

Congressional Budget Justification

FY 2017—Volume IV

Federal Law Enforcement Training Center, Science and Technology Directorate,
Chemical, Biological, Radiological, Nuclear and Explosives Office



**Homeland
Security**

*Department of
Homeland Security
Federal Law Enforcement Training Center
Budget Overview*



Fiscal Year 2017
Congressional Justification

i. Summary of FY Budget Estimates by Appropriation without Emergency Funding

**Department of Homeland Security
Federal Law Enforcement Training Center (FLETC)
Summary of FY 2017 Budget Estimates by Appropriation**

**Total Appropriations
(Dollars in Thousands)**

Appropriation	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017								
	Revised Enacted ¹			Enacted			Request			Total Changes			Program Changes			Adjustments-to-Base		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Operations and Support	1,037	1,012	\$258,338	1,133	1,106	\$245,038	1,095	1,068	\$242,518	(38)	(38)	(\$2,520)	-	-	-	1,095	1,068	\$242,518
Procurement, Construction and Improvements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal, Discretionary	1,037	1,012	\$258,338	1,133	1,106	\$245,038	1,095	1,068	\$242,518	(38)	(38)	(\$2,520)	-	-	-	1,095	1,068	\$242,518
Subtotal, Enacted Appropriations and Budget Estimates	1,037	1,012	\$258,338	1,133	1,106	\$245,038	1,095	1,068	\$242,518	(38)	(38)	(\$2,520)	-	-	-	1,095	1,068	\$242,518
Net, Enacted Appropriations and Budget Estimates:	1,037	1,012	\$258,338	1,133	1,106	\$245,038	1,095	1,068	\$242,518	(38)	(38)	(\$2,520)	-	-	-	1,095	1,068	\$242,518

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

ii. FY 2017 Investment Summary

N/A

iii. Status of Congressionally Requested Studies, Reports and Evaluations

**Department of Homeland Security
Federal Law Enforcement Training Center**

Fiscal Year	Due Date	Reference/Citation	Requirement	Status
FY 2017	N/A	N/A	N/A	N/A

iv. Schedule of Authorized/Unauthorized Appropriations by PPA

Budget Activity				
	Last Year of Authorization	Authorized Level	Appropriation in Last Year of Authorization	FY 2017 Request
	Fiscal Year	Amount	Amount	Amount
Operations and Support	N/A	N/A	N/A	\$242,518
- Law Enforcement Training	N/A	N/A	N/A	\$213,804
- Management and Administration	N/A	N/A	N/A	\$28,714
Procurement, Construction and Improvements	N/A	N/A	N/A	\$0
Total Direct Authorization/Appropriation				\$242,518

Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support



Fiscal Year 2017

Congressional Justification

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Schedule I – Executive Summary of Appropriation Exhibits

A. Summary of Budget Estimates by Program Project Activity- Appropriation Level

**Department of Homeland Security
Federal Law Enforcement Training Center (FLETC)
Operations & Support**

Summary of FY 2017 Budget Estimates by Program Project Activity

FY 2017 Request
(Dollars in Thousands)

Program Project Activity	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017		
	Revised Enacted ¹			Enacted			Request			Total Changes		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Law Enforcement Training	832	812	\$230,258	910	889	\$216,963	872	851	\$213,804	(38)	(38)	(\$3,159)
Management and Administration	205	200	\$28,080	223	217	\$28,075	223	217	\$28,714	-	-	\$639
Total, Operations and Support	1,037	1,012	\$258,338	1,133	1,106	\$245,038	1,095	1,068	\$242,518	(38)	(38)	(\$2,520)
Subtotal, Enacted Appropriations & Budget Estimates	1,037	1,012	\$258,338	1,133	1,106	\$245,038	1,095	1,068	\$242,518	(38)	(38)	(\$2,520)
Net, Enacted Appropriations and Budget Estimates:	1,037	1,012	\$258,338	1,133	1,106	\$245,038	1,095	1,068	\$242,518	(38)	(38)	(\$2,520)

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

Overview

The Operations and Support (O&S) appropriation is critical to ensuring FLETC can provide the necessary mission and mission support activities, salaries, and maintenance required in delivering accredited instruction for Law Enforcement Training. FLETC's O&S appropriation is divided into two Programs, Projects, and Activities (PPAs): Law Enforcement Training (LET) and Management and Administration (M&A), each providing vital support to FLETC's mission.

- **LET:** FLETC's LET PPA provides for training-related salary expenses, support equipment, supplies, and materials, as well as tuition and overhead costs associated with Basic Law Enforcement Training. This PPA also provides for salaries, travel, and supplies necessary for maintaining and executing a quality and efficient accreditation process. As enacted in the FY 2016 Consolidated Appropriation Act (P.L. 114-113), the FY 2017 LET PPA includes funding previously provided by a separate Accreditation PPA. Moreover, the LET PPA provides minor construction and maintenance, environmental compliance, and communications systems funding

- **M&A:** FLETC's M&A PPA provides for salaries, travel, equipment, and supplies necessary for mission support activities, such as the Offices of Budget, Finance, Procurement and other administrative support activities.

B. FY 2016 to FY 2017 Budget Change - Appropriation Level

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)**

	Pos.	FTE	Amount
FY 2015 Revised Enacted	-	-	-
FY 2016 Enacted	-	-	-
Adjustments-to-Base			
Transfers to and from other accounts:			
Transfer from ACI&RE to Operations and Support – LET	-	-	\$27,553
Transfer from Salaries and Expenses - LET to Operations and Support - LET	910	889	\$189,410
WCF Transfer	-	-	(\$21)
Transfer from Salaries and Expenses - M&A to Operations and Support - M&A	223	217	\$28,075
Total Transfers	1,133	1,106	\$245,017
Increases			
2017 Pay Increase	-	-	\$1,548
Annualization of 2016 Pay Raise	-	-	\$419
Performance and Learning Management System	-	-	\$284
Total, Increases	-	-	\$2,251
Decreases			
Non-Recur funds for Emergent Training Requirements	(38)	(38)	(\$4,750)
Total, Decreases	(38)	(38)	(\$4,750)
Total Other Adjustments	(38)	(38)	(\$2,499)
Total Adjustments-to-Base	1,095	1,068	\$242,518
FY 2017 Current Services	1,095	1,068	\$242,518
FY 2017 Request	1,095	1,068	\$242,518
FY 2016 to FY 2017 Change	(38)	(38)	(\$2,520)

C. FY 2017 Investment Summary - Appropriation Level

N/A

Schedule II – Program, Project, Activity (PPA) Exhibits

Exhibit D. FY 2016 to FY 2017 Budget Change- PPA Level

Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support
Management and Administration
 FY 2016 to FY 2017 Budget Change- PPA Level
 (Dollars in Thousands)

Management and Administration		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	-
Base	FY 2016 Enacted	-	-	-
Current Services	2017 Pay Increase	-	-	308
	Annualization of 2016 Pay Raise	-	-	83
	Management Adjustment	-	-	248
	Transfer from Salaries and Expenses - M&A to Operations and Support - M&A	223	217	28,075
Budget Year	FY 2017 Request	223	217	28,714
	Total Change from FY 2016 to FY 2017	-	-	639

PPA DESCRIPTION: Management and Administration

The M&A PPA provides funding for administrative support personnel salaries and benefits, which comprises 93 percent of this total program. In addition to salaries and benefits, M&A also includes funding for travel, services, and supplies for FLETC activities that provide enterprise leadership and management and/or business services such as the Office of Chief Counsel, the Washington Office, the Protocol and Communications Office, the Office of Organizational Health, and the Inspection and Compliance Division. This PPA also provides funding for financial management through the Chief Financial Officer Directorate, human capital management, acquisition oversight, administrative supplies and services, managing FLETC’s property and assets, through the Mission Readiness and Support Directorate, and other general, routine M&A requirements.

Funding requested in the M&A PPA supports current services and is allocated as follows:

- Salaries and Benefits – \$26.746 million 93.1% – 217 FTE
 - Administrative offices – Procurement; Human Capital; Environmental and Safety and Asset Management – \$13.373 million – 50% – 108 FTE
 - Management offices – Protocol and Communications; Office of Chief Counsel; Washington Office and Office of Organizational Health and Inspection and Compliance Division – \$7.489 million - 28% - 61 FTE
 - Financial Management – Budget and Finance – \$5.884 million – 22% – 48 FTE
- Supplies, Services, Equipment and other M&A requirements – \$1.484 million – 5.2%
- Travel – \$484 thousand – 1.7%

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support
Management and Administration**

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted ¹				FY 2016 Enacted				FY 2017 Request				FY 2016 to FY 2017 Change			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	205	200	\$26,359	\$131	223	217	\$26,355	\$120	223	217	\$26,746	\$122	-	-	\$391	\$2

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

** FY 2015 and FY2016 funding does not account for Unobligated Balance

NARRATIVE EXPLANATION OF CHANGES PAY COST DRIVERS:

- **FTE Change FY 2016-2017:** There is no FTE change from FY 2016 – FY 2017.
- **Personnel Compensation and Benefits (PC&B) Change FY 2016-2017:** The addition of \$391 thousand in pay is attributed to the annual pay increase, and annualization of the 2016 pay raise.
- **Average Cost Change FY 2016-2017:** Average cost increased by \$2 thousand as a result of annualization and the 2017 pay raise.
- FY 2017 Planned Performance Award and Bonus amount is \$320 thousand. This request remains in line with OPM Awards Guidance on Spending Limitation.

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support
Management and Administration
Cost Drivers (Non-Pay) - PPA Level (\$000s)**

Appropriation - Management and Administration	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Service Contracts	\$629	\$766	\$857	\$91
Travel	\$423	\$423	\$484	\$61
Supplies and Equipment	\$519	\$362	\$437	\$75
Total	\$1,571	\$1,551	\$1,778	\$227

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

NARRATIVE EXPLANATION OF CHANGES – NON-PAY COST DRIVERS:

- **Service Contracts** – The increase in goods and services contracts of \$91 thousand is attributed to increased labor costs associated with contract labor as well as the need for staff development training that has been deferred in prior years. The FY 2017 request support contracts consists of services such as:
 - Portion of Glynco logistics services \$400 thousand
 - Arbitration services \$100 thousand
 - Chaplain services \$20 thousand
 - Legal research subscriptions \$20 thousand

- **Supplies and Equipment** – The increase in supplies and equipment of \$75 thousand is attributed to replacement of equipment that had been deferred in prior years. The FY 2017 request consists of:
 - Office equipment \$100 thousand
 - Safety supplies \$65 thousand
 - General supplies \$57 thousand
 - Furniture \$25 thousand
 - Software licenses \$20 thousand

- **Travel** – The increase in the travel of \$61 thousand is attributed to normal inflation and a managerial adjustment.

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support
Law Enforcement Training**
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)

Law Enforcement Training		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	-
Base	FY 2016 Enacted	-	-	-
Current Services	2017 Pay Increase	-	-	1,240
	Annualization of 2016 Pay Raise	-	-	336
	Management Adjustment	-	-	(248)
	Non-Recur funds for Emergent Training Requirements	(38)	(38)	(4,750)
	Performance and Learning Management System	-	-	284
	Transfer from ACI&RE to Operations and Support – LET	-	-	27,553
	Transfer from Salaries and Expenses - LET to Operations and Support – LET	910	889	189,410
	WCF Transfer	-	-	(21)
Budget Year	FY 2017 Request	872	851	213,804
	Total Change from FY 2016 to FY 2017	(38)	(38)	(3,159)

PPA DESCRIPTION: Law Enforcement Training

FLETC’s LET PPA provides for training-related salary expenses, support equipment, supplies, and materials, as well as tuition and overhead costs associated with Basic Law Enforcement Training for over 90 Partner Organizations and an annual average throughput of 10,000 basic training students. Because of sequestration and late enactment of appropriation bills, the average annual throughput from FY 2012 through FY 2015 has been low; the FY 2017 request reflects an increase in anticipated throughput when compared to average annual student throughput. LET is funded to provide tuition and 50% of the instructor requirements for basic training, and 50% of the instructor requirement for advanced training. This PPA also provides for salaries, travel, and supplies necessary for maintaining and executing a quality and efficient accreditation process. As enacted in the FY 2016 Consolidated Appropriations Act (P.L. 114-113), the FY 2017 LET PPA includes funds previously provided by a separate Accreditation PPA. Moreover, the LET PPA provides minor construction and maintenance, environmental compliance, and communications systems funding.

Funding requested in the LET PPA provides for current services and is allocated as follows:

At Current Services, the LET PPA provides for the following:

- \$101.767 million for salaries and benefits for the FLETC's Director's office, all of the training directorates to include the Glynco site, Artesia site, Charleston site, Cheltenham site and Office of Domestic and International Training based on historical spending, the 2017 pay raise and annualization of the 2016 pay raise.
- \$50.748 million for tuition and overhead costs associated with Basic Law Enforcement Training for 15,057 projected students and 111,128 projected student weeks.
- \$25.811 million for minor construction and maintenance, which provides alterations and maintenance for approximately 300 buildings at four geographically distinct sites for projects such as:
 - Repair/maintenance of HVAC systems, electrical systems, elevators and fire alarm systems
 - Sewage/potable water systems, boiler systems and storm water drainage systems
 - ADA accessibility issues
 - Roof repair/replacement, roadway repairs, building renovation
 - Minor construction of buildings/structures as necessary.
- \$31.187 million for supplies, services, equipment and other O&S requirements.
- \$4.044 million for official staff travel.
- \$1.325 million for salaries, travel, and supplies necessary for maintaining and executing FLETC's accreditation process;
- \$1.200 million for environmental compliance, which ensures compliance with the Environmental Protection Agency and State environmental laws and regulations;
- \$1.022 million for communications systems funding to repair and maintain or replace the fiber optics telecommunications cable system.
- \$1.500 million for the on-line campus operations, maintenance and licensing, which provides an electronic learning environment for FLETC's training capacity expansion;
- \$200 thousand for modeling and simulation that enhances existing training delivery systems and methodologies by integrating training simulation technologies into various training programs for the FLETC and its Partner Organizations.

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support
Law Enforcement Training**

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted ¹				FY 2016 Enacted				FY 2017 Request				FY 2016 to FY 2017 Change			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	832	812	\$99,838	\$122	910	889	\$93,423	\$117	872	851	\$101,767	\$119	(38)	(38)	\$8,344	\$2

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

** FY 2015 and FY2016 funding does not account for Unobligated Balance

NARRATIVE EXPLANATION OF CHANGES – PAY COST DRIVERS:

- **FTE Change FY 2016-2017:** A FY 2017 decrease of (-38) FTE is due to non-recurring additional FTE provided in FY 2016 to accommodate emergent training requirements.
- **PC&B Change FY 2016-2017:** Non-recurrence of 38 FTE in addition to the annual pay increase and annualization of the 2016 pay raise net a \$3.174 million decrease.
- **Average Cost Change FY 2016-2017:** Average cost increased by \$2 thousand as a result of annualization and the 2017 pay raise.
- FY 2017 Planned Performance Award and Bonus amount is \$1 million. This request remains in line with OPM Awards Guidance on Spending Limitation.

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support
Law Enforcement Training
Cost Drivers (Non-Pay) - PPA Level (\$000s)**

Appropriation - Law Enforcement Training	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Tuition and Training Costs	\$54,154	\$38,981	\$50,748	\$11,767
Land and Structure	\$26,081	\$25,811	\$25,811	-
Other Support Contracts	\$30,443	\$44,623	\$25,223	(\$19,400)
Rental Payments, Communications and Utilities	\$4,532	\$6,643	\$3,669	(\$2,974)
Equipment	\$3,731	\$5,469	\$3,039	(\$2,430)
Supplies	\$3,719	\$5,451	\$3,030	(\$2,421)
Total	\$122,660	\$126,978	\$111,520	(\$15,458)

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

**Tuition and training costs are included in support contracts, rental payments, communications, utilities, printing, supplies and equipment object classes.

NARRATIVE EXPLANATION OF CHANGES – NON-PAY COST DRIVERS:

- **Tuition and Training Costs** – The tuition and training costs for Basic students is one of the largest cost drivers, second only to pay and benefits. The tuition cost crosses many cost drivers. Tuition consists of support contracts, rental payments, communications, utilities, printing, supplies and equipment.
- **Land and Structure** – The individual projects and improvements supported by the Minor Construction and Maintenance funding fall below the threshold for inclusion in the Procurement, Construction, and Improvements appropriation. Consequently the \$25.811 million associated with this activity, as Land and Structure, has been transferred into the LET PPA. This accounts for all of the funds in land and structures. The FY 2017 requirements include:
 - Minor Construction and Maintenance at each site:
 - Glynco \$5 million
 - Artesia \$4 million
 - Charleston \$3 million
 - Cheltenham \$3 million
 - Roof repairs/replacements, Glynco \$2 million
 - Storm drainage and paving repairs \$1 million
 - Bldg. 86 exterior upgrades – Glynco \$800 thousand
 - Replace underground chilled water piping \$400 thousand

- **Other Support Contracts** – The decrease of (\$19.400) million in the support contracts is attributed to the Working Capital Fund (WCF) transfer and the carryover adjustment. The FY 2017 request support contracts consists of services such as:
 - Security \$8.21 million
 - Field Office Support Contracts (FOSS) \$7.04 million
 - Janitorial \$3.37 million
 - Facilities and ground maintenance \$2.80 million
 - Roleplayers \$2.22 million
 - Transportation \$1.58 million

- **Rental Payments, Communications and Utilities** – The decrease of (\$2.974) million is attributed to the WCF transfer and the carryover adjustment. The FY 2017 request consists of services such as:
 - Utilities, i.e. electricity, water, sewer \$3.032 million
 - Cellular and wireless services \$627 thousand
 - Rental payments \$7 thousand

- **Supplies** - The decrease of (\$2.421) million is attributed to the WCF transfer and the carryover adjustment.

- **Equipment** - The decrease of (\$2.430) million is attributed to the WCF transfer and the carryover adjustment.

Schedule III – Other Exhibits

Exhibit E. Justification of Proposed Legislative Language

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support**

[SALARIES AND EXPENSES] OPERATIONS AND SUPPORT

For necessary expenses of the Federal Law Enforcement Training Center, including materials and support costs of Federal law enforcement basic training; the purchase of not to exceed 117 vehicles for police-type use and hire of passenger motor vehicles; expenses for student athletic and related activities; the conduct of and participation in firearms matches and presentation of awards; public awareness and enhancement of community support of law enforcement training; room and board for student interns; a flat monthly reimbursement to employees authorized to use personal mobile phones for official duties; and services as authorized by Section 3109 of Title 5, United States Code; [~~\$217,485,000~~]~~\$242,518,000~~; of which up to [~~\$38,981,000~~]~~\$50,748,000~~ shall remain available until September 30, [2017]2018, for materials and support costs of Federal law enforcement basic training; *of which \$27,553,000 shall remain available until September 30, 2021, for procurement, minor construction, and improvements as necessary for the real property and facilities of the Federal Law Enforcement Training Center*; and of which not to exceed \$7,180 shall be for official reception and representation expenses: *Provided, That the Center is authorized to distribute funds to Federal law enforcement agencies for expenses incurred participating in training accreditation: Provided further, That the Center is authorized to obligate funds in anticipation of reimbursements from agencies receiving training sponsored by the Center, except that total obligations at the end of the fiscal year shall not exceed total budgetary resources available at the end of the fiscal year: Provided further, That Section 1202(a) of Public Law 107–206 (42 U.S.C. 3771 note), as amended under this heading in Title 4 of Public Law 114–4, is further amended by striking "December 31, [2017] 2018" and inserting "December 31, [2018] 2019": Provided further, That the Director of the Federal Law Enforcement Training Center shall schedule basic or advanced law enforcement training, or both, at all four training facilities under the control of the Federal Law Enforcement Training Center to ensure that such training facilities are operated at the highest capacity throughout the fiscal year: Provided further, That the Federal Law Enforcement Training Accreditation Board, including representatives from the Federal law enforcement community and non-Federal accreditation experts involved in law enforcement training, shall lead the Federal law enforcement training accreditation process to continue the implementation of measuring and assessing the quality and effectiveness of Federal law enforcement training programs, facilities, and instructors. (Department of Homeland Security Appropriations Act, 2016.)*

Explanation of Proposed Changes

The legislative language associated with this account has been updated and streamlined to reflect the Department's new Common Appropriations Structure. Funding amounts have been updated to reflect the FY 2017 President's Budget.

Language providing accreditation-related reimbursements has been modified to reflect that funding no longer needs to be designated as no-year funds

Exhibit F. Summary of Fee Collections and Carryover

N/A

Exhibit G. Summary of Reimbursable Resources

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support**
Summary of Reimbursable Resources
(Dollars in Thousands)

Collections by Source:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
DHS - Office of Intelligence and Analysis	-	-	-	-	-	-	14	14	\$1,950	14	14	\$1,950
Department of Justice, Bureau of Prisons	-	-	-	-	-	-	-	-	\$4,155	-	-	\$4,155
Department of Treasury, IRS	-	-	-	-	-	-	3	3	\$1,338	3	3	\$1,338
Department of Justice, Alcohol, Tobacco & Firearms	-	-	-	-	-	-	14	14	\$4,247	14	14	\$4,247
Department of Defence, Air Force	-	-	-	-	-	-	6	6	\$2,915	6	6	\$2,915
Department of Interior, Indian Affairs	-	-	-	-	-	-	15	15	\$3,716	15	15	\$3,716
Department of Homeland Security, CBP	-	-	-	-	-	-	-	-	\$18,392	-	-	\$18,392
Various	-	-	-	-	-	-	25	25	\$33,741	25	25	\$33,741
DHS - Coast Guard	-	-	-	-	-	-	5	5	\$4,819	5	5	\$4,819
DHS - Immigration and Customs Enforcement	-	-	-	-	-	-	-	-	\$6,328	-	-	\$6,328
DHS - Transportation and Security Administration	-	-	-	-	-	-	8	8	\$7,208	8	8	\$7,208
FPS	-	-	-	-	-	-	10	10	\$4,792	10	10	\$4,792
Customs and Border Protection, Border Patrol	-	-	-	-	-	-	-	-	\$16,703	-	-	\$16,703
Department of State	-	-	-	-	-	-	-	-	\$696	-	-	\$696
Total Budgetary Resources	-	-	-	-	-	-	100	100	\$111,000	100	100	\$111,000

Obligations by Program/Project Activity:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Operations	-	-	-	-	-	-	100	100	\$111,000	100	100	\$111,000
Total Obligations	-	-	-	-	-	-	100	100	\$111,000	100	100	\$111,000

Exhibit H. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support
 (Dollars in Thousands)

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Law Enforcement Training	-	-	\$1,901	\$1,901
Total Working Capital Fund	-	-	\$1,901	\$1,901

Exhibit I. Capital Investment and Construction Initiative Listing

N/A

Exhibit J. Object Class Breakout by Appropriation

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support**
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$88,136	\$83,721	\$89,749	\$6,028
11.3 Other than Full-Time Permanent	\$931	\$873	\$950	\$77
11.5 Other Personnel Compensation	\$3,550	\$3,372	\$3,614	\$242
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	\$25	\$24	\$25	\$1
12.1 Civilian Personnel Benefits	\$33,395	\$31,628	\$34,012	\$2,384
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	\$160	\$160	\$163	\$3
Total, Personnel and Other Compensation Benefits	\$126,197	\$119,778	\$128,513	\$8,735
Other Object Classes				
21.0 Travel and Transportation of Persons	\$5,069	\$4,772	\$4,528	(\$244)
22.0 Transportation of Things	\$999	\$935	\$869	(\$66)
23.1 Rental Payments to GSA	-	-	-	-
23.2 Rental Payments to Others	\$11	\$10	\$10	-
23.3 Communications, Utilities, and Misc. Charges	\$10,285	\$9,624	\$8,987	(\$637)
24.0 Printing and Reproduction	\$675	\$632	\$589	(\$43)
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$4,459	\$4,206	\$3,944	(\$262)
25.2 Other Services from Non-Federal Sources	\$9,826	\$9,341	\$8,848	(\$493)
25.3 Other Goods and Services from Federal Sources	\$4,653	\$4,360	\$4,101	(\$259)
25.4 Operation and Maintenance of Facilities	\$32,737	\$30,716	\$28,648	(\$2,068)
25.5 Research and Development Contracts	-	-	-	-
25.6 Medical Care	\$2,997	\$2,812	\$2,621	(\$191)
25.7 Operation and Maintenance of Equipment	\$16,237	\$15,201	\$14,215	(\$986)
25.8 Subsistence & Support of Persons	\$496	\$469	\$440	(\$29)
26.0 Supplies and Materials	\$8,616	\$8,105	\$7,610	(\$495)
31.0 Equipment	\$8,928	\$8,195	\$7,706	(\$489)
32.0 Land and Structures	\$26,081	\$25,811	\$25,811	-
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	-	-	-	-
42.0 Insurance Claims and Indemnities	\$53	\$53	\$61	\$8
43.1 Interest and Dividends	\$19	\$18	\$17	(\$1)
43.2 Immigration Fees	-	-	-	-
44.0 Refunds	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
91.0 Unvouchered	-	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$132,141	\$125,260	\$119,005	(\$6,255)
Total, Direct Obligations	\$258,338	\$245,038	\$247,518	\$2,480
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	(\$5,000)	(\$5,000)
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$258,338	\$245,038	\$242,518	(\$2,520)

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

** Tuition and training costs are included in support contracts, rental payments, communications, utilities, printing, supplies and equipment object classes.

Exhibit K. Object Class Breakout by PPA

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support
Law Enforcement Training**
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$68,671	\$64,259	\$69,999	\$5,740
11.3 Other than Full-Time Permanent	\$903	\$845	\$922	\$77
11.5 Other Personnel Compensation	\$2,766	\$2,588	\$2,818	\$230
11.8 Special Personal Services Payments	\$23	\$22	\$23	\$1
12.1 Civilian Personnel Benefits	\$27,475	\$25,709	\$28,005	\$2,296
Total, Personnel and Compensation Benefits	\$99,838	\$93,423	\$101,767	\$8,344
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$4,646	\$4,349	\$4,044	(\$305)
22.0 Transportation of Things	\$999	\$935	\$869	(\$66)
23.2 Rental Payments to Others	\$11	\$10	\$10	-
23.3 Communications, Utilities, and Misc. Charges	\$10,282	\$9,621	\$8,984	(\$637)
24.0 Printing and Reproduction	\$674	\$631	\$588	(\$43)
25.1 Advisory and Assistance Services	\$4,349	\$4,072	\$3,794	(\$278)
25.2 Other Services from Non-Federal Sources	\$9,307	\$8,709	\$8,141	(\$568)
25.3 Other Goods and Services from Federal Sources	\$4,634	\$4,337	\$4,075	(\$262)
25.4 Operation and Maintenance of Facilities	\$32,734	\$30,712	\$28,644	(\$2,068)
25.6 Medical Care	\$2,963	\$2,772	\$2,576	(\$196)
25.7 Operation and Maintenance of Equipment	\$16,217	\$15,177	\$14,188	(\$989)
25.8 Subsistence & Support of Persons	\$479	\$448	\$417	(\$31)
26.0 Supplies and Materials	\$8,475	\$7,933	\$7,418	(\$515)
31.0 Equipment	\$8,550	\$8,005	\$7,461	(\$544)
32.0 Land and Structures	\$26,081	\$25,811	\$25,811	-
43.1 Interest and Dividends	\$19	\$18	\$17	(\$1)
Total, Other Object Classes	\$130,420	\$123,540	\$117,037	(\$6,503)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	(\$5,000)	(\$5,000)
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total, Adjustments	-	-	(\$5,000)	(\$5,000)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Total Requirements	\$230,258	\$216,963	\$213,804	(\$3,159)
Full Time Equivalents	812	889	851	(38)

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

**FY 2015 and FY2016 funding does not account for Unobligated Balance

***Tuition and training costs are included in support contracts, rental payments, communications, utilities, printing, supplies and equipment object classes.

Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support
Management and Administration
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$19,465	\$19,462	\$19,750	\$288
11.3 Other than Full-Time Permanent	\$28	\$28	\$28	-
11.5 Other Personnel Compensation	\$784	\$784	\$796	\$12
11.8 Special Personal Services Payments	\$2	\$2	\$2	-
12.1 Civilian Personnel Benefits	\$5,920	\$5,919	\$6,007	\$88
13.0 Benefits for Former Personnel	\$160	\$160	\$163	\$3
Total, Personnel and Compensation Benefits	\$26,359	\$26,355	\$26,746	\$391
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$423	\$423	\$484	\$61
23.3 Communications, Utilities, and Misc. Charges	\$3	\$3	\$3	-
24.0 Printing and Reproduction	\$1	\$1	\$1	-
25.1 Advisory and Assistance Services	\$110	\$134	\$150	\$16
25.2 Other Services from Non-Federal Sources	\$519	\$632	\$707	\$75
25.3 Other Goods and Services from Federal Sources	\$19	\$23	\$26	\$3
25.4 Operation and Maintenance of Facilities	\$3	\$4	\$4	-
25.6 Medical Care	\$34	\$40	\$45	\$5
25.7 Operation and Maintenance of Equipment	\$20	\$24	\$27	\$3
25.8 Subsistence & Support of Persons	\$17	\$21	\$23	\$2
26.0 Supplies and Materials	\$141	\$172	\$192	\$20
31.0 Equipment	\$378	\$190	\$245	\$55
42.0 Insurance Claims and Indemnities	\$53	\$53	\$61	\$8
Total, Other Object Classes	\$1,721	\$1,720	\$1,968	\$248
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$28,080	\$28,075	\$28,714	\$639
Full Time Equivalents	200	217	217	-

Reflects reprogrammings/transfers, as applicable, and actual FTE.

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Exhibit L. Permanent Positions by Grade

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support
Permanent Positions by Grade**

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES	-	-	11	11
GS-15	-	-	83	83
GS-14	-	-	138	138
GS-13	-	-	322	322
GS-12	-	-	280	280
GS-11	-	-	87	87
GS-9	-	-	75	75
GS-8	-	-	29	29
GS-7	-	-	15	15
GS-6	-	-	4	4
GS-5	-	-	4	4
GS-4	-	-	3	3
Other Graded Positions	-	-	44	44
Total Permanent Positions	-	-	1,095	1,095
Unfilled Positions EOY	-	-	27	27
Total Permanent Employment EOY	-	-	-	-
Headquarters	-	-	859	859
U.S. Field	-	-	234	234
Foreign Field	-	-	2	2
Total, Operations and Support:	-	-	1,095	1,095
Full Time Equivalents	-	-	1,068	1,068
Average ES Salary	-	-	169,600	169,600
Average GS Salary	-	-	90,400	90,400
Average Grade	-	-	12	12

Exhibit M. Changes in Full Time Employment

**Department of Homeland Security
Federal Law Enforcement Training Center
Operations & Support**

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>
Increases			
Transfer from Salaries and Expenses - LET to Operations and Support – LET	-	-	889
Transfer from Salaries and Expenses - M&A to Operations and Support - M&A	-	-	217
Decreases			
Non-Recur funds for Emergent Training Requirements			(38)
Year End Actuals/Estimated FTEs:	-	-	1,068

Department of Homeland Security
Federal Law Enforcement Training Center
Procurement, Construction and Improvements



Fiscal Year 2017

Congressional Justification

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Schedule I – Executive Summary of Appropriation Exhibits

A. Summary of Budget Estimates by Program Project Activity- Appropriation Level

Department of Homeland Security
Federal Law Enforcement Training Center (FLETC)
Procurement, Construction and Improvements
 Summary of FY 2017 Budget Estimates by Program Project Activity
 FY 2017 Request
 (Dollars in Thousands)

Program Project Activity	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017		
	Revised Enacted			Enacted			Request			Total Changes		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Law Enforcement Training	-	-	-	-	-	-	-	-	-	-	-	-
Total, Procurement, Construction and Improvements	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal, Enacted Appropriations & Budget Estimates	-	-	-	-	-	-	-	-	-	-	-	-
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	-	-	-	-	-	-	-	-	-	-	-	-

Overview

The Procurement, Construction and Improvements (PC&I) appropriation supports FLETC’s requirements for planning, operational development, engineering, and asset procurement necessary in providing the facilities, equipment, and information technology required for conducting basic, advanced, specialized, and refresher training for Federal law enforcement personnel. It enables FLETC to make prudent investments in facility expansion or construction as necessitated by ever evolving Law Enforcement training needs, such as construction of the Intermodal site, completed in 2012 and built in response to increased threats to mass transit systems, and the need for training to combat or prevent catastrophic events. PC&I additionally allows for investment in equipment and information technology used to improve and enhance the training experience, as well as broaden availability of Law Enforcement training. Funds provided through this account support the PC&I of personal property greater than \$250,000 and real property greater than \$2 million.

