

**Department of Homeland Security (DHS)
Science and Technology Directorate (S&T)
Homeland Security Science and Technology Advisory Committee (HSSTAC)**

November 2 - 3, 2015
In-Person Committee Meeting
Location: Homeland Security Acquisition Institute
90 K Street Northeast, Washington, DC 20002
Minutes

Summary: About 65 people attended the meeting (please see list below). A recording of the meetings can be found at: <https://share.dhs.gov/p6tnch8mbfw/> (Day One) and <https://share.dhs.gov/p1q16kb0lhh/> (Day Two).

Day One (Monday, November 2nd)

1. EMERGING THREATS DISCUSSION

HSSTAC Designate Federal Officer, **Bishop Garrison**, convened the meeting at 1:00 p.m. **Garrison** welcomed the committee members back to the session and played a short video on the visionary goals and key objectives of S&T. Afterwards, **Tod Companion**, Director of S&T Interagency Office, introduced **Dr. Bob Griffin**, Deputy Under Secretary, as the first speaker to discuss counter unmanned aerial systems (UAS).

Dr. Griffin started off the discussion with two anecdotes about the recent incidents involving a small gyrocopter landing on the West Lawn of the Capitol last April and the accidental drone crash at the White House in January. These headlines highlighted the issues in addressing new aviation threats and the need for better coordination in the National Capital Region. The presentation continued with a briefing on the current state of aviation security, the agencies involved, and the spectrum of unmanned aerial vehicles (UAVs). Subsequently, Dr. Griffin explained the threats and focused on four of the most common types of UAVs: DJI Phantom Series, DJI S1000, Yamaha RMAX, and Gyrocopter models. The operation of low altitude, slow speed aerial vehicles and nontraditional aircraft in the National Airspace System (NAS) presents a significant technical challenge. Dr. Griffin addressed questions covering specifics on current policies for integrating UAS into NAS, programs to counter UAS threats, and the role of the Federal Aviation Administration (FAA).

Next, **David Gersten**, Deputy Director for Community Partnerships, started the discussion on violent extremism, and explained how his office aims to build relationships and find innovative ways to support communities that seek to discourage violent extremism and undercut terrorist narratives.

Lastly, **Mr. William Braniff**, Executive Director of the National Consortium for the Study of Terrorism and Responses to Terrorism (START), shared his research on emerging violent extremist threats from the DHS Center of Excellence at the University of Maryland, College Park. Braniff's findings revealed that competition, rather than collaboration, between Islamist

groups, correlates with dramatic increases in the lethality of terrorist attacks. He also explained the concept of the Fringe Effect as it relates to the Islamic State of Iraq and the Levant (ISIL) in relation to Al Qaeda and Associated Movements (AQAM). Due to the relative extremism of ISIL, AQAM has become a “mainstream” movement. While ISIL is alienating greater numbers of Muslims, its message is resonating with a small, but vocally significant, subset of the population. There are opportunities to work with the domestic Muslim community to marginalize this small group. In terms of individual radicalization in the United States, Braniff pointed out that far right groups represent a more sustained threat than Islamists, far left groups, and single-issue groups, such as environmentalists.

Regarding the foreign fighter phenomenon, there is an estimated 19 month window from first contact with observable, predictable behaviors. Currently, the only option is to turn over suspects to the authorities, but federal judges are limited in their response – even for minors. Overall, rehabilitation and reintegration programs are the most important thing the United States justice system is not engaged in. Braniff concluded his remarks with a question and answer period, which focused on S&T responsibilities, surveillance monitoring, and counterpropaganda initiatives.

2. CENTERS OF EXCELLENCE BRIEFING

Director of S&T Office of University Programs (OUP) **Matthew Clark** hosted a briefing on topic designation criteria for the Centers of Excellence (COE) program. At the start, Clark explained the role of S&T in providing research support to the components, and summarized the ten COE designees with an annual budget of \$3.5 million each. Since many of the COE designations expire in the next three years, Clark emphasized that this is an ideal opportunity to examine what types of research questions S&T OUP should focus on.

