Statement for the Record

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Committee on Science and Technology
Subcommittee on Technology and Innovation

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INTRODUCTION

Good Morning Chairman Wu, Ranking Member Gingrey, and distinguished Members of the Committee. It is an honor for me to appear before you today to update you on the progress of the Department of Homeland Security's (DHS) Science and Technology Directorate (S&T Directorate) and discuss how the President's Budget Request for Fiscal Year 2009 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 many components that comprise the Department — 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 continue to be very appreciative of the leadership of the Congress in its support of the S&T Directorate, and of me personally, as Under Secretary for Science and Technology. I am grateful for the engaged and nonpartisan relationship we enjoy, which is vitally important for the S&T Directorate. The informed counsel of Committee Members with homeland security oversight, and that of their staffs, has been invaluable to the Department's efforts to position the S&T Directorate for accountability, tangible results and success, both for today and in the future.

Last year, I told you that to achieve long-term success, the S&T Directorate must get four 'gets' right – its organization, its people, its books, and its program content. I also told you that we would concentrate our activities on the four 'Bs' – bombs, borders, bugs and business – to stay focused on priority threat areas for the S&T Directorate.

I'm pleased to report that since last year, we have made significant progress in the four 'gets' and the four 'Bs.'

Highlights of this progress include:

Publishing a strategic plan that provides a framework to guide the Directorate's activities over the next five years;

Strengthening our workforce by increasing federal staff, implementing training initiatives, and building morale through directorate-wide communications and events;

Realigning our organizational structure and research, development, test and evaluation (RDT&E) activities to better serve the Department's components and their end users; and

Establishing a customer-led, Capstone Integrated Product Team (IPT) Process to identify our customers' needs and develop and transition near-term capabilities for addressing them.

This year, I am going to focus on the four 'Ps': People, Process, Partnerships, and Product. Fine tuning and sustaining the four 'Ps' will ensure that the S&T Directorate achieves enduring success.

The first 'P' is for People. That is because once you get the people right, you have to keep the people right. The S&T Directorate will keep the right mix of people by having a solid staffing plan and by being a great place to work. Our employee communications, training opportunities and directorate-wide activities have helped make the S&T Directorate a place where highly skilled professionals want to be. We must sustain this effort.

The second 'P' is for Process, because you need a stable and efficient operational foundation to keep an organization, its program content, and its books right. The S&T Directorate will refine and integrate its internal management processes – financial and administrative – to ensure operational excellence and fiscal responsibility. We must also mature those processes that drive the delivery of products to our customers, such as our customer-led Capstone Integrated Product Team (IPT) Process – and continue to support a balanced portfolio for RDT&E activities.

The third 'P' is for Partnerships, which are essential for long-term success. The S&T Directorate will build on the international and interagency partnerships it put in place this past year by establishing more formal working agreements and commitments to the development of homeland security science and technology.

The fourth 'P' is for Product, because we exist to deliver to our customers' science and technology breakthroughs that will strengthen the security of our homeland.

PEOPLE

The S&T Directorate functions as the Department's science and technology manager. We invest in science and technology that supports DHS component efforts to protect out homeland. To achieve this, the S&T Directorate develops and manages an integrated program of science from basic research and technology innovation through technology transition. The managers of this program are predominantly active scientists and engineers in the many disciplines relevant to Homeland Security. Program investment is guided by a multi-tiered strategy and review process based on higher guidance, customer needs, and technology opportunities.

Our staffing is currently at 93 percent of Full Time Equivalents (FTE). Hiring has been slowed due to the continuing resolution and a reduction in the M&A funding, but we expect to reach our full complement of 381 FTEs by the end of FY 2008. This year we are putting in place a career Senior Executive Service Deputy Undersecretary for Science and Technology to help ensure a seamless transition into the next Administration. I'm also pleased to inform you that in the past several months we have received a number of unsolicited employment applications from very qualified individuals. The word is out that the S&T Directorate is making a difference.

It continues to be very important to me personally that S&T Directorate staff be kept informed of our plans and priorities and that they have a forum for asking questions and expressing their views and concerns. I hold monthly "All Hands" meetings to brief all staff members, including

