



Metrics Used to Make DHS Center of Excellence Awards

June 5, 2015

Fiscal Year 2015 Report to Congress



Homeland
Security

Science and Technology Directorate

Message from the Under Secretary for Science and Technology

I am pleased to submit the following report, “Metrics Used to Make DHS Center of Excellence Awards,” which has been prepared by the Science and Technology Directorate.

This report was prepared pursuant to language in House Report 113-481 accompanying the *Fiscal Year 2015 Department of Homeland Security Appropriations Act* (P.L. 114-4).

Pursuant to congressional requirements, this report is being provided to the following Members of Congress:



The Honorable John R. Carter
Chairman, House Appropriations Subcommittee on Homeland Security

The Honorable Lucille Roybal-Allard
Ranking Member, House Appropriations Subcommittee on Homeland Security

The Honorable John Hoeven
Chairman, Senate Appropriations Subcommittee on Homeland Security

The Honorable Jeanne Shaheen
Ranking Member, Senate Appropriations Subcommittee on Homeland Security

Inquiries related to this report may be directed to me at (202) 254-6033 or to the Department’s Chief Financial Officer, Chip Fulghum, at (202) 447-5751.

Sincerely,

A large, stylized handwritten signature in black ink, appearing to read 'R. Brothers'.

Dr. Reginald Brothers
Under Secretary for Science and Technology
Department of Homeland Security



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I. Legislative Language

This report was prepared pursuant to language in House Report 113-481 accompanying the *Fiscal Year 2015 Department of Homeland Security (DHS) Appropriations Act* (P.L. 114-4).

House Report 113-481 states:

University Programs and Centers of Excellence

The Committee recommends \$41,000,000 for University Programs and Centers of Excellence (COE), \$10,000,000 above the request and \$1,276,000 above fiscal year 2014. This funding level will allow S&T to continue support for all existing COEs, including the new COE to be competitively awarded in the current year. The Committee directs the Department to report on and define the key metrics used to make COE awards.

II. The Selection Process for DHS Centers of Excellence

The Under Secretary for the Science and Technology Directorate (S&T) is responsible for ensuring the high caliber of research conducted by the DHS Centers of Excellence (COEs). Each DHS COE consists of one lead university and multiple partners. This arrangement brings together U.S. universities with specific expertise to collaborate and coordinate their research and educational initiatives to produce high-quality work. COE consortia also consist of partners in state and local governments, the private sector, end users, citizens, and academia, including Minority-Serving Institutions and those from Experimental Program to Stimulate Competitive Research states.

For each COE topic, DHS posts a detailed Notice of Funding Opportunity (NOFO) on grants.gov requesting applications from U.S. colleges and universities to serve as a lead institution. The DHS S&T Office of University Programs (OUP) works closely with representatives of DHS Components to identify high-priority research questions within a selected topic to include in the NOFO. This collaboration ensures that the NOFO accurately reflects the operational needs of DHS customers and homeland security enterprise (HSE) stakeholders. COE topics must be within the DHS mission, address a knowledge gap, and be appropriate for university open-source research.

OUP has established a comprehensive three-tiered review process to verify that the proposed research is high-quality science, mission-relevant, and well-managed. Each university proposal must undergo this rigorous selection and review. During each step, DHS S&T works with scientists and other professionals within and outside of government who have subject matter expertise in the topic areas, as well as experience with peer review to independently evaluate the proposed work.

Three-tiered Peer-Review Process for Centers of Excellence

Scientific Quality (External): Expert review for research quality and education programs, conducted by scientists or subject matter experts (SMEs) from academia, industry, and government.

Mission Relevance (Internal): Programmatic review for mission relevance and demonstrated capability, conducted by DHS scientists and SMEs.

Management Effectiveness (Site Visits): Onsite reviews of proposed lead institutions by the OUP management and DHS SMEs to ensure that the institutions have the capability to manage a DHS COE.

First, SMEs external to DHS assess the technical and scientific merit of the proposals through a narrative critique and discussion, resulting in a rating based on pre-established criteria with an emphasis on research quality (see Section IIIA). The results of this review panel allow for objective information from technical experts who are not affiliated

with the COE activity or funding. Only the highest rated proposals will be referred from the external to the internal review.

Second, experts from the appropriate stakeholder DHS Components and offices evaluate for mission relevancy the most highly rated proposals recommended by the external review panel, and gauge DHS's need for the proposed program of research. Internal reviewers submit their assessments in a rating based on pre-established criteria (see Section IIIB). Only the highest rated proposals will be referred from the internal review to the site visit team.

Last, a panel of S&T OUP and other DHS SMEs conduct site visits at the internal review's most highly rated lead institutions to review the proposed COE's ability to manage a COE and interview proposed COE staff, principal investigators, and major partners. The results of the site visits are rated on the basis of pre-established criteria (see Section IIIC).

Using the results from the three reviews, the Secretary, acting through the Under Secretary for Science and Technology, designates a DHS COE for a specific topic area.

