Statement for the Record

Hon. Jay M. Cohen
Under Secretary, Science and Technology Directorate

U.S. Department of Homeland Security

Before the U.S. House of Representatives
Committee on Science and Technology
Subcommittee on Technology and Innovation

March 8, 2007

INTRODUCTION

Good Morning Chairman Wu, Ranking Member Gingrey, and distinguished Members of the Subcommittee. It is an honor to appear before you today to update you on the progress of the Department of Homeland Security's (DHS) realigned Science and Technology Directorate (S&T Directorate) and discuss how the Directorate's priorities in the President's Budget Request for Fiscal Year 2008 will position us to develop and transition technology to protect the Nation from catastrophic events.

The S&T Directorate is committed to serving our customers, the components that comprise the Department of Homeland Security — and their customers — the hardworking men and women on the front lines of homeland security, especially the first responders, who need ready access to technology and information to perform their jobs more efficiently and safely. I am honored and privileged to serve with the talented scientists, engineers and other professionals who support these dedicated Americans in our shared mission to secure our homeland and defend our freedoms.

First and foremost, I am very appreciative of the leadership of the Congress in its support of the S&T Directorate, and of me personally, as I assumed the role of Under Secretary for Science and Technology last August. The informed counsel of Committee Members with homeland security oversight, and that of their staffs, has been invaluable to my efforts to position the S&T Directorate for accountability, tangible results and success, both for today and in the future.

Also, thank you for your vote of confidence in the Directorate, evidenced by the decision to appropriate $848 million in FY 2007. This has been enormously helpful in my efforts to better align people with our mission to develop a robust science and technology capability to protect the Nation as Congress envisioned in the enabling legislation for the Department. We look forward to working with the 110th Congress in a bipartisan and non-partisan manner to use science to better secure the Nation.

I am also grateful for the leadership of the President and Homeland Security Secretary Michael Chertoff and for the vision and guidance that the Secretary and Deputy Secretary Michael Jackson have contributed to the realignment process.

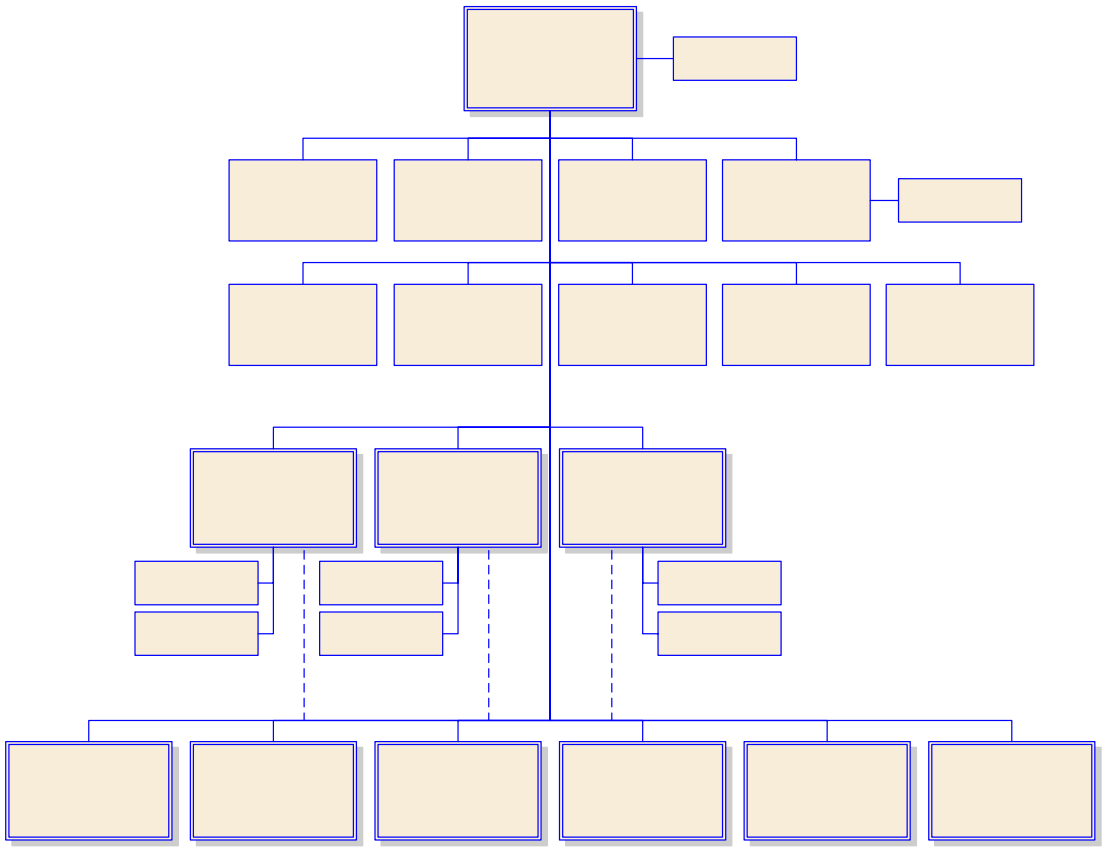
THE FIRST 180 DAYS – ALIGNED AND OPEN FOR BUSINESS

My first six months on the job have been focused on laying the foundation in organization, people, and processes to enable the Directorate to skillfully apply the resources you have wisely provided in ways that best serve the American people and better secure our homeland. I am pleased to report that we are "open for business," and your support of the President's FY 2008 Budget Request will allow us to build upon that momentum.

As I've said on many occasions, the S&T Directorate must excel in four key areas if we are to accomplish these goals: We must get the organization, the people, the books, and the program content right. These four "gets" are the cornerstones of the realignment effort and we've made significant progress in each of these areas. In addition to the four gets, the four Bs — bombs,

borders, bugs and business — provide the thematic approach to help keep us focused on the priority areas for the S&T Directorate.