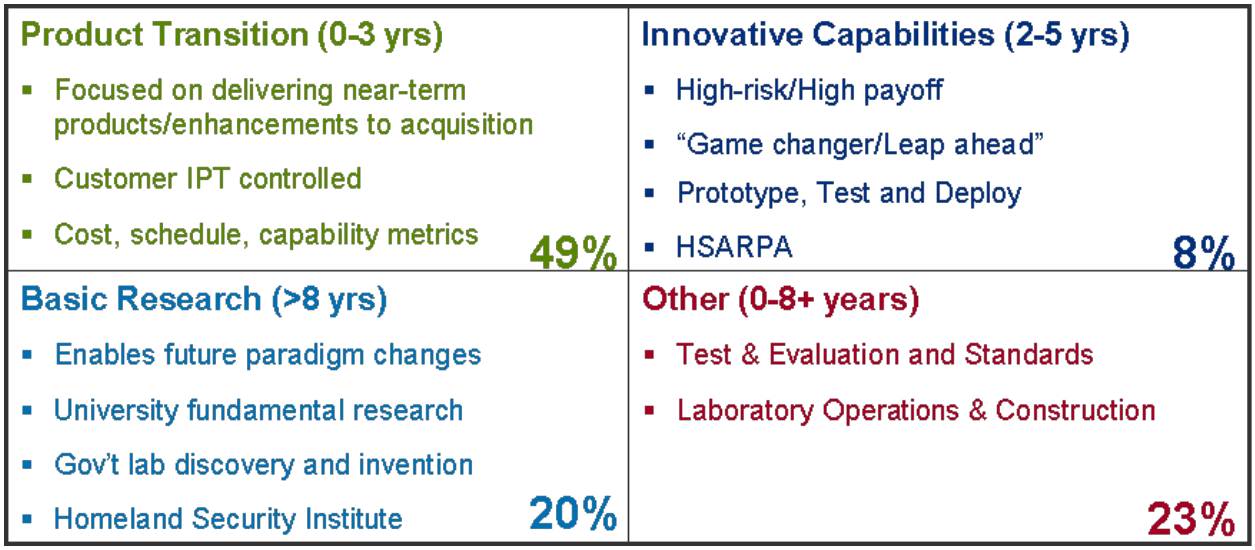
teleconference links with staff in other locations such as the Transportation Security Laboratory in Atlantic City, New Jersey, the Animal Disease Center on Plum Island, New York, the Environmental Measurements Laboratory in New York City, and the National Biodefense Analysis Countermeasures Center in Fort Detrick, Maryland. 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 superb work.

PROCESS

I thank Congress for its support of the new organizational structure, which we put in place in September 2006.

This enabled us to re-engineer our management and administrative processes over the last two years to reduce the costs of our business operations by more than 50 percent. We accomplished this by implementing several efficiency initiatives to make better use of our resources including converting positions filled by contractors to be civil servants, consolidating office space, and limiting our overhead, which I will continue to cap at 9 percent in FY 2009.

It has also supported 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. This is reflected in the President's FY 2009 Budget request, which includes **$145.1 million** for the basic research portfolio; **$361.4 million** for the transition portfolio; and **$58.6 million** (including SBIR) for the innovation portfolio.



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.

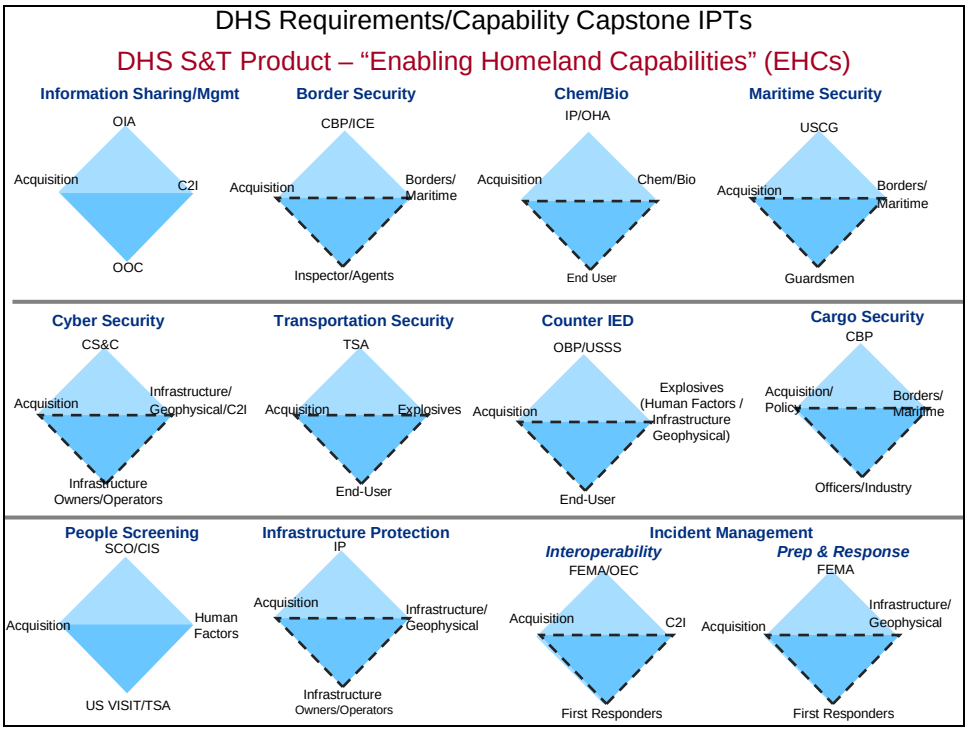
The S&T Directorate's basic research program enables fundamental research at our universities, government laboratories and in the private sector. I have previously stated a goal to grow this account to approximately 20 percent of the budget; and I am pleased today to be able to say that we have met this goal. Approximately 20 percent of the S&T Directorate's investment portfolio, or **$136.2 million,** is allocated for basic research in the current fiscal year with 20 percent or **$145.1** million planned for FY 2009. It is essential 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.

