007*. The AAAS table includes funding for the conduct of R&D and R&D facilities, uses revised estimates of DHS R&D, and notes that DOD expanded its reporting of homeland security funding beginning in 2005. Regular and supplemental appropriations are included. Problems with obtaining R&D data are explained in CRS Report RL32482, *Federal Homeland Security Research and Development Funding: Issues of Data Quality* and in U.S. Government Accountability Office, *Combating Terrorism: Determining and Reporting Federal Funding Data*, Jan. 2006, GAO-06-161.

**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 of 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). The Under Secretary's responsibilities are to: coordinate

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[3] See CRS Report RL31615, *Homeland Security: The Department of Defense's Rol*e.

[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*.

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, conduct and/or coordinate DHS's intramural and extramural R&D; 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 is permitted to continue to conduct R&D at Plum Island. 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; five multi-year awards ranging between $10 million to $18 million have been made for centers on: risk and economic analysis of terrorism at the University of Southern California; agro-security at the University of Minnesota and at Texas A&M; on behavioral and sociological aspects of terrorism at the University of Maryland; and on high consequence event preparedness and response at Johns Hopkins. DHS and EPA jointly fund a cooperative center on advancing microbial risk assessment at Michigan State; there are plans for a DHS-Lawrence Livermore National Laboratory cooperative center on computational challenges for homeland security. DHS also supports a university fellowship/training program, which plans to train 200 students in 2007, down from 300 in 2006, and up to 15 postdoctoral fellows. Regarding intramural R&D, 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., 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 Technologies (SAFETY) Act of 2002, part of P.L. 107-296. DHS also issued a rule 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 to improve information security. P.L. 107-305, the Cyber Security Research and Development Act, authorized $903 million over five years for NSF and NIST R&D and training programs to combat terrorist attacks on computers.

For FY2007, DHS requested funding for R&D *per se* of $1.1 billion, and Congress, in P.L. 109-295, appropriated $1.0 billion, about 22% less than the estimated FY2006 level. This is the first reduction in the agency's R&D budget since DHS was created in 2002. The FY2007 budget increased R&D support for explosives countermeasures, interoperable communications, and cybersecurity. Other areas of R&D, including university centers, received decreased funding. See **Table 2**. The FY2006 appropriations law had increased R&D funding above the President's requested levels for biological countermeasures, explosives countermeasures, DNDO, rapid prototyping, SAFETY Act, interoperable communications, and critical infrastructure. See CRS Report RL33428, *Homeland Security Department: FY2007 Appropriations* and CRS Report RL33345, *Federal Research and Development Funding FY2007*, (section on DHS).

**Interagency Coordination Mechanisms.** The Office of Science and Technology Policy (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 of P.L. 107-296). The Director has chaired the National Security Council's Preparedness Against Weapons of Mass Destruction R&D Subgroup, comprised of 16 agencies. OSTP also manages the interagency National Science and Technology Council (NSTC)'s Committee on Homeland and National Security to 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. An HSC Policy Coordination Committee on R&D was created pursuant to Executive Order 13228. Former DHS Under Secretary 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 R&D-related interagency activities in testimony before the House Committee on Science on February 16, 2005. In 2006, GAO issued a report dealing with Plum Island, *DHS and USDA Are Successfully Coordinating Current Work, But Long-Term Plans Are Being Assessed* (GAO-06-132).

**Oversight Issues.** Controversial issues about DHS's R&D include preventing conflicts of interest in awarding R&D funds since many DHS S&T portfolio managers

are hired from, and will return to, national laboratories which are among the contenders for DHS R&D contracts and awards' decisions, which according to GAO, are often undocumented (based on *DHS Needs to Improve Ethics-Related Management Controls for the Science and Technology Directorate,* Dec. 2005, GAO-06-206); providing Congress with more detailed information regarding priority setting and R&D budgeting and spending (see H.Rept. 109-476 and S.Rept. 109-273 on DHS's FY2007 appropriations request); monitoring HSARPA's mission and performance in transitioning homeland security technology to the field;[5] assessing possible waste in technology procurement;[6] improving the effectiveness of DHS's S&T (only one program of six that were evaluated using OMB's Performance Assessment Rating Tool (PART) received a score of "highly effective);"[7] developing S&T priorities that meet responder needs and benefit from external experts' advice; monitoring the adequacy of cybersecurity R&D;[8] and improving linkages between providing rapid scientific and technical expertise and decisionmaking and responding to weapons of mass destruction attacks and incidents.[9] DHS's Acting Inspector General testified on January 26, 2005 before the Senate Committee on Homeland Security and Governmental Affairs that the S&T Directorate needs to better integrate threat assessment information into its priority-setting and to improve inter- and intra-agency coordination.