I have realigned the S&T Directorate to help it fulfill its potential of becoming the customer-focused, output-oriented, science and technology management organization that Congress intended it to be and the Nation deserves. I thank Congress for its support of the new organizational structure that, in turn, is supportive of a broad and balanced range of activities that are aimed at identifying, enabling and transitioning new capabilities to our customers to better protect the nation. We have organized our program management into six technical divisions that are led by veteran S&T Directorate staff members and linked to three research and development investment portfolio directors in a "matrix management" structure. The technical divisions are focused on enduring homeland security disciplines of Explosives; Chemical and Biological; Command, Control & Interoperability; Borders and Maritime Security; Human Factors; and Infrastructure Protection and Geophysical Sciences. The effort to combat the threat posed by nuclear or radiological weapons is primarily led by the Domestic Nuclear Detection Office. The portfolio directors — Director of Research, Director of Transition, and Director of Innovation/Homeland Security Advanced Research Projects Agency (HSARPA) — provide cross-cutting coordination of their respective aspects of the investment strategy within the technical divisions.



Office of the Under Secretary for Science & Technology

I am pleased to report that today the S&T Directorate has a strong leadership team in place with all key positions filled. Since August, we have also welcomed 20 new highly qualified subject matter experts and professionals to the S&T Directorate, including three former DHS S&T employees who had previously left the Directorate and who have returned. Overall, we are 66 percent staffed and plan to have 100 percent of staff in place by the end of 2007.

I have made significant strides in "getting the books right" by holding the S&T Directorate to a high standard of fiscal responsibility. Toward this end, I have established an Office of Strategy, Policy & Budget Division led by the S&T Chief Financial Officer that has put in place the systems and protocols that will enable the S&T Directorate to be fully responsive and transparent in the budget development process and in the sound fiscal management of S&T appropriations. This new office is enhancing the efficiency of S&T operations by integrating related functions of policy, planning, programming, budgeting and execution. Centralizing financial oversight has enabled the S&T Directorate to implement corrective actions to address financial management deficiencies and accelerate the distribution of funds to DHS Laboratories, Department of Energy (DOE) National Laboratories, private industry and academia. As a result, the S&T Directorate has committed approximately 50 percent of its FY 2007 budget compared to 6 percent at the same time last year, significantly accelerating the distribution of funds to DHS Labs, DOE Labs, industry and academia, which will result in accelerated technology development and delivery to keep our Nation safer.

In other developments, I have added a director of Special Programs to work in select, mission-critical areas. And a new director of Test & Evaluation and Standards is building upon the S&T Directorate's previous work in homeland security standards and adding test and evaluation capabilities to advance this effort and draw greater industry participation in developing new technologies for homeland security applications throughout DHS. We have also established a Corporate Communications Office to inform and engage our customers and their customers in the S&T Directorate's broad investment portfolios.

I also know that we must look beyond our Department, indeed beyond our nation's borders, for solutions in combating domestic terrorism. Therefore, consistent with DHS enabling legislation, I have established Interagency and International Program Offices responsible for, respectively, coordinating with other Executive Branch agencies to reduce duplication and identify unmet needs, and coordinating our international outreach efforts to help us tap into science and technology communities across the globe for solutions to counter domestic terrorism. Embedded S&T Directorate liaisons in Europe, the Americas and Pacific/Asia are casting a wide global net to identify the most viable homeland security solutions and their providers. This office will allow S&T to benefit from and leverage off of the efforts of our allies in the War on Terror.

I have developed mechanisms in three areas to better coordinate the scientific research and technical development activities of the S&T Directorate with those of other Federal Agencies.

First, our overarching policy is to leverage research and development efforts across the Federal Government to benefit our DHS customers as well as first responders. Our preference is to avoid replicating efforts underway by other Federal agencies in favor of coordinating and collaborating

with our Federal counterparts in research areas of mutual interest and benefit. The Homeland Security Act of 2002 provides me with specific authorities in this regard.

The second coordinating mechanism is aimed at better positioning the Directorate to increase our awareness of, and the opportunities to participate in or otherwise benefit from, other Federal research, development, test and evaluation (RDT&E) efforts that are relevant to our mission. The new directors for Interagency Coordination and Special Programs report directly to me regarding their progress in this area.

The third mechanism for coordinating research and development (R&D) is through specific agreements and relationships. For example, in December of 2006, the Department of Defense (Homeland Defense), the Department of Justice, and DHS S&T signed a Memorandum of Agreement (MOA) to promote closer coordination and collaboration of our R&D and technology transfer efforts. The S&T Directorate is also actively engaged in various committees, subcommittees, and working groups of the National Science and Technology Council. In recent months, we have developed a closer working relationship with U.S. Northern Command, U.S. Joint Forces Command, the Technology Support Working Group, the National Guard Bureau, and the Joint IED Defeat Organization regarding research and development initiatives, defining their interoperability requirements through established Defense Department, Joint, and military service-based processes as appropriate. In addition, S&T has established a pilot program and assigned a liaison official to the California Governor's Office of Homeland Security in Sacramento in an effort to recognize and address coordination and interoperability issues early on.

Last December, we saw the "physical manifestation" of our restructuring plan spring to life with the relocation of 340 of our staff members within the Directorate. Staff are now physically co-located within their new organizational alignments. At the same time, I issued the first S&T Organization and Requirements Manual (STORM) that defines functions, duties and responsibilities for the administration and management of the Directorate. The STORM tells our customers who we are and how we function so they may better understand the capabilities we can bring to bear in support of their protective missions.

Throughout this process, it was very important to me personally that S&T staff be kept informed of our plans for the realignment and that they have a forum for asking questions and expressing their views and concerns. Since last August, I have held four "All Hands" meetings at regular intervals to brief all S&T staff, including teleconference links with staff in other locations such as the Transportation Security Laboratory in Atlantic City, Plum Island Animal Disease Center, and the Environmental Measurements Laboratory in New York City. These meetings also allow me to recognize the achievements of staff members, to answer questions and solicit input, and, most importantly, express my gratitude for their excellent work and for all the cooperation, support and patience they have exhibited during this transitional period.