This year, we will focus internally on refining our basic research "thrust areas" and developing better means to measure the effectiveness of the basic research portfolio. I have asked the National Academies to help in this effort.

Product Transition (0 to 3 years)
Development of the product transition portfolio is driven by our customer-led, Capstone Integrated Product Teams (IPTs) 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 Division Heads, and end users as appropriate in our product research, development, transition and acquisition activities.

The Capstone 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.

Our experience over the last year has led us to align our Capstone IPTs structure to 12 major areas: Information Sharing/Management; Border Security; Chemical Defense; Biological/Agricultural Defense; Maritime Security; Cyber Security; Transportation Security; Counter IED; Cargo Security; People Screening; Infrastructure Protection; and Incident Management (includes first responder interoperability).



DHS Requirements/Capability Capstone IPTs

S&T's product transition/IPT process ensures that appropriate technologies are engineered and integrated into the DHS acquisition system for our customers. Approximately **53 percent of S&T's investment portfolio or $376.0 million** is allocated for product transition in the current fiscal year with **49 percent or $361.4 million** planned for FY 2009.

Innovative Capabilities (2 to 5 years)

The Innovation/HSARPA portfolio supports three important efforts to put advanced capabilities into the hands of our customers as soon as possible: Homeland Innovative Prototypical Solutions (HIPS), High Impact Technology Solutions (HITS) and the Small Business Innovative Research (SBIR) program.

HIPS are designed to deliver prototype-level demonstrations of game-changing technologies within two to five years. Projects present moderate- to high–risk, with a high-payoff if successful.

HITS are designed to provide proof-of-concept solutions within one to three years that could result in high-payoff technology breakthroughs. While these projects are high-risk, they offer the potential for "leap-ahead" gains in capability should they succeed.

The Small Business Innovative Research (SBIR) program, which the S&T Directorate manages on behalf of DHS, issues two solicitations each year and generates multiple awards for the small business community. The first solicitation for FY 2008 opened 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 S&T Directorate's six technical divisions.

The Innovation/HSARPA funding request for FY 2008 was **$60** million and **$33** million was approved in the final Appropriations Act. I do not believe this reduction reflected any lack of confidence in the portfolio on the part of the Congress, but was rather an outcome of the extreme pressure in the Appropriations "end game." Therefore, we are requesting **$45 million** in FY 2009 for Innovation's HITS and HIPS activities.

Test & Evaluation and Standards

In 2006, I established the Test and Evaluation and Standards Division (TSD). TSD is working closely with DHS Undersecretary for Management as well as all DHS components to develop and implement a robust Test and Evaluation (T&E) policy for all of DHS that will be fully integrated into the Department's Acquisition Policy. The goal of the T&E policy will be to establish processes to support the evaluation of system efficacy, suitability and safety. TSD has established a T&E Council to allow participation by all components of DHS in promoting T&E best practices and lessons learned in establishing consistent T&E policy and processes for use in acquisition programs throughout DHS. Developmental Testing and Evaluation (DT&E) and Operational Testing and Evaluation (OT&E) are conducted at levels commensurate with validating performance and Technology Readiness Level (TRL) of the system throughout the development process. TRL assessments are initiated early on S&T projects and are performed throughout development to ensure technology is maturing as required and that projects are ready to transition to the DHS components at the appropriate time. DT&E is performed during the developmental phase of a product or system and is concerned chiefly with validating the contractual and technical requirements and the attainment of engineering design goals and manufacturing processes. OT&E focuses on determining operational effectiveness, suitability, and supportability and is performed with production representative equipment, with trained operators in an operational environment by an independent third party.

DHS Acquisition and T&E Policy under development will provide the appropriate review chain both within DHS as well as the approval process for test results and for adequacy of testing. The draft T&E policy that is being developed will require user components to participate in creating, reviewing and signing the Test and Evaluation Master Plan (TEMP). Its primary purpose is to describe the necessary Developmental Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E) that needs to be conducted in order to determine system technical performance, operational capabilities and limitations. The TEMP is an integrated and agreed upon plan to ensure that the right tests are conducted and the products are meeting the user requirements. Having the customers involved in the test planning, execution, and reporting for the technology or system under development will ensure that the components are able to use the results and maintain a current knowledge during the product development. The TEMP also addresses the testing laboratories, capabilities, facilities and ranges required for the test program; testing laboratories are accredited/recognized; and independent oversight of the tests are performed. Additionally, when possible DHS ensures independent operational test teams are involved early in the project development to ensure operational shortcomings are identified and corrected as early as possible during development. The test results will be critical in ensuring that DHS products meet the necessary milestones to continue development.

While the T&E Policy is being finalized, DHS development programs are moving forward with the assistance and guidance of TSD in designing T&E protocols to assess whether systems meet standards, technical specifications and some operational requirements. It is the Department's objective to prepare standard T&E master plans, test plans and test reports to document the planning, execution and reporting phases of the testing. Test plans are required whether the research project is being conducted internally or externally to S&T. Red Teaming will be included in the test plans as required and be employed post deployment when appropriate.

