AAAS R&D Funding Update March 4, 2005 -
Homeland Security R&D in the FY 2006 Budget

Homeland Security R&D Funding Levels off in 2006

- **Federal homeland security R&D would total $4.4 billion in FY 2006**, a gain of $208 million or 4.9 percent that represents a leveling off of the federal investment after dramatic recent increases (see Table).

- The majority of the portfolio would remain outside the Department of Homeland Security (DHS), with **the largest part of funding coming from the National Institutes of Health (NIH) for its biodefense research** portfolio. NIH's portfolio, mostly in the National Institute of Allergy and Infectious Diseases (NIAID), would total $1.8 billion in FY 2006, up 0.4 percent.

- **Total homeland security funding would rise $4 billion or 8.5 percent to $50 billion** next year, somewhat off the pace of recent years but a notable increase in a budget that proposes flat or declining funding for other federal government missions.

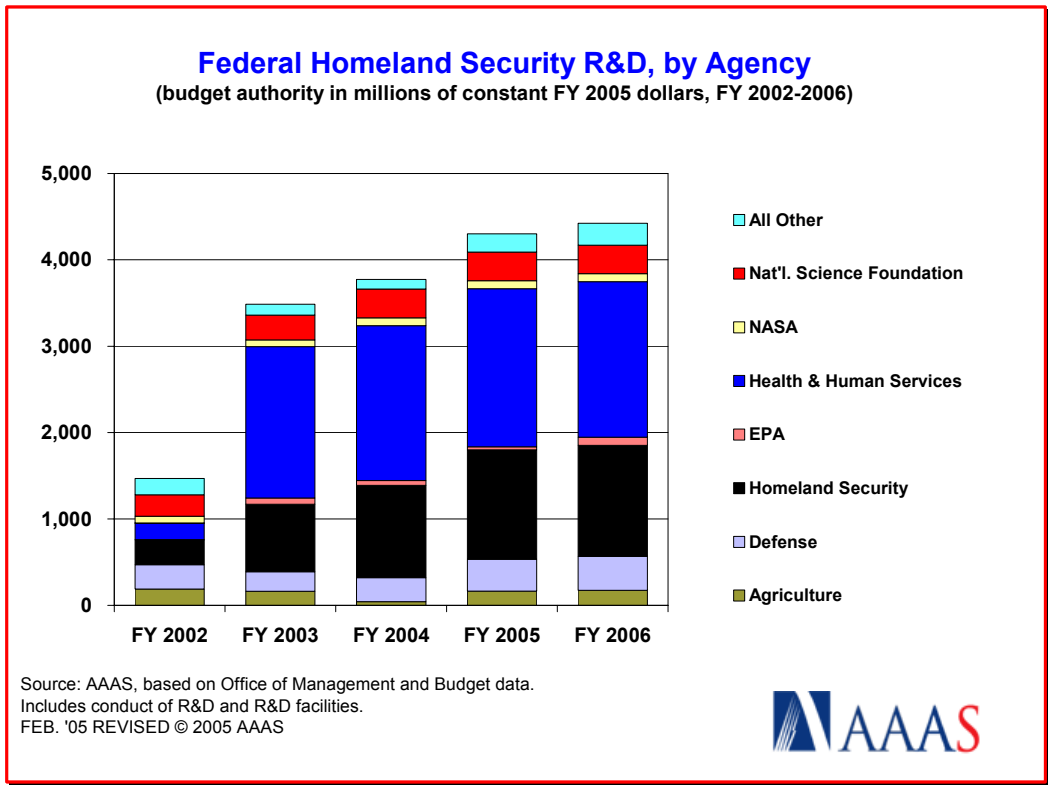

Figure 1. (click on image for PDF)

The Bush Administration has requested $4.4 billion for homeland security-related R&D in the FY 2006 budget, a boost of 4.9 percent or $208 million from the FY 2005 funding level (see Table). As shown in Figure 2, homeland security R&D is funded by nearly a dozen different federal departments, but the majority of funds would remain outside the Department of Homeland Security (DHS). In fact, nearly half of all federal R&D funding for homeland security would come from the Department of Health and Human Services (HHS; $1.8 billion in FY 2006; see Figure 2).