During the first six months of my tenure as Under Secretary for Science and Technology, I have focused on building the organization, team and processes that are necessary for any science and technology management organization to succeed. While our effort to completely institutionalize these changes continue, we now have a foundation in place that allows us to focus on delivering products to our customers as we execute our FY 2007 appropriation. The S&T Directorate is

striving to be effective, cost-efficient, responsive, agile and flexible, and with your support of the President's FY 2008 Budget Request we will build on our current momentum.

CUSTOMER/OUTPUT FOCUSED

The S&T Directorate functions as the science and technology manager within the Department. We invest in science and technology that supports DHS components in their efforts to protect our homeland against catastrophic events – technology that makes the Nation safer. In the last six months, we have established meaningful working relationships with our DHS operational component customers. As they appear before you this year, I encourage you to ask them about the ways that S&T is addressing their operational needs. Thanks to the support of the Congress and the leadership of the Department, we are gaining significant momentum, and I humbly ask for your continued trust and support so that we can build on those efforts.

The S&T Directorate develops and manages an integrated program of science and technology, from basic research through technology transition to customers that are the operating components of DHS, State, local and tribal governments, first responders and private sector entities. The managers of this program are predominantly active scientists and engineers in the many disciplines relevant to Homeland Security. They are guided by a multi-tiered investment strategy and review process based on higher guidance, the stated needs of our customers, and technology opportunities.

S&T's three R&D portfolios support a broad range of program activities across the Directorate. The President's FY 2008 Budget Request includes $86 million for the basic research portfolio which addresses the long-term R&D needs for the Department in sciences of enduring relevance to Homeland Security. The transition portfolio, designed to provide mission-capability relevant technology in support of the Department's acquisition programs, is driven by customer needs through a DHS customer-led IPT process. The President has requested $343 million in FY 2008 for this effort. The Director of HSARPA administers the $73 million innovation portfolio (including the Small Business Innovation Research program) to promote revolutionary changes in technologies with a focus on prototyping and deploying technologies critical to homeland security. This portfolio, balanced around risk, cost, impact and time to delivery, produces capabilities of high technical quality responsive to homeland security requirements.

Product Transition (0-3 yrs)	Innovative Capabilities (2-5 yrs)
▪ Focused on delivering near-term products/enhancements to acquisition ▪ Customer IPT controlled ▪ Cost, schedule, capability metrics	▪ High-risk/High payoff ▪ "Game changer/Leap ahead" ▪ Prototype, Test and Deploy ▪ HSARPA
Basic Research (>8 yrs)	**Other (0-8+ years)**
▪ Enables future paradigm changes ▪ University fundamental research ▪ Gov't lab discovery and invention	▪ Test & Evaluation and Standards ▪ Laboratory Operations & Construction ▪ Management & Administration

DHS Science & Technology Investment Portfolio

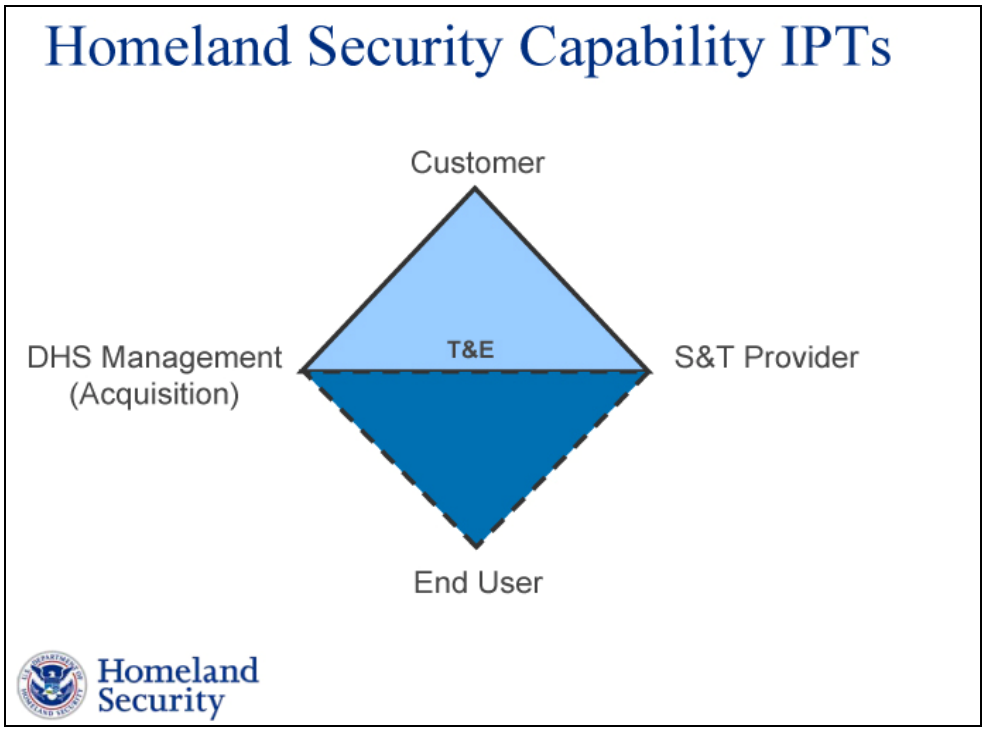
Basic Research (> 8 years)
The S&T Directorate's basic research portfolio addresses long-term research and development needs in support of DHS mission areas that will provide the Nation with an enduring capability in homeland security. This type of focused, protracted research investment has the potential to lead to paradigm shifts in the nation's homeland security capabilities.

The S&T Directorate's basic research program enables fundamental research at our universities, government laboratories and in the private sector. Approximately $95 million is allocated for basic research in FY 2007 and $86 million or 13 percent of S&T's RDT&E budget, is allocated in FY 2008. Eventually, I would like up to 20 percent of the S&T Directorate budget allocated for basic research. It is critical that basic research be funded at consistent levels from year to year to ensure a continuity of effort from the research community in critical areas that will seed homeland security science and technology for the next generation of Americans and prevent technological surprise.