The DHS components working within the DHS Capstone IPT process ensure that the user needs are addressed in the research as well as the testing and evaluation. End user needs are incorporated in the planning and design of the tests. All tests will be performed to component requirements or DHS adopted standards. Reports of efficacy, safety, and suitability are assessed against test criteria which are developed with Component input.

TSD is also developing an accredited/recognized test capability, with the goal of testing all products in accredited/recognized facilities. The accreditation/recognition process is under development and facilities are currently being identified that are capable of conducting different aspects of the testing process. Accomplishing independent testing in realistic operational environments will better assess product effectiveness and suitability. Test results from the above process will allow decision makers to formulate better judgments concerning readiness for transition to the next phase of development or deployment.

TSD has an effort under way to ensure that once testing is completed both components and first responders have access to product performance evaluations. T&E results will be placed on the Responders Knowledge Base (RKB) that is funded and managed by FEMA. In addition to posting the results on the RKB, the DHS T&E policy will provide standard report formats to ensure that the results are useful including system limitations and capabilities.

In the area of standards, I would to like mention our efforts to implement the DHS Standards Policy through the development of a standards infrastructure and the issuance of guidance. Just as with T&E, we have established a Standards Council. TSD and the Standards Council have developed and distributed guidance on the participation in the development and use of non-government standards. We continue to evaluate and adopt voluntary consensus standards in support of the Homeland Security Grant Program as well as key initiatives such as National Preparedness. Our standards development program continues its successful support for research on standards to support national needs in homeland security. In August of 2007 the Office of Standards published its first Annual Report which documents the work and accomplishments of the previous year. In the years ahead we will be focusing on refining our investments to reflect the evolving challenges facing the Department, utilizing S&T's new operating model and the outputs from the Capstone IPTs. The range of projects includes trace and bulk explosives detection, biometrics, credentialing, chemical and biological countermeasures, responder protective equipment and many more. The standards office engages experts from the DHS components and a variety of federal partners, and leverages the outstanding work of private sector standards development organizations.

PARTNERSHIPS

Over the past year, we have built partnerships that have helped us align our efforts within the S&T Directorate, across the Department, and with our public and private partners around the world. Within the Directorate, we have developed and published the *S&T Strategic Plan* that provides the strategy and planning framework to guide the Directorate's activities over the next five years. Through the Capstone IPT process, we have aligned our transition portfolio to our customers' needs. In basic research, we have aligned our university-based Centers of Excellence and, as a result of a meeting I held with the Directors of the Department of Energy (DOE) National Laboratories in May 2007, the National Laboratories to our six technical divisions to focus this enormous capability more closely on the fundamental knowledge gaps that limit our customer oriented applied research programs. We announced five new COEs on February 26, 2008, which will further satisfy the Directorate's need for university-based fundamental research.

Over the past year my Office of Interagency Programs (and First Responder Liaison) has worked very closely with DoD to develop and enhance information sharing opportunities. Among the accomplishments were the development of an implementing agreement among the partners and a senior level DHS-DoD working group. These accomplishments will help ensure the best use of resources while avoiding duplication of effort and will promote further cooperation among our partners. The first S&T liaison position within the California Governor's Office of Homeland Security was also established to enhance interagency efforts with our customers. Many of the experiences of this successful pilot were used as a working model for engaging with our Federal, State, local and tribal customers We will continue to conduct national interagency outreach through site visits, meetings, conferences and symposia to promote Federal, State, Local, and Tribal interoperability, collaboration, and coordination in the area of Science and Technology.

We also developed the *Coordination of Homeland Security Science and Technology* document that establishes the baseline for the efforts of the entire Federal government homeland security research and development community. This document lays out the roles and responsibilities of federal agencies as well as initiatives already under way to counter threats to the homeland. It identifies strategic goals through 2015 and intermediate steps to achieve those goals, and is the first step in developing a more prescriptive plan that will guide the efforts of all participants in the Homeland Security Science and Technology enterprise. For the next steps in the development of that plan, I intend to work with the Office of Science and Technology Policy's National Science and Technology Council to utilize standing processes and committees, specifically the Committee on National and Homeland Security, which I co-Chair. Continued development of the plan concurrent with the Quadrennial Homeland Security Review beginning this year will play an important role in helping align strategies and missions to adapt to a fast-changing world and an ever evolving enemy.

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 for projects that cross all six divisions, seeking prototype or proof of concept demonstrations within 1-5 years.

Innovation/HSARPA plans to release additional BAAs as new technology developments permit and as new gaps in capabilities for homeland security are identified. We have issued a Long Range BAA (08-01) that will remain open throughout the fiscal year. This BAA allows both national and international public and private sector providers to offer solutions to a very broad range of gaps and requirements. As I have often said, 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 from all sources. This is a culture I am working to instill throughout the DHS S&T Directorate.