Although FLETC does not have any planned direct-funded projects that meet the thresholds for inclusion in its PC&I appropriations request for FY 2017, this submission is provided to reflect receipt of anticipated reimbursements for FY 2017. FLETC anticipates future year submissions will include PC&I funding requests, as appropriate.

B. FY 2016 to FY 2017 Budget Change - Appropriation Level

N/A

C. FY 2017 Investment Summary - Appropriation Level

N/A

Schedule II – Program, Project, Activity (PPA) Exhibits

Exhibit D. FY 2016 to FY 2017 Budget Change- PPA Level

**Department of Homeland Security
Federal Law Enforcement Training Center
Procurement, Construction and Improvements
Law Enforcement Training
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)**

PPA DESCRIPTION:

No funding is requested for this PPA in FY 2017

FLETC anticipates future year submissions will include PC&I requests, as appropriate.

**Department of Homeland Security
Federal Law Enforcement Training Center
Procurement, Construction and Improvements
Law Enforcement Training**

NARRATIVE EXPLANATION OF CHANGES PAY COST DRIVERS:

- **FTE Change FY 2016-2017: N/A**
- **PC&B Change FY 2016-2017: N/A**
- **Average Cost Change FY 2016-2017: N/A**

Schedule III – Other Exhibits

Exhibit E. Justification of Proposed Legislative Language

[ACQUISITIONS, CONSTRUCTION, IMPROVEMENTS, AND RELATED EXPENSES] *PROCUREMENT, CONSTRUCTION, AND IMPROVEMENTS*

For [acquisition of necessary additional real property and facilities, construction, and ongoing maintenance, facility improvements, and related expenses] *planning, operational development, engineering, and purchases prior to sustainment and for information technology-related procurement, construction, and improvements, including non-tangible assets* of the Federal Law Enforcement Training Center, [\$27,553,000] \$0, to remain available until September 30, [2020]2021: *Provided*, That the Center is authorized to accept reimbursement to this appropriation from government agencies requesting the construction of special use facilities. (*Department of Homeland Security Appropriations Act, 2016.*)

Explanation of Proposed Change

The legislative language associated with this account has been updated and streamlined to reflect the Department's new Common Appropriations Structure. Funding amounts have been updated to reflect the FY 2017 President's Budget.

Exhibit F. Summary of Fee Collections and Carryover

N/A

Exhibit G. Summary of Reimbursable Resources

**Department of Homeland Security
Federal Law Enforcement Training Center
Procurement, Construction and Improvements**
Summary of Reimbursable Resources
(Dollars in Thousands)

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Collections by Source:												
Immigration & Customs Enforcement	-	-	-	-	-	-	-	-	\$200	-	-	\$200
Various	-	-	-	-	-	-	-	-	\$22,000	-	-	\$22,000
Customs and Border Protection	-	-	-	-	-	-	-	-	\$39,500	-	-	\$39,500
Transportation Security Administration	-	-	-	-	-	-	-	-	\$10,100	-	-	\$10,100
DHS Science & Technology	-	-	-	-	-	-	-	-	\$2,820	-	-	\$2,820
Total Budgetary Resources	-	-	-	-	-	-	-	-	\$74,620	-	-	\$74,620

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Obligations by Program/Project Activity:												
Construction	-	-	-	-	-	-	-	-	\$74,620	-	-	\$74,620
Total Obligations	-	-	-	-	-	-	-	-	\$74,620	-	-	\$74,620

Exhibit H. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

N/A

Exhibit I. Capital Investment and Construction Initiative Listing

N/A

Exhibit J. Object Class Breakout by Appropriation

N/A

Exhibit K. Object Class Breakout by PPA

**Department of Homeland Security
Federal Law Enforcement Training Center
Procurement, Construction and Improvements
Law Enforcement Training
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	-	-	-	-
Full Time Equivalent	-	-	-	-

Exhibit L. Permanent Positions by Grade

N/A

Exhibit M. Changes in Full Time Employment

N/A

Department of Homeland Security

*Federal Law Enforcement Training Center
Salaries and Expenses*



Fiscal Year 2017
Congressional Justification

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II. Summary of FY 2017 Budget Estimates by Program/Project Activity (PPA)

Department of Homeland Security Federal Law Enforcement Training Center Salaries and Expenses:

Summary of FY 2017 Budget Estimates by Program Project Activity

FY 2017 Request (Dollars in Thousands)

Program Project Activity	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017								
	Revised Enacted			Enacted			Request			Total Changes			Program Changes			Adjustments-to-Base		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Management and Administration	205	200	\$28,080	223	217	\$28,075	-	-	-	-	-	-	-	-	-	(223)	(217)	(\$28,075)
Law Enforcement Training	825	805	\$201,122	910	889	\$189,410	-	-	-	-	-	-	-	-	-	(910)	(889)	(\$189,410)
Accreditation	7	7	\$1,295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total, Salaries and Expenses:	1,037	1,012	\$230,497	1,133	1,106	\$217,485	-	-	-	-	-	-	-	-	-	(1,133)	(1,106)	(\$217,485)
Subtotal, Enacted Appropriations & Budget Estimates	1,037	1,012	\$230,497	1,133	1,106	\$217,485	-	-	-	-	-	-	-	-	-	(1,133)	(1,106)	(\$217,485)
505 Rescission	-	-	(520)	-	-	(558)	-	-	-	-	-	-	-	-	-	-	-	558
Net, Enacted Appropriations and Budget Estimates:	1,037	1,012	\$229,977	1,133	1,106	\$216,927	-	-	-	-	-	-	-	-	-	(1,133)	(1,106)	(\$216,927)

III. Current Services Program Description by PPA

**Department of Homeland Security
Federal Law Enforcement Training Center
Management and Administration
Program Performance Justification**
(Dollars in Thousands)

PPA: Management and Administration

	Perm. Pos.	FTE	Amount
FY 2015 Revised Enacted	205	200	\$28,080
FY 2016 President's Budget	223	217	\$28,075
2017 Adjustments-to-Base	(223)	(217)	(\$28,075)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	(223)	(217)	(28,075)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the M&A transitioning to a Common Appropriation Structure, FY 2016 base funds will be transferred out as follows:

Management and Administration		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	205	200	28,080
Base	FY 2016 Enacted	223	217	28,075
Current Services	From Salaries and Expenses - M&A to Operations and Support - M&A	(223)	(217)	(28,075)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	(223)	(217)	(28,075)

**Department of Homeland Security
Federal Law Enforcement Training Center
Law Enforcement Training
Program Performance Justification**
(Dollars in Thousands)

PPA: Law Enforcement Training

	Perm. Pos.	FTE	Amount
FY 2015 Revised Enacted	825	805	\$201,122
FY 2016 President's Budget	910	889	\$189,410
2017 Adjustments-to-Base	(910)	(889)	(\$189,410)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	(910)	(889)	(189,410)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out as follows:

Law Enforcement Training		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	825	805	201,122
Base	FY 2016 Enacted	910	889	189,410
Current Services	From Salaries and Expenses - LET to Operations and Support - LET	(910)	(889)	(189,410)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	(910)	(889)	(189,410)

**Department of Homeland Security
Federal Law Enforcement Training Center
Accreditation
Program Performance Justification**
(Dollars in Thousands)

PPA: Accreditation

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	7	7	\$1,295
FY 2016 President's Budget	-	-	-
2017 Adjustments-to-Base	-	-	-
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	-

CURRENT SERVICES PROGRAM DESCRIPTION:

This account was transferred to the Law Enforcement Training PPA in FY 2016:

Accreditation		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	7	7	1,295
Base	FY 2016 Enacted	-	-	-
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	-

V. Exhibits and Other Supporting Material

B. FY 2016 to FY 2017 Budget Change

Department of Homeland Security Federal Law Enforcement Training Center

Salaries and Expenses:

FY 2016 to FY 2017 Budget Change

(Dollars in Thousands)

	Pos.	FTE	Amount
FY 2015 Revised Enacted	1,037	1,012	\$230,497
FY 2016 Enacted	1,133	1,106	\$217,485
Adjustments-to-Base			
Transfers to and from other accounts:			
From Salaries and Expenses - M&A to Operations and Support - M&A	(223)	(217)	(\$28,075)
From Salaries and Expenses - LET to Operations and Support - LET	(910)	(889)	(\$189,410)
Total Transfers	(1,133)	(1,106)	(\$217,485)
Total Adjustments-to-Base	(1,133)	(1,106)	(\$217,485)
FY 2017 Current Services	(1,133)	(1,106)	(\$217,485)
FY 2017 Request	-	-	-
FY 2016 to FY 2017 Change	(1,133)	(1,106)	(\$217,485)

D. Summary of Reimbursable Resources

**Department of Homeland Security
Federal Law Enforcement Training Center
Salaries and Expenses:
Summary of Reimbursable Resources
(Dollars in Thousands)**

Collections by Source:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
DHS - Office of Intelligence and Analysis	14	14	\$2,031	14	14	\$1,950	-	-	-	(14)	(14)	(\$1,950)
Department of Justice, Bureau of Prisons	-	-	\$3,655	-	-	\$4,155	-	-	-	-	-	(\$4,155)
Department of Treasury, IRS	1	1	\$1,219	1	1	\$1,338	-	-	-	(1)	(1)	(\$1,338)
Department of Justice, Alcohol, Tobacco & Firearms	13	13	\$4,327	13	13	\$4,247	-	-	-	(13)	(13)	(\$4,247)
Department of Defence, Air Force	6	6	\$2,698	6	6	\$2,915	-	-	-	(6)	(6)	(\$2,915)
Department of Interior, Indian Affairs	13	13	\$3,022	13	13	\$3,716	-	-	-	(13)	(13)	(\$3,716)
Department of Homeland Security, CBP	13	12	\$11,845	13	12	\$18,392	-	-	-	(13)	(12)	(\$18,392)
DHS - United States Coast Guard	4	4	\$4,282	4	4	\$4,819	-	-	-	(4)	(4)	(\$4,819)
Various	17	16	\$27,856	17	16	\$34,064	-	-	-	(17)	(16)	(\$34,064)
DHS - Immigration and Customs Enforcement	-	-	\$5,224	-	-	\$6,321	-	-	-	-	-	(\$6,321)
DHS - Transportation and Security Administration	14	14	\$6,395	14	14	\$7,208	-	-	-	(14)	(14)	(\$7,208)
FPS	16	15	\$2,460	16	15	\$4,792	-	-	-	(16)	(15)	(\$4,792)
Customs and Border Protection, Border Patrol	-	-	\$3,630	-	-	\$16,703	-	-	-	-	-	(\$16,703)
Department of State	-	-	\$2,155	-	-	\$380	-	-	-	-	-	(\$380)
Total Budgetary Resources	111	108	\$80,799	111	108	\$111,000	-	-	-	(111)	(108)	(\$111,000)

Obligations by Program/Project Activity:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Law Enforcement Training	111	108	\$80,799	111	108	\$111,000	-	-	-	(111)	(108)	(\$111,000)
Total Obligations	111	108	\$80,799	111	108	\$111,000	-	-	-	(111)	(108)	(\$111,000)

E. Summary of Requirements By Object Class

**Department of Homeland Security
Federal Law Enforcement Training Center
Salaries and Expenses:
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$89,142	\$91,644	-	(\$91,644)
11.3 Other than Full-Time Permanent	\$941	\$978	-	(\$978)
11.5 Other Personnel Compensation	\$3,566	\$3,691	-	(\$3,691)
11.8 Special Personal Services Payments	\$64	\$26	-	(\$26)
12.1 Civilian Personnel Benefits	\$33,717	\$34,797	-	(\$34,797)
13.0 Benefits for Former Personnel	\$160	\$160	-	(\$160)
Total, Personnel and Other Compensation Benefits	\$127,590	\$131,296	-	(\$131,296)
Other Object Classes				
21.0 Travel and Transportation of Persons	\$5,123	\$5,288	-	(\$5,288)
22.0 Transportation of Things	\$1,003	\$1,050	-	(\$1,050)
23.2 Rental Payments to Others	\$11	\$12	-	(\$12)
23.3 Communications, Utilities, and Misc. Charges	\$10,320	\$10,810	-	(\$10,810)
24.0 Printing and Reproduction	\$678	\$710	-	(\$710)
25.1 Advisory and Assistance Services	\$4,424	\$4,653	-	(\$4,653)
25.2 Other Services from Non-Federal Sources	\$9,858	\$10,415	-	(\$10,415)
25.3 Other Goods and Services from Federal Sources	\$4,640	\$4,864	-	(\$4,864)
25.4 Operation and Maintenance of Facilities	\$31,335	\$32,824	-	(\$32,824)
25.6 Medical Care	\$3,007	\$3,154	-	(\$3,154)
25.7 Operation and Maintenance of Equipment	\$16,263	\$17,038	-	(\$17,038)
25.8 Subsistence & Support of Persons	\$497	\$525	-	(\$525)
26.0 Supplies and Materials	\$8,612	\$9,040	-	(\$9,040)
31.0 Equipment	\$8,872	\$9,087	-	(\$9,087)
42.0 Insurance Claims and Indemnities	\$53	\$53	-	(\$53)
43.1 Interest and Dividends	\$20	\$20	-	(\$20)
Total, Other Object Classes	\$104,716	\$109,543	-	(\$109,543)
Total, Direct Obligations	\$232,306	\$240,839	-	(\$240,839)
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	(\$29,844)	(\$28,354)	-	\$28,354
Unobligated Balance, end of year	\$28,354	\$5,000	-	(\$5,000)
Recoveries of Prior Year Obligations	(\$319)	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$230,497	\$217,485	-	(\$217,485)

F. Permanent Positions by Grade

**Department of Homeland Security
Federal Law Enforcement Training Center
Salaries and Expenses:**
Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES	10	10	-	(10)
GS-15	83	83	-	(83)
GS-14	124	138	-	(138)
GS-13	298	327	-	(327)
GS-12	240	294	-	(294)
GS-11	92	92	-	(92)
GS-9	79	79	-	(79)
GS-8	32	32	-	(32)
GS-7	17	17	-	(17)
GS-6	4	4	-	(4)
GS-5	6	6	-	(6)
GS-4	3	3	-	(3)
Other Graded Positions	49	48	-	(48)
Total Permanent Positions	1,037	1,133	-	(1,133)
Unfilled Positions EOY	25	27	-	(27)
Total Permanent Employment EOY	-	-	-	-
Headquarters	804	897	-	(897)
U.S. Field	231	234	-	(234)
Foreign Field	2	2	-	(2)
Total, Salaries and Expenses:	1,037	1,133	-	(1,133)
Full Time Equivalents	1,012	1,106	-	(1,106)
Average ES Salary	167,078	168,300	-	(168,300)
Average GS Salary	89,062	89,700	-	(89,700)
Average Grade	12	12	-	(12)

H. PPA Budget Justifications

**Department of Homeland Security
Federal Law Enforcement Training Center
Salaries and Expenses:
Management and Administration
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$19,465	\$19,462	-	(\$19,462)
11.3 Other than Full-Time Permanent	\$28	\$28	-	(\$28)
11.5 Other Personnel Compensation	\$784	\$784	-	(\$784)
11.8 Special Personal Services Payments	\$2	\$2	-	(\$2)
12.1 Civilian Personnel Benefits	\$5,920	\$5,919	-	(\$5,919)
13.0 Benefits for Former Personnel	\$160	\$160	-	(\$160)
Total, Personnel and Compensation Benefits	\$26,359	\$26,355	-	(\$26,355)
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$423	\$423	-	(\$423)
23.3 Communications, Utilities, and Misc. Charges	\$3	\$3	-	(\$3)
24.0 Printing and Reproduction	\$1	\$1	-	(\$1)
25.1 Advisory and Assistance Services	\$110	\$134	-	(\$134)
25.2 Other Services from Non-Federal Sources	\$519	\$632	-	(\$632)
25.3 Other Goods and Services from Federal Sources	\$19	\$23	-	(\$23)
25.4 Operation and Maintenance of Facilities	\$3	\$4	-	(\$4)
25.6 Medical Care	\$34	\$40	-	(\$40)
25.7 Operation and Maintenance of Equipment	\$20	\$24	-	(\$24)
25.8 Subsistence & Support of Persons	\$17	\$21	-	(\$21)
26.0 Supplies and Materials	\$141	\$172	-	(\$172)
31.0 Equipment	\$378	\$190	-	(\$190)
42.0 Insurance Claims and Indemnities	\$53	\$53	-	(\$53)
Total, Other Object Classes	\$1,721	\$1,720	-	(\$1,720)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$28,080	\$28,075	-	(\$28,075)
Full Time Equivalents	200	217	-	(217)

Department of Homeland Security
Federal Law Enforcement Training Center
Salaries and Expenses:
Law Enforcement Training
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$68,909	\$72,182	-	(\$72,182)
11.3 Other than Full-Time Permanent	\$906	\$950	-	(\$950)
11.5 Other Personnel Compensation	\$2,776	\$2,907	-	(\$2,907)
11.8 Special Personal Services Payments	\$23	\$24	-	(\$24)
12.1 Civilian Personnel Benefits	\$27,569	\$28,878	-	(\$28,878)
Total, Personnel and Compensation Benefits	\$100,183	\$104,941	-	(\$104,941)
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$4,644	\$4,865	-	(\$4,865)
22.0 Transportation of Things	\$1,003	\$1,050	-	(\$1,050)
23.2 Rental Payments to Others	\$11	\$12	-	(\$12)
23.3 Communications, Utilities, and Misc. Charges	\$10,317	\$10,807	-	(\$10,807)
24.0 Printing and Reproduction	\$677	\$709	-	(\$709)
25.1 Advisory and Assistance Services	\$4,314	\$4,519	-	(\$4,519)
25.2 Other Services from Non-Federal Sources	\$9,339	\$9,783	-	(\$9,783)
25.3 Other Goods and Services from Federal Sources	\$4,621	\$4,841	-	(\$4,841)
25.4 Operation and Maintenance of Facilities	\$31,332	\$32,820	-	(\$32,820)
25.6 Medical Care	\$2,973	\$3,114	-	(\$3,114)
25.7 Operation and Maintenance of Equipment	\$16,243	\$17,014	-	(\$17,014)
25.8 Subsistence & Support of Persons	\$480	\$504	-	(\$504)
26.0 Supplies and Materials	\$8,466	\$8,868	-	(\$8,868)
31.0 Equipment	\$8,494	\$8,897	-	(\$8,897)
43.1 Interest and Dividends	\$20	\$20	-	(\$20)
Total, Other Object Classes	\$102,934	\$107,823	-	(\$107,823)
Adjustments	-	-	-	-
Unobligated Balance, start of year	(\$29,499)	(\$28,354)	-	\$28,354
Unobligated Balance, end of year	\$27,823	\$5,000	-	(\$5,000)
Recoveries of Prior Year Obligations	(\$319)	-	-	-
Total, Adjustments	(\$1,995)	(\$23,354)	-	\$23,354
Total Requirements	\$201,122	\$189,410	-	(\$189,410)
Full Time Equivalents	805	889	-	(889)

*FY 2015 and FY2016 funding accounts for Unobligated Balance

**Department of Homeland Security
Federal Law Enforcement Training Center
Salaries and Expenses:
Accreditation
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$768	-	-	-
11.3 Other than Full-Time Permanent	\$7	-	-	-
11.5 Other Personnel Compensation	\$6	-	-	-
11.8 Special Personal Services Payments	\$39	-	-	-
12.1 Civilian Personnel Benefits	\$228	-	-	-
Total, Personnel and Compensation Benefits	\$1,048	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$56	-	-	-
26.0 Supplies and Materials	\$5	-	-	-
Total, Other Object Classes	\$61	-	-	-
Adjustments	-	-	-	-
Unobligated Balance, start of year	(\$345)	-	-	-
Unobligated Balance, end of year	\$531	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total, Adjustments	\$186	-	-	-
Total Requirements	\$1,295	-	-	-
Full Time Equivalents	7	-	-	-

I. Changes In Full Time Employment

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>
BASE: Year End Actual from Prior Year	1,058	1,012	1,106
Increases			
Train Additional CBP Officers	24	-	-
Adjustment for Enacted FTE	-	38	-
Staffing to planned FTE	-	56	-
Subtotal, Increases	24	94	-
Decreases			
Non-Recur of training additional CBP Officers.	(7)	-	-
Adjustment for Enacted FTE	(63)	-	-
Transfer Out to Operations and Support	-	-	(1,106)
Subtotal, Decreases	(70)	-	(1,106)
Year End Actuals/Estimated FTEs:	1,012	1,106	-
Net Change from prior year base to Budget Year Estimate:	(46)	94	(1,106)

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

J. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

Department of Homeland Security
Federal Law Enforcement Training Center
Salaries and Expenses:
(Dollars in Thousands)

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Law Enforcement Training	\$3,193	\$3,127	-	(\$3,127)
Total Working Capital Fund	\$3,193	\$3,127	-	(\$3,127)

Department of Homeland Security

*Federal Law Enforcement Training Center
Acquisitions, Construction, Improvements and Related Expenses*



Fiscal Year 2017
Congressional Justification

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II. Summary of FY 2017 Budget Estimates by Program/Project Activity (PPA)

Department of Homeland Security
Federal Law Enforcement Training Center
Acquisition, Construction, Improvements & Related Expenses:
 Summary of FY 2017 Budget Estimates by Program Project Activity

FY 2017 Request
(Dollars in Thousands)

Program Project Activity	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017								
	Revised Enacted			Enacted			Request			Total Changes			Program Changes			Adjustments-to-Base		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Acquisition, Construction, Improvements & Related Expenses:	-	-	\$27,841	-	-	\$27,553	-	-	-	-	-	-	-	-	-	-	-	(\$27,553)
Total, Acquisition, Construction, Improvements & Related Expenses:	-	-	\$27,841	-	-	\$27,553	-	-	-	-	-	-	-	-	-	-	-	(\$27,553)
Subtotal, Enacted Appropriations & Budget Estimates	-	-	\$27,841	-	-	\$27,553	-	-	-	-	-	-	-	-	-	-	-	(\$27,553)
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	-	-	\$27,841	-	-	\$27,553	-	-	-	-	-	-	-	-	-	-	-	(\$27,553)

III. Current Services Program Description by PPA

Department of Homeland Security
Federal Law Enforcement Training Center
Acquisition, Construction, Improvements & Related Expenses:
Program Performance Justification
 (Dollars in Thousands)

PPA: Acquisition, Construction, Improvements & Related Expenses:

	Perm. Pos.	FTE	Amount
FY 2015 Revised Enacted	-	-	\$27,841
FY 2016 President's Budget	-	-	\$27,553
2017 Adjustments-to-Base	-	-	(\$27,553)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	-

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Acquisition, Construction, Improvements & Related Expenses:		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	27,841
Base	FY 2016 Enacted	-	-	27,553
Current Services	From ACI&RE to Operations and Support - LET	-	-	(27,553)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	-

V. Exhibits and Other Supporting Material

B. FY 2016 to FY 2017 Budget Change

Department of Homeland Security
Federal Law Enforcement Training Center
Acquisition, Construction, Improvements & Related Expenses:
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)

	Pos.	FTE	Amount
FY 2015 Revised Enacted	-	-	\$27,841
FY 2016 Enacted	-	-	\$27,553
Adjustments-to-Base			
Transfers to and from other accounts:			
From ACI&RE to Operations and Support - LET	-	-	(\$27,553)
Total Transfers	-	-	(\$27,553)
Total Adjustments-to-Base	-	-	(\$27,553)
FY 2017 Current Services	-	-	-
FY 2017 Request	-	-	-
FY 2016 to FY 2017 Change	-	-	(\$27,553)

D. Summary of Reimbursable Resources

Department of Homeland Security
 Federal Law Enforcement Training Center
 Acquisition, Construction, Improvements & Related Expenses:
 Summary of Reimbursable Resources
 (Dollars in Thousands)

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Collections by Source:												
Immigration & Customs Enforcement	-	-	\$7,042	-	-	\$200	-	-	-	-	-	(\$200)
Various	-	-	\$1,776	-	-	\$22,000	-	-	-	-	-	(\$22,000)
Customs and Border Protection	-	-	\$1,425	-	-	\$39,500	-	-	-	-	-	(\$39,500)
Transportation Security Administration	-	-	\$368	-	-	\$10,100	-	-	-	-	-	(\$10,100)
DHS Science & Technology	-	-	\$954,755	-	-	\$2,820	-	-	-	-	-	(\$2,820)
Total Budgetary Resources	-	-	\$965,366	-	-	\$74,620	-	-	-	-	-	(\$74,620)

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Obligations by Program/Project Activity:												
Acquisition, Construction, Improvements, and Related Expenses	-	-	\$965,366	-	-	\$74,620	-	-	-	-	-	(\$74,620)
Total Obligations	-	-	\$965,366	-	-	\$74,620	-	-	-	-	-	(\$74,620)

E. Summary of Requirements By Object Class

**Department of Homeland Security
Federal Law Enforcement Training Center
Acquisition, Construction, Improvements & Related Expenses:
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
Total, Personnel and Other Compensation Benefits	-	-	-	-
Other Object Classes				
21.0 Travel and Transportation of Persons	\$14	\$25	-	(\$25)
25.1 Advisory and Assistance Services	\$38	\$67	-	(\$67)
25.3 Other Goods and Services from Federal Sources	\$21	\$37	-	(\$37)
25.4 Operation and Maintenance of Facilities	\$1,150	\$2,022	-	(\$2,022)
25.7 Operation and Maintenance of Equipment	\$23	\$41	-	(\$41)
26.0 Supplies and Materials	\$29	\$51	-	(\$51)
31.0 Equipment	\$65	\$114	-	(\$114)
32.0 Land and Structures	\$19,854	\$35,436	-	(\$35,436)
Total, Other Object Classes	\$21,194	\$37,793	-	(\$37,793)
Total, Direct Obligations	\$21,194	\$37,793	-	(\$37,793)
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	(\$7,593)	(\$14,740)	-	\$14,740
Unobligated Balance, end of year	\$14,740	\$5,000	-	(\$5,000)
Recoveries of Prior Year Obligations	(\$500)	(\$500)	-	\$500
Offsetting Collections	-	-	-	-
Total Requirements	\$27,841	\$27,553	-	(\$27,553)

F. Permanent Positions by Grade

N/A

H. PPA Budget Justifications

**Department of Homeland Security
Federal Law Enforcement Training Center
Acquisition, Construction, Improvements & Related Expenses:
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$14	\$25	-	(\$25)
25.1 Advisory and Assistance Services	\$38	\$67	-	(\$67)
25.3 Other Goods and Services from Federal Sources	\$21	\$37	-	(\$37)
25.4 Operation and Maintenance of Facilities	\$1,150	\$2,022	-	(\$2,022)
25.7 Operation and Maintenance of Equipment	\$23	\$41	-	(\$41)
26.0 Supplies and Materials	\$29	\$51	-	(\$51)
31.0 Equipment	\$65	\$114	-	(\$114)
32.0 Land and Structures	\$19,854	\$35,436	-	(\$35,436)
Total, Other Object Classes	\$21,194	\$37,793	-	(\$37,793)
Adjustments	-	-	-	-
Unobligated Balance, start of year	(\$7,593)	(\$14,740)	-	\$14,740
Unobligated Balance, end of year	\$14,740	\$5,000	-	(\$5,000)
Recoveries of Prior Year Obligations	(\$500)	(\$500)	-	\$500
Total, Adjustments	\$6,647	(\$10,240)	-	\$10,240
Total Requirements	\$27,841	\$27,553	-	(\$27,553)
Full Time Equivalents	-	-	-	-

I. Changes In Full Time Employment

N/A

J. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

N/A

Department of Homeland Security

Federal Law Enforcement Training Center



Fiscal Year 2017
Strategic Context
Congressional Submission

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A. Component Overview

The Federal Law Enforcement Training Center (FLETC) is comprised of the following mission-oriented programs that support achievement of the DHS strategic missions, goals, and objectives.

Law Enforcement Training: The Law Enforcement Training program provides law enforcement training to federal, state, local, tribal, campus, and international law enforcement agencies.

Management and Administration: This program captures activities that provide enterprise leadership, management and/or business administration services and describes the capabilities and activities that support the day-to-day management and back office functions enabling the Department to operate efficiently and effectively. Key capabilities include conducting agency planning and performance management, managing finances, managing agency workforce, providing physical and personnel security, acquiring goods and services, managing information technology, managing agency property and assets, managing agency communications, managing legal affairs, and providing general management and administration.

FY 2017 Budget Request

The table below shows FLETC's FY 2017 Budget request by its mission-oriented programs.

Program	FY 2017 Request	
	FTE	Dollars (in thousands)
Law Enforcement Training	851	\$213,804
Management and Administration	217	\$28,714
Total Budget Request	1,068	\$242,518

B. Component Contributions to Achieving Departmental Missions

The table below shows the alignment of the FY 2017 FLETC programs to the DHS Missions and Mature and Strengthen Homeland Security.

Programs	DHS Missions					Mature and Strengthen Homeland Security
	Prevent Terrorism and Enhance Security	Secure and Manage Our Borders	Enforce and Administer Our Immigration Laws	Safeguard and Secure Cyberspace	Strengthen National Preparedness and Resilience	
Law Enforcement Training*	9%	52%	14%	1%	0%**	25%
Management and Administration						100%

*Totals account for rounding.

**FLETC has funding aligned to Strengthen National Preparedness and Resilience equaling to under 1% of funding

Mission 1: Prevent Terrorism and Enhance Security

Resources Requested

FLETC resources supporting *Prevent Terrorism and Enhance Security* are provided in the table below.

\$ in thousands

Program	FY 2015 Revised Enacted		FY 2016 Enacted		FY 2017 Request	
	\$	FTE*	\$	FTE	\$	FTE
Law Enforcement Training	\$19,825	69	\$18,644	71	\$18,373	68
Total	\$19,825	69	\$18,644	71	\$18,373	68

*Strategic Contexts reflect reprogrammings/transfers, as applicable, and revised enacted FTE. Later tables throughout the CJ submission will use FY 2015 actual FTEs.

Performance Measures

FLETC contributes to this mission, but does not have performance measures in this area.

Mission 2: Secure and Manage Our Borders

Resources Requested

FLETC resources supporting *Secure and Manage Our Borders* are provided in the table below.

\$ in thousands

Program	FY 2015 Revised Enacted		FY 2016 Enacted		FY 2017 Request	
	\$	FTE*	\$	FTE	\$	FTE
Law Enforcement Training	\$118,224	394	\$112,440	399	\$110,633	383
Total	\$118,224	394	\$112,440	399	\$110,633	383

*Strategic Contexts reflect reprogrammings/transfers, as applicable, and revised enacted FTE. Later tables throughout the CJ submission will use FY 2015 actual FTEs.

Performance Measures

For *Secure and Manage Our Borders*, Management Measures are displayed to provide a more thorough context of expected performance results.

Management Measures

Measure: Percent of Partner Organizations that agree the Federal Law Enforcement Training Centers counterdrug-related training meets identified training needs						
Description: This performance measure reflects the satisfaction of Partner Organizations (POs) with their identified counterdrug-related training provided by the Federal Law Enforcement Training Centers (FLETC) for their officers/agents to perform their law enforcement duties such as terrorism and other criminal activity against the U.S. and our citizens.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	N/A	81%	82%	93%	94%	95%
Result:	N/A	92%	100%	84%	N/A	N/A

Mission 3: Enforce and Administer Our Immigration Laws

Resources Requested

FLETC resources supporting *Enforce and Administer Our Immigration Laws* are provided in the table below.