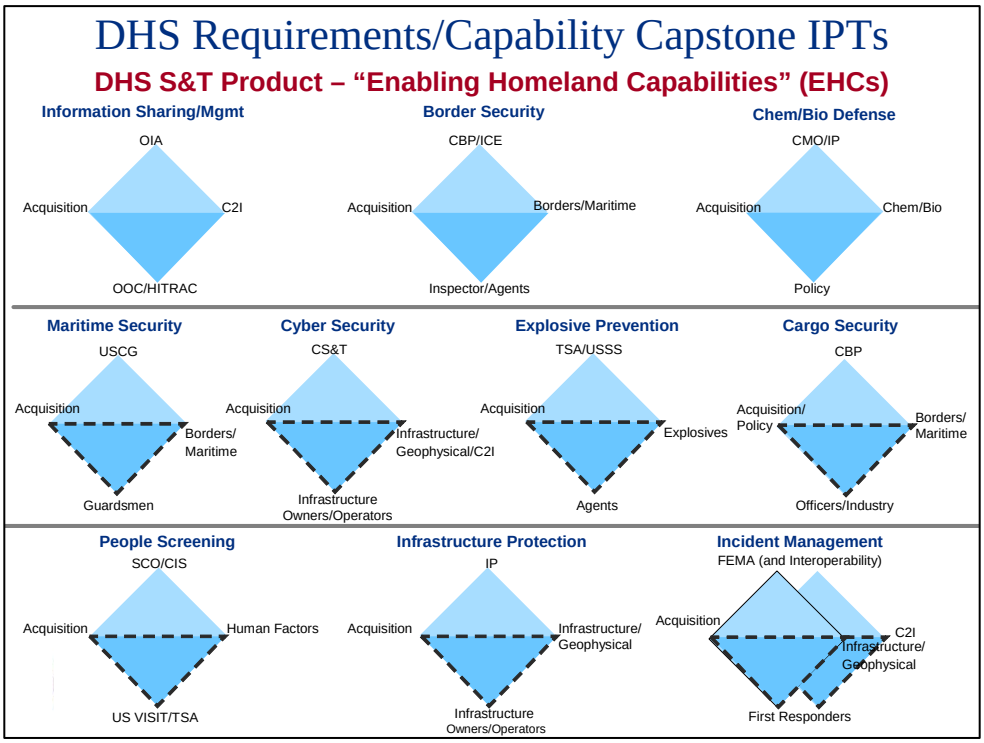
Product Transition (0 to 3 years)
The centerpiece of the S&T Directorate's product transition portfolio are Capstone Integrated Product Teams (IPT) that function in mission-critical areas to identify our customers' needs and enable and transition near-term capabilities for addressing them. These Capstone IPTs engage DHS customers, acquisition partners, S&T technical division heads, and end users as appropriate in our product research, development, transition and acquisition activities.

The IPT process enables our customers to identify and prioritize their operational capability gaps and requirements and make informed decisions about technology investments. The S&T Directorate, in turn, gathers the information it needs to respond with applicable technology solutions for closing these capability gaps. The science and technology solutions that are the outcome of this process, referred to as Enabling Homeland Capabilities, draw upon technologies that can be developed, matured, and delivered to our customer acquisition programs within three years.

Capstone IPTs have been established in 10 major areas: Information Sharing/Management; Cyber Security; People Screening; Border Security; Chemical/Biological Defense; Maritime Security; Explosive Prevention; Cargo Security; Infrastructure Protection; and Incident Management (includes first responder interoperability).



Structure and Stakeholders: Integrated Product Teams



DHS Requirements/Capability Capstone IPTs

The S&T Directorate's product transition/IPT process ensures that appropriate technologies are engineered and integrated into the DHS acquisition system for our customers. The $343 million allocated for product transition for FY 2008 represents nearly half of my RDT&E budget.

The IPT process has created an excellent forum for the S&T Directorate to gain a better understanding of the most important issues of our customer agencies. Another tangible benefit of this Capstone IPT process has been improved coordination in addressing common functional challenges across the Department. This is due in large measure to the enthusiastic participation of DHS agency heads such as TSA Administrator Kip Hawley, Secret Service Director Mark Sullivan, and Border Patrol Chief David Aguilar and many other DHS leaders who have all personally chaired the IPTs relevant to their interests.

In FY 2008, the S&T Directorate plans to transition or transfer four programs that pre-date the IPT process. These programs have reached technical maturity and will be transferred to other DHS agencies who will be responsible for their continued operation. The budget request reflects the transfer to the Office of Health Affairs of the operations portions of BioWatch 1 & 2, the Biological Warning and Incident Characterization (BWIC) system, and the Rapidly Deployable Chemical Detection System, totaling $84.1 million. Moving the operations portions of BioWatch out of S&T allows us to focus on completing the development of BioWatch 3. BioWatch is a bio-aerosol monitoring system designed to provide cities the earliest possible detection of a biological attack. BWIC interprets warning signals from BioWatch and public health surveillance data using incident characterization tools (e.g., plume and epidemiological models) to quickly determine the potential impacts a release may have. Together, these two systems provide emergency personnel with the information they need to respond effectively and initiate life-saving medical countermeasures. In addition, the FY 2008 budget request reflects

the transfer of the non R&D component of the SAFECOM program to the National Protection and Programs Directorate, totaling $5.0 million.

It is important that the S&T Directorate also engage the emergency responder community and address operational issues to help them do their jobs more quickly, effectively and safely. S&T's Technology Clearinghouse and TechSolutions initiatives provide direct support to emergency responders' technology needs. The Technology Clearinghouse, created in accordance with a provision of the *Homeland Security Act of 2002*, is designed to be a "one-stop shop" for access to technology information for Federal, State, and local public safety and first responder communities. TechSolutions provides a Web-based mechanism for responders to register their input regarding capability gaps that need to be addressed to help them in their jobs. S&T responds by identifying existing technology that may meet the need, or if nothing is available, proceeding with the rapid prototyping of an appropriate solution to be fielded in less than 18 months. S&T also houses the Office for Interoperability and Compatibility, which includes some components of the legacy SAFECOM program and aims to increase levels of emergency responder interoperability by developing tools and methodologies, as well as advancing standards that emergency response agencies can put into effect.

