

R&D in the Department of Homeland Security

Kei Koizumi, AAAS

HIGHLIGHTS

- After several years of rapid increases, **the Department of Homeland Security's (DHS) R&D funding would fall for the first time in the 2007 budget, by 10.3 percent down to \$1.1 billion** (see Table II-6). The total DHS budget would continue to increase by 6.6 percent to \$35.4 billion in 2007.
- The radiological and nuclear countermeasures R&D portfolio moves to a new Domestic Nuclear Detection Office (DNDO) in 2006, and would move again to a separate budget account in 2007. DNDO R&D would continue to increase dramatically, from \$209 million to \$328 million.
- **Funding for nearly all DHS R&D activities would decline from previous years.** Only DHS R&D activities in interoperable communications, cybersecurity, and radiological and nuclear countermeasures would increase.
- Because of an emphasis on development, basic and applied research in DHS could decline 20 percent in the 2007 budget plan.
- University and Fellowship Programs funding would drop further to \$52 million in 2007, down \$10 million.

DHS R&D IN THE FY 2007 BUDGET

Nearly five years after the fall 2001 terrorist attacks and more than three years after the hurried creation of a new cabinet-level department to guard against terrorist threats, the Department of Homeland Security (DHS) continues to lead the government effort against terrorism and to coordinate government-wide responses to man-made as well as natural

disasters. The DHS budget continues to be a high priority for the Bush Administration; the FY 2007 budget requests \$35.4 billion for the entire department's appropriated activities, an increase of \$2.2 billion or 6.6 percent following a similar increase last year. But it is a different story for the DHS R&D portfolio: after starting from virtually nothing three years ago and rapidly ramping up its R&D capabilities to become the seventh-largest R&D funding agency, **DHS R&D would fall 10.3 percent to \$1.1 billion in 2007** (see Table II-6) in a broad-based retrenchment of the DHS R&D portfolio.¹

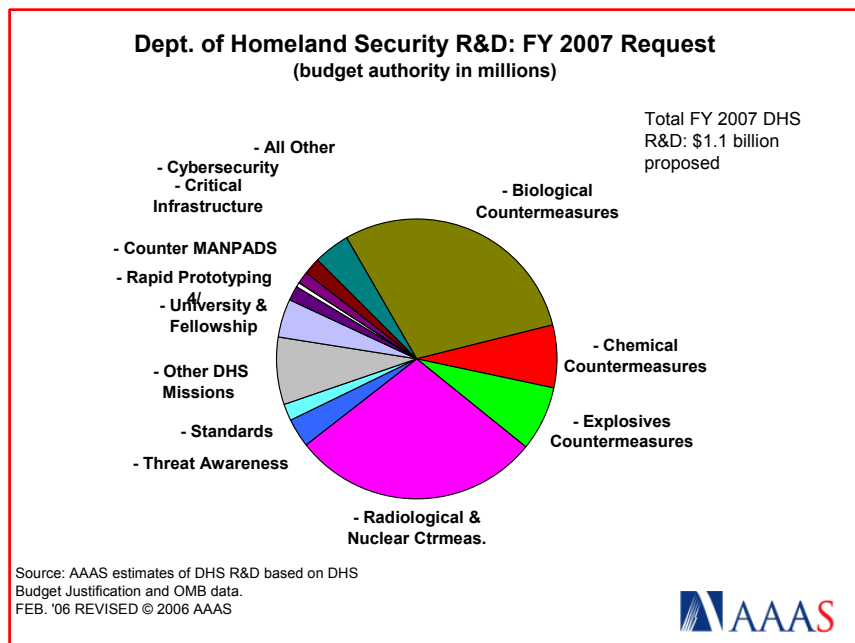


Figure 1.

In FY 2006, nearly all DHS R&D programs have their home in the **Directorate of Science and Technology (S&T)**. This Directorate has responsibility for setting homeland-security R&D goals and priorities, coordinating homeland security R&D throughout the federal government, funding homeland security R&D, facilitating the transfer

¹ The AAAS estimates of DHS R&D in Table II-6 differ significantly from R&D data in the *Budget of the U.S. Government FY 2007*. AAAS has corrected inaccurate codings of non-R&D programs as R&D, added back some R&D funding left out of the Budget, and removed some non-R&D programs from the R&D data after examination of DHS budget documents.