\$ in thousands

Program	FY 2015 Revised Enacted		FY 2016 Enacted		FY 2017 Request	
	\$	FTE*	\$	FTE	\$	FTE
Law Enforcement Training	\$31,200	122	\$29,403	123	\$28,968	118
Total	\$31,200	122	\$29,403	123	\$28,968	118

*Strategic Contexts reflect reprogrammings/transfers, as applicable, and revised enacted FTE. Later tables throughout the CJ submission will use FY 2015 actual FTEs.

Performance Measures

FLETC contributes to this mission, but does not have performance measures in this area.

Mission 4: Safeguard and Secure Cyberspace

Resources Requested

FLETC resources supporting *Safeguard and Secure Cyberspace* are provided in the table below.

\$ in thousands

Program	FY 2015 Revised Enacted		FY 2016 Enacted		FY 2017 Request	
	\$	FTE*	\$	FTE	\$	FTE
Law Enforcement Training	\$1,284	9	\$1,228	9	\$1,208	8
Total	\$1,284	9	\$1,228	9	\$1,208	8

*Strategic Contexts reflect reprogrammings/transfers, as applicable, and revised enacted FTE. Later tables throughout the CJ submission will use FY 2015 actual FTEs.

Performance Measures

FLETC contributes to this mission, but does not have performance measures in this area.

Mission 5: Strengthen National Preparedness and Resilience

Resources Requested

FLETC resources supporting *Strengthen National Preparedness and Resilience* are provided in the table below.

\$ in thousands

Program	FY 2015 Revised Enacted		FY 2016 Enacted		FY 2017 Request	
	\$	FTE*	\$	FTE	\$	FTE
Law Enforcement Training	\$1,117	9	\$1,075	9	\$1,055	8
Total	\$1,117	9	\$1,075	9	\$1,055	8

*Strategic Contexts reflect reprogrammings/transfers, as applicable, and revised enacted FTE. Later tables throughout the CJ submission will use FY 2015 actual FTEs.

Performance Measures

FLETC contributes to this mission, but does not have performance measures in this area.

Mature and Strengthen Homeland Security

Resources Requested

FLETC resources supporting *Mature and Strengthen Homeland Security* are provided in the table below.

\$ in thousands

Program	FY 2015 Revised Enacted		FY 2016 Enacted		FY 2017 Request	
	\$	FTE*	\$	FTE	\$	FTE
Law Enforcement Training	\$58,608	273	\$54,174	279	\$53,567	267
Management and Administration	\$28,080	217	\$28,075	217	\$28,714	217
Total	\$86,688	490	\$82,249	496	\$82,281	484

*Strategic Contexts reflect reprogrammings/transfers, as applicable, and revised enacted FTE. Later tables throughout the CJ submission will use FY 2015 actual FTEs.

Performance Measures

For *Mature and Strengthen Homeland Security*, two types of performance measures are presented. Strategic Measures represent FLETC’s measures that gauge achievement for this mission area, and are considered to be our Government Performance and Results Act Modernization Act (GPRAMA) performance measures. Additional Management Measures are displayed, as appropriate, to provide a more thorough context of expected performance results.

Strategic Measures

Measure: Number of Federal law enforcement training programs and/or academies accredited or re-accredited through the Federal Law Enforcement Training Accreditation process						
Description: This performance measure reflects the cumulative number of Federal law enforcement training programs and/or academies accredited or re-accredited through the Federal Law Enforcement Training Accreditation (FLETA) process. Accreditation ensures that training and services provided meet professional training standards for law enforcement. Re-accreditation is conducted every five years to remain current. The results of this measure provide on-going opportunities for improvements in Federal law enforcement training programs and academies.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	74	99	107	113	118	123
Result:	83	97	107	114	N/A	N/A

Measure: Percent of Partner Organizations that agree the Federal Law Enforcement Training Centers training programs address the right skills (e.g., critical knowledge, key skills and techniques, attitudes/behaviors) needed for their officers/agents to perform their law enforcement duties						
Description: This performance measure reflects the satisfaction of Partner Organizations that Federal Law Enforcement Training Centers' (FLETC) training programs address the right skills needed for their officers/agents to perform their law enforcement duties such as the prevention of the introduction of high-consequence weapons of mass destruction, terrorism and other criminal activity against the U.S. and our citizens. The results of the measure provide on-going opportunities for improvements that are incorporated into FLETC training curricula, processes and procedures.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	97%	97%	97%	94%	95%	95%
Result:	96%	100%	91%	98%	N/A	N/A

Management Measures

Measure: Number of Federal Law Enforcement Training Accreditation assessments conducted for accreditation or re-accreditation						
Description: This performance measure reflects the number of Federal Law Enforcement Training Accreditation (FLETA) assessments conducted for Federal law enforcement training programs and academies in the current fiscal year. Assessments are conducted to determine if training programs and/or academies meet FLETA standards for accreditation or re-accreditation. FLETA assessments for accreditation are conducted when Federal law enforcement agencies submit an application requesting accreditation of their training programs and/or academies. Assessments for re-accreditation are conducted every five years. Working through FLETA, trainers in the same discipline assist each other in evaluating and improving their professionalism, leading to a high-degree of public confidence in competent Federal law enforcement agents and officers.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	23	41	25	25	25	25
Result:	39	33	27	17	N/A	N/A

Measure: Percent of Partner Organizations satisfied with the overall Federal Law Enforcement Training Centers training experience						
Description: This performance measure reflects the satisfaction of Partner Organizations (POs) with the overall Federal Law Enforcement Training Centers (FLETC) training experience. The training experience is defined as law enforcement training and services (e.g., housing, food, logistics, recreation, etc.) provided to PO students and training staff. FLETC training programs prepare PO officers/agents to perform their law enforcement duties such as terrorism and other criminal activity against the U.S. and our citizens.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	97%	97%	95%	95%	95%	95%
Result:	98%	100%	95%	97%	N/A	N/A

Measure: Percent of Partner Organizations satisfied with the training provided by the Federal Law Enforcement Training Centers						
Description: This performance measure reflects the satisfaction of Partner Organizations with the training provided by the Federal Law Enforcement Training Centers (FLETC) to their officers/agents to perform their law enforcement duties such as the prevention of the introduction of high-consequence weapons of mass destruction, terrorism and other criminal activity against the U.S. and our citizens. The results of the measure provide on-going opportunities for improvements that are incorporated into FLETC training curricula, processes and procedures.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017

Federal Law Enforcement Training Center - Strategic Context

Target:	97%	97%	97%	94%	95%	95%
Result:	98%	100%	93%	97%	N/A	N/A

*Department of
Homeland Security
Science and Technology (S&T)
Budget Overview*



Fiscal Year 2017
Congressional Justification

i. Summary of FY Budget Estimates by Appropriation without Emergency Funding

**Department of Homeland Security
Science and Technology (S&T)
Summary of FY 2017 Budget Estimates by Appropriation**

**Total Appropriations
(Dollars in Thousands)**

Appropriation	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017								
	Revised Enacted ¹			Enacted			Request			Total Changes			Program Changes			Adjustments-to-Base		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Operations and Support	333	333	\$261,054	351	351	\$272,492	356	356	\$278,733	5	5	\$6,241	5	5	\$10,279	351	351	\$268,454
Procurement, Construction, and Improvements	10	10	\$322,844	13	13	\$17,942	13	13	\$10,141	-	-	(\$7,801)	-	-	(\$7,659)	13	13	\$17,800
Research and Development	124	124	\$521,160	116	116	\$496,504	112	112	\$469,869	(4)	(4)	(\$26,635)	-	-	(\$14,874)	112	112	\$484,743
Subtotal, Discretionary	467	467	\$1,105,058	480	480	\$786,938	481	481	\$758,743	1	1	(\$28,195)	5	5	(\$12,254)	476	476	\$770,997
Total, Science and Technology (S&T-CAS)	467	467	\$1,105,058	480	480	\$786,938	481	481	\$758,743	1	1	(\$28,195)	5	5	(\$12,254)	476	476	\$770,997
Subtotal, Enacted Appropriations and Budget Estimates	467	467	\$1,105,058	480	480	\$786,938	481	481	\$758,743	1	1	(\$28,195)	5	5	(\$12,254)	476	476	\$770,997
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	467	467	\$1,105,058	480	480	\$786,938	481	481	\$758,743	1	1	(\$28,195)	5	5	(\$12,254)	476	476	\$770,997

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission

ii. FY 2017 Investment Summary

**Department of Homeland Security
Science and Technology (S&T-CAS)
Operations and Support**
FY 2017 Investment Summary- Appropriation Level
(Dollars in Thousands)

Investment Name	PPA(s)	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
Financial Systems Modernization	Management and Administration	\$642	\$3,608	\$7,208
National Bio and Agro-Defense Facility Program	Laboratory Facilities	\$300,000	\$2,000	\$5,000
Total		\$300,642	\$5,608	\$12,208

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

iii. Status of Congressionally Requested Studies, Reports and Evaluations

**Department of Homeland Security
Science and Technology**

Fiscal Year	Due Date	Reference/Citation	Requirement	Status
2015	7/3/215	House Report 113-481	The Committee directs the Secretary to report, not later than 120 days after the date of enactment of this Act, on the current level of cooperation between DHS and DoD, or the possible benefits of cooperation, regarding the development of new and innovative software that improves national capabilities to counter cybersecurity threats.	In DHS Clearance
2015	9/1/2015	Senate Report 113-198	S&T shall consult with CBP, ICE, and the United States Coast Guard [USCG] to fully develop a strategy and plan for situational awareness of illegal border activity between ports of entry along the Southwest border.	In DHS Clearance
2016	2/9/2016	<i>Senate Report 114-68</i>	S&T is required to submit the "Results of Prior Year R&D Report" to Congress concurrent with the FY 2017 President's Budget.	Submit with President's Budget

iv. Schedule of Authorized/Unauthorized Appropriations by PPA

**Department of Homeland Security
Science and Technology**
Schedule of Authorized/Unauthorized Appropriations by Program Project/Activity
(Dollars in Thousands)

Budget Activity	Last Year of Authorization	Authorized Level	Appropriation in Last Year of Authorization	FY 2017 Request
	Fiscal Year	Amount	Amount	Amount
Operations and Support	N/A	N/A	N/A	\$278,733
Management and Administration	N/A	N/A	N/A	\$89,043
Laboratory Facilities	N/A	N/A	N/A	\$133,942
Acquisition and Operations Analysis	N/A	N/A	N/A	\$55,748
Procurement, Construction, and Improvements	N/A	N/A	N/A	\$10,141
Acquisition and Operations Analysis	N/A	N/A	N/A	\$10,141
Research and Development	N/A	N/A	N/A	\$469,869
Research Development & Innovation	N/A	N/A	N/A	\$436,860
University Programs	N/A	N/A	N/A	\$33,009
Total Direct Authorization/Appropriation	N/A	N/A	N/A	\$758,743

Department of Homeland Security

Science and Technology

Operations & Support



Fiscal Year 2017

Congressional Justification

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Schedule I – Executive Summary of Appropriation Exhibits

Department of Homeland Security Science and Technology (S&T-CAS) Operations and Support

Summary of FY 2017 Budget Estimates by Program Project Activity

FY 2017 Request (Dollars in Thousands)

Program Project Activity	FY 2015 ¹			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017		
	Revised Enacted			Enacted			Request			Total Changes		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Management and Administration	131	131	\$91,320	134	134	\$92,355	134	134	\$89,043	-	-	(\$3,312)
Laboratory Facilities	130	130	\$119,950	136	136	\$125,412	141	141	\$133,942	5	5	\$8,530
Acquisition and Operations Analysis	72	72	\$49,784	81	81	\$54,726	81	81	\$55,748	-	-	\$1,022
Total, Operations and Support	333	333	\$261,054	351	351	\$272,492	356	356	\$278,733	5	5	\$6,241
Subtotal, Enacted Appropriations & Budget Estimates	333	333	\$261,054	351	351	\$272,492	356	356	\$278,733	5	5	\$6,241
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	333	333	\$261,054	351	351	\$272,492	356	356	\$278,733	5	5	\$6,241

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

Overview

A.Mission Statement for Science and Technology – Operations and Support:

The mission of Operations and Support (O&S) is to fund the effective and efficient management of the Science and Technology (S&T) Directorate activities to deliver advanced technology solutions to DHS Components and first responders. This includes costs necessary for regular operations, salaries, mission support, headquarters, and management.

B. Budget Activities:

The Directorate has three program, project, and activities (PPAs) in the O&S appropriation. These three PPAs include Management and Administration (M&A), Laboratory Facilities, and Acquisition and Operations Analysis (AOA).

Management and Administration

The M&A PPA funds all of the corporate-level functions in the S&T that allow the technical divisions to manage the Research, Development, Test, and Evaluation (RDT&E) programs. The M&A PPA funds business operations, requirements for the Joint Requirements Council (JRC), and the S&T's share of the DHS Working Capital Fund (WCF). The business operations functions pay for rent, office supplies, utilities, and other operational functions associated with the S&T's headquarters offices. This account pays for the training and travel associated with senior management of S&T and contractor staff who support the execution of headquarters functions including financial management, facility planning, maintenance, and other administrative functions. M&A also funds the administration of the S&T's regulatory and treaty compliance activities, headquarters shared services agreements, and the financial and programmatic databases.

Laboratory Facilities

The Office of National Laboratories (ONL) manages the Laboratory Facilities Programs. ONL provides the Nation with a coordinated, enduring core of productive science, technology and engineering laboratories, organizations and institutions, which will provide the knowledge and technology required to secure our homeland.

Acquisition and Operations Analysis (AOA)

AOA provides expert assistance to entities across the HSE to ensure that the transition, acquisition, and deployment of technologies, information, and procedures improve the efficiency and effectiveness of the operational capabilities across the HSE mission.

C. Budget Request Summary:

The S&T Directorate requests 356 FTE, 356 positions and \$278.733 million for O&S in FY 2017.

The adjustments-to-base total is \$268.454 million, and includes:

- Transfer in from Research, Development, Acquisition and Operations (RDA&O) legacy appropriation \$169.647 million.
- Transfer in from Management and Administration (M&A) legacy appropriation \$107.215 million.
- Transfer out of Management and Administration funding to CIO for Disaster Management
- (0.046million).
- Transfer out of Management and Administration Working Capital fund to DHS HQ (\$11.752 million).
- Increase of 1.6 percent FY 2017 federal pay raise and annualization of pay \$1.116 million.
- Increase in FY 2017 FPS Fee Change for Plum Island Animal Disease Center (PIADC) \$0.166 million.
- Increase in Joint Requirement Council Support \$2.761 million.
- Decrease in HQ Efficiencies: Enterprise efficiency proposal for TOPS and Rebalancing Staff Mix (\$0.653 million)

The program changes total an increase of 5 FTEs and \$10.279 million and include:

- A program increase of \$1.214 million in AOA.
- A program increase of \$9.065 million and five FTE for Laboratory Facilities.

B. FY 2016 to FY 2017 Budget Change - Appropriation Level

**Department of Homeland Security
Science and Technology (S&T-CAS)
Operations and Support
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)**

	Pos.	FTE	Amount
FY 2015 Revised Enacted			
FY 2016 Enacted			
Adjustments-to-Base			
Transfers to and from other accounts:			
Transfer from M&A to Operation & Support- M&A	134	134	\$92,355
Transfer from RDAO to Operation & Support M&A for FSM	-	-	\$5,891
Transfer from WCF to HQ Operations and Support M&A	-	-	(\$11,752)
Transfer to CIO for Disaster	-	-	(\$46)
Transfer from RDA&O- Lab Facilities to Operations & Support- Lab Facilities	136	136	\$124,298
Transfer from M&A to Operation & Support- AOA	81	81	\$14,860
Transfer from RDA&O-AOS to Operations & Support-AOA	-	-	\$39,458
Total Transfers	351	351	\$265,064
Increases			
2017 Pay Increase- Salaries	-	-	\$837
Annualization of 2016 Pay Raise- Salaries	-	-	\$279
FPS Fee Change: PIADIC	-	-	\$166
Joint Requirements Council	-	-	\$2,761
Total, Increases	-	-	\$4,043
Decreases			
HQ Efficiencies: Enterprise Efficiency Proposal S&T Tops	-	-	(\$500)
HQ Efficiencies: Rebalancing Staff Mix	-	-	(\$153)
Total, Decreases	-	-	(\$653)
Total Other Adjustments	-	-	\$3,390
Total Adjustments-to-Base	351	351	\$268,454
FY 2017 Current Services	351	351	\$268,454
Program Changes			
Increases			
Acquisition and Operations Analysis	-	-	\$1,214
Laboratory Operations	5	5	\$9,065
Total, Increases	5	5	\$10,279
Total Program Changes	5	5	\$10,279
FY 2017 Request	356	356	\$278,733
FY 2016 to FY 2017 Change	5	5	\$6,240

C. FY 2017 Investment Summary - Appropriation Level

**Department of Homeland Security
 Science and Technology (S&T-CAS)
 Operations and Support
 FY 2017 Investment Summary- Appropriation Level
 (Dollars in Thousands)**

Investment Name	PPA(s)	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
Financial Systems Modernization	Management and Administration	\$642	\$3,608	\$7,208
National Bio and Agro-Defense Facility Program	Laboratory Facilities	\$300,000	\$2,000	\$5,000
Total		\$300,642	\$5,608	\$12,208

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

Schedule II Program, Project, Activity (PPA) Exhibits

Exhibit D. FY 2016 to FY 2017 Budget Change- PPA Level

**Department of Homeland Security
Science and Technology
Operations & Support
Management and Administration**
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)

Management and Administration		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	-
Base	FY 2016 Enacted	-	-	-
Current Services	2017 Pay Increase- Salaries	-	-	241
	Annualization of 2016 Pay Raise- Salaries	-	-	80
	FPS Fee Change: PIADIC	-	-	166
	HQ Efficiencies: Enterprise Efficiency Proposal S&T Tops	-	-	(500)
	HQ Efficiencies: Rebalancing Staff Mix	-	-	(153)
	Joint Requirements Council	-	-	2,761
	Transfer from M&A to Operation & Support- M&A	134	134	92,355
	Transfer from RDAO to Operation & Support M&A for FSM	-	-	5,891
	Transfer from WCF to HQ Operations and Support M&A	-	-	(11,752)
	Transfer to CIO for Disaster	-	-	(46)
Budget Year	FY 2017 Request	134	134	89,043
	Total Change from FY 2016 to FY 2017	-	-	(3,312)

PPA DESCRIPTION: Management and Administration

The S&T Directorate requests 134 FTE and \$89.043 million for M&A in FY 2017.

CURRENT SERVICES PROGRAM DESCRIPTION:

The 134 FTE provide executive direction to the S&T Directorate for policy analysis, planning, financial management, and guidance formulation. These FTE also conduct program management, execution, oversight, and analysis, as well as operations and maintenance support for all S&T Directorate programs.

The M&A PPA funds all of the corporate-level functions in S&T that allow the technical divisions to manage the RDT&E programs. Those functions include the Finance and Budget Division, including the DHS WCF; Administration and Support Division (ASD); and Corporate Communications Division. This budget request also supports the overhead and administration for S&T's four groups, each of which has an important role in implementing RDT&E activities: First Responders Group (FRG), Homeland Security Advanced Research Projects Agency (HSARPA), Capabilities Development Support (CDS), and Research and Development Partnerships (RDP).

Finance and Budget Division

FBD provides the S&T with high-quality, efficient, and cost-effective financial management services through six branches. The Budget and Performance Branch develops long-term plans for resource allocation, execution plans, Congressional Justifications, and management of financial resources within the S&T. It also develops and implements internal and external performance metrics for S&T programs, as well as risk assessment methodologies to help inform programming decisions. The Acquisition Branch develops the S&T Directorate's acquisition strategy. The Financial Services Branch manages the conferences, travel and purchase card programs. The Financial Operations Branch is dedicated to sound fiscal stewardship of the S&T Directorate's appropriations and reimbursable funding; timely and accurate budget execution, financial management, and financial reporting. The Internal Controls Branch monitors programs and activities to provide assurance about the adequacy of internal controls within the S&T Directorate. The Interagency Branch streamlines work with other agencies and supports the management and oversight of those agreements.

Administration and Support Division

ASD manages the facilities, personnel, and information technology (IT), and provides critical infrastructure support to the S&T Directorate and is composed of seven components: Facilities, Human Capital Office, Office of the Chief Information Officer, Office of the Chief Administrative Officer, Office of Administration and Audits, Central Security Office, and Readiness and Operational Coordination. In compliance with Presidential Directives, Federal regulations, and Departmental guidance, the Administration and Support Division provides support and continuous process improvement through problem identification and solution, sound policy and procedure development, and high-quality service.

Corporate Communications Division

The Corporate Communications Division communicates the objectives and status of homeland security technology programs, disseminates information regarding opportunities for private-sector entities (corporate and academic), and ensures that the media understands and accurately represents DHS technologies and programs. The Corporate Communications Division holds conferences and manages the S&T's presence at other information-sharing events to improve contact among technology developers, vendors, and acquisition personnel. It also promotes the participation of colleges, universities, private research institutes, and companies (and consortia thereof) in the research process by disseminating information regarding research conducted or sponsored by the Department, and provides public-communication support to the S&T Directorate-sponsored FFRDCs.

Working Capital Fund

The DHS WCF provides those shared services that the components rely on to execute their missions, such as contracting officers and the DHS-wide IT infrastructure. Funds provided within the M&A PPA are used to acquire DHS WCF services, which includes: IT services, human resources, procurement operations, and financial systems. The WCF also provides consolidated subscriptions, government-wide mandated services, and DHS crosscutting activities.

**Department of Homeland Security
Science and Technology
Operations & Support
Management and Administration**

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	131	131	\$21,845	\$166	134	134	\$22,129	\$164	134	134	\$22,450	\$167	-	-	\$321	3
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

NARRATIVE EXPLANATION OF CHANGES – PAY COST DRIVERS:

- **FTE Change FY 2016-2017:** There is no change in FTE.
- **PCB Change FY 2016-2017:** The cost change in FTE is due the FY 2017 pay increase and the annualization of the FY 2016 pay raise.
- **Average Cost Change FY 2016-2017:** An increase of \$240,000in pay is attributed to the annual FY 2017 pay increase of 1.6 percent and \$80,000is due to the annualization of the FY 2016 pay raise.

**Department of Homeland Security
Science and Technology
Operations & Support
Management and Administration**

Cost Drivers (Non-Pay) - PPA Level (\$000s)

Management and Administration	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Advisory and Assistance Services	\$23,322	\$23,804	\$24,286	\$482
Goods and Services from Federal Services	\$40,840	\$40,109	\$35,994	(\$4,115)
Operations and Maintenance of Equipment	\$2,464	\$2,464	\$2,464	-
Total	\$66,626	\$66,377	\$62,744	(\$3,633)

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

NARRATIVE EXPLANATION OF CHANGES – NON-PAY COST DRIVERS:

- **Advisory and Assistance Services Cost Change FY 2016-2017:** An increase of \$482,000 in advisory and assistance contracts are attributed to general escalation costs of existing contractual agreements.
- **Goods and Services from Federal Sources Cost Change FY 2016-2017:** A decrease of \$4,115,000 in goods and services is attributed primarily to a decrease in the DHS WCF. These funds are being moved out to cover multiple shared services now being paid directly from DHS headquarters.
- **Travel Cost Change FY 2016-2017:** There is no cost change in travel funding for federal employees supporting the test and evaluation (T&E) program.

**Department of Homeland Security
Science and Technology
Operations & Support
Laboratory Facilities**
FY 2016 to FY 2017 Budget Change - PPA Level
(Dollars in Thousands)

Laboratory Facilities		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted			
Base	FY 2016 Enacted			
Current Services	2017 Pay Increase- Salaries	-	-	434
	Annualization of 2016 Pay Raise - Salaries	-	-	145
	Transfer from RDA&O - Laboratory Facilities to Operations & Support - Laboratory Facilities	136	136	124,298
Program Changes	Laboratory Operations	5	5	9,065
Budget Year	FY 2017 Request	141	141	133,942
	Total Change from FY 2016 to FY 2017	5	5	8,530

PPA DESCRIPTION: Laboratory Facilities

S&T requests 141 FTE, 141 positions and \$133.942 million for Laboratory Facilities in FY 2017.

CURRENT SERVICES PROGRAM DESCRIPTION:

Laboratory Facilities PPA: ONL manages the Laboratory Facilities Programs. ONL provides the Nation with a coordinated, enduring core of productive science, technology, and engineering laboratories, organizations, and institutions, which will provide the knowledge and technology required to secure our homeland.

Laboratory Operations Thrust: FY 2016: \$125.411 million. FY 2017 Request: \$133.942 million. This program manages the operations, core capabilities, maintenance, and personnel requirements of the S&T Laboratories and infrastructure. This program also oversees the continued operations of facilities to meet the mission requirements while maintaining safe, secure, compliant, and efficient operations. In FY 2017, Operations will begin detailed planning to execute the closure of Plum Island and closing of all operations associated with that location.

Chemical Security Analysis Center (CSAC) Operations

This facility develops and informs risk assessments related to national chemical defense. CSAC is co-located at the Department of Defense (DoD) Edgewood Chemical Biological Center (ECBC) at the Aberdeen Proving Grounds in Maryland. CSAC supports a variety of customers within DHS, the Federal Government, and the HSE, to include the S&T's Chemical and Biological Division, DHS Components such as the National Protection and

Programs Directorate (NPPD) and TSA, and Federal agencies, such as the Environmental Protection Agency (EPA), Federal Bureau of Investigation (FBI), and DoD. CSAC also provides science- and technology-based quality assurance information regarding chemical threats to support the unified national effort to secure the Nation. The DoD Sample Receipt Facility at ECBC houses CSAC, providing the capability to integrate knowledge across the full chemical threat spectrum. Operational costs for this facility include rent, security, utilities, energy renewal projects/studies, and information technology.

NBAF Operations

NBAF Operations funding incorporates S&T requirements for the operational stand-up of NBAF, including on-site project and lab management staffing, the Operational Planning and Technology Integration Contract (OPTIC) supporting stand-up activities, and the Management, Operations, & Research Support (MORS) contract award that will support the long term operations of NBAF. NBAF Operations includes a diverse range of one-time stand-up costs necessary to establish the operations of this unique state-of-the-art laboratory as well as support ongoing long term management and operations activities as they phase in and continue to be performed through the achievement of full operating capacity by 2023.

One time stand-up costs include relocation of Federal employees from PIADC, scientific and IT equipment and systems not associated with construction, and establishment of programs and operating models that will set the baseline for the new laboratory's performance. Activities that will be awarded under the OPTIC include: development of detailed Concepts of Operations (CONOPS) that will guide lab management; development of IT System architecture to ensure appropriate technology integration and cybersecurity; and, the Biorepository Transfer Plan for the safe and efficient relocation of the inventory of existing catalog of R&D biological material samples, including Foot and Mouth Disease vaccine, and vaccine bank currently at PIADC.

The NBAF Federal management team and the MORS contract will begin in FY 2017 and achieve Select Agent Registration and full operating capacity by 2023. The timing of federal staff placement, acquisition of contract vehicles, and procurement of equipment is closely linked to construction milestones and funding availability. NBAF also is funded with USDA resources and S&T coordinates stand-up activities and associated funding requests with USDA to ensure proper funding alignment.

National Urban Security Technology Laboratory (NUSTL) Operations

NUSTL provides T&E capabilities to the S&T and other DHS Components including Domestic Nuclear Detection Office (DNDO). NUSTL also is the liaison for the deployment of experimental technologies in the New York City metropolitan area, and provides technical support to the regional first responder community. NUSTL is a Government-owned, Government-operated laboratory located in the borough of Manhattan, New York, NY. Major operational costs include rent, radiological equipment used for testing First Responder equipment, information technology, energy renewal projects/studies, and security.

National Biodefense Analysis and Countermeasures Center (NBACC) Operations

NBACC provides the capability to characterize current and future biological threats, assess their impacts, and inform the development of countermeasures and vaccines in response to events and identified threats. The NBACC mission is to provide the Nation with the scientific basis for characterization of biological threats and bioforensic analysis to support attribution of their planned and actual use. NBACC is part of the National

Interagency Biodefense Campus that includes the Department of Health and Human Services (HHS), DoD, and Department of Agriculture (USDA). The unique missions of threat characterization and bioforensics enhance the Nation's overall biodefense capabilities. NBACC closely collaborates with the FBI and other law enforcement agencies. NBACC also continues to examine opportunities for the cooperative use of existing capacity for work needed by other Federal agencies.

S&T operates NBACC as an FFRDC. The FFRDC plans, manages, and executes the NBACC research programs and operates the facility. NBACC has achieved the required certifications and registrations for its biosafety level (BSL) 2, 3, and 4 laboratories. Major operational costs include information technology and IT upgrades to support regulatory requirements, utility and garrison support costs, energy renewal projects/studies, and security.

Plum Island Animal Disease Center (PIADC) Operations

PIADC conducts research on contagious foreign animal diseases (FAD) (e.g., FMD) and develops strategies and vaccines to protect the Nation's animal industries and exports from foreign animal diseases accidentally or deliberately introduced into the United States. DHS and USDA jointly perform the R&D work at PIADC. The combined work of both agencies supports the S&T's agro-terrorism countermeasures programs. Research at the facility occurs in BSL-2, BSL-3, and BSL-3Ag laboratory spaces. DHS is responsible for the management, operations, and maintenance of the facility. The laboratory is a self-sustaining operation, with its own power plant, fuel storage, fire protection, waste disposal, and security systems. S&T provides the only ferry transport to and from the island, and is responsible for operating and maintaining the ferries, docks, and harbor. S&T delivers the day-to-day operational support, including the operations work force. Major operational costs include security, operations and maintenance contracts, Information Technology upgrades to support regulatory requirements, equipment replacement to endure safe facility operations, energy renewal projects/studies, utilities, and fuel.

Transportation Security Laboratory (TSL) Operations

TSL performs research, development, and validation of solutions to detect and mitigate the threat of explosives. TSL is an RDT&E laboratory that develops promising explosive detection technologies to the point of operational T&E. TSL supports S&T's Explosives Division and CDS, and TSA. The real property and facilities belong to the Federal Aviation Administration (FAA). Major operational costs include rent, operation support contracts, building maintenance, utilities, energy renewal projects/studies, security, and information technology. TSL is located at the FAA William J. Hughes Technical Center in Atlantic City, N.J.

Salaries and Benefits

Funds salaries and benefits for non-headquarters, Federal employees located at S&T's field laboratories. These employees operate and execute programs at the S&T Laboratories in support of S&T divisions, DHS Components, and other government agencies.

**Department of Homeland Security
Science and Technology (S&T-CAS)
Laboratory Facilities
Justification of Program Changes**
(Dollars in Thousands)

Program Increase 1: Laboratory Operations
PPA: Laboratory Facilities
Program Increase: Positions 5, FTE 5,
Dollars \$9,065

Funding Profile

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request		
	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)
Current Services: Laboratory Operations - Laboratory Facilities							135	135	\$124,877
Subtotal, Current Services							135	135	\$124,877
Program Increase: Laboratory Operations - Laboratory Facilities							5	5	\$9,065
Subtotal, Program Increases							5	5	\$9,065
Total Request							140	140	\$133,942

DESCRIPTION OF ITEM:

The increase provides funding for NBAF and Plum Island Animal Disease Center (PIADC) laboratory operations.