Innovative Capabilities (2 to 5 years)

S&T's Innovation/HSARPA portfolio supports a key goal of mine for the Directorate in its efforts to put advanced capabilities into the hands of our customers as soon as possible. It has made important inroads in research areas aligned with our DHS customers. Toward this end, S&T has introduced two important new initiatives. One of these, Homeland Innovative Prototypical Solutions (HIPS) is designed to deliver prototype-level demonstrations of game-changing technologies within two to five years.

The second initiative, High Impact Technology Solutions (HITS), is designed to provide proof-of-concept solutions within one to three years that could result in high-payoff technology breakthroughs. While these projects are very high-risk, they offer the potential for "leap-ahead" gains in capability should they succeed. While projects are separately budgeted in "Innovation/HSARPA" (based on moderate to high risk with a high payoff, if successful), ALL are executed within the six technical divisions.

The S&T Directorate also continues to manage an active Small Business Innovative Research (SBIR) program on behalf of DHS that currently issues two solicitations each year and generates multiple awards for the small business community. The first solicitation for FY 2007 opens in mid-February and the second solicitation is planned for release in May. The solicitations will address topics in areas that are aligned with the six technical divisions.

The Innovation/HSARPA portfolio is receiving $60 million in FY 2008 funding for the innovative/leap-ahead HIPS and HITS projects. Because of the short timeline for HIPS and HITS, we anticipate that these projects will respond to the urgent needs of the DHS components for solutions to fill capability gaps.

ENABLING U.S. LEADERSHIP IN SCIENCE & TECHNOLOGY

University Based Centers of Excellence

The S&T Directorate is developing a robust, results-oriented network of Homeland Security Centers of Excellence (COEs) to leverage the independent thinking and ground-breaking capabilities of the Nation's colleges and universities. The COEs are conducting multidisciplinary research and education, each focused on an area critical to homeland security. The Office of University Programs is providing the communications and infrastructure to produce, share, and transition the Centers' research results, data, and technology to customers and end users.

Currently, seven pre-existing COEs connect experts and researchers at more than 80 colleges and universities, including several Minority Serving Institutions (MSI). More than 20 partners representing industry, laboratories, think tanks, nonprofit organizations, and other agencies also participate. University Programs is coordinating COE efforts with other S&T Directorate-sponsored, university-based initiatives. Under the new S&T organizational construct, existing COEs are being strategically aligned with at least one S&T division, or to Directorate-wide activities such as Operations Analysis and the Homeland Security Institute, in a structure that will best support the Divisions' fundamental research and development activities and other requirements.

We are proceeding with plans to establish four additional COEs over the next two fiscal years to help round-out the Directorate's need for university-based fundamental research. The new COEs will combine the research missions of some existing COEs and add new research areas under the division-aligned construct to meet DHS needs. S&T has released Broad Agency Announcements (BAAs) regarding plans to establish new COEs in the areas of explosives detection, mitigation, and response; border security and immigration; maritime, island, and extreme/remote environment security; and natural disasters, coastal infrastructure and emergency management. The competitive selection process is designed to ensure that institutions of high quality and academic merit participate from as many areas of the United States as practicable.

DHS Scholars and Fellows Program

DHS education programs are helping to attract and nurture future scientific leaders for the homeland security workforce and to strengthen the expertise of our existing labor pool. University Programs is engaging high-performing students through the DHS Scholars and Fellows program. Increasingly, S&T's scholarships and fellowships will become aligned to the Centers of Excellence and to the DHS mission. During this period of transition, we will honor our commitments to all currently participating Scholars and Fellows.

The FY 2008 budget requests $38.7 million for S&T's University Programs, which includes the Homeland Security Centers of Excellence and the Scholars and Fellows Program.

Office of National Laboratories

In carrying out its mission, the S&T Directorate works to develop, sustain, and renew a coordinated network of DOE National Laboratories, Federal laboratories and University Centers, the infrastructure needed by multi-disciplinary teams of scientists, engineers and academics to discover, develop and transition homeland security capabilities to operational end-users.

The FY 2008 budget request includes $88.8 million for the Office for National Laboratories (ONL), through which the S&T Directorate's laboratory facilities programs are executed. ONL provides the Nation with a coordinated, enduring core of productive science, technology and

engineering laboratories, organizations and institutions, which can supply knowledge and technology required to secure our homeland. In addition to oversight of laboratory operations in direct support of the Department and its missions, ONL also has the specific responsibility for coordinating homeland security-related activities and laboratory-directed research conducted within the DOE National Laboratories.

Industry Participation in DHS Science & Technology

Industry is a valued partner of DHS S&T and its continued participation in developing solutions for homeland security applications is vital to our effort to safeguard the nation. Consistent with S&T's new structure, our Innovation/HSARPA portfolio and six technical divisions will be releasing BAAs that seek industry participation to address specific challenges in their respective areas. For example, Innovation/HSARPA has already posted BAAs seeking expertise in tunnel detection technologies, container security (SAFECON program), and a mobile screening laboratory to support human screening R&D in the field.

Innovation/HSARPA plans to release six additional BAAs shortly to address areas that include critical infrastructure protection, hostile intent detection and other key areas. By spring 2007, we intend to issue a BAA for longer-term efforts that cover our complete innovation topic area portfolio.

No one knows where good ideas come from and for that reason I have been personally proactive in both seeking out and receiving technology briefs and opportunities. This is a culture I am working to instill throughout the DHS S&T Directorate.