Additionally, DHS S&T has held several Stakeholder Conferences to foster business partnerships with key customers and partners, including industry, Federal, State, and local government leaders, and academia. The Command, Control, and Interoperability Division also held their annual Industry Roundtable to engage industry leaders on the future of communications interoperability issues.

The Support Anti-terrorism by Fostering Effective Technologies (SAFETY) Act of 2002, administered in the S&T Directorate, continues to be a valuable tool in expanding the creation, proliferation and use of cutting edge anti-terrorism technologies throughout the United States. During FY 2007, the Office of SAFETY Act Implementation achieved an increase of 81 awards, an 83 percent increase over the total cumulative number of approvals attained over the previous three years of the program. Approximately 86percent of the approved awards during FY 2007 have relevance for the classes of capabilities and needs identified by the Science and Technology Capstone IPTs. The number of applications was up 63 percent, while processing time has been reduced 31 percent. The career federal staffing level of the SAFETY Act office was increased to three, thus providing more continuity of leadership, and permitting more attention and a quicker response to individual applicants. 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 held the first Homeland Security Science & Technology Stakeholders Conference in May 2007 here in Washington. We were partners in a conference in London last December that focused on international outreach. And we held a conference in Los Angeles in January 2008, focused on "Putting First Responders, First." On March 19 and 20, we will sponsor the second University Programs Summit here in Washington, an event at which participants will show off the results of their fantastic research at the colleges and universities that are part of the Homeland Security University Centers of Excellence. We will have another industry stakeholders' conference in Washington, June 2 – 5, 2008. I invite you and all elected Members and staffs to attend these events so you might see for yourself the power of innovation and technology in making our Nation safer.

I also know that we must look beyond our Nation's borders, for solutions to combating domestic terrorism. Therefore, consistent with DHS enabling legislation and the recent *Implementing the Recommendations of the 9/11 Commission Act*, the International Programs Division is responsible for coordinating international outreach efforts to help us tap into science and technology communities across the globe. We have proactively pursued bilateral technology and programmatic cooperation with my counterparts in the United Kingdom, Canada, Australia,

Sweden, Singapore, the European Union, Germany, Mexico, France, Japan, and Israel. Formal agreements currently exist with Canada, the UK, Australia, Sweden and Singapore. With our current partners, we have twenty concrete projects in a number of high priority research areas including air cargo explosive detection, chemical and biological countermeasures, visualization and analytics, critical infrastructure protection, and incident management. In addition to these projects, active information sharing with our foreign partners has reduced duplication of research efforts, streamlined project development, and synergized the expertise of the broader international community to produce mutually beneficial results. The International Programs Division maximizes these relationships across the U.S. Government through active coordination with DHS Components and other agencies, including the Departments of State and Defense. Embedded S&T liaisons in Europe, the Americas and Pacific/Asia cast a wide global net to seek out new science and technology solutions with current and prospective partners. Annual academic grant competitions are open to the global community and provide world-wide access to cutting-edge S&T research in support of our homeland security mission. S&T is actively engaging with partners across the globe to develop coordinated efforts and joint solutions to our shared security challenges.

PRODUCT

I am committed to best apply across the S&T Directorate the resources you have wisely provided in ways that best serve the American people and better secure our homeland. Your support over the last year has allowed us to "hit our stride," and I humbly ask for your continued trust and support of the President's FY 2009 Budget Request to allow us to build upon that momentum. The following are a few examples of products we have developed and in some cases transitioned to our customers.

Border and Maritime Security

• Developed a lightweight shipping container with embedded security features within its walls, doors and floor to detect intrusions. Shippers benefit from weight savings by allowing them to load more goods per container, encouraging the use of these more secure containers.
• Conducted a joint test of the Marine Asset Tag Tracking System (MATTS) with Japan. When fielded, MATTS will provide the ability to track shipping containers in near-real time from their origin to final destination using a remote global communications and tracking device interfaced with sensors that detect container breaching.

Chemical and Biological

• Completed the Project BioShield material threat determinations for all traditional biothreat agents of significant public health concern. Such determinations are required before the authorized use of the BioShield Special Reserve Fund to procure new medical countermeasures.
• Transitioned BioWatch Generation 1 and Generation 2 operations to the Office of Health Affairs (OHA).

Command, Control and Interoperability

• Combined several government-funded testbeds to increase cyber security capabilities to create a realistic model of the internet on which to test cyber security technologies.

• Assisted states in identifying and implementing effective statewide technical interoperability solutions; conducted piloted programs to assess and demonstrate data and video technologies in real-world environment.

Explosives
• Evaluated and tested commercial off-the-shelf systems capable of detecting homemade explosives to find the most effective existing technologies.
• Completed a system false alarm analysis of deployed check baggage technology and provided results to the Transportation Security Administration (TSA).

Human Factors
• Developed a database of public needs that were unmet during Hurricanes Katrina and Rita and made recommendations to address those needs during future emergencies.