III. Center of Excellence Evaluation Criteria and Metrics

As noted above, DHS's review process has three distinct phases to select COE lead and partner institutions. The phases are: (1) an external scientific quality review by a panel of peers external to DHS, (2) an internal relevancy review by a panel of DHS SMEs, and (3) site visits by a team of DHS SMEs.

Only the highest rated proposals will be referred from the external to the internal review, and only the highest rated of those will be referred from the internal review to the site visit team. Each review phase has distinct rating criteria appropriate to each of the phases noted above. The criteria are described as follows.

A. Scientific Quality Review (External)

Reviewers will rate how the proposal addresses the following criteria using numerical ratings of 1 to 5 (poor to excellent) and apply the percentage-weighting factor as indicated for an overall rating.

1. Research Program and Projects: Research Quality and Influence (75% total)

- a. *Research Program Originality and/or Innovativeness (20%)*
 - Is it original (i.e., does the proposed effort challenge and seek to shift current research or paradigms by utilizing novel theoretical concepts, approaches, or methodologies)?
 - Is it innovative (i.e., is the proposal a novel refinement, improvement, or new application of theoretical concepts, approaches, or methodologies proposed)?
 - Does this research have the potential to generate influential peer-reviewed publications in the scientific community or lead to new discoveries or areas of investigation?
 - Does the research plan involve all essential disciplines, including computer science, engineering, physical sciences, social sciences, business administration, law, and policy analysis?
- b. *Project Goals, Approaches, and Methodologies (20%)*: Reviewers will rate how the proposal themes and example projects address the following criteria:
 - Are the research goals clear and based on sound theory?
 - Are the proposed methods clearly stated and appropriate for testing the hypotheses?
 - Are the data generation or collection approaches appropriate for the research methods?
 - Is the proposed timeframe to complete the project(s) appropriate?

- c. *Program Integration and Partnerships (20%)*
 - Does the application show an appropriate balance of effort among relevant funding opportunity announcement (FOA) research theme areas?
 - Does the application show partnerships and cooperative initiatives with other institutions/organizations, including large and small businesses; federally funded research and development centers; state, local, tribal, and territorial organizations; nonprofits; and all essential academic disciplines?
 - Does the research program have an integrated approach that supports the vision and goals of the center?
 - Does the research program appropriately incorporate education initiatives?
- d. *Qualifications of Personnel and Suitability of Facilities (15%)*
 - Does the research team have the qualifications—credentials, expertise, and experience—to carry out the proposed research?
 - Are the facilities suitable for the proposed research? If so, does the applicant demonstrate a commitment from facility owners to allow researchers to use necessary facilities?

2. Workforce and Professional Development Program (20%)

- Does the proposal demonstrate a sound education plan and the ability to establish a program of study for the relevant disciplines related to DHS’s mission?
- Are the disciplines of potentially supported students relevant to DHS?
- Does the education program describe the development of new courses, certificates, degrees, or other targeted initiatives that involve students?
- Is there a plan to ensure that the student population reflects the diversity of the U.S. population?
- Is the mix between undergraduate and graduate studies appropriate?
- Does the proposal demonstrate a long-term plan to build student capacity in homeland security-relevant science, engineering, and business administration disciplines?

3. Costs (5%): Are the proposed research and education costs appropriate and reasonable?

B. DHS Relevancy Review (Internal)

Reviewers rate how proposals address the following DHS mission-relevant criteria using numerical ratings of 1 to 5 (poor to excellent) and apply the percentage-weighting factor as indicated for an overall rating.

1. Mission Relevance (60% total)

a. *Research Program (30%)*

- Do proposed projects address the research themes that DHS has identified in the FOA?
- Do proposed research and education programs relate to DHS's mission?
- Does the applicant discuss where, in what circumstances, and by whom research results would be used?
- Are the potential research outcomes and end users of the research well-described?
- Has the applicant demonstrated an understanding of DHS's existing research and development programs, information systems, and databases in relevant areas?
- Does the proposed program address a knowledge gap not already addressed by research and development programs sponsored by DHS or others?
- Is there an estimated and reasonable timeframe for making COE research results available in a usable format?
- How would the research transition from university to end user?

b. *Collaboration, Integration, Communications, and Outreach (15%)*

- Does the application demonstrate a viable plan for developing substantial and continuing engagement with the HSE?
- Does the proposal show ability to work with mission agencies?
- Is there a plan to communicate with and integrate end users into research programs?
- Does the proposal show a workable plan to communicate the center's capabilities and research results to mission agencies?

c. *Workforce Development (15%)*

- Will the applicant develop curricula that incorporate relevant case studies or/or content linked to homeland security-related science and technology issues and challenges?
- Does the proposal describe university/industry/government partnerships that could potentially provide internship experiences, employment opportunities, or career mentorships for the center's students?
- Does the proposal describe initiatives for tracking career development of the center's students post-graduation?
- Does the applicant have a plan to ensure that students and the research faculty have opportunities to work in homeland security settings?
- Does the plan incorporate information on the current workforce needs within the relevant HSE sectors?

2. Capability Gaps (20%)

- Do the research program and its individual elements focus on areas that DHS has identified as capability or knowledge gaps, either explicitly or implicitly in the FOA?