The Support Anti-terrorism by Fostering Effective Technologies (SAFETY) Act of 2002, administered in the S&T Directorate, is proving to be a valuable tool in expanding the creation, proliferation and use of cutting edge anti-terrorism technologies throughout the United States. Over the past year we have made significant improvements in implementing the Act, including a new Rule; a revised, streamlined Application Kit; new coverage for emerging technologies that are undergoing test and evaluation; increased use of pre-application teleconferences between SAFETY Act technology evaluators and applicants to review requirements and answer questions prior to submitting a full application; and formal procedures to expedite applications for technologies involved with pending government procurements. The Office of SAFETY Act Implementation (OSAI) has made significant strides in reducing application processing time and providing more Qualified Anti-Terrorism Technologies (QATTs) that could save lives. Through increased efficiencies and process improvements, the average time to process SAFETY Act applications has been reduced from 233 days in the early days of the program to less than 140 days in FY 2007. As of February 2007, OASI has received 223 full applications and 376 pre-applications. A total of 137 SAFETY Act awards have been granted – 87 applications have qualified for both Designation and Certification and 50 have received Designation only. I am mindful of the interest in this program in the Congress and across the Nation.

As part of our outreach efforts to encourage greater industry participation, the Directorate is hosting the first Homeland Security Science & Technology Stakeholders Conference, May 21-24. The conference will inform government, industry and academia of the direction, emphasis, and scope of the research investments by the S&T Directorate, and provide information about business opportunities. The conference will present the Directorate's new organization, explain how to do business with the DHS S&T research enterprise, and provide visibility into new and

emerging technologies through an Innovation Gateway Marketplace. I hope you will join us for this event at the Ronald Reagan Building and International Trade Center.

FY 2008 BUDGET OVERVIEW

Science and Technology Directorate's budget request of $799.1 million includes $142.6 million for Management and Administration (M&A) and $656.5 million for research, development, testing and evaluation. M&A funds federal employees' salaries, benefits, travel, and other expenses at Headquarters and the S&T laboratories. This staff maintains oversight of S&T's extensive day-to-day technical and administrative operations. M&A also funds business operations, including working capital fund, and management support. Research, Development, Acquisition and Operations supports the needs of the operational components of the Department and is categorized to match the new S&T organization. The basic research, product transition and innovation R&D activities undertaken by S&T cut across the Directorate and its divisions and are incorporated into the following projects and programs that are included in the President's budget for FY 2008.

- The $25.9 million requested for Borders and Maritime Security will support technology development for the Secure Border Initiative (SBI), a comprehensive multi-year plan to secure America's borders. This Division is providing the tools, processes, and manpower to ensure SBI implementation is effective and affordable. We are working directly with the SBI program executive office to provide a transformation strategy for SBI; develop the next generation of modeling and analysis tools for strategic planning; and provide systems engineering support. The Division will also develop and transition technologies to industry to reduce risk and support border security programs like SBInet, a technology acquisition program under the Customs and Border Protection SBInet Program Management Office.

  We are also developing technologies to ensure the integrity of cargo shipments with known origins, and to better target suspicious shipments, and to enhance the end-to-end security of the supply chain – from the manufacturer of goods to final delivery. One of the most significant potential terrorist threats to the Nation is the vast numbers of shipping containers that flow through our borders each year, most of which enter without physical inspection. Technologies and processes developed within this area will assure government customs and shippers of the integrity of shipping containers and its cargo and communicate the container's status as well as security information. By employing a system-of-systems approach, this will deliver technological capabilities to DHS customers and end users that address supply chain vulnerabilities. These capabilities are directed toward enhanced physical security and information management, and bound by a security architecture which encompasses the world's supply chain.

- The $228.9 million requested for Chemical and Biological will provide the basic knowledge, technologies and systems needed to protect against possible chemical and biological attacks on the Nation's population, agriculture or infrastructure. The greatest emphasis is on those biological attacks that have the greatest potential for widespread catastrophic damage to the population. These include – but are not limited to – aerosolized anthrax, and smallpox.

The Division conducts material threat and risk assessments on both naturally occurring and engineered agents; conducts experiments to close major scientific knowledge gaps that could have a large impact on how the Nation responds to a biological attack; and provides scientific support to the intelligence community. As such, the primary output is an intelligence-informed, scientific characterization and prioritization of the bio-terrorist risks to be used by the Homeland Security Council and partnering agencies (e.g. Department of Health and Human Services, Environmental Protection Agency, Department of Agriculture, and the Intelligence Community).

Based on this knowledge, we are developing effective measures for deterrence, detection, and mitigation of biological terrorism acts against the U.S. population, infrastructure, and agricultural system. This includes developing tools to meet Federal, State, and, local emergency responder needs such as operational models to support Interagency Modeling and Atmospheric Assessment Center (IMAAC).

The Division is developing next-generation, biological-threat-agent detectors that recognize the signatures or fingerprints of biological agents. These detectors will be incorporated into the BioWatch system to substantially increase the system's capabilities and significantly reduce the response time. Other significant program activities include developing biological aerosol detection and sensor systems for monitoring the Nation's critical infrastructure such as government buildings, airports, subways, office buildings, shopping malls, sports arenas, hotels and hospitals. These "detect-to-protect" systems detect biological agents within minutes (acting as reliable 'smoke alarms') to protect high value facilities and their occupants. Many of the technologies being developed in this program will be manufactured and used by the private sector.

Chemical countermeasures work enhances the Nation's capability to anticipate, prevent, protect from, respond to and recover from chemical terrorist attacks. The chemical threat spectrum comprises a broad array of chemicals, to include chemical warfare agents, toxic industrial chemicals, and non-traditional agents (NTAs). Existing and emerging chemical warfare agents can potentially be used against virtually any civilian target resulting in significant loss of life and impedance in the use of key infrastructure. Chemical countermeasures addresses these threats by: enabling comprehensive understanding and analyses of chemical threats; developing pre-event assessment, discovery, and interdiction for chemical threats; developing warning, notification, and timely analysis of chemical attacks; optimizing technology and process for recovery from chemical attacks; and enhancing the capability to identify a chemical attack's source.

- The $63.6 million requested for Command, Control and Interoperability will fund programs focused on cyber security; communications, compatibility and interoperability; and knowledge management.