Clark described the topic designation process, and elaborated on how federal coordinating committees are assembled with interagency partners to find use-based research questions. The criteria for research topic evaluation are based on seven key questions:

1. Is this significant to the DHS mission?
2. Will it continue to be a major mission area?
3. Is there a real knowledge gap?
4. Is there a relevant Congressional, White House, or DHS directive?
5. Is there demand expressed by DHS leadership?
6. Is this similar to existing research?
7. Can the amount of resources available ensure a significant impact?

In addition, Clark announced the nine future COE topic areas currently being discussed: Law Enforcement Investigations (2016); Applied Quantitative Analysis (2016); Countering Bio-threats (2016); Counterterrorism (2017); Transportation Security and Screening (2018); All Domain Awareness (2019); Border Security, Trade, and Immigration (2019); Infrastructure Protection and Resilience (2020); and Natural Hazards and Resilience (2020). Subsequently, Clark responded to questions on whether these topics were distinct enough from the current COE topics, the alignment of OUP with the other groups in S&T, how outside partners are leveraged for financial support, the absence of cyber in topic designation discussions, and the

rationale for evenly distributing funds between COEs. In addition, several committee members suggested OUP should focus on less topic areas, become more outcome-oriented, and select research questions based on the threat risk, rather than only customer requirements.

3. COMMITTEE RECOMMENDATIONS AND RECAP

Garrison opened the session for public comments, and there were no questions posed to the group. Subsequently, John Sims, the HSSTAC co-chair, addressed the committee as a whole to share their thoughts and concerns in an open forum. He followed with a question to Griffin on what degrees of freedom the committee has in terms of suggestions, such as submitting recommendations to eliminate a COE project idea or alternative funding models. **Michael Goldblatt** addressed the committee to acknowledge that DHS has a very broad mission and is compelled to satisfy all of its customers with such limited resources. Goldblatt remarked that, in the absence of leadership, OUP decided to spread its resources thin without much accomplishment. Another member had asked whether the comments and recommendations will be responded to by the Agency and who will look at the committee's findings. Garrison responded that those requests will be sent directly to leadership and the S&T Front Office.

As a follow up, **Garrison** further explained the responsibilities of HSSTAC as a formal advisory group and clarified that there needs to be a deliverable but what that product looks like, (whitepaper, action memo, or report) is at the behest of the USST. There was a request from a committee member for future meetings for S&T briefings to not only focus on the "what" (i.e., initiatives, missions, goals) but also the "how" (i.e., structure, process, issues, people, culture). Another member suggested that the content and format of HSSTAC meetings should be determined by the committee chairs to ensure their needs are more effectively met. Lastly, one member told Bishop that the S&T briefers appeared to be overly defensive about their programs during HSSTAC's line-of-questioning.

4. **ADJOURN:** **Garrison** adjourned the meeting at approximately 4:30 p.m.

Day Two (Tuesday, November 3rd)

1. RECONVENE AND OPENING

Garrison welcomed the committee members at 9:00 a.m. and summarized the agenda for the day. Subsequently, he provided an overview of how HSSTAC will fit into and provide support for the S&T mission. **Tod Companion** introduced the several members of DHS S&T staff in attendance. Garrison invited Under Secretary for Science and Technology, **Dr. Reginald Brothers**, to address the group. Dr. Brothers began his remarks with a brief anecdote, and emphasized the difference between the DoD and DHS regarding their research and development programs. He emphasized his desire for HSSTAC to generate recommendations on how to improve the organizational structure, how to build the homeland security industrial base, and how to find the right mix of basic versus applied sciences. After Dr. Brothers explained the Accelerator program, DHS Joint Requirements Council, and

Integrated Project Teams, members responded with several questions. **Mark Maybury** conveyed his support for the Under Secretary's emphasis on cross-cutting, but expressed surprise that the concept of return-on-investment, whether in lives or dollars, had not yet been discussed. Next, **Annie McKee** asked Dr. Brothers about the issue of low employee morale and how HSSTAC could help improve the culture. After several questions, Dr. Brothers concluded his remarks.