Despite the creation of DHS, homeland security R&D is an interagency effort that is still a work of progress. The concept of homeland security is still new, and is an outgrowth of longstanding multi-agency federal investments in counter-terrorism programs given new urgency and new direction after the fall 2001 terrorist attacks. Until FY 2001, counter-terrorism R&D was an effort of about $500 million a year with the majority of support coming from the Department of Defense (DOD), because it was assumed that U.S. military forces abroad were the most at risk from terrorist attacks. After the September 11 and anthrax attacks, this thinking changed dramatically and, as a consequence, homeland security as an effort to prevent, minimize, and recover from terrorist attacks within the United States became a new concept and mission for the federal government. Ultimately, this newly-articulated mission found expression in a cabinet-level federal department to consolidate many but not all federal counter-terrorism programs, and a dramatic expansion of federal homeland security spending both inside and outside the new DHS. But 'homeland security' is still a concept grappling for a standardized definition, and is still a mission area that cuts across traditionally defined government missions such as justice, defense, and transportation.

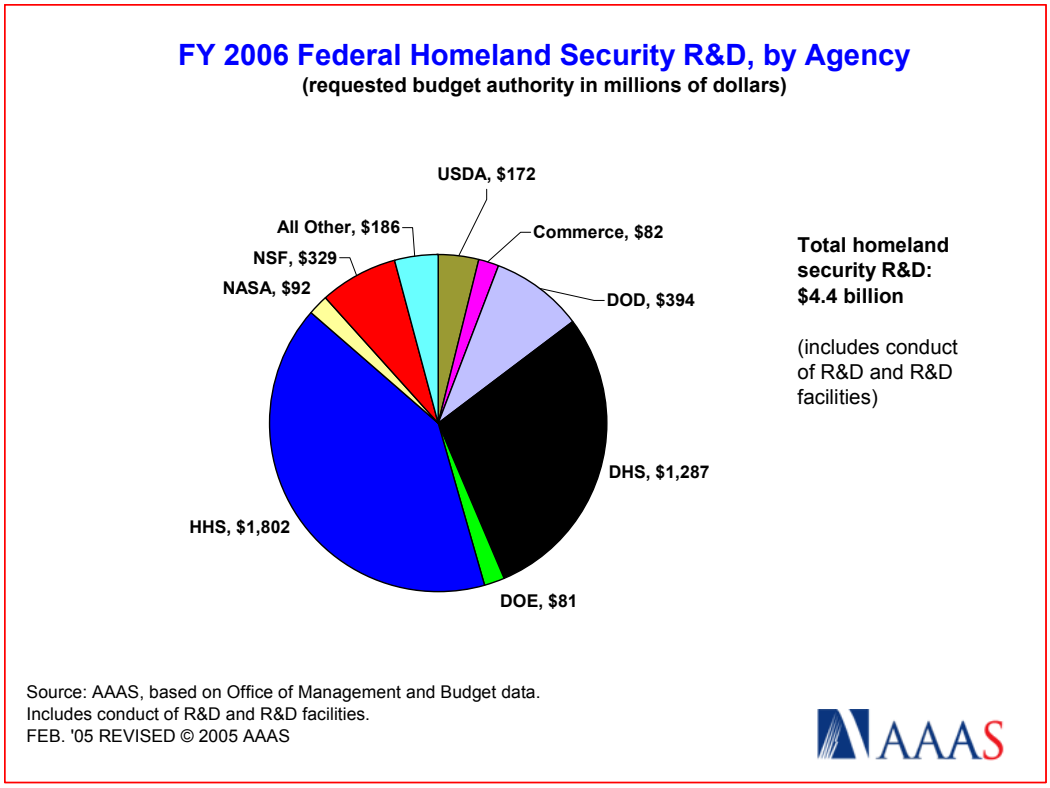

Figure 2. (click on image for PDF)

From $1.5 billion in FY 2002, mostly new funding enacted in the immediate aftermath of the fall 2001 terrorist attacks, the homeland security-related R&D portfolio more than doubled to $3.3 billion in FY 2003, primarily because of a $1.5 billion increase in the National Institutes of Health (NIH) biodefense R&D portfolio (see Figure 1). In FY 2006, HS R&D growth would level off somewhat and increase 4.9 percent to $4.4 billion because of continuing growth in DHS and in other agencies. Within a tight overall discretionary budget in which most R&D programs would see funding cuts or flat funding, HS R&D would still fare better than the average.