Justification:

These funds will be used for the NBAF Federal management team and the Management Operations and Research Support (MORS) contract beginning in FY 2017 and achieve Select Agent Registration and full operating capacity by 2023. The timing of Federal staff placement, acquisition of contract vehicles, and procurement of equipment is closely linked to construction milestones and requires necessary funding to be available confidently in advance of expenditures to avoid program impacts. NBAF stand-up activities and associated funding requests are coordinated with concurrent USDA activities and funding that would incur delay and increases if proper funding alignment is not achieved

At PIADC, these funds will also be used to meet the bio-containment waste management requirements set under the current consent order with the New York State Department of Environmental Conservation (DEC) and the new select agent Tier 1 requirements for high threat biologic select agent(s) at PIADC, such as FMD. Additional funds will also be used to focus on waste characterization and management requirements in order to minimize the potential for enforcement actions (e.g. fines, suspension of permits) that could adversely impact PIADC's ability to complete its mission. Funding will also support PIADC in meeting additional Tier one regulatory requirements to strengthened 55 security monitoring (cameras), intrusion detection and screening (x-ray and metal detectors), and occupation health medical evaluations of staff.

Impact on Performance:

The FY 2017 increase will allow S&T to maintain the schedule to reach full operational capability through achievement of select agent registration of the NBAF by December 2022. The receipt of select agent registration at NBAF is critical to ensuring that the PIADC transition and closure remains on schedule. Delay in achieving NBAF (full operational capability) FOC may extend the period of concurrent operations of both laboratories, thereby increasing total operating costs to the government. NBAF FOC delays may incur additional operating costs at both labs, including increased operating risk associated with reliance on PIADC's over 60 year old infrastructure. The NBAF operations funding primarily supports the critical development of the IT system planning ensuring cybersecurity compliance as well as the management staff for operational planning. Additionally, this increase allows S&T to ensure PIADC compliance with New York State waste management regulations and enhanced Tier 1 Select Agent requirements. Failure to comply with these requirements will result in fines and possible impact to PIADC operations, safety and security. NBAF will support Laboratory Facilities' ability to establish additional direct relationships between its researchers and customers across DHS. This extensive network facilitates the delivery of enduring capabilities vital to DHS and the national homeland security mission, and houses some of the most advanced scientific expertise and capabilities in the world. As a result, the Homeland Security Enterprise is able to leverage, transfer, and apply a wealth of expertise to inform policy, improve operations, and advance research in support of homeland security.

**Department of Homeland Security
Operations and Support
Laboratory Facilities**

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	130	130	\$21,224	\$162	130	130	\$22,221	\$170	135	135	\$22,800	\$168	5	5	\$579	\$115
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

NARRATIVE EXPLANATION OF CHANGES – PAY COST DRIVERS:

- **FTE Change FY 2016-2017:** There is no change in FTE.
- **PCB Change FY 2016-2017:** The cost change in FTE is due the FY 2017 pay increase and the annualization of the FY 2016 pay raise.
- **Average Cost Change FY 2016-2017:** An increase of \$2,140,000 is expected for Laboratory Facilities in FY 2017. The increase of \$434,000 is attributed to the annual FY 2017 pay increase of 1.6 percent and \$145,000 annualization of the FY 2016 pay raise. The remaining increase of \$1,561,000 will support an increase of 5 FTEs in support of NBAF operational stand up.

**Department of Homeland Security
Science and Technology (S&T-CAS)
Laboratory Facilities
Cost Drivers (Non-Pay) - PPA Level (\$000s)**

Appropriation - Laboratory Facilities	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
R&D contracts	\$7,269	\$7,269	\$7,269	-
Advisory and Assistance services	\$10,977	\$10,977	\$10,977	-
Operations and Maintenance of Facilities	\$53,779	\$58,244	\$66,195	\$7,951
Communications, Utilities and Misc. charges	\$12,804	\$12,804	\$12,804	-
Total	\$84,829	\$89,294	\$97,245	\$7,951

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

NARRATIVE EXPLANATION OF CHANGES – NON-PAY COST DRIVERS:

- **Research and Development Contracts Cost Change FY 2016-2017:** There is no cost change in management and support services for R&D activities.
- **Advisory and Assistance Services Cost Change FY 2016-2017:** There is no cost change in management and support services for R&D activities.
- **Operations and Maintenance of Facilities Cost Change FY 2016-2017.** There is an increase of \$7,951,000 in R&D operations and maintenance of facilities due to increased Federal Protective Services cost at PIADC. These costs are responsible for the upkeep of facilities to meet the mission requirements while maintaining safe, secure, compliant, and efficient operations.
- **Travel Cost Change FY 2016-2017:** There were no cost changes in travel funding for federal employees supporting the T&E program.

**Department of Homeland Security
Science and Technology
Operations & Support
Acquisitions and Operations Analysis
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)**

Acquisition and Operations Analysis		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted			
Base	FY 2016 Enacted			
Current Services	2017 Pay Increase- Salaries	-	-	162
	Annualization of 2016 Pay Raise- Salaries	-	-	54
	Transfer from M&A to Operation & Support- AOA	81	81	14,860
	Transfer from RDA&O-AOS to Operations & Support-AOA	-	-	39,458
Program Changes	Acquisition and Operations Analysis	-	-	1,214
Budget Year	FY 2017 Request	81	81	55,748
	Total Change from FY 2016 to FY 2017	-	-	1,022

PPA DESCRIPTION: Acquisitions and Operations Analysis

The S&T Directorate requests 81 FTE, 81 positions and \$55.748 million for AOA in FY 2017.

CURRENT SERVICES PROGRAM DESCRIPTION:

Acquisition and Operations Analysis (AOA) PPA – The AOA PPA provides expert assistance, including systems engineering, to entities across the HSE to ensure that the transition, acquisition, and deployment of technologies, information, and procedures improve the efficiency and effectiveness of the operational capabilities across the HSE mission. This includes providing technological assessment of major acquisition programs in the DHS to help ensure that technologies, concept of operations (CONOPS), and procedures meet operational requirements, technology analysis and technology review of analysis of alternatives at the beginning and throughout an acquisition program’s life; standards to support the homeland security mission; and administration of the Support Anti-Terrorism by Fostering Effective Technologies (SAFETY) Act program.

Salaries & Benefits

S&T requests \$15.076 million in AOA for Salaries and Benefits.

The five thrust areas of AOA are Operations and Requirements Analysis; SAFETY Act; Standards; Systems Engineering; and Technology Transition Support.

1. Operations and Requirements Analysis Thrust – FY 2016: \$10.116 million. FY 2017 Request: \$9.036 million.

- *Problem:* The need to identify and prioritize cross-Department capability gaps, and duplications as well as identify solutions for Component operations and process inefficiencies.
- *Solution:* Execute enterprise capabilities based assessments to identify cross-Department capability gaps and develop courses of action to address the identified gaps; and conduct operations and process analyses to address Component operations issues.
- *Impact:* Improves operations efficiencies, and unifies DHS's efforts to reduce duplicative programs through joint capability developments where appropriate.

In addition, this thrust area supports S&T's role in providing support for Department capabilities and requirements analysis.

Capability Development Support

This project provides S&T and DHS with leadership and oversight of standards, systems analysis, and systems engineering. Working with the Under Secretary for Management, CDS leverages S&T's critical mass of scientific and engineering expertise to ensure that DHS develops and/or procures technologies that work as expected, and are delivered, or transitioned on time and on budget. In addition, this project supports S&T's role in providing support for Department capabilities and requirements analysis.

Joint Requirements Support

This effort leads capabilities and requirements analysis for the DHS Joint Requirements Council (JRC). A key element of the Secretary's Unity of Effort initiative, the JRC is a Component-led body that aims to identify and prioritize cross-Department capability gaps and inform investment decision making. The analysis that this effort performs for the JRC allows DHS leadership to address the gaps and duplications at an enterprise level rather than at the individual Component level, potentially enabling DHS to realize cost savings of tens of millions of dollars. This effort is responsible for performing capabilities analysis for each of the DHS portfolio areas brought before the JRC in order to identify, coordinate, and assess departmental capabilities, as well as recommend courses of action to address gaps in key areas including CBRN, aviation, and cybersecurity. It draws upon S&T's previous development of a repeatable, structured analytic process that was successfully validated in the Integrated Investment Life Cycle Management pilot analyses. Key outputs of this effort for each portfolio area include operational visualizations, functional analyses, operational analysis reports, capabilities-based assessments, mission analyses, and prioritized shortfalls.

Operations Analysis

This effort comprehensively defines operational problems, characterizes current operations and processes, describes the future state for operations and processes, and identifies alternative solutions to enable the future operational state. It provides rapid analytic support that enables tough operational challenges to be systematically addressed. This effort leverages S&T's subject matter expertise in operations analysis, modeling and simulation, and Lean Six Sigma process improvement to support Headquarters and Component mission analyses. By engaging early in the life cycle, Operations Analysis helps optimize analysis of alternatives through analytic insight into operational context, gaps, and requirements. Additionally, this effort is used to deliver short-turn, non-materiel operational solutions that directly impact critical DHS missions. Key outputs of this project include process maps, value streams, efficiency opportunities, and cost benefits analyses.

Homeland Security Operations and Analysis Center (HSOAC)

HSOAC is a Federally Funded Research & Development Center (FFRDC) working in the public interest to ensure the highest levels of excellence by bringing together the expertise and point-of-view of government, industry, and academia. The HSOAC works to solve complex HSE problems based on their core technical capabilities, their long-term relationship with the Department, their special access to data, and their inherent objectivity and independence. HSOAC supports DHS Components by providing specialized expertise in a spectrum of mission-critical capacities, to include program analyses and evaluation, targeted tradeoff studies of mission-level goals and strategies; analyzing operations and operational requirements; assessing DHS organizations and their governance; and evaluating performance metrics to effectively meet the future challenges facing the Nation.

2. SAFETY Act Thrust – FY 2016: \$8.043 million. FY 2017 Request: \$8.043 million. This program provides liability protections for claims resulted from an act of terrorism and provides legal liability protection for providers of qualified anti-terrorism technologies. The program incentivizes the private sector to commit additional resources to significantly improve anti-terrorism preparedness and resiliency. This program also creates pathways for S&T to work with industry and small businesses in a synchronized, strategic fashion to improve the pace and quality of solution development for the critical needs of the homeland security enterprise. The Office of SAFETY Act Implementation has evidence of significant investment of resources by the private sector in addressing terrorism risks as a direct result of the incentives offered by the SAFETY Act. In addition, the SAFETY Act Program actively supports DHS programs and initiatives (e.g., the National Infrastructure Protection Plan, Transportation Security Administration’s (TSA) Certified Cargo Screening Program, U.S. Customs and Border Protection’s Customs-Trade Partnership Against Terrorism) and other Federal agencies anti-terrorism programs by developing a streamlined procedure for providing SAFETY Act coverage known as Block Designations.

3. Standards Thrust – FY 2016 Request: \$3.000 million. FY 2017 Request: \$3.000 million.

This program implements the Department’s statutory responsibilities for the utilization and participation in the development of consensus standards with end users - private sector. These responsibilities are enabled through memberships in, and coordination with, national and international standards development organizations. Additionally, this program ensures that standards activities across all of the DHS components are harmonized and compatible with the mission, authority, and priorities of the Department. Finally, this program ensures technologies and equipment are safe, stable in the field, and the accelerated delivery of essential homeland security national standards.

4. Systems Engineering Thrust – FY 2016: \$4.364 million. FY 2017: \$4.364 million. Under this Program, the Office of Systems Engineering develops and assists DHS Acquisition and Research and Development programs in implementing systems engineering policies and processes. Systems Engineering is critical to the success of all DHS programs because it lays the framework for managing the technical design and development activities of acquisition and R&D programs, as well as facilitates sound decision-making relative to trade studies, system performance, risk, cost, and schedule. Current efforts include operating the DHS Systems Engineering Center of Excellence through which systems engineering experts work directly with DHS acquisition programs to implement systems engineering policy and process; revising the DHS Systems Engineering Life Cycle (SELC) policy and guidebook; developing a systems engineering-based framework within S&T to guide the selection and management of S&T R&D investments; and developing a DHS Systems Engineering Level I, II, and III certification program.

Systems Engineering Programs

This project establishes DHS systems engineering policies and processes and provides systems engineering guidance to Acquisition and R&D programs across DHS and within S&T. The Office of Systems Engineering works to ensure that S&T and DHS institutionalizes an objective and consistent approach for transforming mission needs and delivering operational capabilities that meet mission needs in a timely and cost-effective manner. Additionally, under this project, the Office of Systems Engineering provides systems engineering support to Acquisition and R&D programs to help them implement systems engineering policies and processes. Finally, the Office of Systems Engineering will assess an acquisition program's technical readiness and performance and inform acquisition decision-makers to facilitate informed acquisition decisions. OSE will be responsible for integrating, coordinating, and periodically assessing applicable programs to ensure those programs are applying an appropriate amount of systems engineering in light of the specific characteristics of those programs.

Technical Risk Assessment

This project focuses on assessing technical risks of acquisition programs, such as risks related to requirements, technology maturity, manufacturing, software and IT systems, design, and development. Continual assessment of technical risk throughout DHS Acquisition programs enables earlier identification of technical risks, allows for closer monitoring and earlier troubleshooting of such risks, and enables more informed Acquisition decision-making. The findings of these assessments will be provided to the DHS Acquisition Review Board via the Director of Systems Engineering to facilitate more informed DHS acquisition decisions, thereby increasing the likelihood of programs reaching its performance, cost, and schedule goals.

5. Technology Transition Support Thrust – FY 2016: \$14.343 million. FY 2017 Request: \$16.229 million. This thrust facilitates the transition of S&T Directorate product solutions to customers. These activities involve integrating technology development efforts across S&T to develop the most cost-effective and timely solutions, and processes to meet customer requirements, including first responders.

Interagency Programs

This program addresses high-priority homeland security needs through facilitation and collaboration with cooperative science, technology, and RDT&E endeavors with other Federal agencies, academia, and private sector. It establishes trusted partnerships with government agencies to leverage their investments and other resources, acting as a force-multiplier for S&T programs and initiatives. It provides a key conduit for government agencies to capitalize on S&T innovation and leverages the capabilities and investments of external organizations to reduce duplication and identify unmet needs pursuant to §302 (13) of the *Homeland Security Act of 2002*. Outreach is conducted with Federal, State, local, territorial, and tribal government partners to strengthen collaborative efforts and to collect input on their technology gaps.

Project Schedule including Milestones

- The Homeland Security Science and Technology Advisory Committee will meet four times a year, three in person meetings (quarterly) and one webinar (FY 2016 Q4).
- The Committee on Homeland and National Security will meet three times in FY 2016.

International Cooperative Programs Office (ICPO)

As security challenges continue to emerge and evolve, S&T is developing relationships with international allies to enhance our innovative R&D knowledge, funding, and other unique capabilities and resources. ICPO develops understandings and agreements, and facilitates the planning and implementation of international cooperative activity to address the strategic priorities for the HSE. The United States and its allies in the global war on terrorism will mutually benefit from the sharing of technological expertise to combat domestic and international terrorism and other high consequence events.

Prior Year Key Events

- Facilitate nine bilateral meetings for the Under Secretary and Deputy Under Secretary for S&T.
- Jointly fund European Union (EU) – U.S. Supply Chain Security Demonstration Pilot Project.

Current Year Key Events

- Facilitate nine bilateral meetings for the Under Secretary and Deputy Under Secretary for S&T.

Budget Year Key Events

- Facilitate nine bilateral meetings for the Under Secretary and Deputy Under Secretary for S&T.

Knowledge Management and Technology Scouting (formerly Tech Foraging)

This program enhances the S&T's ability to gather and manage accumulated knowledge and essential information for the benefit of the HSE to identify and evaluate existing or developing technologies, services, and emerging trends.

The Knowledge Management program develops and maintains an environment where S&T employees share and access relevant knowledge and lessons learned, and foster collaborative development efforts. Proper management of knowledge and information helps to protect the privacy of all individuals, ensures compliance with Freedom of Information Act (FOIA) requirements, and cost-effectively shares important information with a wide and diverse homeland security enterprise audience. Knowledge Management works with S&T staff to assess privacy risks, recommend privacy protections, and mitigate improper disclosures and breaches of personal information, encourage cost effective use of electronic knowledge sharing, while also facilitating efforts to promote an open and transparent government.

Technology scouting program supports S&T strategic and tactical R&D investment decision-making by providing Program Managers with a better understanding of the state of technology, including new and emerging technology, market analysis, and private sector innovation landscape. Technology scouting shapes the way S&T discovers, monitors, and assesses new and emerging technologies critical to homeland security enterprise missions. Technology scouting provides the foundation for S&T program decisions and helps shape program priorities. Technology scouting program goals are to improve alternative options, increase speed of project execution, and reduce costs for projects.

Program Transition

This project establishes and implements a technology development program to focus near-term S&T work on the transitioning projects and capabilities needed by DHS operational Components, and their external customers.

Public Private Partnerships

S&T builds partnerships through a series of programs and tools that identify, develop, and transfer technology solutions between industry, S&T, and the homeland security enterprise. Programs and tools include technology scouting, operational experimentation, technology transfer, accelerators, prize competitions, emerging technology, industry outreach, and related initiatives that seek solutions to address DHS R&D challenges. These program and tools are designed to reach all parts of industry, to include non-traditional industry such as those within the entrepreneurial community to harness inventive solutions that are on the cusp of emerging into the marketplace. Operational experimentation provides S&T programs the opportunity for end-users to assess technologies in an operational environment. In addition, the technology transfer program offers DHS R&D programs the opportunity to collaborate with industry partners to develop novel solutions to bring to the HSE. These tools provide opportunities for S&T to communicate problems directly to the innovation ecosystem and find innovative ideas and encourage product development in the marketplace that addresses homeland security challenges. These programs and tools are developing stronger public-private partnerships and, collectively, increasing the delivery of more effective and impactful solutions to the homeland security enterprise, through enhanced industry partnerships.

Prior Year Key Events

- Provided market and technology evaluation products for the technology topic areas of Unmanned Aerial Vehicles (UAV); rapid 3D rendering; tracking and locating; sensors; body cameras; situational awareness; robots; cyber defense; radiation detection; semiconductors; cargo inspection; and airport security.
- Conducted S&T's first Prize competition to identify technologies to locate and track personnel in confined environments.

Current Year Key Events

- Conclude S&T's Accelerator pilot, use experience to inform and launch a follow-on effort.
- Conduct two Prize events in collaboration with DHS end users.
- Initiate DHS S&T operational experimentation program.

Budget Year Key Events

- Conduct operational experimentation events to connect industry and operators.
- Execute a series of accelerators and prize competitions to address high-priority DHS R&D needs.
- Provide technology scouting and market analysis to inform initiation of new R&D programs.

**Department of Homeland Security
Science and Technology (S&T-CAS)
Acquisition and Operations Analysis
Justification of Program Changes**
(Dollars in Thousands)

Program Increase 2: Systems
Engineering and Technology Transition
PPA: Acquisition and Operations Analysis
Program Increase: Positions 0, FTE 0, Dollars \$1,214

Funding Profile

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request		
	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)
Current Services: Acquisition and Operations Analysis - Acquisition and Operations Analysis							-	-	\$54,534
Subtotal, Current Services							-	-	\$54,534
Program Increase: Acquisition and Operations Analysis - Acquisition and Operations Analysis							-	-	\$1,214
Subtotal, Program Increases							-	-	\$1,214
Total Request							-	-	\$55,748

DESCRIPTION OF ITEM:

The funding increase in Acquisitions and Operations Analysis reflects funding to support Systems Engineering and Technology Transition Support.

Justification:

Systems Engineering is critical to the success of DHS programs because it lays the framework for managing the technical design and development activities of acquisition and R&D programs as well as facilitates sound decision-making relative to trade studies, system performance, risk, cost, and schedule.

Technology Transition Support programs and tools include technology scouting, operational experimentation, technology transfer agreements, industry outreach, and other programs that seek solutions to address DHS R&D challenges.

The S&T's FY 2017 request provides funding to continue developing and improving Systems Engineering and Technology Transition.

Impact on Performance:

The FY 2017 increase will allow S&T to develop and assist additional DHS Acquisition and Research and Development programs in implementing systems engineering policies and processes. Application of systems engineering principles and processes and technology transition programs and tools increase the likelihood of successfully delivering capability and integrating technology development efforts across S&T at the best cost. It will also increase the delivery of effective and impactful solutions to the HSE by enhancing relationships with industry as well.

**Department of Homeland Security
Operations and Support
Acquisition and Operations Analysis**

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted ¹				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	72	72	\$13,531	\$187	81	81	\$14,860	\$182	81	81	\$15,076	\$185	-	-	\$216	3
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

NARRATIVE EXPLANATION OF CHANGES – PAY COST DRIVERS:

- **FTE Change FY 2016-2017:** There is no change in FTE.
- **PCB Change FY 2016-2017:** The cost change in FTE is due the FY 2017 pay increase and the annualization of the FY 2016 pay raise.
- **Average Cost Change FY 2016-2017:** An increase of \$162,000 in pay is attributed to the annual FY 2017 pay increase of 1.6 percent and \$54,000 annualization of the FY 2016 pay raise.

**Department of Homeland Security
Science and Technology (S&T-CAS)
Acquisition and Operations Analysis
Cost Drivers (Non-Pay) - PPA Level (\$000s)**

Appropriation - Acquisition and Operations Analysis	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Advisory and Assistance Services	\$1,252	\$1,252	\$1,252	-
Travel	\$592	\$592	\$592	-
Research and Development Contracts	\$33,925	\$37,537	\$38,343	\$806
Total	\$35,769	\$39,381	\$40,187	\$806

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

NARRATIVE EXPLANATION OF CHANGES – NON-PAY COST DRIVERS:

- **Advisory and Assistance Services Cost Change FY 2016-2017:** There were no cost changes in management and support services for R&D activities.
- **Travel Cost Change FY 2016-2017:** There is no cost change in travel funding for federal employees supporting the T&E program.
- **Research and Development Contracts Cost Change FY 2016-2017:** An increase of \$806,000 in R&D contracts are attributed to general escalation costs of existing contracts in support of Acquisition and Operations Analysis support services.

Schedule III – Other Exhibits

Exhibit E. Justification of Proposed Legislative Language

Department of Homeland Security

**Science and Technology
Operations & Support**

Language Provision	Explanation
<p>For necessary expenses to support science and technology research and development, acquisition, and laboratory operations as authorized by title III of the Homeland Security Act of 2002 (6 U.S.C. 181 et seq.), and the purchase or lease of not to exceed 5 vehicles \$278,733,000 of which \$89,043,000 is for management and administration; and of which \$189,690,000 shall remain available until September 30, 2019: Provided, That not to exceed \$7,650 shall be for official reception and representation expenses.</p>	<p>The legislative language associated with this account has been updated and streamlined to reflect the Department’s new Common Appropriations Structure. Funding amounts have been updated to reflect the FY 2017 President’s Budget.</p>

Exhibit F. Summary of Fee Collections and Carryover

**Department of Homeland Security
Science and Technology (S&T-CAS)
Operations and Support
Fee 1
(Discretionary Offsetting Fees ONLY)
Summary of Fee Collections and Carryover
(Dollars in Thousands)**

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
Collections (Actual or Anticipated)	-	-	-
Carryover (Includes Recoveries)	\$447,757	\$50,372	\$249,064
Portion of Current Year Collection Sequestered	-	-	-
Previous Year Sequestered Funds Available	-	-	-
Total Budget Authority	\$447,757	\$50,372	\$249,064

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

Exhibit G. Summary of Reimbursable Resources

**Department of Homeland Security
Science and Technology (S&T-CAS)
Operations and Support
Summary of Reimbursable Resources
(Dollars in Thousands)**

Collections by Source:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Department of Agriculture	-	-	-	-	-	-	-	-	\$250	-	-	-
Department of Energy	-	-	-	-	-	-	-	-	\$1,000	-	-	-
DHS - United States Coast Guard	-	-	-	-	-	-	-	-	\$2,500	-	-	-
DHS - Secret Service	-	-	-	-	-	-	-	-	\$4,000	-	-	-
Customs & Border Protection	-	-	-	-	-	-	-	-	\$16,000	-	-	-
DHS - US Citizenship & Immigration Service (USCIS)	-	-	-	-	-	-	-	-	\$4,000	-	-	-
DHS - Federal Emergency Management Agency	-	-	-	-	-	-	-	-	\$250	-	-	-
DHS - Immigration and Customs Enforcement	-	-	-	-	-	-	-	-	\$5,000	-	-	-
DHS - Transportation and Security Administration	-	-	-	-	-	-	-	-	\$11,000	-	-	-
Department of Homeland Security - US Visit	-	-	-	-	-	-	-	-	\$2,000	-	-	-
DHS - National Protection & Programs Directorate	-	-	-	-	-	-	-	-	\$22,000	-	-	-
07. Department of Justice	-	-	-	-	-	-	-	-	\$3,500	-	-	-
01. Department of Homeland Security	-	-	-	-	-	-	-	-	\$18,000	-	-	-
02. Department of Defense	-	-	-	-	-	-	-	-	\$1,500	-	-	-
Domestic Nuclear Detection Office	-	-	-	-	-	-	-	-	\$2,000	-	-	-
Total Budgetary Resources	-	-	-	-	-	-	-	-	\$93,000	-	-	-

Obligations by Program/Project Activity:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Management and Administration	-	-	-	-	-	-	-	-	\$100	-	-	-
Laboratory Facilities	-	-	-	-	-	-	-	-	\$5,900	-	-	-
Acquisition and Operations Support	-	-	-	-	-	-	-	-	\$87,000	-	-	-
Total Obligations	-	-	-	-	-	-	-	-	\$93,000	-	-	-

Exhibit H. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

Department of Homeland Security
 Science and Technology (S&T-CAS)
 Operations and Support
 (Dollars in Thousands)

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Management and Administration			\$28,350	(\$11,752)
Total Working Capital Fund			\$28,350	(\$11,752)

Exhibit I. Capital Investment and Construction Initiative Listing

**Department of Homeland Security
Science and Technology
Operations & Support
Capital Investment and Construction Initiative Listing**

N/A

Exhibit J. Object Class Breakout by Appropriation

**Department of Homeland Security
Science and Technology (S&T-CAS)
Operations and Support
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$40,271	\$42,271	\$43,077	\$806
11.3 Other than Full-Time Permanent	-	-	-	-
11.5 Other Personnel Compensation	-	-	-	-
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	-	-	-	-
12.1 Civilian Personnel Benefits	\$16,329	\$16,939	\$17,249	\$310
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	\$56,600	\$59,210	\$60,326	\$1,116
Other Object Classes				
21.0 Travel and Transportation of Persons	\$1,581	\$1,581	\$1,581	-
22.0 Transportation of Things	-	-	-	-
23.1 Rental Payments to GSA	\$1,250	\$1,250	\$1,250	-
23.2 Rental Payments to Others	-	-	-	-
23.3 Communications, Utilities, and Misc. Charges	\$12,804	\$12,804	\$12,804	-
24.0 Printing and Reproduction	-	-	-	-
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$34,551	\$36,033	\$36,515	\$482
25.2 Other Services from Non-Federal Sources	\$800	\$800	\$800	-
25.3 Other Goods and Services from Federal Sources	\$45,621	\$44,889	\$40,775	(\$4,115)
25.4 Operation and Maintenance of Facilities	\$53,945	\$58,410	\$66,361	\$7,951
25.5 Research and Development Contracts	\$41,194	\$44,806	\$45,612	\$806
25.6 Medical Care	-	-	-	-
25.7 Operation and Maintenance of Equipment	\$3,083	\$3,083	\$3,083	-
25.8 Subsistence & Support of Persons	-	-	-	-
26.0 Supplies and Materials	\$5,713	\$5,713	\$5,713	-
31.0 Equipment	\$3,668	\$3,668	\$3,668	-
32.0 Land and Structures	-	-	-	-
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	\$245	\$245	\$245	-
42.0 Insurance Claims and Indemnities	-	-	-	-
43.1 Interest and Dividends	-	-	-	-
43.2 Immigration Fees	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
44.0 Refunds	-	-	-	-
91.0 Unvouchered	(\$1)	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$204,454	\$213,282	\$218,407	\$5,124
Total, Direct Obligations	\$261,054	\$272,492	\$278,733	\$6,240
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$261,054	\$272,492	\$278,733	\$6,240

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

Exhibit K. Object Class Breakout by PPA

**Department of Homeland Security
Science and Technology (S&T-CAS)
Operations and Support
Management and Administration**
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$15,917	\$16,004	\$16,247	\$243
12.1 Civilian Personnel Benefits	\$5,928	\$6,125	\$6,203	\$78
Total, Personnel and Compensation Benefits	\$21,845	\$22,129	\$22,450	\$321
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$532	\$532	\$532	-
25.1 Advisory and Assistance Services	\$22,322	\$23,804	\$24,286	\$482
25.2 Other Services from Non-Federal Sources	\$800	\$800	\$800	-
25.3 Other Goods and Services from Federal Sources	\$40,840	\$40,108	\$35,994	(\$4,115)
25.4 Operation and Maintenance of Facilities	\$156	\$156	\$156	-
25.7 Operation and Maintenance of Equipment	\$2,464	\$2,464	\$2,464	-
26.0 Supplies and Materials	\$500	\$500	\$500	-
31.0 Equipment	\$1,861	\$1,861	\$1,861	-
Total, Other Object Classes	\$69,475	\$70,226	\$66,593	(\$3,633)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$91,320	\$92,354	\$89,043	(\$3,312)
Full Time Equivalents	131	134	134	-

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

**Department of Homeland Security
Science and Technology (S&T-CAS)
Operations and Support
Laboratory Facilities**
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$15,325	\$16,023	\$16,429	\$406
12.1 Civilian Personnel Benefits	\$5,899	\$6,198	\$6,371	\$173
Total, Personnel and Compensation Benefits	\$21,224	\$22,221	\$22,800	\$579
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$457	\$457	\$457	-
23.1 Rental Payments to GSA	\$1,250	\$1,250	\$1,250	-
23.3 Communications, Utilities, and Misc. Charges	\$12,804	\$12,804	\$12,804	-
25.1 Advisory and Assistance Services	\$10,977	\$10,977	\$10,977	-
25.3 Other Goods and Services from Federal Sources	\$4,611	\$4,611	\$4,611	-
25.4 Operation and Maintenance of Facilities	\$53,779	\$58,244	\$66,195	\$7,951
25.5 Research and Development Contracts	\$7,269	\$7,269	\$7,269	-
25.7 Operation and Maintenance of Equipment	\$616	\$616	\$616	-
26.0 Supplies and Materials	\$5,163	\$5,163	\$5,163	-
31.0 Equipment	\$1,800	\$1,800	\$1,800	-
Total, Other Object Classes	\$98,726	\$103,191	\$111,142	\$7,951
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$119,950	\$125,412	\$133,942	\$8,530
Full Time Equivalents	130	136	141	5

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

**Department of Homeland Security
Science and Technology (S&T-CAS)
Operations and Support
Acquisition and Operations Analysis
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$9,029	\$10,244	\$10,401	\$157
12.1 Civilian Personnel Benefits	\$4,502	\$4,616	\$4,675	\$59
Total, Personnel and Compensation Benefits	\$13,531	\$14,860	\$15,076	\$216
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$592	\$592	\$592	-
25.1 Advisory and Assistance Services	\$1,252	\$1,252	\$1,252	-
25.3 Other Goods and Services from Federal Sources	\$170	\$170	\$170	-
25.4 Operation and Maintenance of Facilities	\$10	\$10	\$10	-
25.5 Research and Development Contracts	\$33,925	\$37,537	\$38,343	\$806
25.7 Operation and Maintenance of Equipment	\$3	\$3	\$3	-
26.0 Supplies and Materials	\$50	\$50	\$50	-
31.0 Equipment	\$7	\$7	\$7	-
41.0 Grants, Subsidies, and Contributions	\$245	\$245	\$245	-
91.0 Unvouchered	(\$1)	-	-	-
Total, Other Object Classes	\$36,253	\$39,866	\$40,672	\$806
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$49,784	\$54,726	\$55,748	\$1,022
Full Time Equivalents	72	81	81	-

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

Exhibit L. Permanent Positions by Grade

**Department of Homeland Security
Science and Technology (S&T-CAS)
Operations and Support**
Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES			8	-
Total, EX			1	-
GS-15			104	4
GS-14			91	1
GS-13			52	-
GS-12			31	-
GS-11			17	-
GS-9			20	-
GS-8			4	-
GS-7			7	-
GS-6			9	-
GS-5			1	-
Other Graded Positions			11	-
Total Permanent Positions			356	5
Unfilled Positions EOY			-	-
Total Permanent Employment EOY			-	-
Headquarters			356	5
Total, Operations and Support:			356	5
Full Time Equivalents			356	5
Average ES Salary			179,181	179,181
Average GS Salary	-	-	114,244	114,244
Average Grade	-	-	14	14

Exhibit M. Changes in Full Time Employment

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>
Increases			
Transfer from M&A to Operation & Support- M&A	-	-	134
Transfer from RDA&O- Lab Facilities to Operations & Support- Lab Facilities	-	-	136
Transfer from M&A to Operation & Support- AOA	-	-	81
Laboratory Operations	-	-	5
Decreases			
Year End Actuals/Estimated FTEs:	333	351	356

Department of Homeland Security

Science and Technology

Procurement, Construction and Improvements



Fiscal Year 2017

Congressional Justification

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Schedule I – Executive Summary of Appropriation Exhibits

A. Summary of Budget Estimates by Program Project Activity- Appropriation Level

**Department of Homeland Security
Science and Technology (S&T)
Procurement, Construction, and Improvements
Summary of FY 2017 Budget Estimates by Program Project Activity**

**FY 2017 Request
(Dollars in Thousands)**

Program Project Activity	FY 2015 ¹			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017		
	Revised Enacted			Enacted			Request			Total Changes		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Acquisition and Operations Analysis	10	10	\$7,805	13	13	\$9,623	13	13	\$10,141	-	-	\$518
Laboratory Facilities	-	-	\$315,039	-	-	\$8,319	-	-	-	-	-	(\$8,319)
Total, Procurement, Construction, and Improvements	10	10	\$322,844	13	13	\$17,942	13	13	\$10,141	-	-	(\$7,801)
Subtotal, Enacted Appropriations & Budget Estimates	10	10	\$322,844	13	13	\$17,942	13	13	\$10,141	-	-	(\$7,801)
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	10	10	\$322,844	13	13	\$17,942	13	13	\$10,141	-	-	(\$7,801)

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Overview

The mission of S&T is to *strengthen America’s security and resiliency by providing knowledge products and innovative technology solutions for the Homeland Security Enterprise (HSE)*. This appropriation supports S&T acquisition work including test and evaluation, buying, building, or improving the tools and buildings used to support S&T’s research and development.