2. PRESENTATION ON HSARPA

Deputy Director **Robert Burns** explained the three primary objectives of the Homeland Security Advanced Research Projects Agency (HSARPA):

1. To provide a balance between near term, lower risk technologies and longer term, high-risk/high-payoff technologies;
2. To encourage opportunities for new ideas and competition from the private sector, small business, industry, academia, and federally-funded research and development centers (FFRDCs); and
3. Identify technology solutions from external partners via the concepts of technology scouting and technology scanning.

Burns mentioned the shift from technology development to scouting and foraging, and answered a question on how HSARPA collects requirements from operators and customers. He also discussed the four HSARPA Divisions, the Apex Programs and Engines, and their alignment with DHS components. Burns responded to questions about HSARPA's response to the advent of autonomous systems and to concerns regarding large-scale collection and management of biometric data and other personal information. One member had asked about the current mix of long- and short-term technology development, and Burns explained that their portfolio has shifted from 75 percent in long-term investments four to five years ago to 80 percent short-term investments today. In response to several questions, Burns and Dr. Brothers emphasized the newfound importance of alignment between the COEs and Apex Engines and Programs.

3. PRESENTATION ON FIRST RESPONDER GROUP

Greg Price, Director, Responder Technologies Division, First Responder Group (FRG), discussed the mission of FRG to strength the responder's ability to protect the homeland, and the process for obtaining requirements from operators in the field. Price mentioned a few success stories of the technology transition program, and responded to questions on performance evaluation, communication with stakeholders, and the contracting process. Lastly, Price provided a brief overview of the long-term vision of FRG, namely the Next Generation First Responders (NGFR) program.

At 11:20 a.m., Jeffrey Booth, Director, Information, Applications and Standards Division, FRG, discussed the three major themes of FRG in detail: Disaster Resiliency; Public Safety Cloud; and Identity, Credential, and Access Management (ICAM). One member asked how FRG defines its technology standards, Booth answered that FRG works closely with nine multinational corporations and the Open Geospatial Consortium. Booth also responded to

questions regarding the work on developing an authentication and credentialing system for first responders during a crisis.

4. PRESENTATION ON RESEARCH & DEVELOPMENT PARTNERSHIPS

At 11:35 a.m., **Marlene Owens**, Acting Deputy Director of the Research and Development Partnerships Group (RDP), elaborated on her office's mission to strengthen the homeland security enterprise access to science-based capabilities and solutions through partnerships. Owens briefly described the roles and responsibilities of RDP's five functional units: Interagency Office (IAO), Office of National Labs (ONL), Office of University Partnerships (OUP), Office of Public-Private Partnerships (PPP), and the International Cooperative Programs Office (ICPO). In particular, she provided a detailed briefing on TITAN (Targeted Innovated Technology Acceleration Network) and the programmatic tools available through PPP, such as the Small Business Innovation Research (SBIR), Technology Transfer Office, Long-Range Broad Agency Announcement (LRBAA), and the SAFETY Act Office. Owens concluded by addressing the challenges with building the homeland security industrial base and answered questions on technology transfer, industry relations, and the long-term strategy for TITAN.

5. PRESENTATION ON CAPABILITY DEVELOPMENT SUPPORT GROUP

Following the briefing on RDP at 11:46 a.m., Program Manager **Tom Tomaiko** explained that the mission of the Capability Development Support Group (CSD) is to support program managers (PMs) and its four functional units: Operations and Requirements Analysis; Standards; Test and Evaluation; Transportation Security Laboratory; and Systems Engineering. In the past, CSD focused on supporting PMs later in the process for acquisition or research and development, but Tomaiko expressed his goal to transition earlier on for support. He also discussed the challenges involved with operationalizing S&T support and responded to questions on CSD's methodology to identify future risks and emergent threats.

6. REMARKS FROM THE UNDER SECRETARY

At 11:56 a.m., Dr. Brothers responded to questions from committee members on employee morale, technology transfer success rates, and threat scanning. He also received feedback on areas of improvement for future briefings. Dr. Brothers concluded with an invitation for HSSTAC members to participate in the Partnering for Innovation & Operational Needs through Embedding for Effective Relationships (PIONEER) program to tour the laboratories and view programs in the field.