  Cyber security research, development, testing and evaluation is focused on improving the security of the existing cyber infrastructure and providing a foundation for a more secure infrastructure through coordinated efforts with other Government agencies and private industry. Cyber attacks on U.S. information networks can have serious consequences such as disrupting critical operations, causing loss of revenue and intellectual property, or loss of life. The Division also addresses cyber security requirements from internal Department customers

in support of the DHS's operational missions in critical infrastructure protection. It also addresses related aspects of national security and emergency preparedness telecommunications.

Communications, interoperability and compatibility programs within Command, Control and Interoperability strengthen interoperable wireless communications, improve effective information sharing, and develop tools to enhance overall coordination and planning at all levels of government. Currently, the Nation's capacity for interoperable communications is hindered by sub-optimized planning and coordination, and the Office for Interoperability and Compatibility is working to strengthen and integrate interoperability and compatibility.

We are also developing knowledge management tools to reduce the risk of terrorist attacks and to prepare for and respond to natural and man-made disasters. This will provide new capabilities for the DHS Intelligence & Analysis Directorate and the DHS information enterprise for the integration, management, analysis, and dissemination of actionable information. This knowledge management research provides tools and methods to handle massive amounts of information that is widely dispersed in a great variety of forms. Being able to find such information, understand its meaning, and then use it to assess an actual threat and determine the level of risk before an attack or incident occurs is the best way to save lives and preserve our way of life.

- The $63.7 million requested for Explosives will fund programs focused on the detection, mitigation, and response to explosives threats such as improvised explosive devices (IEDs) and suicide bombers. The Division employs a broad range of existing and emerging approaches to detect and lessen the impact of explosive materials. These include baggage-screening devices as well as the capability to identify explosives residue. Terrorist events like the Madrid rail bombing, the London Underground attack, and the recent disclosure of planned attacks on U.S.-bound flights from the United Kingdom, all involved explosive threats. Those events underscore the operational need for a unified approach to the detection of, response to, and mitigation of explosive threats across all modes of transportation.

  In explosives detection, we are improving existing explosive detection methods, developing new technologies, and integrating improvements and technological developments into both deployed and new systems. Detection is a key defense against successful attacks. For example, the Check Point Program applies to multiple venues where real or virtual portals exist. Historically, airports have received the most attention, but similar portal situations can be found at rail stations and cruise ship terminals. Check point programs address suicide bombers, carry-ons, leave-behind IEDs, and vehicle-borne IEDs. The two other principal programs in this area are checked baggage and cargo. Like aviation, rail and ship modes share checked baggage and cargo screening challenges.

  The check point program addresses the risk of catastrophic loss of mass transit resulting from small IEDs detonated in passenger cabins and the catastrophic loss or hostile takeover of mass transit resulting from the presence of certain weapons in passenger cabins. The principal objective of the program is developing advanced technology for integration with future check point systems to detect explosives and concealed weapons, while meeting requirements for automation, efficiency, and cost reduction. Longer-term objectives include applying systems integration and a seamless flow of information with reduced impact to the

checkpoint operations environment. The program also strives to upgrade currently deployed technologies to address emerging threats and concealment methods.

The checked baggage program identifies and develops the next generation of checked baggage screening systems, and supports continuous improvements toward the Congressionally directed goal of 100-percent screening of aviation checked baggage by electronic or other approved means with minimum or no impact to the flow of people or commerce. Checked baggage will focus on continuing work with Manhattan II by conducting system development and integration of the Manhattan-II checked baggage program, complete the preliminary system architecture test and evaluation, and conduct detection-technology test and evaluation.

The cargo program is developing the next generation of air cargo screening systems, with transition targeted for FY 2011.

- The $12.6 million requested for Human Factors will apply the social and behavioral sciences to improve detection, analysis, and the understanding of threats posed by individuals, groups, and radical movements. This knowledge will support the preparedness, response and recovery of communities impacted by catastrophic events and to advance national security by integrating human factors into homeland security technologies. Further this will enhance the capability to control movement of individuals into and out of the United States and its critical assets through accurate, timely, and easy-to-use biometric identification and credentialing validation tools.

- The $24.0 million requested for Infrastructure and Geophysical will develop technical solutions and reach-back capabilities to improve State, local, tribal, and private sector preparedness for and response to all hazardous events impacting the population and critical infrastructure.

  The Division's focus is on identifying and mitigating the vulnerabilities of the 17 critical infrastructure sectors and key assets that keep our society and economy functional. The Division models and simulates the Nation's critical infrastructures to determine how various scenarios will affect each sector, provides decision support tools to guide decision makers in identifying gaps and vulnerabilities, and develops predictive tools and methods to aid in preparing for and responding to various catastrophes. Additionally, the Division focuses on responder preparedness and response capabilities that improve the ability of the Nation to prepare for, respond to, and recover from all-hazards emergencies. Applying the best available science and technology for the safety and security our emergency responders and homeland security professionals ensures they may effectively perform their jobs–saving lives and restoring critical services.

  The Division is also developing a capability that will enable owners and operators of the most vital critical infrastructure sites to implement affordable and reliable blast and projectile mitigation measures improving capabilities to withstand these threats. The program is developing suites of advanced materials, design procedures, and innovative construction methods that can be used to protect critical infrastructure and key resources.

In addition, the Division is developing decision-making and information-sharing tools to aid responders. This will dramatically enhance the information management and information sharing capabilities of incident commanders and emergency responders as emergencies increasingly demand more highly coordinated responses.

- The $59.9 million requested for Innovation/HSARPA will focus on homeland security research and development that poses a risk of failure, but if successful would lead to significant technology breakthroughs that would greatly enhance DHS operations. HSARPA carries out its activities in two areas: (1) Homeland Innovative Prototypical Solutions, which are designed to deliver prototype-level demonstrations of game-changing technologies in two to five years. These programs are moderate risk, but offer high pay-off and (2) High Impact Technology Solutions, which are designed to provide proof-of-concept answers that could result in high-payoff technology breakthroughs. Though there is a considerable risk of failure, these projects offer the potential for significant gains resulting from success.