The S&T has two program, project, and activities (PPAs) under Procurement, Construction and Improvements (PC&I): Laboratory Facilities and Acquisition and Operations Analysis (AOA).

Acquisition and Operations Analysis (AOA)

AOA provides expert assistance to entities across the HSE to ensure that the transition, acquisition, and deployment of technologies, information, and procedures improve the efficiency and effectiveness of the operational capabilities across the HSE mission. The Testing and Evaluation (T&E) program is the primary focus of this type of work in AOA.

Laboratory Facilities

The Office of National Laboratories (ONL) oversees a coordinated network of five DHS laboratories, and has one under construction – NBAF – that are vital to the national homeland security mission. This extensive network enables America’s brightest scientists and engineers to apply their expertise and develop solutions that address our most dangerous threats and homeland security vulnerabilities. The Infrastructure Upgrades program area of Laboratory Facilities is accounted for in the PC&I appropriation. The Lab Facilities PPA is not funded in FY 2017.

The S&T requests 13 positions, 13 FTE, and \$10.141 million for PC&I in FY 2017.

The adjustments-to-base total is \$9.481 million, and includes:

- Transfer in from Research, Development, Acquisition and Operations (RDA&O) legacy appropriation \$7.060 million.
- Transfer in from Management and Administration (M&A) legacy appropriation \$2.386 million.
- Increase of 1.6 percent FY 2017 federal pay raise and annualization of pay \$0.035 million.

The O&S program changes total an increase of \$0.660 million in AOA PPA.

B. FY 2016 to FY 2017 Budget Change - Appropriation Level

**Department of Homeland Security
Science and Technology (S&T)
Procurement, Construction, and Improvements
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)**

	Pos.	FTE	Amount
FY 2015 Revised Enacted			
FY 2016 Enacted			
Adjustments-to-Base			
Transfers to and from other accounts:			
Transfer from M&A to Procurement Construction & Improvement- AOS	13	13	\$2,386
Transfer from RDA&O-AOS to Procurement Construction and Improvement-AOA	-	-	\$7,060
Transfer from RDA&O- Lab Facilities to PCI- Lab Facilities	-	-	\$8,319
Total Transfers	13	13	\$17,765
Increases			
2017 Pay Increase- Salaries	-	-	\$26
Annualization of 2016 Pay Raise- Salaries	-	-	\$9
Total, Increases	-	-	\$35
Total Other Adjustments	-	-	\$35
Total Adjustments-to-Base	13	13	\$17,800
FY 2017 Current Services	13	13	\$17,800
Program Changes			
Increases			
Acquisition and Operations Support	-	-	\$660
Total, Increases	-	-	\$660
Decreases			
Laboratory Infrastructure Upgrades	-	-	(\$8,319)
Total, Decreases	-	-	(\$8,319)
Total Program Changes	-	-	(\$7,659)
FY 2017 Request	13	13	\$10,141
FY 2016 to FY 2017 Change	-	-	(\$7,801)

C. FY 2017 Investment Summary - Appropriation Level

N/A

Schedule II – Program, Project, Activity (PPA) Exhibits

Exhibit D. FY 2016 to FY 2017 Budget Change- PPA Level

**Department of Homeland Security
Science and Technology
Procurement, Construction and Improvements
Acquisitions and Operations Analysis
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)**

Acquisition and Operations Analysis		Positions	FTE	Amount
Current Services	2017 Pay Increase- Salaries	-	-	26
	Annualization of 2016 Pay Raise - Salaries	-	-	9
	Transfer from M&A to Procurement Construction & Improvement - AOA	13	13	2,386
	Transfer from RDA&O-AOS to Procurement Construction and Improvement - AOA	-	-	7,060
Program Changes	Acquisition and Operations Analysis	-	-	660
Budget Year	FY 2017 Request	13	13	10,141
	Total Change from FY 2016 to FY 2017	-	-	518

PPA DESCRIPTION: Acquisitions and Operations Analysis

S&T requests 13 FTE, 13 positions and \$10.141 million for AOA in FY 2017.

CURRENT SERVICES PROGRAM DESCRIPTION:

Acquisition and Operations Analysis (AOA) PPA – AOA provides expert assistance, including systems engineering, to entities across the homeland security enterprise (HSE) to ensure that the transition, acquisition, and deployment of technologies, information, and procedures improve the efficiency and effectiveness of the operational capabilities across the HSE mission. This includes providing oversight of the T&E of DHS major acquisition programs.

Testing and Evaluation – This program establishes policies and procedures, and coordinates test and evaluation resources to verify attainment of technical performance specifications and to evaluate operational effectiveness/suitability prior to system deployment. T&E works to ensure that DHS integrates a uniform and centrally managed departmental test and evaluation process into the systems engineering and acquisition lifecycle. The infrastructure area will assess, integrate, and coordinate DHS and non-DHS test assets to ensure that adequate test capabilities are available to support DHS programs and projects.

Operational Test & Evaluation (OT&E)

Operational Test & Evaluation (OT&E) is responsible for issuing DHS OT&E policy and procedures; reviewing and analyzing the results of OT&E conducted for each acquisition program on the Major Acquisition Oversight List (MAOL); observing OT&E events leading up to fielding decisions; providing independent assessments when needed; and overseeing major DHS acquisition programs to ensure OT&E is adequate to confirm operational effectiveness, suitability and cyber security of DHS systems.

Developmental Test & Evaluation (DT&E)

Developmental Test & Evaluation (DT&E) will be responsible for: reviewing system engineering strategy prior to approving T&E strategy; ensuring requirements are stated in terms that are testable, measurable and achievable; approving foundational operational and support-related performance attributes provide the capabilities required; concurring on CONOPS for correctly translated operational requirements; observe DT&E events before key production decisions when needed, and providing support to 111 programs not just those on MAOL.

First Responder Technologies (System Assessment and Validation for Emergency Responders [SAVER])

- **Problem:** Emergency response equipment is being purchased at an increasing rate by Federal, State, local, and tribal emergency first responders to meet current national security challenges. The State, local and tribal responders need an honest broker of procurement-related information on responder equipment to allow them to make informed procurement decisions.
- **Solution:** SAVER provides unbiased, comparative assessments of commercially available responder equipment along with other relevant equipment information to the emergency first responder community in an operationally useful form. SAVER assesses those products using responders in realistic operational environments and real world scenarios. SAVER also performs verification tests; tests that verify manufacturer claims.
- **Impact:** SAVER performs the testing that provides the emergency responder community with knowledge products that enable first responders to better select, procure, use, and maintain equipment. SAVER is the available source of objective, operationally oriented testing information on commercially available responder equipment, and its assessments results and other relevant information are posted on FirstResponder.gov and First Responder Communities of Practice. This sharing of information is a life-saving and cost-saving asset for DHS, as well as for Federal, State, local, and tribal users of emergency response equipment.

SAVER contains More than 900 assessments of equipment that falls within 21 different categories on the DHS Authorized Equipment List (AEL). Categories include:

- Search and Rescue
- Information Technology
- CBRNE Detection

- Personal Protective Equipment
- Decontamination
- Surveillance
- Explosives Countermeasures

**Department of Homeland Security
Science and Technology (S&T)
Acquisition and Operations Analysis
Justification of Program Changes**
(Dollars in Thousands)

Program Increase 1: Acquisition and Operations Support
PPA: Acquisition and Operations Analysis
Program Increase: Positions 0, FTE 0, Dollars \$660

Funding Profile

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request		
	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)
Current Services: Acquisition and Operations Analysis							-	13	\$9,481
Subtotal, Current Services							-	13	\$9,481
Program Increase: Acquisition and Operations Analysis							-	-	\$660
Subtotal, Program Increases							-	-	\$660
Total Request							-	13	\$10,141

DESCRIPTION OF ITEM:

The increase of \$0.660 million in the Acquisition Operations and Analysis PPA reflects an increase in Test and Evaluation.

Justification:

The S&T's Office of Test and Evaluation (OTE) works across all DHS Components and entities to support T&E programs. OTE integrates T&E into the entire development and acquisition cycle via early and continuous evaluation of system test requirements, planning, and execution. OTE coordinates with other federal agencies to implement effective T&E programs.

The increase in funding will allow the OTE to establish additional policies and programs to support the development, coordination, and operational management of T&E infrastructure. OTE oversees test and evaluation for DHS major acquisitions, ensuring homeland security technologies are reliable, interoperable and effective.

Impact on Performance:

The FY 2017 increase will allow AOA to continue to maintain established direct relationships between its researchers and customers across DHS. Further, it will allow S&T to provide additional aid with program planning and executing robust T&E throughout the acquisition lifecycle, bringing credible assessments to all acquisition decisions.

**Department of Homeland Security
Procurement, Construction, and Improvements
Acquisition and Operations Analysis**

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				FY 2016 to FY 2017 Change			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	10	10	\$2,356	\$235	13	13	\$2,386	\$183	13	13	\$2,421	\$186	-	-	\$35	3
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS pay cost drivers Exhibit may reflect a higher average FTE cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

NARRATIVE EXPLANATION OF CHANGES – PAY COST DRIVERS:

- **FTE Change FY 2016-2017:** There is no change in FTE.
- **PCB Change FY 2016-2017:** The cost change in FTE is due the FY 2017 pay increase and the annualization of the FY 2016 pay raise.
- **Average Cost Change FY 2016-2017:** An increase of \$35,000 in pay is attributed to the FY 2017 pay increase of 1.6 percent and annualization of the FY 2016 pay raise.

**Department of Homeland Security
Science and Technology (S&T)
Acquisition and Operations Analysis
Cost Drivers (Non-Pay) - PPA Level (\$000s)**

Appropriation - Acquisition and Operations Analysis	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non-Pay Cost Drivers (greatest-least)				
Research and Development Contracts	\$4,913	\$6,701	\$7,184	\$483
Advisory and Assistance Services	\$350	\$350	\$350	-
Travel	\$119	\$119	\$119	-
Total	\$5,382	\$7,170	\$7,653	\$483

¹FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

NARRATIVE EXPLANATION OF CHANGES – NON-PAY COST DRIVERS:

- **Research and Development Contracts Cost Change FY 2016-2017:** An increase of \$483,000 in R&D contracts are attributed to general escalation costs of existing contracts in support of Test and Evaluation services supporting.
- **Advisory and Assistance Services Cost Change FY 2016-2017:** There were no cost changes in management and support services and technical support services for R&D activities.
- **Travel Cost Change FY 2016-2017:** There were no cost changes in travel funding for federal employees supporting the T&E program.

**Department of Homeland Security
Science and Technology
Procurement, Construction and Improvements
Laboratory Facilities
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)**

Laboratory Facilities		Positions	FTE	Amount
	Transfer from RDA&O - Lab Facilities to PCI-Laboratory Facilities	-	-	8,319
Program Changes	Laboratory Infrastructure Upgrades	-	-	(8,319)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(8,319)

PPA DESCRIPTION: Laboratory Facilities

S&T is not planning any laboratory construction for FY 2017.

**Department of Homeland Security
Science and Technology (S&T)
Laboratory Facilities
Justification of Program Changes**
(Dollars in Thousands)

Program Decrease 1: Laboratory Infrastructure Upgrades

PPA: Laboratory Facilities
Program Increase: Positions 0, FTE 0, Dollars (\$8,319)

Funding Profile

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request		
	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)
Program Decrease: Laboratory Infrastructure Upgrades - Laboratory Facilities							-	-	(\$8,319)
Subtotal, Program Decreases							-	-	(\$8,319)
Total Request							-	-	(\$8,319)

DESCRIPTION OF ITEM:

The decrease of \$8.319 million is due to S&T not planning any capital improvements to its laboratory facilities for FY 2017. S&T plans to request full funding for the cost of TSL construction in a future budget. While large scale capital projects are an infrequent occurrence, S&T typically has smaller scale capital improvement to its laboratory facilities each year.

Justification:

The highest priority for infrastructure upgrades in FY 2016 through FY 2018 is ensuring that the Transportation Security Laboratory (TSL) is positioned to meet the emerging and expanding RDT&E demands of the Aviation and Transportation Security sector, and deliver leading edge screening technologies to meet the explosive and contraband threats of tomorrow. The primary and keystone feature of the TSL Master Plan is the Detection Sciences Testing & Applied Research (DSTAR) Center. The DSTAR Center construction allows for the co-location of multiple laboratories that perform research and technical functions that are fundamental to the entire breadth of the TSL mission. This investment enhances overall campus efficiency by co-locating RDT&E functions and unencumbering support facilities; replaces work currently accomplished in five temporary trailers which are beyond their service lifecycle; and, provides necessary Sensitive Compartmented Information Facility (SCIF) space for expanded classified activities.

The DSTAR Center is being designed with FY 2016 funds and, as with all laboratory infrastructure, contains significant complexity to integrate RDT&E mission requirements and maintain safety when handling explosive materials. The construction will occur as a single construction bid once the design is completed and funding appropriated.

Impact on Performance:

The reduction of FY 2017 funding will not impact the Laboratory Facilities' ability to meet mission to manage and maintain its portfolio in this instance. S&T plans to request funding in a future budget to execute the TSL Master Plan efforts and maintain the appropriate level of effort for planning, programming, budgeting, and management of its entire laboratory portfolio.

**Department of Homeland Security
Science and Technology
Procurement, Construction and Improvements
Laboratory Facilities**

N/A

**Department of Homeland Security
Science and Technology
Procurement, Construction and Improvements
Laboratory Facilities**

N/A

Schedule III – Other Exhibits

Exhibit E. Justification of Proposed Legislative Language

**Department of Homeland Security
Science and Technology
Procurement, Construction and Improvements**

Language Provision	Explanation
For necessary expenses for science and technology test and evaluation, acquisition support and construction of laboratory facilities as authorized by title III of the Homeland Security Act of 2002 (6 U.S.C. 181 et seq.) \$10,141,000, to remain available until September 30, 2019.	The legislative language associated with this account has been updated and streamlined to reflect the Department's new Common Appropriations Structure. Funding amounts have been updated to reflect the FY 2017 President's Budget.

Exhibit F. Summary of Fee Collections and Carryover

Department of Homeland Security
Science and Technology (S&T)
Procurement, Construction, and Improvements
Fee 1
(Discretionary Offsetting Fees ONLY)
 Summary of Fee Collections and Carryover
 (Dollars in Thousands)

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
Collections (Actual or Anticipated)	-	-	-
Carryover (Includes Recoveries)	\$11,418	\$13,901	\$12,660
Portion of Current Year Collection Sequestered	-	-	-
Previous Year Sequestered Funds Available	-	-	-
Total Budget Authority	\$11,418	\$13,901	\$12,660

Exhibit G. Summary of Reimbursable Resources

**Department of Homeland Security
Science and Technology
Procurement, Construction and Improvements
Summary of Reimbursable Resources**

N/A

Exhibit H. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

**Department of Homeland Security
Science and Technology
Procurement, Construction and Improvements
FY 2017 Schedule of Working Capital Fund by Program/Project Activity**

N/A

Exhibit I. Capital Investment and Construction Initiative Listing

**Department of Homeland Security
Science and Technology
Procurement, Construction and Improvements
Capital Investment and Construction Initiative Listing**

N/A

Exhibit J. Object Class Breakout by Appropriation

**Department of Homeland Security
Science and Technology (S&T)
Procurement, Construction, and Improvements
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$1,908	\$1,840	\$1,868	\$28
11.3 Other than Full-Time Permanent	-	-	-	-
11.5 Other Personnel Compensation	-	-	-	-
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	-	-	-	-
12.1 Civilian Personnel Benefits	\$448	\$546	\$553	\$7
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	\$2,356	\$2,386	\$2,421	\$35
Other Object Classes				
21.0 Travel and Transportation of Persons	\$119	\$119	\$119	-
25.1 Advisory and Assistance Services	\$350	\$350	\$350	-
25.5 Research and Development Contracts	\$4,913	\$6,701	\$7,184	\$483
25.7 Operation and Maintenance of Equipment	\$1	\$1	\$1	-
26.0 Supplies and Materials	\$15	\$15	\$15	-
31.0 Equipment	\$2	\$2	\$2	-
32.0 Land and Structures	\$315,039	\$8,319	-	(\$8,319)
41.0 Grants, Subsidies, and Contributions	\$49	\$49	\$49	-
Total, Other Object Classes	\$320,488	\$15,556	\$7,720	(\$7,836)
Total, Direct Obligations	\$322,844	\$17,942	\$10,141	(\$7,801)
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$322,844	\$17,942	\$10,141	(\$7,801)

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

Exhibit K. Object Class Breakout by PPA

**Department of Homeland Security
Science and Technology (S&T)
Procurement, Construction, and Improvements
Acquisition and Operations Analysis
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$1,908	\$1,840	\$1,868	\$28
12.1 Civilian Personnel Benefits	\$448	\$546	\$553	\$7
Total, Personnel and Compensation Benefits	\$2,356	\$2,386	\$2,421	\$35
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$119	\$119	\$119	-
25.1 Advisory and Assistance Services	\$350	\$350	\$350	-
25.5 Research and Development Contracts	\$4,913	\$6,701	\$7,184	\$483
25.7 Operation and Maintenance of Equipment	\$1	\$1	\$1	-
26.0 Supplies and Materials	\$15	\$15	\$15	-
31.0 Equipment	\$2	\$2	\$2	-
41.0 Grants, Subsidies, and Contributions	\$49	\$49	\$49	-
Total, Other Object Classes	\$5,449	\$7,237	\$7,720	\$483
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$7,805	\$9,623	\$10,141	\$518
Full Time Equivalents	10	13	13	-

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

**Department of Homeland Security
Science and Technology (S&T)
Procurement, Construction, and Improvements
Laboratory Facilities**
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
32.0 Land and Structures	\$315,039	\$8,319	-	(\$8,319)
Total, Other Object Classes	\$315,039	\$8,319	-	(\$8,319)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$315,039	\$8,319	-	(\$8,319)
Full Time Equivalents	-	-	-	-

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

Exhibit L. Permanent Positions by Grade

**Department of Homeland Security
Science and Technology (S&T)
Procurement, Construction, and Improvements**
Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES	1	1	1	-
GS-15	6	8	8	-
GS-14	2	4	4	-
GS-13	1	-	-	-
Total Permanent Positions	10	13	13	-
Unfilled Positions EOY	-	-	-	-
Total Permanent Employment EOY	-	-	-	-
Headquarters	10	13	13	-
Total, Procurement, Construction, and Improvements:	10	13	13	-
Full Time Equivalents	10	13	13	-
Average ES Salary	-	-	165,300	165,300
Average GS Salary	-	-	134,785	134,785
Average Grade	-	-	15	15

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

Exhibit M. Changes in Full Time Employment

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>
Increases			
Transfer from M&A to Procurement Construction & Improvement- AOA	-	-	13
Decreases			
Year End Actuals/Estimated FTEs:	10	13	13

Department of Homeland Security

Science and Technology

Research and Development



Fiscal Year 2017

Congressional Justification

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Schedule I – Executive Summary of Appropriation Exhibits

A. Summary of Budget Estimates by Program Project Activity- Appropriation Level

**Department of Homeland Security
Science and Technology
Research and Development**

Summary of FY 2017 Budget Estimates by Program Project Activity

**FY 2017 Request
(Dollars in Thousands)**

Program Project Activity	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017		
	Revised Enacted			Enacted			Request			Total Changes		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Research, Development and Innovation	114	114	\$479,564	106	106	\$454,883	102	102	\$436,860	(4)	(4)	(\$18,023)
University Programs	10	10	\$41,596	10	10	\$41,621	10	10	\$33,009	-	-	(\$8,612)
Total, Research and Development	124	124	\$521,160	116	116	\$496,504	112	112	\$469,869	(4)	(4)	(\$26,635)
Subtotal, Enacted Appropriations & Budget Estimates	124	124	\$521,160	116	116	\$496,504	112	112	\$469,869	(4)	(4)	(\$26,635)
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	124	124	\$521,160	116	116	\$496,504	112	112	\$469,869	(4)	(4)	(\$26,635)

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission *FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

Overview

The mission of S&T is to *strengthen America’s security and resiliency by providing knowledge products and innovative technology solutions for the Homeland Security Enterprise*. Congress created the S&T Directorate under the *Homeland Security Act of 2002*, to among other things “[conduct] basic and applied research, development, demonstration, testing, and evaluation activities relevant to any or all elements of the Department.”

The extraordinary breadth and diversity of Department of Homeland Security’s (DHS) missions requires S&T to address a wide range of programs including DHS’ Components near-term needs for new operational capabilities and improved operational effectiveness, efficiency, and safety. S&T also has responsibilities related to understanding and creating solutions to biological and

chemical threats, and to conducting the research and development (R&D) required to meet homeland cybersecurity needs. While S&T's work is often identified with technology development, equally important are the Directorate's contributions to homeland security in the form of analyses or knowledge products. These include analyses of alternative technology options; assessments of complex issues such as the relative risk of different chemical and biological threats; operational testing and evaluation of technologies proposed for acquisition; and the detailed technical characterization of potential biological threat organisms to support both human and agricultural biodefense. In addition, the Directorate's capacity to engage R&D activities worldwide is greatly augmented by S&T's university-based Centers of Excellence (COEs) and 13 bilateral international agreements.

In order to meet the broad scope of our mission, S&T has built a highly trained and technically-proficient staff that is DHS's core source of science, engineering, and analytical expertise. Using our staff and budget for maximal impact, we have focused our energies on efforts that have a direct and demonstrable link to improving the efficiency, effectiveness, and safety of DHS's operational missions and enhancing the safety, interoperability, and communications capabilities of the first responder community. S&T's contributions to the Department and the Homeland Security Enterprise (HSE) fall into four general categories:

- *New capabilities and knowledge products* – S&T creates new technological capabilities that address DHS operational needs that are necessary to address evolving homeland security threats.
- *Process enhancements and efficiencies* – S&T conducts systems-based analysis to provide streamlined, resource-saving process improvements to existing operations.
- *Acquisition support* – The Department achieves more effective and efficient operations and avoids costly acquisition failures and delays by leveraging S&T's technical expertise to improve project management, operational analysis, and acquisition management.
- *Understanding of homeland security risks and opportunities* – S&T's relationships across DHS and the HSE contribute to strategic understanding of existing and emerging threats as well as opportunities for collaboration across departmental, interagency, and state/local boundaries.

Research, Development, and Innovation

RD&I provides state-of-the-art technology and/or solutions to meet the needs of DHS operational Components and the first responder community. It includes customer focused and output-oriented RDT&E programs that balance risk, cost, impact, and time to delivery. RD&I includes: Apex; Border Security; Chemical, Biological, and Explosive (CBE) Defense; Counter Terrorist; Cyber Security/Information Analytics; and First Responder/Disaster Resilience.

University Programs

University Programs supports critical homeland security-related research and education at U.S. colleges and universities to address high priority DHS-related issues and to enhance homeland security capabilities over the long term. University Programs includes Centers of Excellence and Minority Serving Institutions.

The S&T Directorate's request for Research and Development include 112 positions, 112 FTE, and \$469.869 million for FY 2017, a decrease of \$26.635 million from FY 2016.

The adjustments-to-base total is \$484.743 million, and includes:

- Transfer in from Research, Development, Acquisition and Operations (RDA&O) legacy appropriation \$470.380 million.
- Transfer in from Management and Administration (M&A) legacy appropriation \$21.930 million.
- Transfer out of threat assessment program funding and 4 FTE to Chemical, Biological, Radiological, Nuclear and Explosives (CBRNE) Directorate (\$7.884 million).
- Increase for 2016 annualization of Pay Raise \$0.078 million.
- Increase for 1.6 percent 2017 federal pay raise \$0.239 million.

The program changes total a decrease of \$14.874 million and include:

- An increase in research and development work in Cyber Security, Apex, and Border Security \$36.800 million.
- A reduction in research and development work in CBE Defense, Counter Terrorist, and First Responder/Disaster Resilience. (\$43.326 million).
- A reduction in University Programs (\$8.348 million).

B. FY 2016 to FY 2017 Budget Change - Appropriation Level

**Department of Homeland Security
Science and Technology
Research and Development
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)**

	Pos.	FTE	Amount
FY 2015 Revised Enacted	124	124	\$521,160
FY 2016 Enacted	116	116	\$496,504
Adjustments-to-Base			
Transfers to and from other accounts:			
Transfer from M&A to Research & Development-RD&I	106	106	\$20,033
Transfer from RDAO-RD&I to Research and Development-RD&I	-	-	\$430,947
Transfer to CBRNE	(4)	(4)	(\$7,884)
Transfer from M&A to Research & Development- UP	10	10	\$1,897
Transfer from RDA&O- UP to Research & Development- UP	-	-	\$39,433
Total Transfers	112	112	\$484,426
Increases			
Annualization of FY 2016 Pay Raise	-	-	\$78
FY 2017 Pay Increase	-	-	\$239
Total, Increases	-	-	\$317
Total Other Adjustments	-	-	\$317
Total Adjustments-to-Base	112	112	\$484,743
FY 2017 Current Services	112	112	\$484,743
Program Changes			
Increases			
Apex	-	-	\$6,337
Border Security	-	-	\$23,839
Cyber Security/Information Analysis	-	-	\$6,624
Total, Increases	-	-	\$36,800
Decreases			
CBE Defense R&D	-	-	(\$19,684)
Counter Terrorist	-	-	(\$9,379)
First Responders/Disaster Resilience	-	-	(\$14,263)
University Programs	-	-	(\$8,348)
Total, Decreases	-	-	(\$51,674)
Total Program Changes	-	-	(\$14,874)
FY 2017 Request	112	112	\$469,869
FY 2016 to FY 2017 Change	(4)	(4)	(\$26,635)

C. FY 2017 Investment Summary - Appropriation Level

**Department of Homeland Security
Science and Technology
Research and Development**
FY 2017 Investment Summary- Appropriation Level
(Dollars in Thousands)

N/A

Schedule II – Program, Project, Activity (PPA) Exhibits

Exhibit D. FY 2016 to FY 2017 Budget Change- PPA Level

**Department of Homeland Security
Science and Technology
Research and Development
Research, Development and Innovation
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)**

Research, Development and Innovation		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	-
Base	FY 2016 Enacted	-	-	-
Current Services	Annualization of FY 2016 Pay Raise	-	-	72
	FY 2017 Pay Increase	-	-	218
	Transfer from M&A to Research & Development- RD&I	106	106	20,033
	Transfer from RDAO-RD&I to Research and Development-RD&I	-	-	430,947
	Transfer to CBRNE	(4)	(4)	(7,884)
Program Changes	Apex	-	-	6,337
	Border Security	-	-	23,839
	CBE Defense R&D	-	-	(19,684)
	Counter Terrorist	-	-	(9,379)
	Cyber Security/Information Analysis	-	-	6,624
	First Responders/Disaster Resilience	-	-	(14,263)
Budget Year	FY 2017 Request	102	102	436,860
	Total Change from FY 2016 to FY 2017	(4)	(4)	(18,023)

PPA DESCRIPTION: Research, Development and Innovation

Research, Development, and Innovation (RD&I) PPA – Provides state-of-the-art technologies and solutions to meet the needs of DHS’s operational Components and the first responder community. This PPA includes funding for Integrated Product Teams, crosscutting projects for the Office of the Chief Scientist, Financial Systems Modernization, Project Tracker to ensure that projects are executed accordingly. The RD&I PPA includes customer-focused and output-oriented RDT&E programs that balance risk, cost, impact, and time to delivery. The six thrust areas of RD&I include: Apex; Border Security; CBE Defense; Counter Terrorist; Cyber Security/Information Analytics; and First Responder/Disaster Resilience.

FY 2017 RD&I PPA by Thrust Area	
S&B	\$19.440
Apex	\$78.973
Border Security	\$55.999
CBE Defense	\$58.389
Counter Terrorist	\$65.707
Cyber Security/Information Analytics	\$70.986
First Responder/Disaster Resilience	\$87.366
FY 2017 Request	\$436.860

S&T uses Technology Readiness Levels (TRLs) to define the maturity of a technology. The following table describes each level.

Basic Research		Applied Research		Technology Development	Technology Demonstration	System Development	System Test and Launch		System Viability and Operations
Technology Readiness Level-1	Technology Readiness Level-2	Technology Readiness Level-3	Technology Readiness Level-4	Technology Readiness Level-5	Technology Readiness Level-6	Technology Readiness Level-7	Technology Readiness Level-8	Technology Readiness Level-9	Technology Deployment
Basic Principles Observed/ Reported	Technology Concept/ application formulated	Critical Function or Characteristic proof of concept	Validation in lab Environment	Validation in Relevant Environment	System Prototypes in relevant environment	System Prototypes in operational environment	Actual system completed and qualified through test and demonstration	Actual system proven through successful mission operations	Actual system commences with regular and sustained operations [to be cleared by S&T]

1. **Salaries and Benefits-** FY 2016: \$20.033 million. FY 2017 Request: \$19.440 million. Research and Development appropriation request includes salaries and benefits related to 102 FTE, in support of RD&I at S&T. The 102 FTE conduct program management, execution, oversight, and analysis for S&T Directorate programs.
2. **Apex** – FY 2016: \$78.198 million. FY 2017 Request: \$78.973 million. Consists of crosscutting, multi-disciplinary projects agreed to by the requesting DHS Component Head and the Under Secretary for S&T.
 - A. **Apex Programs** – FY 2016: \$55.375 million. FY 2017 Request: \$60.974 million. Increased funding for the Apex Programs will enable additional work within the Apex Screening at Speed program. Within Apex Programs, \$3.5 million is included for In-Q-Tel projects.