7. PRESENTATION ON THE OFFICE OF THE CHIEF SCIENTIST

Dr. Dewey Murdick, Chief Analytics Officer in the Office of the Chief Scientist (OCS), began his briefing at 12:11 p.m., and opened with an overview of his responsibilities for developing and executing analytic strategies to improve the efficiency, effectiveness, and timeliness of decision making within S&T and DHS components. Murdick communicated that OCS is in the process of creating a data collection framework for the entire agency, with

the ultimate goal of plotting program data that will reveal operating conditions and changes over time. Dr. Murdick also replied to questions regarding the portfolio risk profiles for DHS programs and the success rate of S&T's technology scanning. In addition, a committee member had asked what percentage of the Directorate's time is dedicated to responding to crises and headline issues. Murdick responded with at least 50 percent of their bandwidth is directed to emergencies.

8. LUNCH INTERMISSION (12:40 P.M.)

9. SMALL GROUP BREAKOUT SESSIONS

At 1:30 p.m., the entire committee divided into three smaller groups to discuss their ideas and record key takeaways from the two-day retreat.

Group 1: **James Grove, Senior Advisor** for Research and Development Partnership Program, moderated group one. The following members participated in group one: James Hendler, Phillip Coyle, Ted Willke, John Sims, Eric Haseltine, William Crowell, and Jay Farr. The moderator started off the discussion with a lightning round. Ideas included: DHS versus Homeland Security Enterprise; CI cascades and interdependencies; critical infrastructure and key resources (CIRK) and cyber/physical; national versus regional capacity; catastrophic failures versus redundancies; CoEs focus and reallocation and objectives versus constraints. First Responders should consider crosscutting law enforcement; best practices tied to risk discussion Critical Infrastructure, Cyber link and Nuke detection/interdiction. Other suggestions included: looking at what are DHS's biggest problems (example: the Manhattan Project); technology CONOPS/OP-EX; structural issues need cross program integration; architecture and pipeline for research and development; what are the risk, return, ROI, models; requirements collection should be more agile; DHS culture and communication need to be audited and defined (Classification is a barrier); S&T culture and workforce should be reviewed; CoEs should be leveraged to access the homeland security community, especially with transitioning technology.

After the lightning round, the members in the group addressed the needs of HSSTAC. In the future they would like to have the following information available: Command briefings with the priorities, how and where decisions are made, S&T visions integrated into the programs, identifying stovepipes and connecting missing information, a clearer understanding of the Cyber foundation, a more holistic approach and advanced information (such as the Strategic Plan), SAGE briefing, Titan Briefing and how they are utilized, S&T mapping, and more on the history of HSSTAC.

The group also identified a few suggestions for task force creation but stressed they really needed to know what the Under Secretary's priorities were before moving forward. These ideas included: partner cultivation and leveraging, organization and management, interdisciplinary research and resiliency, cyber/CIKR nexus with a focus on physical infrastructure.

Group 2: **Rosemary James, a Supervisory Attorney Advisor** on Intellectual Property in the

DHS Office of General Counsel, moderated Group Two, which comprised of seven HSSTAC members: Yacov Haimen, Gerry Parker, Marian Greenspan, Christina Williams, Keith Bryant, Mark Maybury, and Jim Schwartz. In addition, Marlene Owens was also in attendance in an observational capacity. The group members firstly engaged the moderator with questions about the number of patents owned by DHS, the use of open source software, and the comparative structure of COEs versus research consortiums. Christina had honed her line of questioning on the topic of intellectual property and the benefits of the industry consortium model. Yacov mentioned that the academic community perceives DHS as not manageable and unfocused, and asked the group for ideas on how to change that perception. Mark suggested that S&T should emphasize project prioritization, peer-reviewed deliverables, and a comprehensive risk framework across offices. In addition, HSARPA should implement a personnel rotation program, where scientists from outside DHS are loaned for a 2-4 year period and subsequently released if performance does not reach expected levels – similar to the DARPA model. The group began a discussion on how the current S&T process for ideation is a bottom-up approach – driven by the components, rather than with a vision communicated from DHS leadership.