R&D IN THE DEPT. OF HOMELAND SECURITY

and deployment of technologies for homeland security, and advising the DHS Secretary on all scientific and technical matters. Congress keeps Coast Guard (CG) R&D separate within the Coast Guard appropriation at \$19 million in 2006; the FY 2007 request would keep it there at \$15 million. But Transportation Security Administration (TSA) R&D, which like the Coast Guard transferred to DHS from the Department of Transportation (DOT) in 2003, moves to the S&T Directorate in 2006 at a reduced funding level of roughly \$95 million, down by nearly half from \$178 million (see Table II-6). But the consolidation would reverse somewhat in FY 2007 as the radiological and nuclear countermeasures portfolio would migrate out of S&T to a separate Domestic Nuclear Detection Office (DNDO).

R&D against weapons of mass destruction dominates the DHS R&D portfolio (see Figure 1). Defenses against biological, chemical, explosive, radiological, and nuclear threats continue to make up nearly three-quarters of the R&D investment, but of these areas only the radiological and nuclear R&D portfolio would increase in 2007.

Biological countermeasures would continue to be the largest portfolio with \$337 million, down 10.4 percent from 2006. DHS' biodefense effort works with the Department of Defense (DOD), the National Institutes of Health (NIH), the U.S. Department of Agriculture (USDA) and other agencies. Construction of the National Biodefense Analysis and Countermeasures Center (NBACC) continues in FY 2006 and 2007 toward a target completion date of 2008. NBACC will be part of a biodefense complex of DHS, NIH, and DOD facilities at Fort Detrick, Maryland. The FY 2006 appropriation contains \$23 million in new funds to start construction of a new National Bio and Agrodefense Facility (NBAF), a \$450 million total project which continues in 2007 with a scheduled completion of 2010 to enhance DHS capabilities to respond to food or animal-borne terrorist threats and to replace DHS' existing facility on Plum Island, New York.

Explosives countermeasures funding appears to increase in 2007 (see Table II-6), but the apparent increase is due to the transfer of civil aviation explosives detection R&D from the Transportation Security Administration (TSA) in 2005 to an R&D Consolidation account in 2006 and to the Explosives Countermeasures account in 2007; with each transition, funding would be reduced dramatically.

The Domestic Nuclear Detection Office (DNDO), which funds the radiological and nuclear countermeasures portfolio, begins operations in 2006 within the S&T Directorate, but would move to a separate budget account in 2007. The DNDO will develop, acquire, and support a domestic system to detect and report terrorist attempts to transport or use radiological or nuclear materials. DNDO will be staffed with a multi-agency team and will coordinate its efforts with the intelligence community, and will fund R&D, develop new technologies, and transition these technologies to field use. The total DNDO budget of \$334 million in 2006 would increase dramatically to \$536 million in 2007. Subtracting \$178 million in procurement of nuclear detection devices for U.S. ports of entry and \$30 million in management costs for the newly independent office would leave \$328 million for R&D, up dramatically from \$209 million in 2006 and just \$123 million the year before (see Figure 2). (The initial DNDO budget for 2006 is \$334 million within S&T, of which \$125 million would go to procurement; in 2005, these procurement costs were in other parts of the DHS budget.)

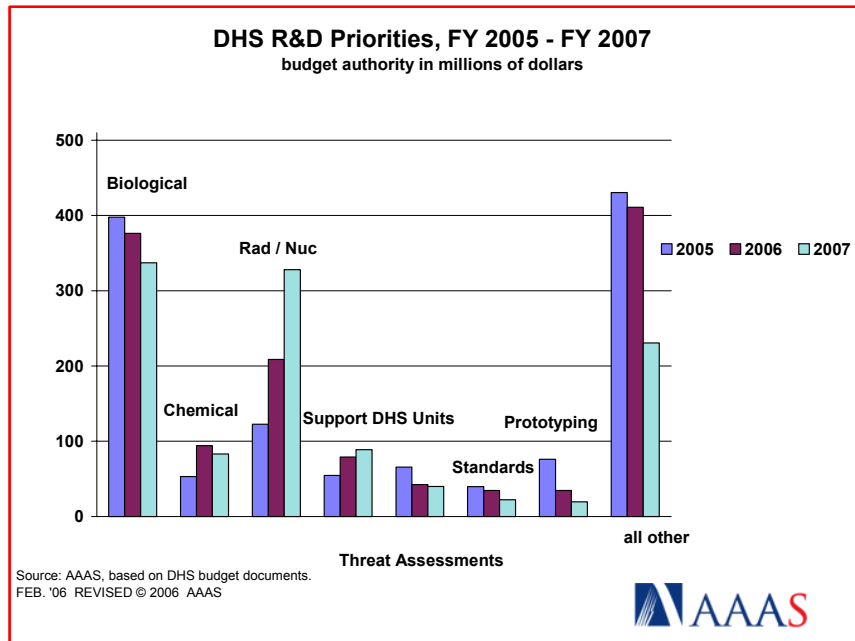


Figure 2.