Apex Screening at Speed

- *Problem:* Continuously evolving threats at checkpoints, necessitates a program that provides technological innovation while allowing for changing operational needs. The solutions must improve passenger experience and enhance threat detection capabilities at low cost. As an example, current checkpoint throughput (135-150 passengers per hour per lane) negatively impacts commerce and incurs sizable costs to the Government due to the number of lanes that must be staffed each day in order to securely screen the roughly 660 million passengers that board an aircraft nationwide each year. Current systems are not integrated with developing standards and new processes such as Transportation Security Administration's (TSA) Risk-Based Screening (RBS) and Dynamic Aviation Risk Management System (DARMS), which dynamically adjust thresholds based on TSA-provided passenger risk profiles. Although a primary use will be for aviation screening, other screening venues also will be considered during development.
- *Solution:* The multi-year Apex Screening at Speed (SaS) program researches and develops the new technology, techniques, and processes so that aviation checkpoints can screen 300 passengers and their carry-on belongings per lane per hour to TSA's highest security standards. New systems will reduce the need for removal of clothing or liquids and electronics from carry-on bags, and adapt dynamically to information provided by risk-based screening. Raising throughput and lowering costs will also enable highly secure screening to support Homeland Security customers including Customs and Border Protection and United States Secret Service. Apex SaS will seek novel technologies and techniques complementary to other explosives detection efforts, most notably Primary Screening for Passengers, Primary Screening for Carry-On Baggage, and Secondary Screening Technology Development.
- *Impact:* People will pass through a screening area in less time and agencies will have more confidence in the security system performance. Improved detection probabilities and reduced false alarms will translate to fewer secondary inspections, thereby lowering per-passenger costs for TSA, and reducing inconvenience for airline passengers.

Prior Year Key Events

- Developed the program architecture.
- Developed a checkpoint test bed.

Current Year Key Events

- Complete Broad Agency Announcement, Source Selection, and contract award for next-generation technologies necessary for achieving program throughput goals, detection, and Risk-Based Screening.
- Issue awards for component technologies with joint funding from the Primary Screening for Passengers, Primary Screening for carry-on baggage, and Secondary Screening Technology Development programs.
- Complete assessment of alternative screening processes.

Budget Year Key Events

- Develop integrated screening system architecture.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	\$6,400	\$4,000	\$12,600

Project Schedule Including Milestones

- Test and Evaluate advanced carry-on bag screening devices (FY 2016).
- Demonstrate a cutting-edge advanced imaging technology (AIT) prototype (FY 2016).
- Evaluate TRL 2 proof-of-concept for classified novel detection method in conjunction with other government agency (FY 2016).
- Demonstrate a Coded Aperture Micro Mass Spectrometry Explosives Trace Detection (ETD) prototype (FY 2016).
- Research novel technology solutions to increase throughput and detection capabilities (FY 2017).
- Develop integrated screening system architecture (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program plans to begin at TRL2 and end at TRL7.

Transition Plans

- S&T will work closely with TSA to create a checkpoint architecture evolution plan.
- Systems developed by funded awardees will initially transition to TSA’s Office of Security Capabilities, after the completion of Developmental Test and Evaluation (DT&E) at the Transportation Security Laboratory (TSL). Other Government customers may leverage this DT&E towards additional applications.
- Screening device development spirals will be coordinated with TSA’s recapitalization plans ensuring smooth and timely technology insertion.
- S&T will engage industry through outreach events (Industry Days), Broad Agency Announcements, and the Small Business Innovation Research (SBIR) program.

Apex Border Situational Awareness (BSA)

- *Problem:* U.S. Customs and Border Protection (CBP) and partner law enforcement agencies (Federal, State, local, tribal, and international) need improved situational awareness to more effectively and efficiently deploy its resources to the areas of highest risk.
- *Solution:* To improve border situational awareness by establishing an enterprise capability to (1) access more data sources, (2) make available decision support tools to translate the available data into actionable information and intelligence, and (3) share that actionable information and intelligence with partner law enforcement agencies.

- *Impact:* The Apex BSA program will enable the HSE to achieve increased border situational awareness leading to increased border incursion detection, interdictions, and deterrence. Specifically, the increased situational awareness will result in:
 - Improved measurement of border illegal activity to understand current state.
 - Improved assessment of risks by identifying current threats along with emerging patterns and trends.
 - Improved alignment of resources to risk for current and future operations on both a tactical and strategic level.

Prior Year Key Events

- Initiated the program by planning the cost, schedule, and performance baseline.
- Performed requirements analysis and develop requirements.
- Released Broad Agency Announcement (BAA) for decision support tools.
- Began evaluation of selected Government off the shelf (GOTS) solutions.

Current Year Key Events

- Begin evaluation of selected commercial off the shelf (COTS) solutions.
- Begin integration and developmental testing of selected COTS and GOTS solutions.
- Begin coordination and planning of field test and evaluation activities.

Budget Year Key Events

- Conduct a Spiral 1 pilot of the Border Situational Awareness project which focuses on establishing a federated enterprise information sharing for architecture CBP.
- Transition Spiral 1 enterprise information sharing capability into existing CBP system baseline.
- Perform Spiral 2 requirements analysis and develop requirements which focus on tactical response for CBP.
- Begin integration and developmental testing of selected Spiral 2 solutions.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	\$2,913	\$8,794	\$9,279

Project Schedule Including Milestones

- Begin evaluation of selected commercial off the shelf (COTS) solutions (FY 2016).
- Begin integration and developmental testing of selected COTS and GOTS solutions (FY 2016).
- Begin coordination and planning of field test and evaluation activities (FY 2016).
- Develop System Design (FY 2016).
- Conduct pilot of Spiral 1 of the Border Situational Awareness project which focuses on establishing enterprise information sharing for CBP (FY 2017).
- Perform Spiral 2 requirements analysis and develop requirements which focus on tactical response for CBP (FY 2017).
- Begin integration and developmental testing of selected Spiral 2 solutions (FY 2017).

- Transition Spiral 1 enterprise information sharing capability into existing CBP system baseline (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program plans to begin at TRL 5 and end at TRL 8.

Transition Plans

- Pilot integrated enterprise proof-of-concept capability at select Southwest border locations.
- Establish operational utility and prove cost/benefit of capability.
- Enhance capability based on user-defined operational needs and field analysis.
- Demonstrate initial operating capability and transition to CBP.
- Assist CBP in implementing full operating capability.

Apex Next Generation Cyber Infrastructure

- *Problem:* Hacking of the cyber fabric underlying our Nation's critical infrastructure (CI) is a threat to U.S. national security. Known penetration of financial sector networks by sophisticated adversaries combined with existing fragilities exist in the core of the financial sector present a clear and growing risk to our economic and national security.
- *Solution:* S&T is partnering with the Financial Services Sector (FSS) to develop and deliver advanced sensing technologies, situation understanding, response, and recovery and network protections to institutional, sector, and cross sector levels.
- *Impact:* With S&T's assistance, the FSS will reduce security vulnerabilities, improve information sharing, and increase response and recovery times.

Prior Year Key Events

- Initiated Business Case Analysis
- Completed Technology Experiment 1

Current Year Key Events

- Complete Sector Requirements Analysis
- Determine Technology Forage
- Determine Go/No-Go Decision for Testing and Evaluation of Forage Result
- Conduct Testing and Evaluation of Forage Result

Budget Year Key Events

- Conduct Annual Financial Sector Exercise
- Transition of selected technologies to Financial Sector

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	\$13,090	\$10,039	\$10,000

Project Schedule Including Milestones

- Complete Sector Requirements Analysis (FY 2016).
- Determine Technology Forage (FY 2016).
- Determine Go/No-Go Decision for Testing and Evaluation of Forage Result (FY 2016).
- Conduct Testing and Evaluation of Forage Result (FY 2016).
- Conduct Annual Financial Sector Exercise (FY 2017).
- Transition of selected technologies to Financial Sector (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program plans to begin at TRL 3 and end at TRL 6.

Transition Plans

All analyses, models, technology prototypes, and knowledge products will be transitioned to FSS institutions, commercialized or made available through open source during the course of the Apex project. Products may include, but are not limited to:

- Sensor capabilities to verify the presence or absence of attacker modifications to network infrastructure.
- Real Time Intrusion prevention capability using non signature based technologies.
- Behavior modeling tools to detect potential violations of system security policy by an authorized user, identify anomalous behavior within a network in real time using probabilistic modeling and traffic analysis, and detect patterns of impending pending data exfiltration.
- Sensor correlation tools and tools to drastically reduce the amount of data that requires analysis.
- Tools to measure logical and physical internet topologies and measure the effectiveness of routing in order to determine problem areas.

Apex Real-Time BioThreat Awareness

- *Problem:* The timely detection, coordination and information sharing of a potential biological hazard in a public space is a critical challenge within Federal, State, local, and tribal governments, including the Public Health and First Responder communities.

- *Solution:* This Apex develops and integrates biosurveillance technology advancements in data fusion concepts, sensor detection capabilities, and data visualization to demonstrate the art-of-the-capable with coordination between the Federal agencies, State and Local Public Health First Responder communities. It explores a variety of methods and systems to rapidly collect and exploit information useful for identifying outbreaks or unusual events using current and future computing architectures. S&T works with the Office of Health Affairs (OHA) BioWatch Program and OHA National Biosurveillance Integration Center (NBIC) in partnership with Department of Defense (DoD) when directing requirements development utilizing the Homeland Integrated Biosurveillance and Response Information Demonstration (HIBRID) project to update potential operational architectures. Additional coordination and collaboration with other Federal agencies is being forged in various specialized areas. All tasks and projects within the bio-threat Apex are coordinated and aligned with both the Biowatch and NBIC programs. An Integrated Product Team (IPT) has been working for approximately one year to ensure project/program alignments.
- *Impact:* Optimized collection and integration of relevant environmental, animal, and public health data will promote prompt awareness of a bio-attack or disease outbreak, resulting in reduced casualties, and faster implementation of early mitigation steps.

Prior Year Key Events

- Established Sub-Integrated Product Teams with Federal customer, the Office of Health Affairs, to begin capture of biosurveillance gaps and requirements.

Current Year Key Events

- Identify and validate Federal, State, and local requirements via IPT and workshop activities.
- Demonstrate rapid data feed integration from four disparate environmental monitoring and emergency call sources, analysis, and reporting using the National Biosurveillance Integration System (NBIS). Integrate additional data sources and demonstrate information sharing platforms within local jurisdictions.

Budget Year Key Events

- Issue a Biosurveillance Prize for innovation in cross-jurisdictional information sharing.
- Perform baseline biosurveillance workshops and table-tops in local jurisdictions to capture current situational awareness capabilities of state and local governments.
- Demonstrate tools for capture and analysis of biosurveillance related data sources at the State and local level.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	\$1,750	\$7,000	\$6,000

Project Schedule Including Milestones

- Demonstrate operational and transition of technology improvements for BioWatch (FY 2016). In the planning stages, five planned improvement programs include: Biological Trigger, New/Improved Biological Collection System, Portable Biological Identifier, Alternatives to Polymerase Chain Reaction (PCR) Analysis Technology, and Indoor Autonomous Detection System. Integrate additional data sources and demonstration of information sharing platforms within local jurisdictions (FY 2016).
- Issue a Biosurveillance Prize for innovation in cross-jurisdictional information sharing (FY 2016).

- Integrate additional data sources and demonstration of information sharing platforms within local jurisdictions (FY 2016).
- Demonstrate integration of additional data sources and information-sharing platforms within local jurisdictions (FY 2016).
- Demonstrate real-time capture of biosurveillance data in state and local jurisdictions (FY 2016)
- Issue a Biosurveillance Prize for innovation in cross-jurisdictional information sharing (FY 2016).
- Demonstrate integration of environmental sensor data with disease surveillance data (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

The program plans to begin at TRL 6 and end at TRL 8.

Transition Plans

- Technologies and data integration processes developed under this project will be demonstrated and transitioned to the Office of Health Affairs (OHA) BioWatch and NBIC programs, as well as to the State and local public health departments.

Apex Next Generation First Responder

- *Problem:* First responders rely primarily on disparate voice radio communications, limited network connectivity for data and video, and personal protective equipment (PPE) with insufficient threat protection—each of which offers little or no access to available or advanced sensor technologies.
- *Solution:* The Apex Next Generation First Responder (NGFR) project develops a scalable and modular ensemble that includes an enhanced duty uniform, personal protective equipment, wearable computing and sensing technology, and robust voice and data communication networks. NGFR will harness the best existing and emerging technologies and integrate them in a well-defined and standards-based open architecture.
- *Impact:* NGFR’s cutting-edge technologies accelerate decision-making and improve response to better safeguard lives and property before, during, and after incidents.

Prior Year Key Events

- Conducted DHS S&T’s first prize competition under the *America COMPETES Reauthorization Act of 2010* (Title 15, United States Code, Section 3719), awarding a total of \$25,000 to two innovative small businesses that developed solutions to locate and track first responders indoors, increasing the likelihood that responders make it out of an emergency safely.
- Helped launch the EMERGE! Accelerator Program for Wearable Technology for First Responders, working with established accelerators to decrease the time needed to market for cutting-edge technologies that could perform, supporting eighteen startups and connecting them with investors.
- Participated in the White House Smart Cities Forum, discussing how NGFR will make smart cities safer by giving first responders better situational awareness, accelerating their response time and giving them the information they need before they arrive on scene, so they are ready

to act faster and more accurately.

- Established a Responder Steering Committee to review and validate requirements, including members of the Inter-Agency Board and S&T’s First Responder Resource Group.
- Facilitated direct engagement between the first responder community and industry, including reaching more than 900 stakeholders at in-person events and leading the Responder of the Future dialogue as part of the S&T National Conversation. S&T is dedicated to engaging both responders and industry from start to finish, ensuring their input and questions are addressed as the program continues, which will facilitate commercialization and adoption of NGFR technologies over the next four years.

Current Year Key Events

- Demonstrate the integration and interoperability of NGFR technology (e.g. IoT, Communications Hub and PPE projects). This will be the first demonstration of an agile six-month NGFR Integration Spiral process to incrementally integrate NGFR capabilities.
- Demonstrate NGFR technology integration Spiral 2, incorporating additional technologies and functionality including the Wearable Communications Hub, advanced environmental and physiological monitoring, and enhanced data analytics.
- Conduct a First Responder Operational Exercise, evaluating the impact of GNSS-challenged and electronic threat environments on first responder communications systems.
- Collaborate with Standards Development Organization (SDO) to develop industry open standards for NGFR technology integration Spirals to include Internet of Things for sensors as part of Spiral 1 and 2.
- Develop and publish an NGFR Interface Control Document to raise industry awareness of the standards, data formats and interfaces NGFR devices are using,
- Develop prototypes of the Wearable Communications Hub and plan integration into NGFR system architecture.
- Develop concept of operations for indoor navigation and tracking of first responders.

Budget Year Key Events

- Demonstrate NGFR technology integration Spiral 3, incorporating additional technologies and functionality of including the Wearable Communications Hub, advanced environmental and physiological monitoring, and enhanced data analytics.
- Demonstrate NGFR Integration Spiral 4, incorporating additional technologies and functionality from the Spiral 3 event, including environmental and physiological monitoring augmented intelligence-enabled data synthesis, and personal protective equipment.
- Continue to develop prototypes of the Wearable Communications Hub and integrate into NGFR system architecture.
- Develop prototype for indoor navigation and tracking of first responders (FY 2017).

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	\$6,628	\$4,542	\$4,546

Project Schedule Including Milestones

- Refine operational and technical requirements (FY 2016).
- Finalize NGFR Apex program Concept of Operations (CONOPS) (FY 2016).

- Facilitate direct engagement between first responder community and industry (FY 2016).
- Initiate technology foraging and landscape assessment (FY 2016).
- Create voice and data communications prototype system (FY 2016).
- Develop conceptual communications hub design with multiple network access (FY 2016).
- Conduct NGFR Prototype and Operational Field Assessment (FY 2016).
- Incorporate additional technologies and functionality into NGFR (FY 2016 and FY 2017).
- Operationally test NGFR technologies (FY 2016 and FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program begins at TR2 and ends at TRL 6.

Transition Plans

- FRG has initiated a portfolio approach to integration of capabilities for the NGFR Program. All proposed initiatives must be assessed against an architectural system framework to determine functional and operational requirements that are then integrated into the NGFR Spiral deployments. All initiatives must demonstrate an interoperable approach, allowing a services-based approach using open standards that allows industry to propose enhanced products to integrate with the NGFR capabilities.
- All analyses, models, technology prototypes, and knowledge products will be transitioned to industry, commercialized, or made available through open source platforms during the course of the NGFR Apex program.
- NGFR technologies will be considered for inclusion on the DHS FEMA Approved Equipment List (AEL) for DHS Grant funding available to State and local governments.
- NGFR's commitment to a modular design, interoperability, open source standards, and continual engagement with industry will facilitate transition. Technologies developed under the NGFR Apex program are required to interface or integrate using open standards, which will allow responder organizations to incrementally acquire new NGFR capabilities while extending the life of legacy systems.
- In addition, NGFR technologies can "plug-and-play" with commercial technologies that are not typically considered part of the first responder market (i.e. health sensors for athletes), increasing dual use for secondary markets and allowing first responder organizations to custom-build the suite of NGFR-compatible technologies that mission requirements and resource constraints.
- Collaborate with industry and identify key partners to test (OT&E) interoperability of commercially available sensors and communications equipment with NGFR system during NGFR Integration Spiral 3.

Apex Flood

- *Problem:* Floods of all kinds represent a leading cause of fatalities and economic losses in the United States from natural disasters. The goal of the Flood Apex is conceive, develop, test and transition into operational use technologies that will reduce future flood fatalities and economic damages.
- *Solution:* This Apex program will culminate in development of the National Flood Decision Support Toolbox (NFDST), which will enable the translation of science into actions that reduce flood risk exposure and enhance community resiliency. The Toolbox will consists of modules that will support flood response, recovery, and resiliency decision making. When fully developed, the Toolbox will be transitioned to Federal Emergency Management Agency (FEMA) to assist Federal, State, local, tribal, territorial and other stakeholder group in making planning, disaster response and recovery, and investment decisions related to floods.
- *Impact:* With support from S&T, the FEMA will be able to: 1) leverage existing data sources to create multi-dimensional representations of community functions using an integrated system-of-systems approach; 2) enhance whole community collaboration around disaster risk reduction; 3) identify indicators of community resilience and opportunities to introduce advanced technology solutions; 4) empower communities with decision support capabilities to enable both pre-event scenario-based risk planning and adaptive recovery in the post-event environment; and 5) enable faster decision-making.

Prior Year Key Events

- Engaged with FEMA’s Office of Response and Recovery, Federal Insurance & Mitigation Administration, and Office of the Chief Technology Officer to identify key requirements and gaps.
- Conducted research to identify community resilience indicators which will be used for quantifying and projecting the impact and cost of flood-related disasters on populations, properties, and infrastructure disruptions.

Current Year Key Events

- Develop data roadmap of critical data sources sufficient to support resilience indicators and all emergency support functions (ESFs), which will create a comprehensive understanding of community resilience to flood-related disasters.
- Develop plans for community benchmarking pilot studies to ‘ground truth’ resilience indicators.
- Develop and deploy a decision support capability for mutual aid during flood disasters.
- Develop and demonstrate an initial operating capability for support of Post Disaster Mitigation (PDM) investment decisions after flood events.
- Develop national natural hazards vulnerability and community resilience indices.
- Demonstrate the technical capability to issue geo-target flood alerts.
- Initiate development of a Tsunami Module for the FEMA HAZUS program.

Budget Year Key Events

- Complete Tsunami Module for FEMA HAZUS program.
- Transition PDM flood decision support tool to operational use.
- Develop technology and plan to scale geo-targeted flood alerts nationally.
- Complete data strategy and information sharing architecture for the NFDST.
- Complete NFDST roadmap study and initial architecture design, including specification of decision support modules.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	\$2,295	\$5,000	\$5,000

Project Schedule Including Milestones

- Establish a RAPID Research Review Board to inform programmatic structure and frame research topics for the RAPID Apex Program (FY 2016).
- Identify indicators of resilience in Community Rating System (CRS)-participating communities (FY 2016).
- Develop an initial data portfolio to inform the development of data roadmap, based on current and anticipated data requirements of the resilience indicator methodology and decision support tool (FY 2016).
- Complete technical and proof-of-concept studies and experiments for flood decision support for mutual aid, PDM, and geo-target alerts (FY 2016).
- Evaluate and prioritize sites and identify back-up locations for the community and regional benchmarking studies (FY 2016).
- Deploy national natural hazards vulnerability and community resilience indices for operational use (FY 2016).
- Deploy Tsunami Module for HAZUS to operational use (FY 2016).
- First phase of community benchmarking studies completed (FY 2017).
- Transition to early models for regional pilots (FY 2017).
- Develop trial portfolio of investment options (FY 2017).
- Draft logic requirements for National Flood Decision Support Tool (NFDST) (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

This program begins at TRL2 and ends at TRL6.

Transition Plans

- Development of charter and Integrated Product Team (IPT) to maintain close coordination with FEMA and to ensure the program’s development aligns with operational requirements.
- Development of transition agreement to transfer decision support tool to FEMA for deployment to Federal, State, local users and other stakeholders, including non-governmental agencies.

Apex Cyber.gov

- *Problem:* Government networks and those that run our critical infrastructure are under regular reconnaissance and attack. Government networks have recently demonstrated significant weaknesses that have been exploited, resulting in loss of personally identifiable information, intellectual property, and sensitive security information.
- *Solution:* DHS is authorized to administer the implementation of federal cybersecurity policies and to issue binding operational directives, monitor agency cybersecurity practices, and provide operational and technical assistance. S&T will work with government network owners and operators to develop advanced sensing technologies for intrusion detection and prevention. S&T will also develop a robust data correlation and data analytics capability in partnership with NPPD and other Federal Agencies.
- *Impact:* This effort will improve the ability of government networks to be aware of when they are being probed and attacked, to model behaviors to anticipate insider threats, and to leverage analytics to correlate incidents, events and network traffic.

Prior Year Key Events

- N/A

Current Year Key Events

- Initiate program plan approval.
- Start evaluation of the utility of classified signatures.
- Initiate measurement infrastructure analysis.
- Initiate architecture analysis leveraging existing data types and protocols.
- Active red teaming of all capability development.

Budget Year Key Events

- Evaluate the utility of classified signatures.
- Demonstration of “complete” measurement infrastructure.
- Demonstration of integrated E3A and CDM.
- Demonstration of inclusion of all Internet traffic types and protocols across multiple communication mediums.
- Demonstration of timely dissemination of information to D/As.
- Active red-teaming of all capability development.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	\$10,000	\$10,000

Project Schedule Including Milestones

- Evaluate the utility of classified signatures (FY 2017).
- Demonstration of complete measurement infrastructure (FY 2017).

- Demonstration of integrated E3A and CDM (FY 2017).
- Demonstration of inclusion of all Internet traffic types and protocols across multiple communication mediums (FY 2017).
- Demonstration of timely dissemination of information to D/As (FY 2017).
- Active red-teaming of all capability development (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

Once complete, technology developed under this effort will be deployed to all interested government agencies.

B. ***Apex Engines*** – FY 2016: \$18.000 million. FY 2017 Request: \$18.000 million.

Identity and Access Management Engine (IDAM-E)

- *Problem:* Apex projects have identified requirements associated with identity and access management capabilities, including controlled access of secure data and system user identification tools for approved users who have an operational “need to know.” Currently, DHS does not have a set of baseline IDAM capabilities for program managers to incorporate into their R&D projects.
- *Solution:* S&T’s IDAM Engine has the ability and expertise to apply identity and access management solutions to the various Apex projects focus areas. The Engine will employ existing capabilities, including an Identity Management Test bed, and develop new technologies for program managers to leverage while executing their Apex projects.
- *Impact:* The IDAM Engine will create efficiencies by offering and implementing solutions addressing logical and physical access decisions across multiple domains. This work will provide individuals and systems with a digital identity, credentials, authentication, and authorization to allow the right people the right data at the right time and in a secure manner.

Data Analytics Engine (DA-E)

- *Problem:* The importance of combining authorized mission sources with the exponential growth associated with the Internet of Things (IoT) will lead to an order of magnitude increase in data required to compute threats, impacts, risks, decision support, and situational awareness. Further, data analytics technologies, including computational, methodological and systems components that are rapidly evolving on six month innovation cycles, thus making it difficult to track solution options.
- *Solution:* To keep pace with the need to utilize growing data sets and rapidly evolving technologies, requires an agile core technical service that can quickly diagnose privacy, security, computation and analytics for the missions of S&T, the Department and the extended HSE. HSARPA has created the Data Analytics Engine (DAE) and laboratory to assist in problem definition and the development of solutions for Department programs using relevant data sets, analytic methodology, technologies and systems in collaboration with SME staff from government, industry

and academia. Further, the Data Analytics Engine works across disciplines to illuminate next generation problem sets and technologies to inform program planning, avoid technical obsolescence and mission surprise.

- *Impact:* DAE provides S&T and Department programs with coordinated information, subject matter expertise, mission studies, analysis of alternatives, experiments, prototypes, business methodologies and transition planning to improve program efficiency, share best practices, improve security and privacy protection across DHS analytics system investments.

Model & Simulation Engine (MS-E)

- *Problem:* There is no centralized Modeling and Simulation (M&S) repository or single M&S manager in S&T. M&S is used for multiple S&T projects, they have similar elements and requirements, and they are often discarded after the completion of the project.
- *Solution:* MS-E will provide a centralized repository and single-manager function for mission-based models as well as modeling and simulation tools that will be available for use to S&T program managers.
- *Impact:* The MS-Engine will increase efficiency, eliminate duplication and save resources and money.

Behavioral, Economic, and Social Science Engine (BESS-E)

- *Problem:* Current Apex Projects have project components related to human subject research, public perceptions of new technologies, metrics development, organizational adoption of new technologies, and program evaluation and impact studies. However, there is not currently a centralized location for program managers to receive help on these social science issues.
- *Solution:* S&T will develop a BESS-E which has the ability and expertise to apply social science techniques to the myriad programs that the Apex Projects focus on. The Engine will create a backbench capability for program managers to reach out to subject matter expertise in the social sciences. Additionally, the Engine will assist Apex Project managers with specific tasks and deliverables of importance to the program which require social science techniques.
- *Impact:* BESS-E will analyze the social and behavioral implications of new technologies, programs, and policies to support their research, implementation, and diffusion. Centralizing this capability in an Engine will allow the social sciences to impact multiple Apex Projects.

Manufacturing Engine (M-E)

- *Problem:* The development of deliverables that use cutting-edge technology and that lead to the development of prototypes often do not consider the industrial difficulties associated with the transition of the prototype to a high-rate manufactured item. This often results in extended project timelines, increased costs, and even failure to deliver the desired product.
- *Solution:* The M-E will provide technical expertise on manufacturing readiness and production requirements that support efficient transition from prototype to full scale manufacturing.
- *Impact:* The M-E will significantly increase the probability of a project's smooth transition from concept, to prototype, to manufactured deliverable, and reduce delivery time and cost.

Communications & Networking (CN-E)

- *Problem:* The incompatibility of communications hardware and software, and the complexities these incompatibilities impose on our communications architecture is a major problem for DHS and its components. Mission essential information and data that must be processed, integrated, recorded, and shared is growing at an exponential rate, while the proliferation of communication devices and protocols that transmit, encode and display this information and data is growing at a similar rate, all of this is leading to debilitating incompatibility and interoperability

of our operational components.

- *Solution:* CN-E provides Apex projects with the most efficient, effective, and assured secure access to integrated networking solutions in order to ensure interoperable communication across all network platforms and mediums (voice, video and data).
- *Impact:* CN-E ensures that Apex projects and DHS components can exchange critical information and data across all mediums, on any platform, and that the most critical and relevant information will be rapidly accessible to the right decision makers.

Situational Awareness & Decision Support (SANDS-E)

- *Problem:* The loss of valuable data and situational understanding due to the incompatibility of communications hardware and software, and the complexities these incompatibilities impose on our communications architecture is a major problem for DHS and its components. Mission essential information and data that must be processed, integrated, recorded, and shared is growing at an exponential rate, while the proliferation of communication devices and protocols that transmit, encode and display this information and data is growing at a similar rate, all leading to debilitating incompatibility and interoperability.
- *Solution:* The SANDS Engine provides Apex projects with the most efficient and effective assured, secure access to databases (or knowledge bases), shared situational awareness, and integrated networking solutions ensuring interoperable communication across all network platforms and mediums (voice, video and data).
- *Impact:* The SANDS Engine ensures that Apex projects and DHS components can exchange critical information and data across all mediums and on any platform, and that the most critical and relevant information will be rapidly accessible to the right decision makers to achieve improved situational awareness and meet Apex defined requirements.

3. Border Security FY 2016: \$32.684 million. FY 2017 Request: \$55.999 million. DHS secures the borders, territorial waters, ports, terminals, waterways, and air, land, and sea transportation systems of the United States. S&T invests in border security research and development for technologies and solutions to prevent the illicit movement and illegal entry or exit of people, weapons, dangerous goods, and contraband, and manage the risk posed by people and goods in transit.

A. Cargo and Port of Entry (POE) Security – FY 2016: \$12.471 million. FY 2017 Request: \$21.726 million. This program develops technologies to ensure the integrity of cargo shipments (including sea, air, and land conveyances) and enhances the end-to-end security of the supply chain, from the manufacturer of goods to final delivery, while ensuring economic throughput for the U.S. economy. This work will reduce the risk of terrorists and transnational criminal organizations from manipulating cargo as it conveys across various transit modes in the international supply chain.

Air Cargo Screening

- *Problem:* Current Air Cargo screening is accomplished by private industry through TSA's Certified Cargo Screening Program (CCSP). Screening facilities are low-margin facilities. Even a low false alarm rate causes additional labor to resolve which impacts costs and throughput. Future increases in air cargo volume will necessitate more automation/technology, fewer false alarms, and increased throughput to maintain or improve the current probability of detection capability.
- *Solution:* S&T will develop technologies which decrease false alarms and system lifecycle costs for emerging Explosive Trace Detection (ETD) and X-Ray systems while improving throughput and probability of detection. S&T will also develop improved Automated Threat Recognition (ATR) software and threat libraries for deployed systems X-ray.

- *Impact:* The development of low cost air cargo screening systems, offering improved probabilities of detection, would enhance TSA’s ability to ensure a more effective air cargo screening capability by enabling the procurement of these systems by indirect air carriers (IACs) and air carriers at costs that are deemed acceptable.

Prior Year Key Events

- Completed prototype development of palletized Air Cargo screening system.
- Developed an automated tool to ensure that air cargo screeners employing X-ray systems do not clear packages that are too dense or complex to be reasonably screened.

Current Year Key Events

- Deliver second findings of “ground truth” IED Cargo Build Studies – Report on second threats.

Budget Year Key Events

- Continue adapting other Explosive Division (EXD) systems (ETD & X-ray) to the air cargo mission area developing new air cargo unique systems.
- Deliver firm findings on “ground truth” IED Cargo Build Studies – Report on final 6 threats.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$12,083	\$11,944	\$2,000	\$5,000	\$5,200	\$7,476

Project Schedule Including Milestones

- Develop Air Cargo Box Set specifications for use in development of automated threat recognition (ATR) software (FY 2016).
- Issue improvised explosive devices (IED) Cargo Build Studies - Report on Additional Threats (FY 2016).
- Demonstrate retrofit of the ETD System (FY 2016).
- Deliver developmental high resolution portable trace system for TSL testing (FY 2017).
- Deliver initial prototype of upgraded Air Cargo system (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program plans to begin at TRL 3 and end at TRL 5.

Transition Plans

- Report identifying effectiveness of screening systems against various streams of commerce (Inform TSA of potential regulatory changes).
- Hardware / Software modifications to existing or emerging technology to improved capabilities (Decreased False-Alarms, Decreased Lifecycle Costs, Increased Throughput).