The group discussed the different types of stakeholders involved in COEs and federally-funded research projects, and agreed that agencies (i.e., NIST, NSF, DoD) with overlapping areas in R&D should work together. Another issue mentioned was that there is a problem with high turnover for program managers, which negatively impacts the project lifecycle and knowledge management. Lastly, it was pointed out that there has been no conversation about STEM employees or Millennials in the workforce. The Defense Department, according to Maybury, has an advanced system to track the quantity and employment profiles of STEM employees. Given that DHS claims science and technology are a large part of its identity, it is worth monitoring this information on an agency-level.

Group 3: Ted Soliday, Program Manager, Partnering for Innovation & Operational Needs thru Embedding for Effective Relationships (PIONEER), moderated group 3, which included the following HSSTAC members: James Decker, Daniel Dubno, Michael Goldblatt, Annie McKee, David Paulison, and Brock Reeve. The group discussed how the presentations from S&T needed to be better aligned with Dr. Brothers' visionary goals for S&T. When comparing the visionary goals laid out by Dr. Brothers' to the presentations from the S&T staff, it was difficult to see the connection, if any at all. The committee suggests that working on narrowing the focus to a few issues that need to be address or resolved would be more effective. Paulison pointed out that looking at what Dr. Brothers' and S&T hope to accomplish would be a good start. Followed by clearly stating the goals to determine if they are long term or short term.

The group then discussed how S&T can better illustrate leadership and accomplish their goals. Decker stated that budget distribution and investments must be clearly stated. Dubno added that money/resources seem to be too evenly distributed, some issues and projects are inherently more important than others. He questioned if the current advances, threats and innovations are being adequately addressed. Reeve questioned how decisions were made and who makes the decisions regarding what issues or tasks are central goals and peripheral goals. Threats evolve faster than solutions. Paulison added that pre-disaster mitigation is

important and needs to be addressed more. One suggestion from the group discussion was to have the committee participate in an exercise to see who they would react and work on situations faced by S&T or even present the committee with a resolved solution so that they can review a successful process within S&T to help provide Success Stories.

In addressing culture and morale at S&T, the group felt that the topic was not discussed enough. McKee commented that there should be a constant effort to address and improve the culture and morale of S&T, even with the changing leadership. Goldblatt added that S&T should identify the best and most satisfactory operating model for program managers. An Independent Project Analysis could yield a great deal of benefits.

10. RECONVENE AND LARGE GROUP DISCUSSION

John Sims, HSSTAC co-chair, opened with a few remarks about scheduling and deliverables for the next meeting. In particular, Dr. Brothers requested a whitepaper on an interdisciplinary approach to resilience, and three members (James Hendler, Christine Williams, and Steven Flynn) volunteered to accomplish this task on behalf of the group. Yacov Haimes will review the final report, prior to submission. After Tod Companion offered thanks to colleagues and staff for supporting the HSSTAC event, **Ted Wilkie**, the representative from Group One, shared their ideas and considerations to the entire committee:

- There are gaps, and regular command briefings are required to understand vision and how it intends to work in practice.
- HSSTAC and S&T need to further consider investment in cyber and better define what the boundary conditions are between other agencies and research endeavors.
- HSSTAC requests more information on SAGE, TITAN, and their interplay.
- It would be useful to see historical organizational structure charts to understand how S&T has changed over time and how it actually functions. In addition, the complete history of HSSTAC should be made available to members for context.
- Regarding the Office of Chief Scientist, Group One also wanted clarification on the type of modeling that will be used and how return-on-investment will be measured for programs.
- Group One requested a response from the Under Secretary whether or not he agrees that DHS S&T is in the storming phase, according to Tuckman's stages of group development.
- There was also a near consensus that the COE program is spread too thin, in terms of funding and topic designation. Perhaps, COE mission investments should directly relate to the top priorities.

Next, Mark Maybury presented on behalf of Group Two, and stated that there is an apparent need for better interagency coordination – a “Unity of Effort,” but on a broader level. Maybury also communicated the importance of reputation and morale in the workplace and the need for an effective measurement system. Although a comprehensive set of visions had been shared over the two days, Maybury expressed concern that S&T needs a more concrete

strategy with measurable outcomes. Similar to Group One, he also emphasized the need for a risk framework, peer-reviewed deliverables, and a personnel exchange program for HSARPA. In addition, he stated that ten year terms for COEs seemed too long, and the funding should not be spread across recipients evenly.