Infrastructure and Geophysical
• Developed a risk-informed decision support system. The system provides information for making critical infrastructure protection (CIP) decisions by considering all 17 critical infrastructure sectors and their primary interdependencies, and computing human health and safety, economic, public confidence, national security, and environmental impacts. Built out CIP-Decision Support System (DSS) to include cyber-disruptions, nuclear event, and physical/natural disaster disruption scenarios.
• Developed the system requirements and designs for a first responder 3D location system for tracking personnel that provide incident commanders situational awareness through accurate location and monitoring inside threatened buildings, collapsed buildings, and subterranean areas.

Innovation
• Initiated Homeland Innovative Prototypical Solutions (HIPS) to deliver prototype-level demonstrations of game changing technologies in two to five years. These projects are moderate-to-high risk with high payoff potential.
• Started High Impact Technology Solutions (HITS) to provide proof-of-concept answers that could result in high technology breakthroughs. These projects have the potential to make significant gains in capability; however, there is a considerable risk of failure.
• Built upon the efforts in Explosives and demonstrated the ability of sensors based on a high altitude platform to detect the launch of and track MANPADS.
• Investigated various technologies including probe systems to be installed on the cranes that on load and off load ship carried containers, sensors and container materials to improve the effectiveness and efficiency of the screening of cargo containers.

Laboratory Facilities
• Managed the operations and maintenance of specialized DHS laboratories and infrastructure including the Plum Island Animal Disease Center (PIADC), portions of the National Biodefense Analysis and Countermeasures Center (NBACC), Chemical Security Analysis Center (CSAC), Transportation Security Laboratory (TSL), and the Environmental Measurements Laboratory (EML).
• Began operation of the NBACC facility as a Federally Funded Research and Development Center (FFRDC).

• Started construction of the Chemical Security Analysis Center (CSAC).
• Conducted the conceptual design of the National Bio Agro Defense Facility (NBAF), which will be an integrated animal, foreign animal, and zoonotic disease research, development, and testing facility that will support the complementary missions of DHS and U.S. Department of Agriculture (USDA). Down-selected potential sites for the NBAF.

Test & Evaluation (T&E) and Standards
• Continued to develop standards for an integrated chemical, biological, radiological, nuclear, and explosive (CBRNE) sensor.
• Completed multi-modal biometrics standards, including standards for latent fingerprint analysis, rapid biometric evaluation, and biometric image and image feature quality.
• Developed performance standards for emergency responder locator communications in collapsed structures. These standards will apply to new signal processing technologies that allow amplification of weak signals through rubble from collapsed structures.

Transition
• Aligned and coordinated the Directorate's transition effort with the Departmental component's requirements through the use of Capstone Integrated Product Teams (IPT) and provided support and analysis to the customer-led IPTs in developing prioritized science and technology capability gaps based on their experience and projected requirements.
• Conducted a Marine Asset Tag Tracking System (MATTS) test and workshop/conference on results with Japan and conducted a bi-national S&T exercise with Sweden to identify and describe transformational approaches to mitigating the effects of improvised explosive devices in mass transit systems

University Programs
• Established five new DHS Centers of Excellence (COE) and developed a number of efforts to improve the capabilities of Minority Serving Institutions (MSIs) to conduct research in areas critical to homeland security and to develop a new generation of scientists capable of advancing homeland security goals.
• Provided scholarships for undergraduate and fellowships for graduate students pursuing degrees in fields relevant to homeland security.

FY 2009 BUDGET OVERVIEW

The S&T Directorate's FY 2009 Budget Request reflects the refinement of our four "Ps" and a commitment to the S&T investment portfolio. The request of $868.8 million is approximately 5 percent over the FY 2008 appropriation and 9 percent over the FY 2008 request.

Program, Project, and Activity (PPA)	FY 2008 PB	FY 2008 Enacted	FY 2009 Request
Management and Administration	**142.6**	**138.6**	**132.1**
Borders and Maritime	25.9	25.5	35.3
Chemical and Biological	228.9	208.0	200.4
Command, Control and Interoperability	63.6	57.0	62.4
Explosives	63.7	77.7	96.1
Human Factors	12.6	14.2	12.5
Infrastructure and Geophysical	24.0	64.5	37.8
Innovation	59.9	33.0	45.0
Laboratory Facilities	88.8	103.8	146.9
Test and Evaluations, Standards	25.5	28.5	24.7
Transition	24.7	30.3	31.8
University Programs	38.7	49.3	43.8
Research, Development, Acquisition and Operations	**656.5**	**691.7**	**736.7**
S&T Total	**799.1**	**830.3**	**868.8**

The Management and Administration request reflects several efficiency initiatives to make better use of its resources and better accounts for program activity costs at the laboratories. The Research, Development, Acquisition and Operations request is primarily based on the increased support for the development of additional technologies for specific high-priority, customer-identified needs identified during the S&T Capstone IPT process.

Administration (M&A)

The S&T Directorate requests $132.1 million for M&A in FY 2009. This is a decrease of $6.5 million from the FY 2008 budget request. This reflects a shift of $14 million and 124 positions to the Laboratory Facilities PPA combined with a $7.5 million increase to fully fund our planned FTEs.