The **National Institutes of Health (NIH)** has supported **bioterrorism-related research** for years, but its research portfolio became a high priority after the fall 2001 postal anthrax attacks. In the FY 2006 request, biodefense R&D continues to be a high priority. NIH identifies $1.8 billion for biodefense R&D in FY 2006, up 0.4 percent from this year. But a decline in biodefense laboratory construction funding would allow for an 8 percent increase in biodefense R&D grants and contracts to a total of $1.7 billion. Most NIH

biodefense R&D is funded by the National Institute of Allergy and Infectious Diseases (NIAID). NIAID would continue to award biodefense research grants in FY 2006; fund clinical development of vaccines for plague, tularemia, and other threats; fund clinical development of anthrax treatments; and fund preclinical development of potential new therapies against bioterror agents. After providing $148 million this year to fund extramural construction for biosafety level (BSL) 3 and 4 laboratories around the nation, NIAID would ramp down to $30 million next year. In addition to funds in the NIH budget, there would be an additional $97 million in funds from the Office of the (HHS) Secretary for NIH to spend on developing medical countermeasures against nuclear, radiological, and chemical terrorist attacks. (For more on NIH R&D, see the NIH R&D Funding Update.)

The DHS R&D portfolio mirrors the trends in the overall DHS budget: after annual increases greater than 20 percent in the first few years of its existence, **growth in the DHS R&D portfolio would level off with an FY 2006 request of $1.3 billion, up $44 million or 3.6 percent** (see Table). Increases in some parts of the DHS R&D portfolio would require offsetting cuts in other areas that have previously enjoyed large increases. Unlike other DHS activities, DHS inherited few R&D programs from other agencies at its birth in 2003; therefore, the large increases in R&D funding for the past few years were devoted to building R&D capabilities from scratch to meet the urgent need for science and technology to address homeland security concerns. Now that the start-up phase of DHS R&D is mostly complete, R&D programs should see more stable funding profiles with trade-offs between different areas based on changing assessments of DHS' science and technology needs.

The top priorities in the DHS R&D portfolio would be radiological and nuclear countermeasures (doubling to $246 million in FY 2006), including the establishment of a Domestic Nuclear Detection Office (DNDO); chemical countermeasures (almost doubling to $102 million); and R&D to counter portable anti-aircraft missiles (up 80 percent to $110 million). The FY 2006 budget would provide $227 million in FY 2006 for a new Domestic Nuclear Detection Office (DNDO), which would make up most of the $246 million DHS investment in radiological and nuclear countermeasures, double the $123 million FY 2005 investment. The DNDO would develop, acquire, and support a domestic system to detect and report terrorist attempts to transport or use radiological or nuclear materials. The Counter MANPADS portfolio would nearly double to $110 million (up 80.3 percent). Man Portable Air Defense Systems (MANPADS) are shoulder-mounted portable air missiles that have been used (unsuccessfully so far) against passenger aircraft. Fears of a successful MANPADS attack against commercial aircraft have jump-started DHS' Counter MANPADS effort. A large part of the 93 percent increase for R&D on chemical countermeasures to $102 million would be for $20 million in new funds for a Low Volatility Agent (LVA) Warning System. This development effort would attempt to develop technologies that could detect and warn against chemical threats with low vapor pressures that elude current detectors, with a vision of deployable detectors that can detect and identify low-vapor threats in time to respond effectively.

Large increases for the priorities above would be offset by cuts in other areas of the DHS R&D portfolio, including explosives countermeasures (down a quarter to $15 million), threat and vulnerability assessments (down 29 percent to $47 million), standards development (down 11 percent to $36 million), rapid prototyping (down two-thirds to $21 million), critical infrastructure, cybersecurity, and transportation security. TSA and Coast Guard R&D programs, mostly in transportation security, funded at a combined $196 million in FY 2005 would be consolidated within the S&T Directorate at $117 million in FY 2006, a dramatic reduction. (For more on DHS R&D, see the DHS R&D Funding Update.)

The **Department of Defense (DOD)** would boost its homeland security R&D funding by 8.7 percent to $394 million in FY 2006. Nearly all of the investment would come from the Defense Agencies, particularly the Defense Advanced Research Projects Agency (DARPA), which focuses primarily on military applications in areas such as biological warfare defense, and the Chemical and Biological Defense Program (CBDP). While these agencies focus primarily on protecting U.S. soldiers from biological and chemical attack on the battlefield, the R&D results could have important insights on better protecting civilian populations against attack. Both DARPA and CBDP would receive increases in their chemical and biological defense R&D programs.