- The $88.8 million requested for Laboratory Facilities will fund operation of the S&T laboratory facilities, including Plum Island, the Transportation Security Lab, Environmental Measurements Laboratory, the Chemical Security Analysis Center, and the National Biodefense Analysis and Countermeasures Center. Laboratory Facilities also funds design work on the National Bio and Agrodefense Facility and upgrade of the Plum Island facility.

- The $25.5 million requested for Test & Evaluation and Standards funds two areas Test and Evaluation (T&E) and Standards. T&E works across DHS and ensures that systems meet the capability needs of users, validates performance and provides measurable improvement to operational capabilities. Effective testing and evaluation programs provide crucial information to decision makers for acquisition and deployment of technology. Standards are consensus based measures – from basic specifications to performance criteria – that give DHS and its customers confidence that technology and systems will perform as required. The S&T Directorate works across DHS and with numerous external partners to build consensus and support development of needed standards.

- The $24.7 million requested for Transition programs will expedite technology transition to deliver near-term products and technologies to meet DHS component requirements. This area also funds the Office of the SAFETY Act Implementation, transition support programs such as the Technology Clearinghouse, and the S&T Directorate's international and interagency programs.

- The $38.7 million requested for University Programs will allow the S&T Directorate to engage the academic community to support current DHS priorities and enhance homeland security capabilities by providing ground-breaking research, analyses and educational approaches. The program is designed to bring together the best scientific talent and resources from U.S. academic institutions to help solve complex and technologically challenging homeland security problems facing our Nation. Program activities simultaneously focus on building homeland security expertise in the academic community, creating strategic partnerships, and fostering a new generation of homeland security experts.

  The program works to:
  - Strengthen U.S. scientific leadership in homeland security research;

- Generate and disseminate knowledge and technical advances to aid homeland security frontline professionals;
- Foster a homeland security culture within the academic community through research and education programs; and
- Build a highly-trained science and engineering workforce dedicated to homeland security that will sustain progress over time.

This program invests in two areas: the university-based Centers of Excellence, and student Scholarships and Fellowships intended to build and develop the next generation of academic researchers in disciplines that are relevant and essential to homeland security.

Department of Homeland Security
Science and Technology Directorate
Research, Development, Acquisitions, and Operations
Summary of FY 2008 Budget Estimates by Program/Project Activity
(Dollars in Thousands)

NEW RESEARCH, DEVELOPMENT, ACQUISITION, AND OPERATIONS BUDGET STRUCTURE

Program/Project Activity	FY 2006 Actual		FY 2007 Revised Enacted 1/		FY 2008 Request		Increase (+) or Decrease (-) For FY 2008					
							Total Changes		Program Changes		Adjustments-to-Base	
	FTE	AMOUNT	FTE	AMOUNT	FTE	AMOUNT	FTE	AMOUNT	FTE	AMOUNT	FTE	AMOUNT
Borders and Maritime Security		$72,607		$33,436		$25,936		($7,500)		(7,500)	---	$0
Chemical and Biological 2/		$490,319		$313,553		$228,949	---	(84,604)			---	(84,604)
Command, Control, and Interoperability 3/		$108,550		$62,612		$63,600	---	988			---	988
Explosives		$83,094		$105,231		$63,749	---	(41,482)		(41,482)	---	---
Human Factors		$6,924		$6,800		$12,600	---	5,800		5,800	---	---
Infrastructure and Geophysical		$47,186		$74,781		$24,000	---	(50,781)		(50,781)	---	---
Innovation		$0		$38,000		$59,900	---	21,900		21,900	---	---
Laboratory Facilities		$96,987		$105,649		$88,814	---	(16,835)		(16,835)	---	---
Test and Evaulation , Standards		$32,399		$25,432		$25,520	---	88			---	88
Transition		$6,814		$24,040		$24,700	---	660			---	660
University Programs		$43,622		$48,575		$38,700	---	(9,875)		(9,875)	---	---
Subtotal, Enacted Appropriations and Budget Estimates	**---**	**$988,502**	**---**	**$838,109**	**---**	**$656,468**	**---**	**($181,641)**	**---**	**($98,773)**	**---**	**($82,868)**
Less: Adjustments for Other Funding Sources:												
Less Prior Year Recission, P.L. 109-295		($20,000)		($125,000)								
Net, Enacted Appropriations and Budget Estimates	**---**	**$968,502**	**---**	**$713,109**	**---**	**$656,468**	**---**	**($181,641)**	**---**	**($98,773)**	**---**	**($82,868)**

1/ FY 2007 funding is represented as “revised enacted” due to the realignment of the budget to reflect the organizational changes in FY 2007.

2/ Reflects ($84,100) transfer to OHA

3/ Reflects ($5,000) transfer to NPPD

CONCLUSION

In conclusion, I am pleased to report that the S&T Directorate is well positioned today to mobilize the nation's vast technical and scientific capabilities to enable solutions to detect, protect against and recover from catastrophic events.

Our plans for restructuring the organization have been implemented and it is indeed gratifying to see that they appear to be working as we advance to the critical phase of product transition. Increasingly, our DHS customers are recognizing the substantial value that S&T's technical expertise brings to their operations. We have engaged them, eliciting participation at the highest levels, to join us at the table to work constructively on solutions for countering the formidable threats this nation faces.

We appreciate the many demands on the taxpayers' precious dollars and you have my commitment that the S&T Directorate will be wise stewards of the public monies you have entrusted to us. We are steadfast in our resolve to serve the best interests of the nation by investing in the talent and technology that will provide America with a sustainable capability to protect against acts of terror and other high-consequence events for generations to come.

Members of the Committee, I thank you for the opportunity to meet with you today to discuss a newly realigned Science & Technology Directorate that is meeting homeland security challenges with a renewed sense of purpose and mission. I look forward to working with you throughout the 110th Congress.