Research, Development, Acquisitions, and Operations (RDA&O)

The S&T Directorate requests $736.7 for RDA&O in FY 2009. This is an increase of $80.2 above the FY 2008 budget request and $45.0 above the FY 2008 appropriation. The following is a summary of the FY 2008 to FY 2009 changes – many are due to the increased support for the development of additional technologies for specific high-priority, customer needs identified during the S&T Capstone IPT process, specifically:

Borders and Maritime Security

The FY 2009 program increase of **$9.4 million** above the FY 2008 request allows the development of additional technologies for specific high-priority, customer-identified needs identified during the S&T Directorate's Capstone IPT process. The increase will allow for the development of technologies for advanced detection, identification, apprehension and enforcement capabilities along the maritime borders that support a framework that includes Coast Guard partners for rapid, coordinated responses to anomalies and threats. A science and technology investment in these areas will provide significant risk mitigation complementary to proposed major acquisition efforts such as the Coast Guard's Command 21 program. This increase will also provide tools and technologies to border security and law enforcement officers allowing for efficient, effective and safe vehicle and vessel inspections. These tools will improve

Coast Guard boarding teams' and Border Agents' effectiveness and enhance officer/agent safety while searching vessels/vehicles.

Chemical and Biological
The FY 2009 program decrease of $7.6 million from the FY 2008 appropriation is in large part due to the BioWatch Gen 3 Detection Systems and Detect-to-Protect Triggers and Confirmers projects within the Surveillance and Detection R&D Program of the Biological Thrust area coming to an end in FY 2009. Also, the Autonomous Rapid Facility Chemical Agent Monitor (ARFCAM) and Low Vapor Pressure Chemicals Detection System (LVPCDS) projects in the Detection program of the Chemical Thrust area are ramping down to end in FY 2010.

Command, Control, and Interoperability
The FY 2009 program increase of $5.4 million over the FY 2008 appropriation funds the development of additional technologies for specific high priority customer-identified needs identified during the S&T Directorate's Capstone IPT process. The increase in Cyber Security R&D will allow the division to address Supervisory Control and Data Acquisition (SCADA) and Process Control Systems (PCS) security increasing the protection and improving the resiliency of the electric distribution grid. These systems will proactively manage threats by identifying and responding to vulnerabilities and threats before they are maliciously exploited to significantly impact critical infrastructure. They will also provide autonomy of operations that can quickly respond to natural disasters and security events and address new vulnerabilities.

Explosives
The increase in the FY 2009 request of $32.4 million over the FY 2008 request supports Counter-IED Research, which includes Vehicle Borne Improvised Explosive Device/ Suicide Bomber Improvised Explosive Device (VBIED/SBIED) Program, the Render Safe Program, and the Detection and Neutralization Tools Program. The increase in funding in the Counter-IED Research will allow the Explosives division to improve large threat mass detection in such areas as the transit environment, special events and other large areas.

The implementation of Homeland Security Presidential Directive 19 (HSPD-19), *Combating Terrorist Use of Explosives in the United States*, requires new science and technology solutions to address critical capability gaps in the areas of deterring, predicting, detecting, defeating, and mitigating the use of IEDs in the United States. The Office for Bombing Prevention (OBP) is currently assessing the nation's ability to address this threat and is developing a prioritized set of technology gaps. The S&T Directorate is working with OBP to support basic science and develop technologies for the following kill chain:

- Deter: Actionable Social and Behavioral Indicators of IED Attacks; Intent-based Countermeasures;
- Predict: IED Target Projections; IED Staging Area Projections; Anomalous Behavior Prediction; Suicide Bombing Prediction; Deceptive Behavior Screening; Multi-Modal Behavioral & Biometric Screening;
- Detect: Suicide Bomb Detection; Technology Demonstration & System Integration; VBIED Detection; Canine R&D; Tagging R&D; Standards;
- Defeat: Electronic Countermeasures; Robotics; Render Safe & Diagnostics; Directed Energy; Post Blast Forensics; Forensic Marking; Bomb Components; Outreach; and

- Mitigate: Blast Mitigation; Body Armor; Inerting.

We are performing valuable work to improve methods of detecting explosives threats on people, in personal items and in cargo. As part of the Checkpoint Program, S&T's Explosives Division is working with TSA to complete test and evaluation efforts on the Whole Body Imaging system that could help operators of check points better identify potential threats. We are also conducting tests to enhance the screening of carried baggage and personal items. We are conducting Operational Test & Evaluation (OT&E) of the Fido II Explosives Detection System and currently have units deployed at multiple airports in the United States. The portable detection system has been enhanced to detect liquid explosive components and will be used by TSA to counter the growing threat liquid explosives pose to transit security. This effort is complemented by our significant work to characterize the homemade and liquid explosives threat, which has included live fire tests to assess potential damage and the efficacy of hardening materials.