Cargo Forensics

- *Problem:* CBP has limited capability to collect and analyze evidence from cargo and cargo containers to enforce trade law. CBP is heavily dependent on commercial laboratories to process pollen samples for enforcement of trade compliance. Not only is this expensive, it induces a large time delay that results in lost opportunities to enforce trade law and collect customs revenue. Pollen sample analysis demands have more than doubled in the last 10 years. Similarly, CBP’s limited capability to collect and analyze DNA samples from cargo and packages limits their ability to support prosecution of illegal activity.
- *Solution:* This project provides CBP with the capability to detect and prosecute illegal activity through the forensic analysis of material collected from suspicious packages and cargo.
- *Impact:* Improved tools and methods to validate cargo and enforce trade compliance will increase the availability of forensic evidence enabling enhanced trade compliance enforcement. Improved enforcement of trade law will increase the collection of millions of dollars of currently uncollected tariffs and duties.

Prior Year Key Events

- Developed a database with DNA and metadata evidence.
- Developed a pollen sample collection and processing directive for preparing pollen evidence to improve collection and processing efficiency.
- Prototype evaluation of Polymerase Chain Reaction (PCR) Collection techniques.
- Prototype evaluation of Pollen Forensic techniques.

Current Year Key Events

- Additional pollen collections and processing for database.
- Transition of pollen forensic capability.
- Lab testing with field package samples using PCR Collection directive and DNA/Package Metadata.

Budget Year Key Events

- Transition of PCR Collection directive and DNA/package metadata database.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	\$8,406	\$8,300	\$6,784	\$1,000

Project Schedule Including Milestones

- Operational Evaluation of PCR Collection Capability (FY 2016).
- Operational Evaluation of Pollen Forensic Capability (FY 2016).
- Publish and transition to customers at least four Chemical Forensics Standard Methods for the collection or analysis of Chemical Threat Agents of interest (FY 2016).
- Publish at least two Chemical Forensic articles in relevant scientific journals (FY 2016).
- Transition to CBP an in-laboratory Pollen Forensic Identification and Geo-location capability (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Transition to CBP (1) an in-house capability for pollen sample collection, preparation, analysis, and storage, (2) a robust regional pollen database, and (3) compiled reference material on the geographic distribution of pollen.
- Transition to CBP methods of the DNA analysis process; DNA purification, DNA extraction, PCR analysis versus other methods, and geo-location or criminal database comparison analysis.

People Screening

- *Problem:* Increases in international travel have strained CBP resources, resulting in increased wait times and delays for passengers to clear some Federal Inspection Service areas. In FY 2017, S&T Directorate will expand efforts to introduce process and technology improvements to CBP traveler inspection operations in order to strengthen traveler vetting and facilitate lawful and legitimate travel in support of the President's National Travel and Tourism Strategy.
- *Solution:* Analyze current entry operations, and implement technologies and process enhancements to existing airport operations, to increase CBP's capability to expedite and strengthen screening of travelers entering the United States. Develop recommended approaches and implement improvements in processes and/or technologies for cost-effective and integrated biometric, biographic, or other capabilities to support transformation of the inspection process and facilitate increased travel and tourism. This will include focus on traveler queuing optimization, next-generation Federal Inspection Service inspections, development of inspection metrics and analytics, integrated customs and agriculture baggage inspection, and evaluations of officer-systems performance.
- *Impact:* With S&T's assistance, CBP will increase its ability to confirm the identity of persons entering the United States, quantify the increase in efficacy of inspections, fulfill its obligation to keep our nations' borders safe and secure as required by the National Security Strategy, and ensure that processes are efficient and keep pace with the projected growth in international trade and travel.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Deliver Final Technology and Process Assessment Report Counting & Measuring.
- Develop CONOPs to enhance traveler identification validation and CBP operations by integrating biometrics validation or Pre-Clearance Technology into CBP capabilities.
- Conduct a pilot and field test in an operationally-relevant environment to determine the effectiveness of new/improved traveler inspection tools and queuing schemes on the time required for a traveler to complete entry processing into the U.S.
- Deliver Business Case Report for *Global Entry* Evolution to support CBP acquisition planning.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$5,850

Project Schedule Including Milestones

- Conduct a pilot and field test in an operationally-relevant environment to determine the effectiveness of new/improved traveler queuing schemes on the time required for a traveler to complete entry processing into the United States (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program begins at TRL3 and ends at TRL7.

Transition Plans

- All analysis, models, technology prototypes, and knowledge products will be transitioned to CBP. Products include all field trial evaluation reports, laboratory and scenario based testing results, and business case documentation for follow-on CBP acquisition and/or sustainment to include Business Case Analysis and foundational acquisition documentation.

Cargo and Conveyance Security

- *Problem:* The lack of actionable information used in the targeting of cargo for inspection diverts resources from higher risk shipments, while reducing the efficient flow of low risk/legitimate cargo. Inefficient targeting and lack of confidence in the security of containerized cargo in the global supply chain costs U.S. importers billions in lost revenue per year. Moreover, the volume of inbound cargo to U.S. ports-of-entry (POEs) is projected to increase from year to year while CBP manpower will not be increased proportionately. As such, new or improved technology can be a force multiplier or enabler to help address these problems.
- *Solution:* This project develops technologies for collecting additional cargo security data, while also investing in the analysis methods for transforming new and existing cargo security data into actionable information. This improved targeting leads to a higher probability of detecting illegal or hazardous materials in cargo while expediting the delivery of legitimate cargo.
- *Impact:* Improved targeting and improvements in container security through the use of technology will reduce the number of containers requiring scanning and/or manual inspection saving CBP millions annually in labor and facility costs, while increasing the throughput of legitimate cargo. The use of technology could yield millions of dollars in additional tax revenue and would allow the automation of manual processes at the Points of Entry (POEs), freeing up thousands of hours/year of CBP labor.

Prior Year Key Events (2015)

- Obtained Defense Procurement Act, Title III funding to productize the Secure Hybrid Container (FY 2015 Q1).
- Finalized U.S.-EU Maritime Cargo Security Pilot Test Plan (FY 2015 Q3).
- Completed Border Wait Time/Supply Chain Security Roadmap. (FY 2015 Q3).
- Conducted preliminary assessment of the efficacy of various cargo security devices for use in the US-EU Maritime Cargo Security Pilot (FY 2015 Q4).
- Government [reusable electronic conveyance security](#) (RECONS) devices: Completed CBP Truck Demos (Detroit) (FY 2015 Q4).
- Delivered [secure transit corridors](#) (STC)/RECONS Transition Plan to CBP (FY 2015 Q4).
- Completed operational evaluation of container security/tracking devices with Federal Protective Service (FPS); FPS selected a final device to include as part of their overall CONOPS (FY 2015 Q4).

Current Year Key Events (2016)

- Government RECONS: Transitioned comprehensive study results to CBP (T&E Analysis, Cost/Benefit Analysis, Acquisition Recommendation, Vendors List) (FY 2016 Q1).
- Conducting end-to-end analysis that will influence electronic chain-of-custody processes, procedures, and technology implementations (FY 2016 Q2).
- Follow-on study of Border Wait Time Pilot Candidate Technologies is currently underway; evaluating potential application of an enterprise-wide solution (FY 2016 Q3).
- Working with FPS to integrate vehicle security device hardware & software into the new Scanning Facility operations enterprise (FY 2016 Q4).

Budget Year Key Events (2017)

- Develop definitive requirements and Concept of Operations for data analytic tool, Citris User Interface Development (FY 2017 Q4).
- Refine operational test and evaluation of cargo trend analysis and anomaly detection into CBP's automated targeting system (FY 2017 Q3).

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$1,000	\$2,812	\$3,450	0	0	\$1,000

Project Schedule Including Milestones (2016 and beyond)

- Develop definitive requirements and Concept of Operations for data analytic tool, Citris User Interface Development (FY 2017 Q4).
- Refine operational test and evaluation of cargo trend analysis and anomaly detection into CBP's automated targeting system (FY 2017 Q3).
- Integrate cargo trend analysis and anomaly detection capability into CBP's automated targeting system (FY 2017 Q4).

Delayed Milestones

- Finalization of U.S.-EU Maritime Cargo Security Pilot Test Plan delayed until FY 2015 Q3 due to DHS S&T Borders and Maritime expanding the original concept of maritime security device pilot to include an EU/Dutch Customs Shipping Information Pipeline project.

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Delivered STC/RECONS Transition Plan to CBP (FY 2015 Q4).
- Deliver to FPS an automated capability to permit logging of deliveries within the National Capital Region (NCR), communication with container security devices, and tracking of container movement. This includes:
 - Development, implementation, and training of a software backend system;
 - Analysis, operational evaluation, and selection of appropriate container security/tracking devices;
 - Integration of the overall capability into FPS' operation at the St. Elizabeth's Hospital campus
 - Final operational evaluation.
- CITRIS Transition Plan is being developed. In FY 2019 S&T plans to deliver the project to ICE/HSI:
 - CITRIS software & installation
 - CITRIS training
 - CITRIS Operator Manuals.
- Deliver ATS-integrated cargo trend analysis and anomaly detection capability to CBP in FY 2018.
- Transition Barriers:
 - Schedule risk due to the sensitive nature of the data and data systems involved.
 - Security certification requirements of information systems.
 - CBP and TSA Acquisition budgets.

Land/Sea Cargo Scanning

- *Problem:* Several CBP non-intrusive cargo scanning systems are reaching the end of their service life and are exhibiting reduced performance and rising maintenance costs. Other scanning systems are using technology that needs to be refreshed to maintain parity with the smuggling threat. In addition, CBP lacks the capability to non-intrusively detect contraband hidden in the walls of refrigerated cargo containers and in structural voids of conveyances and vehicles, requiring them to use time intensive manual inspection techniques. CBP has limited capability to collect and analyze evidence from cargo and cargo containers to enforce trade law. Currently, CBP Agriculture Inspectors search for pests/invasive species using time-consuming manual techniques. CBP/ICE has limited ability to detect/interdict counterfeit merchandise entering the U.S. and the estimated \$65 billion in bulk cash being illegally smuggled out of the U.S. each year.
- *Solution:* This project develops software and hardware upgrades for the legacy cargo scanning units, infusing state-of-the-art technology which will enhance their detection performance and extend their service life, and prototypes non-intrusive scanning capabilities for refrigerated cargo containers and structural voids. This project also provides CBP with the capability to detect the transport of contraband, counterfeit merchandise, or invasive species in inbound and outbound cargo at the Ports of Entry (POEs).
- *Impact:* The S&T Directorate's efforts will enhance CBP's effectiveness in detecting contraband at Ports of Entry while increasing the throughput of legitimate cargo. The project will also increase the availability of evidence enabling enhanced trade compliance enforcement, allowing for the collection of millions of dollars of currently uncollected tariffs and duties. Upgrades to CBP cargo scanning systems will improve performance, while significantly reducing operational and maintenance costs. The project anticipates the seizure of a larger portion of the estimated \$65 billion in bulk cash being illegally smuggled out of the U.S. each year.

Prior Year Key Events (2015)

- Developed preliminary design of the Void and Deck Anomaly Detector (FY 2015 Q3).
- Awarded contract for development of the Mid-Level Scanning System Upgrade prototype(s) (FY 2015 Q4).
- Prototyped and tested microwave and acoustic systems for detection of invasive species in a laboratory. Performance comparison will be made with human operators (FY 2015 Q3).
- Completed critical design of the Mid-Level Energy Scanning System Upgrade (FY 2015 Q4).
- Developed preliminary design of the Mobile Backscatter Scanning System Upgrade (FY 2015 Q4).
- Determined performance (sensitivity and cycle time) of a prototype mobile screening unit against counterfeit items packed in containers (FY 2015 Q4).
- Prototyped a currency detection system that will be field tested at a border crossing in order to assess detection performance, usability, and operational reliability (FY 2015 Q4).

Current Year Key Events (2016)

- Initiate transition of Mid-Level Scanning System Upgrade (FY 2016 Q4).
- Initiate transition of pre-production Mobile Backscatter Scanning System (FY 2016 Q3).
- Initiate transition of Currency Detection System (FY 2016 Q4).

Budget Year Key Events (2017)

- Let contract for Common Viewer Workstation combined with Bulk Currency Detection Module (FY 2017 Q3).
- Develop common future non-intrusive inspection (NII) capability standard from Mid-Level Scanner and Mobile Backscatter Scanner to improve performance of future NII systems (FY 2017 Q4).

- Combine and contract for development of Through Wall/Floor Void Detection in conjunction with Mobile Backscatter Scanner (FY 2017 Q4).

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	\$2,600	\$3,600	\$487	\$6,400

Project Schedule Including Milestones (2016 – beyond)

- Operational Testing & Evaluation of Mid-Level Scanning System (FY 2016 Q2).
- Initiate transition of pre-production Mid-Level Scanning System (FY 2016 Q3).
- Operational Pilot of Common Viewer Workstation under real conditions (FY 2016 Q4).
- Operational Pilot of a currency detection system under real-life conditions (FY 2016 Q4).
- Initiate transition of Currency Detection System (FY 2016 Q4).
- Operational Testing & Evaluation of Mobile Backscatter Scanning System (FY 2017 Q2).
- Initiate transition of pre-production Mobile Backscatter Scanning (FY 2017 Q2).
- Operational Testing & Evaluation of Void & Deck Anomaly Detector (FY 2017 Q3).
- Transition pre-production Void & Deck Anomaly Detector (FY 2017 Q4).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Transition to CBP (potentially TSA also) a Common Viewer Workstation for non-intrusive inspection systems.
- Deliver to CBP one or more pre-production Mid-Level Energy Scanning System units and the associated technical data package from which to develop an acquisition package and procure additional systems. The S&T development contract will contain an option that CBP can procure additional units. S&T will assist CBP with acquisition or commercialization.
- Transition a field installation kit to modernize the CBP Mobile Backscatter Scanning Systems, extend the life of the units, and create a baseline for modernization and upgrade of other CBP Backscatter units. Specifically the project will deliver to CBP one or more pre-production units and the associated technical data package from which to develop an acquisition package and procure additional systems. The S&T development contract will contain an option by which CBP can procure additional units. S&T will assist CBP with acquisition or commercialization.
- Transition to CBP, USCG, and ICE a Conveyance Void and Anomaly Detection system with the ability to quickly detect the existence of a false compartment aboard ship/boats as well as in automobiles and small trucks where narcotics and other contraband are frequently hidden and smuggled into the U.S. The project will transition several pre-production units and the associated technical data package from which to procure

additional systems. The S&T development contract will contain an option by which CBP/ICE can procure additional units. S&T will assist with the acquisition or commercialization.

- Transition operational prototype currency detection tools for field evaluation at selected POEs. Assuming successful operational evaluation in FY 2017, the project will contract for Low Rate Initial Production (LRIP) of detection units. LRIP contract will include options for CBP to procure additional units.
- Transition Barriers:
 - Technical challenge of providing adequate scanning system performance within acceptable personal radiation dosage levels

B. Land Border Security – FY 2016: \$13.347 million. FY 2017 Request: \$21.773 million. This program develops and transitions technical capabilities that strengthen U.S. land border security by safeguarding lawful trade and travel and by helping to prevent illegal goods and people from crossing the border.

Air Based Technologies

- *Problem:* DHS operating components have the responsibility to detect and interdict illegal entry and smuggling activity along the vast expanses of U.S. land and maritime borders at and between Ports of Entry (POEs). DoD and industry have developed airborne surveillance systems that could be repurposed/adapted/leveraged to dramatically improve situational awareness of remote regions of the U.S. border. Small unmanned aircraft systems (sUAS) will soon be widely utilized by DHS and first responders, requiring knowledge about capabilities, benefits, and the safe operations of sUAS within the National Airspace System (NAS). The difficult terrain and harsh environment of the northern border poses extreme difficulties for a system to reliably and accurately detect, track, and classify aircraft of all sizes.
- *Solution:* This project identifies, tests, and evaluates sensors mounted on a variety of manned and unmanned air platforms for possible use by DHS Components for improved detection, classification, and tracking of illicit activity. It also provides DHS Components and the First Responder community unbiased assessments of available airborne sensors in realistic, operationally relevant scenarios for improved situational awareness for law enforcement, search and rescue, disaster response, and border and maritime security missions. In addition, the project is developing methods and technologies to enable safe and effective sUAS operations in the NAS. The project successfully optimized the small dark aircraft (SDA) capability and has optimized and deployed it on the northern border to detect, track, and classify low flying, low observable aircraft. This effort will repurpose the SDA for the southern border by optimizing the system to recognize illicit aircraft flown and reject clutter typical in this region.
- *Impact:* Airborne sensors and sensor systems will provide DHS operating Components and First Responders with invaluable situational awareness before making the decision to dispatch agents/assets to respond to and engage in potentially dangerous operations. The project will improve CBP, USCG, and the first responder community's awareness and usage of mature air based technologies for border security and public safety missions, resulting in more effective allocation of assets on local, regional, and national levels. The SDA on Southern Border effort can provide situational air awareness 24/7, 365 days of the year in the most difficult areas seldom patrolled by CBP, enabling agents to detect, identify, and locate illicit air traffic, respond immediately or preposition interdiction assets, and mitigate the threat.

Prior Year Key Events

- Continued to perform operational field training and assessments of sUAS for improved detection, identification, and classification of illicit activity and improved situational awareness in land operational scenarios.

- Performed operational field assessments of sUAS for improved detection, identification, and classification of illicit activity and improved situational awareness in maritime operational scenarios.
- Published reports assessing performance of sUAS in land operational scenarios.
- Published reports assessing performance of sUAS in maritime operational scenarios.
- Conducted search for Sense and Avoid technologies that could be incorporated into the small form factor of a sUAS.
- Conducted analysis of technologies for countering the threat of illicit techniques (GPS Spoofing, network hacking, cell data skimming, etc.) and enable safe and effective use of sUAS in operational environments.
- Integrated Moving Target Indicator (MTI) radar system on CBP Office of Air and Marine aircraft in preparation for extended operational assessment.
- Commenced Operational Evaluation of Moving Target Indicator technology.
- Assessed issues and recommend solutions to nonstandard UAS data protocols that prevent UAV track data or video from being readily ingested by data management systems.

Current Year Key Events

- Demonstrate dismount movement target indicator (DMTI) on medium altitude long endurance (MALE) UAS.
- Perform operational field training and assessments of sUAS for improved detection, identification, and classification of illicit activity and improved situational awareness in land and maritime operational scenarios.
- Publish reports assessing performance of sUAS in land and maritime operational scenarios.
- Conduct analysis of technologies for countering the threat of illicit techniques (GPS Spoofing, network hacking, cell data skimming, etc.) and enable safe and effective use of sUAS in operational environments.
- Commence Operational Evaluation of Moving Target Indicator technology.
- Assess issues and recommend solutions to nonstandard UAS data protocols that prevent UAV track data or video from being readily ingested by data management systems.

Budget Year Key Events

- Area and terrain assessment to determine area coverage, number of sensors needed and sensor placement.
- Conduct assessment of a method to manage the amount of video collected for investigations.
- Modify design of existing SDA system to accommodate Southern Border changes.
- Continue to perform operational field training and assessments of sUAS for improved detection, identification, and classification of illicit activity and improved situational awareness in land and maritime operational scenarios.
- Publish reports assessing performance of sUAS in land and maritime operational scenarios.
- Conduct analysis of technologies for countering the threat of illicit techniques (GPS Spoofing, network hacking, cell data skimming, etc.) and enable safe and effective use of sUAS in operational environments.
- Assess issues and recommend solutions to nonstandard UAS data protocols that prevent UAV track data or video from being readily ingested by data management systems.
- Augment models and sensor data processing with aircraft signatures and environmental clutter found on the Southern Border.
- Begin construction of system.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$5,000	\$4,469	\$2,618	\$5,250	\$1,468	\$7,173

Project Schedule Including Milestones

- Evaluate Wide Area Air Surveillance Sensor technologies (FY 2016).
- Develop requirements and concepts for Unmanned Transportation Management Build 1.x (FY 2016).
- Deliver small UAS Test Reports to USCG (FY 2016).
- Develop recommendations for future small UAS positioning, navigation, and timing (FY 2016).
- Deliver sUAS Test Reports to CBP customers (FY 2016).
- Deliver Test Reports to CBP customers (FY 2016).
- Area and terrain assessment to determine area coverage, number of sensors needed and sensor placement (FY 2017).
- Modify design of existing SDA system to accommodate Southern Border changes (FY 2017).
- Begin construction of SDA system (FY 2017).
- Conduct assessment of a method to manage the amount of video collected for investigations (FY 2017).
- Upgrade mission planning and execution software for UAS use (FY 2017).
- Develop requirements and concepts for unmanned transportation management (FY 2016).
- Deliver small UAS Test Reports to USCG (FY 2017).
- Develop recommendations for future small UAS positioning, navigation, and timing (FY 2017).
- Deliver small UAS Test Reports to CBP customers (FY 2017).
- Conduct assessments of Sense and Avoid technologies for sUAS to enable/enhance access to the National Airspace System (FY 2017).
- Conduct search for sensor technology for sUAS (FY 2017).
- Augment models and sensor data processing with aircraft signatures and environmental clutter found on the Southern Border (FY 2017).
- Deploy SDA on Southern Border (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- The project plans to transition the following technologies to enable/enhance sUAS access to the NAS resulting in improved surveillance capabilities of high-risk land border areas:
 - GPS Spoofing Countermeasures for sUAS (FY 2017).
 - Sense and Avoid capabilities for sUAS (FY 2017).
- The project plans to perform evaluations of aircraft mounted sensor performance and DHS utility resulting in the following transitions:
 - sUAS in maritime operational scenarios
 - Publish test reports (FY 2015).
 - Manned aircraft surveillance capabilities
 - Deliver performance, procurement, and integration data (FY 2016).
 - sUAS for Border Security scenarios
 - Publish test reports (FY 2015-2016).
 - Moving Target Indicator System
 - Deliver performance, procurement, and integration data (FY 2016).

Border Technologies Trident Specter

- *Problem:* CBP’s Office of Technology Innovation and Acquisition (OTIA) needs the ability to inexpensively and rapidly field prototypes for use and assessment in order to gather input for future OTIA acquisitions.
- *Solution:* This project enables short term delivery of high priority new technology prototypes to the field. This project will jointly assess COTS or near-COTS solutions for use in areas of critical need for border security. The need will be identified by CBP, the near-term requirements will be jointly evaluated, and the S&T Directorate will provide one or more prototype units for field use and evaluation.
- *Impact:* This project will enhance CBP’s ability to quickly adopt available technology to improve their capabilities and/or reduce O&M costs of existing capability.

Prior Year Key Events

- Provide engineering analysis and system design for a fuel efficient power system for FOB in Ajo, Arizona.

Current Year Key Events

- Develop, test, and evaluate technology (i.e., COTS and near-COTS) solutions.
- Deliver test reports and recommendations to CBP customer(s).

Budget Year Key Events

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	\$1,045	\$979	\$1,400	\$500	\$2,100

Project Schedule Including Milestones

- Identify critical CBP capability gaps or area of potential cost savings, conducted in partnership with CBP OTIA (FY 2016).

- Conduct detailed interviews of customer staff and field officers to define/validate requirements for rapid evaluation and integration of COTS and near-COTS technology (FY 2016).
- Perform tech foraging and an analysis of alternatives (with strong customer and user input) to identify a tech development strategy (FY 2016).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- FOB Camp Grip power assessment and fuel efficient generator transition.
- FOB Ajo, Arizona fuel efficient power system transition.

Ground Based Technologies

- *Problem:* Multiple DHS Components are in need of new or improved border surveillance capabilities – especially for difficult terrains, harsh weather, and remote locations – that provide effective use of resources, improve investigations, and enhance agent safety. Additionally, new technology is needed to deter border spotter efforts to defeat U.S. law enforcement operations.
- *Solution:* Ground Based Technologies is a collection of multiple border surveillance projects that focus on: enhancing situational awareness, providing automated detections and alerts, improving target classification while minimizing false alarms, and maximizing battery life or renewable energy. The projects address gaps identified by Border Security IPTs, and U.S. Border Patrol Strategic Plan. This project is also identifying methods and technologies to effectively counter border spotters, optimize sensor deployments, record / transmit / process / archive only essential data, and enhance agent safety during border operations.
- *Impact:* CBP's improved situational awareness of U.S. terrestrial borders between the POEs will result in higher interdiction rates of illegal activity through higher detection rates, fewer false alarms, and more efficient and safer utilization of officers, agents, and assets.

Prior Year Key Events

- Completed Phase I System Design Review of the RF Sensing Unattended Ground Sensor.
- Performed independent laboratory and field testing of piezo-electric unattended ground sensor.
- Demonstrated buried tripwire system.
- Drafted the Final Assessment Report of the prototype buried tripwire system.

Current Year Key Events

- Demonstrate Automated Scene Understanding (ASU)/Canadian-U.S. Sensor Sharing Pilot (CUSSP).
- Draft final "summer" (no ice on the bay) engineering test report of the Canadian-U.S. Sensor Sharing Pilot (CUSSP).

- Transition Automated Scene Understanding (ASU)/Canadian-U.S. Sensor Sharing Pilot (CUSSP) capability to CBP.
- Transition Slash CameraPole (1 pole configuration).
- Install the 3 pole configuration of the Slash CameraPole system and commence operational assessment.
- Transition buried tripwire to CBP’s U.S. Border Patrol.
- Test SBIR USCG system by Independent Government team. Demonstrate Remote Imaging Device Engineering capability.

Budget Year Key Events

- Conduct RF Sensing CDR.
- Conduct Border Spotter PDR.
- Conduct Remote Radio Link Pilot PDR for radio communications.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$4,000	\$4,002	\$5,219	\$8,400	\$7,261	\$8,200

Project Schedule Including Milestones

- Conduct Market Survey and Analysis of Alternatives for Border Spotter (FY 2016).
- Conduct Site Survey and planning for remote radio link pilot (FY 2016).
- Establish Engineering Test Bed for RF Sensing (FY 2016).
- Conduct fiber and system installation pilot (FY 2016).
- Begin transition of Automated Scene Understanding (ASU)/Canadian-U.S. Sensor Sharing Pilot (CUSSP) capability to CBP (FY 2016).
- Perform independent government testing of SBIR unattended ground sensor system (FY 2016).
- Conduct Operational Assessment of Unattended Ground Sensors (FY 2016).
- Install three pole configuration of the slash Camera Pole system (FY 2016).
- Conduct RF Sensing CDR (FY 2017).
- Conduct survey of renewable energy sources that could provide extended power for remotely emplaced sensors (FY 2017).
- Conduct Border Spotter PDR (FY 2017).
- Conduct Remote Radio Link Pilot PDR for radio communications (FY 2017).
- Conduct assessment of a method to manage the amount of video collected for investigations (FY 2017).

Delayed Milestones

Install the 3 pole configuration of the Slash CameraPole system and commence operational assessment.

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Transition Buried Tripwire to provide high probability of detection and enhance classification capability to discriminate between humans, animals, vehicles, and aircraft without the use of imagers.
- Transition Slash CameraPole (1-pole configuration) technology to improve CBP's ability to detect and classify illegal border incursions. 3-pole configuration to transition in FY 2017.
- Transition ASU/CUSSP system providing a joint surveillance capability to both CBP and Royal Canadian Mounted Police agents, using both U.S. and Canadian sensor information.
- Transition technology to detect, locate, and disrupt Border Spotters employed by traffickers along the Southwest border.
- Transition Radio Frequency sensing UGS system technology to track illegal incursions.

Tunnel Detection and Surveillance

- *Problem:* Cross-border tunnels are dug by transnational criminal organizations to smuggle contraband into the U.S. Current detection capabilities rely on random tips and a laborious human intelligence (HUMINT) collection process, and when tunnels are discovered, CBP/U.S. Immigration and Customs Enforcement (ICE) lack the ability to exploit the tunnel to arrest and prosecute those involved in the creation and use of the tunnel.
- *Solution:* This project provides CBP and ICE the capability to locate clandestine tunnels, and the ability to perform forensic analysis of a detected tunnel to support investigations and prosecution.
- *Impact:* Using the S&T Directorate-developed tunnel detection tools and systems, a 50 percent increase in the number of detected tunnels is anticipated. This will result in a reduction in the flow of contraband smuggled into the U.S. via tunnels, keeping hundreds of tons of drugs off U.S. streets while saving thousands of CBP labor hours. Tunnel Age forensic tools/processes developed will enable ICE to assign attribution for tunneling activity and thereby increase the ability to arrest and prosecute individuals involved in the creation/use of tunnels for smuggling.

Prior Year Key Events

- Demonstrate method for sample collection and analysis to determine tunnel age in a controlled (lab) environment.
- Tested Developmental Prototype of Tunnel Age Kit.
- Tested Developmental Prototype of Tunnel Detection System.
- Developed and tested prototype components at the soils test range that will be eventually combined into a tunnel detection system.

Current Year Key Events

- Field Test Developmental Prototype of Tunnel Detection Sub-Systems.
- Field Test and Operator Training of Tunnel Age Kits.

Budget Year Key Events

- Field Experimentation of Developmental Prototype of Tunnel Detection System.
- Field Test and Operator Training of Developmental Prototype of Tunnel Detection System.
- Research the state of the art in unmanned ground systems (UGS).
- Research sensor requirements for UGS tunnel operations.

- Develop UGS strategy for tunnel investigation.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	\$2,894	\$4,626	\$5,800	\$4,118	\$4,300

Project Schedule Including Milestones

- Conduct Field Test for Developmental Prototype of Tunnel Detection System (FY 2016).
- Conduct Field Test of Tunnel Age Kits (FY 2016).
- Deliver prototype Tunnel Detection system and Technical Data Package to CBP Acquisition Program Office (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program starts at TRL2 and ends at TRL6.

Transition Plans

- Tunnel Detection Prototype
 - Delivered Sensor Performance Tool and Guidebook to inform which sensor types work best in the various border locations and the confidence level using each. This tool will help CBP make better use of tunnel detection equipment they already bought and better understand their performance limitations.
 - Conduct field testing of a prototype of a new tunnel detection system.
 - Deliver developmental and demonstration prototype(s) for operational evaluation by CBP.
 - Deliver final prototype Tunnel Detection system and Technical Data Package to CBP Acquisition Program Office.
- Tunnel Age Kit
 - Deliver a toolkit that can be routinely used by CBP and ICE agents to analyze and determine the age of discovered tunnels.
 - Provide a contract vehicle for Low Rate Initial Production that will include options for CBP to procure additional kits.

C. **Maritime Border Security** – FY 2016: \$6.866 million. FY 2017 Request: \$12.500 million. This program develops and transitions technical capabilities that enhance U.S. maritime border security by safeguarding lawful trade and travel and helps to prevent illegal use of the maritime environment to transport illicit goods or people.

Port and Coastal Surveillance

- *Problem:* DHS components have insufficient ability to identify, prioritize, characterize, and share actionable information and intelligence on maritime threats in a tactically relevant manner to support unity of effort and intelligence-driven operations across the HSE. DHS operational components also need to leverage technology as a force multiplier to improve their operational effectiveness, improve efficiency, and/or reduce operations and maintenance costs.
- *Solution:* This project contributes to the department's unity-of-effort initiative and develops solutions to improve maritime situational awareness by establishing an enterprise capability to (1) access more data sources (including space based sensors), (2) make available decision support tools to translate the available data into actionable information and intelligence, and (3) share that actionable information and intelligence with federal, state, local, tribal, and international partners. This will enable an appropriate and rapid tactical response to maritime threats as well as enhance strategic planning/resource allocation at the Joint Task Forces (JTF), regional, and national level. Other project initiatives identify and develop technology to allow DHS operational components to more efficiently utilize and allocate resources and/or reduce their operations and maintenance costs.
- *Impact:* The S&T developed technology will improve operational effectiveness and enhance the maritime domain awareness leading to increased detections, interdictions, and deterrence. Specifically, the increased effectiveness and situational awareness will result in:
 - Improved measurement of illegal activity to understand current state and impacts from addition of resources or other actions taken to improve security.
 - Improved assessment of risks by identifying current threats along with emerging patterns and trends.
 - Improved alignment of resources-to-risk for current and future operations on both a tactical and strategic level

Prior Year Key Events

- Installed, tested, and evaluated Coastal Surveillance System (CSS) operational nodes at strategic locations to improve U.S. maritime domain awareness.
 - Expanded CSS Pilot to include USCG Sector San Diego.
 - Expanded CSS Pilot to include USCG Sector Los Angeles-Long Beach.
 - Expanded CSS Pilot to include Maryland Natural Resource Police (MNRP).
- Integrated new data sources into CSS.
- Obtained Interim Authority To Operate (ATO) for CSS General Support System (GSS).
- Planned and executed Technical Test (TT-1), St. Petersburg, FL.
- Planned and executed Technical Demonstration (TD-1), Chesapeake, MD.