After a 2006 budget in which there were ups and downs for the first time, after nothing but ups in the first few years, **cuts would far outnumber**

increases in the 2007 request (see Figure 2). Funding for many areas would decline for the second year in a row. Other than radiological and nuclear countermeasures, only the interoperable communications (up \$4 million to \$30 million) and cybersecurity portfolios (up \$6 million to \$23 million) would increase in 2007 (see Table II-6). All other DHS R&D areas would see cuts in 2007; the apparent increases in explosives countermeasures and R&D for DHS Agencies would be due to transfers from the R&D Consolidation account. The Counter MANPADS portfolio would plummet from \$109 million down to \$5 million, primarily because the development phase of this project would end in 2006 with the production of prototypes. Man Portable Air Defense Systems (MANPADS) are shoulder-mounted portable air missiles that have been used (unsuccessfully so far) against passenger aircraft. In 2007, field testing of these prototypes on cargo aircraft would allow Congress and DHS to choose how to proceed on further development or procurement.

University and Fellowship Programs would fall \$10 million to \$52 million in 2007, after a similar cut in 2006. This program funds university-based Centers of Excellence that are multi-year university consortia to perform R&D on homeland security-related topics, Cooperative Centers that are multi-agency university centers, and also fellowships to encourage U.S. students to pursue scientific and technical degrees in areas of study related to homeland security. There are now five DHS Centers of Excellence, the latest awarded in December 2005 to Johns Hopkins University and partners for the National Center for the Study of Preparedness and Catastrophic Event Response. The FY 2007 request would continue funding for these centers and would leave open the possibility of a sixth center. But the declining budget would not allow for any more university centers. The first Cooperative Center, a joint DHS-EPA effort, was awarded to Michigan State University and partners for microbial risk assessment. It will be joined in 2006 by a DHS-Lawrence Livermore National Laboratory center on computational challenges for homeland security, and both will continue to be funded in 2007. On the fellowships side, DHS would support 200 students and scholars (down significantly from 300 this year), and also up to ten postdoctoral fellows and up to five AAAS fellows to participate in DHS research with the resources provided in the FY 2007 request.

DHS has recently reclassified its R&D portfolio, from primarily development to primarily research. DHS support of basic and applied

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research would total \$903 million in FY 2007, more than three-quarters of the R&D portfolio, compared to less than half in previous reports. But the DHS request would favor development activities (primarily in DNDO's work) over research, resulting in a 20 percent cut to the DHS research portfolio.

NEXT STEPS AND LIKELY IMPACTS

DHS R&D, after a rapid ramp-up phase, now appears to be a mature R&D portfolio and subject like other R&D funding agencies to cuts because of the tight budget situation facing domestic programs. DHS began life with only a few R&D laboratories and programs that it inherited from USDA, DOE, and DOD, unlike the massive transfer of personnel and capabilities that happened in the rest of the new department. From a transfer of less than \$300 million of programs in 2002, DHS began rapidly creating new R&D capabilities after its foundation in FY 2003, adding portfolios on long-neglected technology areas to address homeland security, establishing relationships with existing national laboratories and federal laboratories, and setting up new structures for funding external R&D. DHS has set up its own FFRDC, the Homeland Security Institute (HSI), and has also consolidated R&D activities at laboratories it inherited from other departments. The extramural R&D portfolio in the S&T directorate is now managed by the Homeland Security Advanced Research Projects Agency (HSARPA), modeled on the Defense Advanced Research Projects Agency (DARPA) in the Department of Defense (DOD). HSARPA awards extramural grants for basic and applied research to promote revolutionary changes in homeland security technologies; develops and tests potential homeland security technologies; and accelerates or prototypes the development of homeland security technologies to get them ready for deployment.

But after DHS finished its start-up phase in 2005, budget growth slowed down in 2006 and would reverse in 2007. After several years in which every part of the DHS R&D portfolio grew dramatically, in 2006 and 2007 there would be difficult rebalancing choices made within the portfolio, as DHS shifts resources out of some technologies and into others. While this could be a sign that DHS is now a mature R&D funding agency, it could also be a sign that homeland security is now one of many priorities in the government that compete for scarce resources, after many years in which it was a paramount national priority.