In addition to addressing the risk of catastrophic loss resulting from IEDs in carry-on baggage or at public events, our Explosives Screening Program is identifying and developing the next generation of screening systems which will support 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. We have continued our work on the Manhattan II and began test and evaluation efforts of the system's ability to identify real explosive devices, both homemade and conventional. We have also worked with industry to develop a common performance standard for coupling algorithms and hardware. Another part of our effort is the Air Cargo Explosives Detection pilot program. We began operations at San Francisco International Airport and at Cincinnati-Northern Kentucky International Airport, and launched and completed operations at Seattle-Tacoma International Airport. At all locations we are capturing vital information for TSA, including data on the costs of running a system capable of screening amounts of cargo above current levels, including equipment needs, staff requirements, and system upkeep, in addition to the impacts of these upgrades to overall airport operations. This data can be extrapolated to airports nationally, based on, among other things, the amount of cargo they handle and airport size. It will also allow TSA to develop operational plans that incorporate proven ways to screen air cargo while maintaining an effective and efficient air transport system.

Human Factors

The budget request for FY 2009 is $12.5 million, which is $1.7 million less than the amount enacted for FY 2008. In FY 2008, the Human Factors Division received funds for the Institute for Homeland Security Solutions (IHSS) to conduct applied technological and social science research. In FY 2009, the Human Factors Division is not requesting any funds for IHSS. The Division still intends to support efforts that address high-priority capability gaps in biometrics and credentialing, suspicious behavior detection, hostile intent determination, group violent intent modeling, and radicalization deterrence as identified by customers through the Capstone Integrated Product Team (IPT) for People Screening and the Technology Oversight Group (TOG), chaired by the Deputy Secretary. Two other Capstone IPTs, Border Security and Explosives Prevention, also identified Suspicious Behavior Detection as critical to meeting their respective high-priority capability gaps.

Infrastructure and Geophysical
The FY 2009 request of $37.8 million is an increase of $13.8 million over the FY 2008 request to fund several new program areas specifically identified by our customers, with efforts focused on high priority technology gaps in the areas of Infrastructure Protection and Emergency Incident Management. Specifically, funded efforts will improve the protection of our critical infrastructure by providing technologies for hardening these vital critical infrastructure assets and for rapid response and recovery for critical infrastructure assets to limit damage and consequences and allow for normal operations to be resumed more quickly than would otherwise be possible.

Innovation
The FY 2009 program increase of $12 million reflects an increase in scope of existing programs as they mature and might allow for additional projects that would address gaps identified by the S&T Capstone IPT process. These projects are high risk in nature but would dramatically increase capabilities in responding to threats posed by terrorism and natural disasters. The high risk factor means that the Office of the Director of Innovation requires flexibility in the projects it funds. These projects will reach critical decision points to continue or stop. New projects are always under consideration, and the FY 2009 request will potentially fund new projects or current ones that justify further development based on results.

Laboratory Facilities
The FY 2009 request of $146.9 million is an increase of $43.1 million over the FY 2008 appropriations. The S&T Directorate intends to cover the FY 2009 operations and maintenance (O&M) start-up costs of the new NBACC facility. These costs include the installation and outfitting of portable laboratory equipment and furnishings and funding interim space lease. Also in FY 2009, the S&T Directorate intends to move the remaining functions of EML into much smaller office space in the same building or another General Services Administration (GSA) facility in the New York area and pay for a one-time cost for final cleanup of EML space (e.g., final disposal of contaminated material, removal of fume hoods, large exhaust ducting, furnaces, and shielded spaces). Also, the Directorate will begin a detailed design of the National Bio and Agrodefense Facility (NBAF) which will support the initiation of construction in FY 2010.

The increase also reflects a transfer of funds from Management and Administration to the Laboratory Facilities PPA to pay for salaries and benefits of FTEs located at the laboratories. All Homeland Security laboratory employees work on RDA&O products. The shift of laboratory FTEs into the RDA&O account better reflects the actual Science and Technology RDA&O program costs.

University Programs
In FY 2009, the S&T Directorate is requesting $5.5 million less for its University Programs. This decrease reflects no funding request for the Naval Post Graduate School and a reduction to the educational programs within the S&T Directorate that fund scholars and fellows in homeland security related fields.

Transition

The FY 2009 program increase of $1.5 million will support a DHS competition for a new Federally Funded Research and Development Center (FFRDC). The FFRDC will provide discreet, independent, and objective analysis to inform homeland security policies and programs and ensure continuity of FFRDC support.

Test Evaluation and Standards
The S&T Directorate requests $3.8 million less for FY 2008 than enacted for FY 2008. This decrease is the result of having initiated the independent peer review program in FY 2008 and the program will therefore not need additional funding in FY 2009. The S&T Directorate is also implementing a reallocation of funds by the TOG during the Capstone IPT process.

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.

We appreciate the many demands on the taxpayers' precious dollars and you have my continued 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. I truly believe that through Science and Technology can come Security and Trust, and I look forward to working with you to meet our homeland security challenges with a renewed sense of purpose, mission and urgency in the last year of the Administration.