Executive Order 13311 transferred to DHS the President's responsibilities to design procedures to protect sensitive unclassified homeland security information that were mandated by Sec. 892 of P.L. 107-296. DHS issued guidance for its own information control procedures in *Management Directive System MD Number: 11042.1, 01/05/05*, but has not yet released government-wide guidance on this controversial topic. For additional information, see CRS Report RL33303, *"Sensitive But Unclassified" Information and Other Controls: Policy and Options for Scientific and Technical Information*.

**Legislation.** During the 109th Congress, 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. It would have required creation of the Technology Clearinghouse mandated in P.L. 107-296, a homeland security technology transfer program, and a working group, including the DOD Secretary, to advise the clearinghouse to identify relevant military technologies. It would also have required assessment of whether DHS procurements are candidates for the litigation and risk management protections of P.L. 107-296, established a university center of excellence for border security, authorized academic and other types of cybersecurity R&D, and allowed DOE laboratories to participate in proposal writing and other activities of the university centers of excellence.

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[5] Zack Phillips,"DHS Launches Major Review of R&D Wing as Lawmakers Call for More Focus," *CQ Homeland Security,* Mar. 22, 2006.

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

[7] DHS, *Science and Technology Directorate, FY2007, Strategic Context,* p. 5.

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

[9] James Jay Carafano and David Heyman, *DHS 2.0: Rethinking the Department of Homeland Security,* Special Report 02, The Heritage Foundation, Dec. 2004.

On June 14, 2006, the Homeland Security Committee reported two bills. An amended H.R. 4941, the Homeland Security S&T Enhancement Act, would have required DHS to transfer anti-terrorism technology developed by federal agencies or the private sector, to develop standards for first-responder communications equipment, require the government to share results of tests of equipment with first responders, to develop a strategic plan for S&T activities, and to work to develop guidelines for researchers about the potential homeland security implications of their work. H.R. 4942, the Promoting Anti-Terrorism Capabilities Through International Cooperation Act, would have required DHS's S&T Directorate to support homeland security R&D with U.S. allies. It was reported (H.Rept. 109-674), amended, and approved on September 26, 2006. H.R. 5814, an authorization bill, reported by the Homeland Security Committee on July 19, 2006, would have streamlined SAFETY Act procedures to develop anti-terrorism technology, enhanced biosurveillance systems, and created an assistant secretary for cybersecurity.

## Table 2. Department of Homeland Security R&D Budget

(Budget authority in millions of dollars; figures are rounded off)

| Directorate or Program | FY2005 Actual | FY2006 Estimate | FY2007 Appropriation |
|---|---|---|---|
| **Science and Technology Directorate[1 5]** | **$1,043** | **$1,262** | **$713** |
| Biological Countermeasures | *363* | *376* | *350* |
| NBACC Construction[2] | *35* | *0* | *0* |
| Chemical Countermeasures | *53* | *94* | *60* |
| Explosives Countermeasures | *20* | *44* | *87* |
| Radiological/Nuclear Countermeasures[3 5] | *123* | *209* | *0* |
| Threat Awareness | *66* | *43* | *35* |
| Standards | *40* | *35* | *22* |
| R&D Support of DHS Components | *55* | *79* | *86* |
| University and Fellowships | *70* | *62* | *50* |
| Emerging Threats[4] | *11* | *8* | |
| Rapid Prototyping[4] | *76* | *35* | *19* |
| Counter MANPADS | *61* | *109* | *40* |
| Interoperable Communications | *21* | *26* | *27* |
| SAFETY Act | *10* | *7* | *5* |
| Critical Infrastructure Protection | *27* | *40* | *35* |
| Cyber Security | *18* | *17* | *20* |
| R&D Consolidation[1] | *0* | *99* | *0* |
| Rescission of Unobligated Funds | *-4* | *-20* | *-125* |
| Pacific NW Laboratory | *0* | *0* | *2* |
| **Border and Transportation Security (TSA)[1]** | **178** | **0** | **0** |
| **Domestic Nuclear Detection Office[3 5]** | **0** | **0** | **273** |
| **U.S. Coast Guard RDT&E[1]** | **19** | **19** | **17** |
| **Total DHS R&D** | **$1,240** | **$1,281** | **$1,003** |

**Source:** Adapted from AAAS, Table II-6, "DHS R&D Falls in 2007 Budget," Feb. 28, 2006. AAAS used OMB data and agency supporting documents to compile data. Table notes: 1. The FY2006 budget consolidated TSA R&D within the S&T Directorate; 2. Construction funds for National Biodefense Analysis and Countermeasures Center; 3. Radiological and nuclear countermeasures will transfer to the DNDO in 2007; 4. Will be consolidated into a new Emergency and Prototypical Technology line in 2007; 5. R&D items only. Non-R&D components and line items are excluded. For additional information on appropriations action for DHS, see CRS Report RL33345, *Federal Research and Development Funding: FY2007*, Table 7. Data in Table 7 include some management and administrative obligations that do not appear in the AAAS-based data in this short report.