Lastly, Michael Goldblatt spoke for Group Three, and began with the suggestion that S&T should look for ways to align its visionary goals with the organizational culture and morale. As an example, the first visionary goal is “screening at speed,” and thus DHS should implement those new technologies and procedures here at Headquarters to show employees what we are trying to achieve. On another note, Group Three recommended that S&T create materials that depicts what programs are accomplishing each visionary goal, which also includes information on proportional resource allocation to show agency priorities. It is also worth adding what the endpoint of those programs are and how much additional funding would be required for it to be completed on time. Goldblatt pointed out that the average tenure for a political appointee is 18 months, so S&T should limit itself to no more than three primary objectives or “visionary goals.” Since there is only \$450 million in discretionary spending for program management, S&T should constantly seek out opportunities for additional sources of funding. Moreover, Goldblatt emphasized that S&T should identify programs and/or topic areas that could be delegated to state and local governments. The group also requested insight into the life of a typical S&T project from two perspectives. Firstly, regarding an existing program, the group wants to understand the internal ideation process in terms of duration and workflow. Secondly, they asked to be walked through the whole process for a program that has not yet been developed.

11. QUESTIONS FROM THE PUBLIC

Garrison addressed a series of question from **Gary Becker**, Chief Economist for Catalyst Partners, regarding S&T programs focused on pre-disaster economic preparedness and mitigation.

12. ADJOURN: **Garrison** adjourned the meeting at 3:10 p.m.

Signed: _____ (**John Sims, HSSTAC Co-Chair**)

Date: _____

NOTE: Vincent Chan, HSSTAC Co-Chair, was not able to attend this meeting.

MEETING ATTENDEES

Members:

Jim Brigham
Keith Bryant
Lee Buchanan
Phillip Coyle
William Crowell

Mark Dean
Jim Decker
Daniel Dubno
Murray J. Farr
Stephen Flynn

Michael Goldblatt
Marian Greenspan
Yacov Haimés
Eric Haseltine
James Hendler
Mark Maybury
Annie McKee
Gerry Parker
David Paulison

Brock Reeve
Jim Schwartz
John Sims
Brian Toohey
David Whelan
Roy “Chip” Wiggins
Christina Williams
Theodore “Ted” Willke

DHS Briefers and Observers:

Bishop Garrison (briefer)
Robert Griffin (briefer)
David Gersten (briefer)
William Braniff (briefer)
Matt Clark (briefer)
Gretchen Cullenberg
Suzy Dixon Rhodes
Matt Sarlouis
Ana Vazquez
Tod Companion
Mary Hanson
Mitch Erickson
Joseph Martin
Pinal Shah
Jason Robinson
Malia Farmartino
Kevin Brown
Heidi Whiteree
Rosemary James
Daryl Kramer
Paul Ragsdale
Greg Price (briefer)
Jeff Booth (briefer)
Bob Burns (briefer)
Marlene Owens (briefer)
Tom Tomaiko (briefer)
Ted Soliday
Jim Tuttle
Tyler Newton (Virtual)
Paul Bertovich (Virtual)
Lisa Sobolewski (Virtual)
Ari Schuler
Ash Cope (Virtual)
Bruce Davidson (Virtual)
Loretta Young (Virtual)
Adam Hutter (Virtual)

Others:

Gary Becker
Blake Sobozak
Guilio Busolini
Laura Dean (Virtual)
Byron Collie (Virtual)
Matthew Monetti (Virtual)
Douglass Harrison (Virtual)
Tim Bergen (Virtual)
Brian Hammond (Virtual)
Tom Leithauser (Virtual)
John Pucci (Virtual)
M Kaeris (Virtual)
Ted Logan (Virtual)
Joseph Fitch (Virtual)

NOTE: All meeting materials (listed below) are posted at <http://www.dhs.gov/st-hsstac>. No handouts were distributed during the meeting.

Meeting Documents:

N/A

Read Ahead Materials: N/A