The **U.S. Department of Agriculture (USDA)** has had only a small dedicated homeland security research effort until now, but in recent years made enormous investments in securing its laboratory facilities, which house pathogens such as anthrax, against terrorist attack. Now, USDA plans to step up its homeland security research programs with big investments this year and next year. Most of USDA's homeland security R&D funding in 2005 and 2006 would go to the renovation of animal research and diagnostic facilities at the National Centers for Animal Health in Ames, Iowa, that would be the heart of a USDA-wide food and biosafety initiative aimed at securing the U.S. food supply against both natural and terrorist threats. The largest increase in the USDA budget would be for homeland security-related research, surging from $27 million this year to $69 million in 2006 split roughly equally between food supply defense and agriculture defense. (For more on USDA R&D, see the USDA R&D Funding Update.)

Homeland security-related R&D would be a big winner in the EPA R&D portfolio, nearly tripling from $33 million in FY 2005 to $94 million next year (see Table). EPA efforts would be focused in two areas. Drinking water security research would be one priority, and would involve EPA efforts to develop better surveillance and laboratory networks for drinking water supplies to counter potential terrorist threats. The other priority would be decontamination research, to develop better technologies and methods for decontaminating terrorist attack sites such as the Senate office buildings that EPA decontaminated from anthrax in 2001. EPA would also continue threat and consequence assessments and testing potential biodefense and other decontamination technologies. Much of this work would be conducted at EPA's National Homeland Security Research Center (NHSRC) in Cincinnati. (For more on EPA R&D, see the EPA R&D Funding Update.)

Among other agencies, the **National Institute of Standards and Technology (NIST)** in Commerce funds R&D on cryptography and computer security and will provide scientific and technical support to DHS in these areas. The **National Science Foundation (NSF)** funds research to combat bioterrorism in the areas of infectious diseases and microbial genome sequencing; these programs would increase slightly to $329 million in FY 2006. The **Department of Energy (DOE)** has longstanding expertise in countering radiological and nuclear threats, and would continue its R&D efforts in FY 2006.

As the Table shows, **total homeland security funding would rise $4 billion or 4.9 percent to $50 billion** next year despite fiscal austerity for other federal government missions. The majority of this $50 billion effort would be in the DHS.

> (This analysis is an issue brief highlighting budget data detailing the federal investment in homeland security R&D, and is a preview of the forthcoming *AAAS Report XXX: R&D FY 2006*, a comprehensive analysis of R&D in the FY 2006 budget. More materials on R&D in the FY 2006 budget, historical data and charts, and more information on *AAAS Report XXX: Research and Development FY 2006*, can be found on the AAAS R&D Web site at http://www.aaas.org/spp/rd.)

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Table. Federal Homeland Security R&D by Agency

(budget authority in millions of dollars)

	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Estimate	**FY 2006 Budget**	Change FY 05-06 Amount	Change FY 05-06 Percent
Agriculture	175	155	40	161	**172**	11	6.8%
Commerce	20	16	23	73	**82**	9	11.9%
Department of Defense	259	212	267	362	**394**	32	8.7%
Department of Energy	50	48	47	92	**81**	-12	-12.5%
Department of Homeland Security	266	737	1,028	1,243	**1,287**	44	3.6%
Environmental Protection Agency	95	70	52	33	**94**	61	185.1%
Health and Human Services	177	1,653	1,724	1,796	**1,802**	6	0.4%
- National Institutes of Health	*162*	*1,633*	*1,703*	*1,774*	***1,781***	6	0.4%
National Aeronautics and Space Adm.	73	73	88	88	**92**	4	4.5%
National Science Foundation	229	271	321	326	**329**	3	1.0%
Transportation	106	7	3	0	**0**	0	- -
All Other	48	47	32	42	**92**	50	118.8%
Total Homeland Security R&D	1,499	3,290	3,626	4,216	**4,425**	208	4.9%
(Total Homeland Security Spending)	*32,881*	*42,447*	*40,834*	*46,015*	***49,943***	*3,928*	*8.5%*

AAAS, based on Office of Management and Budget data from OMB's *2003 Report to Congress on Combating Terrorism* and *Budget of the U.S. Government FY 2006.* Figures adjusted from OMB data by AAAS to include conduct of R&D and R&D facilities, and revised estimates of DHS R&D.

Figures do not include non-R&D homeland security activities, nor do they include DOD R&D investments in overseas combating terrorism.

Funding for all years includes regular appropriations and emergency supplemental appropriations.

REVISED February 17, 2005