3. Transition Strategy (20%)

- Does the transition plan describe transition pathways for technologies, tools, and knowledge products to end users in the HSE?
- Does the transition plan propose a process to identify and engage end users?
- Does the applicant have a university resource (e.g., technology transition office) to provide assistance (e.g., filing invention disclosures, patents, licensing agreements)?

C. Site Visit Review

The site visit is for proposals that have sufficiently high ratings to make it to the third and final review phase. The site visit review team examines the results of the external and internal reviews and determines the extent to which applicants' proposals and any site visit materials address the following criteria. Reviewers rate applications using numerical ratings of 1 to 5 (poor to excellent) for each major category listed as follows, and apply the percentage-weighting factor as indicated for a final rating. Final ratings determine which institution becomes the COE lead, and which projects are funded from eligible lead and partner institutions.

1. Management/Administrative (30% total)

a. Ability to Lead Multidisciplinary Efforts (10%)

- Does the proposal contain a viable plan for leadership and management of the center as described in this FOA?
- Has the applicant demonstrated its ability to lead multidisciplinary, collaborative team projects that (1) are designed to address complex homeland security issues, and (2) included a variety of partners, e.g., universities, industry, national labs, international partners, and Minority Serving Institutions (MSIs)?
- Does the COE bring together partners from as many regions of the United States as practicable to participate?
- Has the applicant secured the best expertise from around the country to address DHS research priorities?

b. *Project Management (20%)*

- Does the proposal contain a viable plan for program and project management as described in this FOA?
- Has the applicant developed or proposed a plan to sponsor open competitions for research projects?
- Does the applicant identify appropriate milestones and metrics for success to monitor and track the progress of research and education activities?
- Does the applicant have a successful track record of completing research projects on time and within budget?

2. Past Performance (20% total): The following criteria refer to the applicant's existing programs and capabilities supported by DHS or any other funding source:

a. *Collaboration/Partnerships (5%)*

- Does the applicant have a track record of demonstrated engagement with the HSE?
- Does the applicant have experience conducting multidisciplinary and multi-institutional research?
- Does the applicant have existing partnerships with MSIs?
- Has the applicant demonstrated responsiveness to homeland security-related stakeholders when the applicant's expertise or assistance was requested?

b. *Integration of Research and Education (5%)*

- Has the applicant successfully integrated homeland security science, engineering, and business administration content and research activities?
- Has the applicant supported courses/workshops/training sessions that bring together relevant researchers and stakeholders?
- Has the applicant developed initiatives for tracking career development of the center's students in the HSE?

c. *Transition (5%)*

- Has the applicant successfully transitioned research to appropriate stakeholders, specifically:
 - o Developed strategic transition plans for applied research;
 - o Demonstrated experience with the technology transition process (e.g., conducting market assessments, applying for patents, filing invention disclosures, obtaining licensing agreements) from academia to the HSE;
 - o Applied best practices in testing and evaluation (e.g., those available from American Society for Testing and Materials, National Institute of Standards and Technology, or other similar organizations) to objectively

identify capabilities and limitations of projects being readied for transition; and

- Demonstrated experience with established technology test and evaluation processes (e.g., piloting, testability, reproducibility, maintainability, reliability, availability, affordability, human factors, and environmental impacts)?

d. *Assistance Agreements (5%)*

- Has the applicant successfully completed and managed an assistance agreement similar in size, scope, and relevance? If so:
 - Does the applicant have a history of completing tasks and expending government funds appropriately and on time?
 - Does the applicant have a history of submitting interim and final reports on time?
 - Does the applicant have a history of producing high-quality technical reports that meet or exceed reporting requirements?
 - Does the applicant submit appropriate and well-documented invoices on time?

3. Resource Commitment (10%)

- Does the applicant demonstrate or propose a substantive commitment to supporting a DHS COE through:
 - University-supported faculty
 - University-supported students
 - Capital investments such as lab and office space
 - Incentives (e.g., tenure and promotion procedures) that reward interdisciplinary and practical research
 - Technology transition support (e.g., technology transition office)
 - Marketing support (e.g., public affairs, media affairs, federal affairs offices)

4. Collaboration, Integration, Outreach, and Communication (10%)

- Does the proposal include a viable communication and outreach strategy that specifies how the center will communicate with its partners, across the COE network and with external stakeholders such as HSE practitioners and end users?
- Does the applicant have a plan or track record to effectively communicate with its partners so that they clearly understand how they fit in with the center and the DHS mission?
- Does the applicant have a plan or track record to effectively communicate results to homeland security stakeholders?

- Does the applicant have experience developing effective communications materials (e.g., Web sites, fact sheets, newsletters, press releases)?

5. Research Quality and Influence (20%)

- The rating for this criterion is carried over from the aggregate rating for the Research Quality and Influence criterion provided by the Phase 1 external review panel.

6. Other Factors (10%)

- DHS S&T reserves the right to consider other factors, such as geographical distribution of COE lead and partner institutions and strength of commitment to engage with and conduct mission-related research with DHS and others in the HSE.