Current Year Key Events

- Obtain Authority To Operate (ATO) for CSS General Support System (GSS).
- Install, test, and evaluate Coastal Surveillance System operational nodes at strategic locations to improve U.S. maritime domain awareness.
 - Expand accredited boundary to MNRP node.
 - Expand accredited boundary to AMOC node.
 - Expand CSS Enterprise to include CBP OIC Detroit.
 - Expand CSS Enterprise to USCG Sector Puget Sound.
- Deliver Integrated Maritime Domain Enterprise (IMDE) Reference Architecture Package to OCIO.
- Transition IMDE as enterprise services.

- Plan and execute Technical Demonstration (TD-2).
- Fabricate and test person in the water detection capability micro turret (Niah).

Budget Year Key Events

- Test Niah Integrated System in Open Ocean.
- Deliver to DHS HQ an affordable, sustainable, OCIO-compliant, enterprise data integration/information sharing platform.
- Conduct Plug-Fest to examine the utility of various space-based systems and capabilities.
- Complete IMDE-CSS Operational Demonstration.
- Conduct Plug-Fest to examine the utility of various space-based systems and capabilities.
- Transition IMDE-CSS sustainment and operations of prototype system to USCG and/or CBP.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$3,134	\$6,683	\$7,250	\$9,500	\$6,866	\$10,750

Project Schedule Including Milestones

- Deliver IMDE Reference information sharing Architecture Package to OCIO (FY 2016).
- Obtain authority to operate for current field coastal surveillance nodes (FY 2016).
- Establish an initial operational capability at CBP Air and Marine Operations Center for the use of space based imagery in tactical operations (FY 2016).
- Deliver reports on the assessment of technology deployed for Arctic communication and on a survey of commercial satellites (FY 2016).
- Conduct Plug-Fest to examine the utility of various space-based systems and capabilities (FY 2017).
- Complete IMDE-CSS Operational Demonstration (FY 2017).
- Conduct Plug-Fest to examine the utility of various space-based systems and capabilities (FY 2017).
- Deliver to DHS HQ an affordable, sustainable, OCIO-compliant, enterprise data integration/information sharing platform (FY 2017).
- Transition IMDE-CSS sustainment and operations of prototype system to USCG and/or CBP (FY 2017).
- Niah Integrated System Open Ocean Test (FY 2017).

Delayed Milestones

- Expansion of CSS Pilot to include CBP OIC Detroit delayed due to resource availability and extensive stakeholder coordination and approvals required. Site survey completed 1Q FY 2016 and sensor integration into IMDE-CSS system via AMOC IMDE-CSS node planned (FY 2016).

Type of Research

Developmental

Technical Readiness Level

The program begins at TRL4 and ends at TRL7.

Transition Plans

- Integrated Maritime Domain Enterprise (IMDE) – Deliver to DHS HQ a compliant reference segment architecture integration platform for agile information sharing and discovery.
- Coastal Surveillance System (CSS) – Deliver to CBP and USCG a coastal maritime sensor fusion system that enables cooperative maritime awareness of non-emitting vessels and the sharing of that time-critical, mission-useful sensor information between DHS Components including USCG and CBP and State, local and regional partners.
- Transition capability to use commercial space-based imagery in support of tactical operations.
- Niah-Engineering Development Model (EDM) turn over to USCG for Operational Test. Transition includes documentation of the system, training, test support and O&M support after turnover.
- Transition capability to use commercial space-based imagery in support of tactical operations to CBP.

Small Dark Vessel Detection

- Problem: DHS operating agencies have limited capability to detect, track, and identify maritime threats such as self-propelled semi-submersible (SPSS) and non-emitting small vessels and go-fast boats transporting contraband or people unlawfully into the U.S.
- Solution: Develop/evaluate sensor systems capable of automating, locating, and detecting vessels of all sizes across the maritime domain. Perform R&D to improve the ability of sensors to detect and track waterborne threats, and reduce clutter issues to improve detection rates and lower false alarms. The associated capabilities will provide economical, effective, and persistent domain awareness.
- Impact: Improved and more persistent detection of small dark vessel activity. S&T products will assist the USCG and CBP in the acquisition and implementation of small dark vessel detection capabilities.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Assess adversary tactics and emerging small dark vessel threats (FY 2017 Q1).
- Assess environmental clutter issues and technological challenges (FY 2017 Q2).
- Research existing COTS/GOTS (FY 2017 Q3).
- Initiate evaluation of small vessel detection COTS/GOTS (FY 2017 Q4).

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
0	0	0	0	0	\$750

Project Schedule Including Milestones

- Assess adversary tactics and emerging small dark vessel threats (FY 2017 Q1).
- Assess environmental clutter issues and technological challenges (FY 2017 Q2).
- Research existing COTS/GOTS (FY 2017 Q3).
- Initiate evaluation of small vessel detection COTS/GOTS (FY 2017 Q4).

Delayed Milestones

- N/A

Type of Research

Developmental

Technical Readiness Level

Begins at TRL 6 and completed at TRL 7.

Transition Plans

- The project will inform CBP and USCG acquisition strategies for the deployment of small dark vessel capability.

Port Resiliency

- *Problem:* DHS expends considerable time and resources to fulfill their mandate to provide for the safety and economic security of our maritime ports. Currently, the DHS has no computer-based tool to review, modify and/or design risk-based port resiliency strategies; nor does it possess the modeling and simulation capability to conduct port health assessments or analyze the condition of ports in a post disaster or attack environment.
- *Solution:* New or improved technology can be a force multiplier/enabler to help address the DHS maritime challenges. The project will leverage work from S&T Centers of Excellence to develop and design a port resiliency analytical tool that uses available computer-based technologies to provide our port managers with a more effective and user friendly capability while maintaining fiscal responsibility.
- *Impact:* S&T Directorate developed technology will allow DHS to maintain or increase their effectiveness while reducing their resource investment required to provide for the maritime safety and economic security of our ports. The specific analytical port tool improves port resiliency by substantially reducing the time a port is closed to traffic and trade due to a significant disaster or attack event.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Assess enterprise architecture alignment (FY 2017 1Q).

- Perform Program of Record database assessment (FY 2017 2Q).
- Develop pilot prototype (FY 2017 3Q).
- Plan technology refresh of existing Program of Record upgrade of port tool using pilot data (FY 2017 4Q).

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
0	0	0	0	0	\$1,000

Project Schedule Including Milestones

- Assess enterprise architecture alignment (FY 2017 1Q).
- Perform Program of Record database assessment (FY 2017 2Q).
- Develop pilot prototype (FY 2017 3Q).
- Plan technology refresh of existing Program of Record upgrade of port tool using pilot data (FY 2017 4Q).

Delayed Milestones

- N/A

Type of Research

Developmental

Technical Readiness Level

Begins at TRL 6 and completes at TRL 7

Transition Plans

- The software tool will be integrated into an existing Program of Record. USCG CG-1 is the operational sponsor, CG-6 and CG-7 are the resource sponsors.

Arctic Communications and Technologies

- Problem: The United States is an Arctic nation with significant interests in the future of the region. DHS has specific statutory responsibilities in U.S. Arctic waters. DHS is responsible for ensuring safe, secure, and environmentally responsible maritime activity in U.S. Arctic waters. DHS is extending operations into the Arctic in areas that were once inaccessible but are now ice-free during summer months. The vast distances, lack of communications infrastructure, harsh weather, and high latitude ionic disturbances combine to make communications and operations in the Arctic difficult. Efforts must be accomplished in close coordination with DHS components, and involve facilitating commerce, managing borders, and improving resilience to disasters.
- Solution: this project will identify and evaluate appropriate technology to enable and enhance voice and data communications in the Arctic region for DHS security and safety operations.
- Impact: S&T developed technology solutions will assist the DHS maritime components in the acquisition and implementation of capabilities in the Arctic, essential for safe and effective operations.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Identify effects of the Arctic environment on DHS mission execution (FY 2017 Q2).
- Demonstrate/evaluate technology with the potential to improve/enhance mission performance (FY 2017 Q4).
- Develop and support joint efforts and interagency cooperation between government and civilian entities operating in and researching Arctic environments (FY 2017 Q4).

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
0	0	0	0	0	\$750

Project Schedule Including Milestones

- Identify effects of the Arctic environment on DHS mission execution (FY 2017 Q2).
- Demonstrate/evaluate technology with the potential to improve/enhance mission performance (FY 2017 Q4).
- Develop and support joint efforts and interagency cooperation between government and civilian entities operating in and researching Arctic environments (FY 2017 Q4).

Delayed Milestones

- N/A

Type of Research

Developmental

Technical Readiness Level

Begins at TRL 6 and completes at TRL 7.

Transition Plans

- The project will inform a DHS acquisition strategy for the deployment of an Arctic Communications capability.

4. CBE Defense – FY 2016: \$78.619 million. FY 2017 Request: \$58.389 million. S&T Directorate invests in R&D to support prevention and protective strategies and coordinated surveillance and detection to address CBE threats. R&D work provides technology, methods, and procedures for

the prevention of terrorism; reduction of vulnerability of critical infrastructure from terrorist attacks and other hazards; and prevention of the illicit movement and illegal entry or exit of people, weapons, dangerous goods, and contraband, and the detection of CBE threats.

- A. *Bioagent Detection*** – FY 2016: \$25.000 million. FY 2017 Request: \$18.079 million. This program conducts research and develops and identifies tools to enable rapid detection and provide advanced warning of attacks or releases of biological threat agents against the population and agriculture of the United States. It defines the intended use and application, develops the requirements, and executes the technology developmental efforts to support early detection and warning of potential bioagent threats to humans and animals.

Agricultural Screening and Surveillance

- *Problem:* High-priority threats to livestock wildlife, plants and food threaten the U.S. agricultural critical infrastructure.
- *Solution:* This collection of projects will develop and standardize technologies and protocols, including immunoassay-based approaches, information systems and mobile technologies, to enable the early identification of current and emerging agricultural threats within the U.S. and at the borders.
- *Impact:* The diagnostic screening tools, information technology, software applications and mobile technologies developed and deployed to the U.S. Department of Agriculture (USDA) domestically and both USDA and CBP at U.S. borders will help prevent importation, and/or mitigate the impact of outbreaks and attack with high-priority threats that could cause severe economic damage to U.S. agricultural critical infrastructure.

Prior Year Key Events

- Transition validated sensitive molecular screening tool for the detection of Foot-and-Mouth disease (FMD) in bulk milk tanks using the existing dairy industry milk transportation and quality control infrastructure in the NAHLN and key dairy states
- Enhance Passive Surveillance iOS app in Apple store/ Droid App available in Google Play Store to promote and enable wider use of animal disease surveillance toolset.
- Deliver report summarizing the occurrence of Foreign Animal Diseases (FADs) in wildlife species in endemic regions, including a compilation of susceptible U.S. species with data on ecological, behavioral and environmental factors that could influence disease severity and spread.
- Develop a Rift Valley Fever (RVF) cELISA for possible commercialization and use with multi-species samples.
- Statement of procedures created for use of stabilization/inactivation media in conjunction with oral fluid sampling in herds for surveillance and disease detection; currently in the process of being entered into the APHIS Master Control ISO document database

Current Year Key Events

- Down select applicable technologies for enhanced development and initial testing of Border Agricultural Screening System.
- Develop fit-for-purpose standard operating procedures with the user for implementation into the Border Agricultural Screening System.
- Deliver risk analysis and modeling tools (including spatial disease risk maps) and an analysis of countermeasure and strategies to mitigate and control disease in free ranging wildlife populations and feed biosurveillance systems.

Budget Year Key Events

- Identify gaps in screening and surveillance of agricultural threats
- Expand the development of diagnostic countermeasures
- Host a Table Top Exercise/Workshop with key stakeholders to assist in developing target CONOPs.

- Down select applicable technologies for enhanced development and initial testing.
- Integrate data from wildlife foreign animal disease screening and surveillance testing into guidance for veterinarians.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$3,325	\$3,304	\$7,273	\$750	\$2,000	\$3,099

Project Schedule Including Milestones

- Develop operational requirements documents for agricultural screening systems at the borders (FY 2016).
- Evaluate impact of background clutter on the libraries of volatile signatures used to detect Khapra Beetles (FY 2016).
- Deliver risk analysis and analysis of diagnostic and countermeasure strategies to mitigate and control disease in free ranging wildlife populations (FY 2016).
- Host a Table Top Exercise/Workshop with key stakeholders to assist in (1) developing target CONOPs; (2) down selection of applicable technologies for enhanced development and initial testing (FY 2017).
- Initiate development of fit-for-purpose standard operating procedures (SOPs) with the End User for implementation into the end-user’s system (FY 2017).
- Integrate data from wildlife foreign animal disease screening and surveillance testing into guidance for veterinarians (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program plans to begin at TRL 4 and end at TRL 6.

Transition Plans

- Assays and screening tools that demonstrate sufficient analytical performance, as per the NAHLN Methods Technology Working Group guidance, will be transitioned to the NAHLN.
- The EPS project will result in the development of a full concept of operations in each participating industry/state that can be transitioned to any industry/state with stakeholder commitment to continue utilization without DHS support. In addition, the development of freely available apps for use on veterinarian’s personal equipment and a verification process for including that data into the relevant state/industry data stream will contribute to the creation of a broad user base. The EPS system itself will transition to a non-profit or commercial entity that will be provided with the ability to license the open architecture framework for independent development. The funds from licensing will support the maintenance of the framework and part of the licensing agreement will be the provision of data back into the system to ensure that every licensing opportunity also expands the impact of the EPS system. Full transition of the system should be completed by the end of FY 2016.

- Findings from the FADs in wildlife susceptibility report will inform development of a diagnostic disease panel that can be used to detect and identify prioritized FADs, and be transitioned to and modified by stakeholders as needed. The disease panel will be delivered through an existing platform, which will entail technology transfer to stakeholders interested in employing this diagnostic system.

Bioassays

- *Problem:* First Responders and Public Health officials do not have well-validated detection assays to analyze potential bio-threat samples and inform appropriate actions to ensure public safety and public health actions and decision.
- *Solution:* Develop highly robust assays; that includes test, evaluation, and validation of nucleic acid detection assays (TaqMan Polymerase Chain Reaction (PCR)); antigen detection assays (immunoassays); as per the Public Health Actionable Assay (PHAA) standards and First Responder Actionable Assay (FRAA) performance criteria and rapid antimicrobial susceptibility assays (based on micro-culture and PCR) for deployment and employment through the Centers for Disease Control and Prevention (CDC) Laboratory Response Network and other federally sponsored laboratory response networks to support rapid detection of an event, respond to an event, and recover from an event as well as the First Responder Actionable Assays for First Responder Use in the field. The PHAA assays are intended to be dual-use assays that can be used for environmental sample analysis as well as clinical specimen analysis while the FRAA is strictly designed to be used in the field for environmental powders evaluation and screening.
- *Impact:* Enables capabilities to rapidly screen and detect high-consequence biological pathogens and toxins to provide critical information to support actions and decisions regarding public health and public safety. This project will also develop bioinformatics resources, reference strain and antibody repositories along with appropriate standards to recognize and identify traditional, emerging, advanced, and enhanced threat agents.

Prior Year Key Events

- Completed testing, evaluation and validation of Ebola and Marburg and started on *Burkholderia mallei* and *pseudomallei* nucleic acid PHAA assays.
- Completed testing, evaluation of Ricin, Abrin, *Bacillus anthracis*, *Yersinia pestis* and *Francisella tularensis* lateral flow assays for First Responder use in support of public safety actions and screening of suspicious materials in the field.
- Completed Rapid Antimicrobial Susceptibility tests for *Bacillus anthracis*, *Yersinia pestis* and started on *Francisella tularensis*.
- Transitioned a suite of fully validated TaqMan PCR Assays with multiple primer and probe sets for use in the detection of Filoviruses Ebola and Marburg, both are CDC Category A viral biothreat agents.
- Transitioned a suite of fully validated TaqMan PCR Assays with multiple primer and probe sets for use in the detection of *Variola*, a CDC Category A viral biothreat agent.
- Transitioned a suite of fully validated TaqMan PCR Assays with multiple primer and probe sets for use in the detection of *Francisella tularensis*, a Tier 1 Select Agent.
- Transitioned a suite of fully validated TaqMan PCR Assays with multiple primer and probe sets for use in the detection of *Yersinia pestis*, a Tier 1 Select Agent.
- Transitioned a suite of fully validated TaqMan PCR Assays with multiple primer and probe sets for use in the detection of *R. prowazekii*, a Tier 2 Select Agent.
- Transition a suite of fully validated TaqMan PCR Assays with multiple primer and probe sets for use in the detection of *R. rickettsia*, a Tier 2 Select agent.

Current Year Key Events

- Complete testing, evaluation and validation of *Bacillus anthracis* nucleic acid PHAA assays.
- Conduct testing and validation of *Brucella suis, abortus & melitensis* PHAA assays.
- Conduct assay optimization for the *Coxiella burnetti* PHAA assay.
- Conduct testing and validation of the *T2 Mycotoxin* and *Saxitoxin* toxin PHAA assays.
- Complete Rapid Antimicrobial Susceptibility tests for *Burkholderia mallei* and *pseudomallei*.
- Conduct testing and validation of the nucleic acid based detection assays for *Burkholderia spp.*
- Conduct assay optimization of *Lassa Fever Virus* PHAA assays.
- Begin testing of multiplexed Variola prototype lateral flow assays

Budget Year Key Events

- Transition nucleic acid based detection assays for *Burkholderia spp.* (causing Glanders or Melioidosis) and *Bacillus anthracis* (causing Anthrax) to end users and stakeholders.
- Begin Validation of Conotoxin and Saxitoxin reagents and prototype assays.
- Transition of Rapid Antimicrobial Susceptibility tests for *Burkholderia mallei* and *pseudomallei* to end users.
- Begin validation of multiplexed Variola lateral flow assays.
- Begin optimization of *Brucella spp.* prototype assays.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$4,000	\$3,975	\$7,000	\$4,000	\$2,000	\$5,165

Project Schedule Including Milestones

- Complete testing, evaluation and validation of field deployable First Responder Actionable Assays for detection of *Bacillus anthracis*, *Yersinia pestis* and *Francisella tularensis* (FY 2016).
- Complete testing and validation of Public Health Actionable Assays for detection of *Burkholderia mallei* and *Burkholderia pseudomallei* (FY 2016).
- Complete testing and validation of Public Health Actionable Assays for detection of *Coxiella burnetti* (FY 2016).
- Complete testing and evaluation of Rapid Antimicrobial Susceptibility tests for *Bacillus anthracis*, *Yersinia pestis*, *Burkholderia mallei* and *Burkholderia pseudomallei* (FY 2016).
- Transition of nucleic acid based detection assays for *Burkholderia spp.* (causing Glanders or Melioidosis) and *Bacillus anthracis* (causing Anthrax) to end users and stakeholders (FY 2017).

Delayed Milestones

- Delays in the Rapid Antimicrobial Susceptibility tests were incurred due to the shutdown the CDC experienced in 2014 and other safety stand-downs in 2015 (*e.g.*, incident involving the DoD Critical Reagents Program that led to the discovery that they had sent out live Anthrax spores to nearly two-hundred laboratories).
- Due to the filovirus outbreak in West Africa and our need to expand bioassays for Ebola virus to meet laboratory response network requirements we had to delay *Bacillus anthracis* and *Burkholderia* assay testing and evaluation activities.

Type of Research

Applied

Technical Readiness Level

The program plans to begin at TRL 5 and end at TRL 6-7.

Transition Plans

- Transition PHAA validated assays to CDC LRN to support national bio-preparedness and defense mission.
- Rapid Biothreat Screening assays will be transitioned to FEMA and S&T's FRG to support screening of suspicious material in the field and public safety actions in a timely manner.

Biosurveillance Systems

- *Problem:* In the event of biological attack or disease outbreak, there is a lack of protocols for prompt recognition, coordination and early response action amongst Federal, State, local governments and the private sector.
- *Solution:* This project assembles and demonstrates biosurveillance technology advances in new sensor architects, data fusion concepts and warnings against use of advanced, enhanced and synthetic agents to build concepts of operations (CONOPS) with strong coordination among Federal, State, and local partners. It explores a variety of methods and systems to rapidly collect and exploit information useful for identifying outbreaks or unusual events using existing cloud-based computing architectures. To inform requirements and potential operational architectures, a demonstration will be conducted in partnership with Department of Defense (DoD), the U.S. Department of Agriculture (USDA), and Department of Health and Human Services (HHS) and will be based on scenario(s) of interest to these stakeholders and selected local communities.
- *Impact:* Optimized collection and integration of relevant environmental, animal, and public health data will promote prompt awareness of a bio-attack or disease outbreak, resulting in reduced casualties and the application of early mitigation steps.

Prior Year Key Events

- Released Requests for Information (RFIs) and participated in market surveys for technology enhancements to BioWatch for environmental monitoring.
Conducted stakeholder workshops to refine requirements for information needs during a biological event.
- Initiated development of requirements for integrated biological, chemical, and radiological surveillance architectures.
- Evaluated existing modeling and analytical tools for baseline capabilities in aggregating surveillance data around biological events.

Current Year Key Events

- Build standard data set of biosurveillance information that will be used to evaluate model performance improvements throughout project.
- Initiate series of tabletop exercises with two local jurisdictions to demonstrate information aggregation tools for rapid awareness of a biological event.
- Demonstrate feasibility of a low-cost, sustainable environmental detection architecture (SenseNet) using dual-use technologies.

Budget Year Key Events

- Conduct first full scale exercise of improved biosurveillance capabilities with a local jurisdiction partner, and document lessons learned and technology gaps.
- Pilot field testing and installation of rapid and sustainable environmental monitoring systems with a local community partner for indoor and outdoor venues.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	\$1,046	\$6,900	\$16,000	\$9,814

Project Schedule Including Milestones

- Build standard data set of biosurveillance information that will be used to evaluate model performance improvements throughout project (FY 2016).
- Initiate series of tabletop exercises with two local jurisdictions to demonstrate information aggregation tools for rapid awareness of a biological event (FY 2016).
- Demonstrate feasibility of a low-cost, sustainable environmental detection architecture (SenseNet) using dual-use technologies (FY 2016).
- Find test data points from 3-4 data modalities for improved incident awareness (FY 2016).
- Pilot technologies for massive data ingest and improved data processing (FY 2016).
- Conduct first full scale exercise of improved biosurveillance capabilities with a local jurisdiction partner, and document lessons learned and technology gaps (FY 2017).
- Initiate requirements and analysis of alternatives for advanced outdoor detection systems (FY 2017).
- Pilot field testing and installation of rapid and sustainable environmental monitoring systems with a local community partner for indoor and outdoor venues (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

Completed system TRL5 – Fully functional in a relevant operational environment.

Transition Plans

An operational demonstration of integrated response CONOPS for a biosurveillance system will be held in a jurisdiction. The tools and CONOPS developed through the workshops and exercise will be transitioned to the local jurisdiction.

B. Chemical Detection – FY 2016: \$0.000 million. FY 2017 Request: \$3.099 million. This program seeks to develop more reliable chemical detectors, which will promote their use and reduce vulnerabilities of the population and critical infrastructure in a wide array of operational applications.

Multifunction Detectors

- *Problem:* There is a lack of current reliable and chemical sensing technologies able to detect a broad range of chemical threats to include chemical warfare agents and toxic industrial chemicals yielding high quality data for high confidence response. High false alarm rates and high costs (acquisition and maintenance) remain significant hurdles for first responder deployment.
- *Solution:* Development of enhanced chemical detectors which incorporate advancements in optics, electronics, and algorithms toward the development of systems with high specificity, increased sensitivity with concomitant reduction in false alarm rates. Autonomous system for buildings that can be integrated with video/air quality control to create a smart system capable of detecting and mitigating multiple threats will also be evaluated.
- *Impact:* Successful demonstration of enhanced performance of detectors, in several forms (stationary, portable, handheld, and wearable) with reduction in false alarms is necessary to transition these systems into the field where they will serve to increase the security of critical infrastructure and occupants. If feasible, successful integration of chemical and biological detection capability into a single system will provide increased security indoors (high asset buildings, transit subways and terminals). Successful demonstration of capability to integrate with representative video and air quality controls will provide for low regret strategies. Successful demonstration of capability to integrate a secure, continuous data stream to a command and control center to allow for first responders access in-route to an incident.

Budget Year Key Events

- Establish an independent testing effort for current detectors being purchased by our first responders/other users to validate performance outside of vendor claims
- Assess chemical using Chemical Security Analysis Center developed models for specific applications (subway setting vs building)
- Conduct workshop with other government agencies to establish R&D baseline.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$3,099

Project Schedule Including Milestones

- Establish IA with independent testing laboratory and initiate testing (FY 2017).
- Critical Infrastructure Specific Threat Analysis Report (FY 2017).
- R&D Baseline Workshop Report (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

Completed system TRL5 – Fully functional in a relevant operational environment.

Transition Plans

- Chemical detectors prototypes to be transitioned to Transit Authorities via TSA OSC; FPS/GSA, First Responders
- Stage event at potential transition partner site.
- CONOPS to be provided to the transition partner.

C. Explosives Detection – FY 2016: \$53.619 million. FY 2017 Request: \$37.211 million. This program researches, develops, and/or identifies tools to detect and locate explosives intended to be used as terrorist weapons and strengthens aviation security by bolstering the international aviation security system, processes, and technologies, and by encouraging partnerships with industry. It defines concepts, requirements, and procedures for improved techniques for early detection and warning of potential explosive threats, including explosive threats to the Nation's transportation systems and large public gatherings.

Canine Explosives Detection

- **Problem:** The Homeland Security Enterprise (HSE) maintains over 3,000 explosive detection canine teams, spread across the Federal, State, local and tribal law enforcement community. These teams have limited access to training materials and limited time where they can train on particular explosive materials, thus decreasing their proficiency and ability to improve detection techniques. Non-detonable, non-hazardous training aids will allow the teams to train more frequently, maintain a high level of proficiency, facilitate a simplified explosive storage plan, and allow for the frequent assessment of the effectiveness of current concepts of operations (CONOPS). The growing threat of person-borne improvised explosive devices (PB-IEDs) has led to the need for canine explosives detection teams to expand their CONOPS to include PBIED detection capabilities. Special consideration is given to high throughput mass transit rail venues and large public crowd events. Maintaining a large number of odors that canine teams must train with is resource intensive from both a manpower and fiscal perspective. The reduction in the number of odors required to maintain proficiency across the explosive threat matrix would be a significant advancement and allow for improved training efficiency and detection proficiency.
- **Solution:** The mission of the Explosive Detection Canine Program is to provide the HSE with the tools, techniques, and knowledge to better understand, train, and utilize the explosive detection canine. S&T will develop and test non-hazardous, non-detonable HMEs and conventional canine training aids to provide performance results equivalent to or better than performance on the actual explosive. Secondly, S&T will provide the HSE, specifically the TSA National Explosive Detection Canine Team Program (NEDCTP), other DHS explosive canine team users and the first responder law enforcement canine community, with operational performance data to make decisions on improved concept of operations, techniques, and training. Lastly, through scientific analysis and controlled testing of the

combination of the refined explosive odor sets and expanded knowledge base on basic canine olfaction and cognition, S&T will determine if significant efficiencies can be made to improve the operational performance of the explosive detection canines while dramatically reducing the resources in time and cost needed to establish and maintain a high level of proficiency.

- *Impact:* Improve the operational proficiency of DHS’ and other HSE partners’ fielded teams to more efficiently and effectively detect explosives. S&T is established as the RDT&E focal point for domestic use detection canines. Development of a formal testing capability and lower-cost training aids will significantly lower lifecycle costs and expedite training and deployment of canine teams.

Prior Year Key Events

- Delivered second of two field validated, low-cost, non-hazardous canine training aids for peroxide-based HMEs to TSA/HSE.
- Delivered explosive odor generalization study to support reducing the current number of trained odors.
- Determined operational performance parameters and recommended CONOPS of person-search canine in high throughput subway rail environment.
- Assessed/implemented canine application focused on force protection for insider threat (DHS Chief Security Officer).

Current Year Key Events

- Complete Odor Reduction proof of principle.
- Conduct operational assessments for person-search (mass transit, force protection, large crowd events), other TSA/partner testing.
- Determine operational performance parameters of person-search canine in large crowd venues.

Budget Year Key Events

- Publish results of comprehensive person-borne IED canine parametric study.
- Complete analysis of odor generalization theory assessment.
- Develop additional non-hazardous canine training aids for emerging threat homemade explosives.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$2,513	\$2,497	\$4,200	\$4,500	\$4,800	\$5,269

Project Schedule Including Milestones

- Demonstrate Odor Reduction proof of principle (FY 2016).
- Conduct operational assessments for person-search (mass transit, force protection, large crowd events), with HSE partners to determine operational performance parameters (FY 2016).
- Finalize commercialization of first non-hazardous homemade explosives (HME) Canine Training Aid for use in the HSE (FY 2016).
- Deliver second non-hazardous HME canine training aid for operation test and evaluation (OT&E) and commercialization for use in the HSE (FY 2016).
- Deliver basic research study results for canine cognition and olfaction supporting operational improvements (FY 2017).
- Provide the results of TSA canine operational assessments (FY 2017).
- Deliver low-cost non-hazardous training aids for selected conventional explosives (FY 2017).

- Conduct Phase 2 prototype testing for canine mounted track and transmit device (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

The program plans to begin at TRL 5 and end at TRL 7

Transition Plans

- **Training Aids**

- Delivered canine training aids for TSA regional rollout for homemade explosives detection.
- Transferred Government owned design and manufacturing methodology to third party manufacture.
- Provide RFP to industry.
- Integrate into TSA canine training aid acquisition programs.

- **Operational Test and Evaluation (OT&E)**

- Results are guiding operational deployment decisions by TSA and HSE.
- Informed TSA Passenger Screening Canine testing to support risk-based screening-managed inclusion (RBS-MI) deployment.
- Increased partner evaluation of first responder proficiency of canines using non-hazardous training aids.
- Results informed U.S./UK sharing for recent aviation threat vector.
- Results informed TSA policy decisions for TSA air cargo screening with Remote Explosive Scent Tracing/Remote Air Sampling for Canine Olfaction (REST/RASCO) methods.

Checked Baggage

- *Problem:* TSA needs enhanced explosive detection systems (EDS) to detect the full array of potential improvised explosives threats in checked baggage. Modifying existing equipment to address these threats would result in greatly increased false alarm rates and an increase in operating costs.
- *Solution:* In collaboration with TSA, S&T is developing next generation X-ray systems that incorporate enhanced measurement techniques, novel detection algorithms, subsystem retrofits, and new standalone systems. There is a focus on collaboration between different performers to develop these innovative systems, relying in part, on the advancements produced by the Defense Advanced Research Projects Agency's Knowledge Enhanced Compressive Measurement (KECoM) program. The Checked Baggage project invests in high-performing enabling technologies that will be migrated into next generation checkpoint screening equipment.
- *Impact:* These next generation X-ray systems are anticipated to provide TSA with enhanced threat detection capabilities and reduced false alarm rates (below 10 percent) for checked baggage screening operations allowing the TSA to be more efficient and effective. These next generation X-ray systems are anticipated to provide TSA with enhanced threat detection capabilities, improved onscreen alarm resolution, lower false alarm rates (below 10 percent), and reduced lifecycle cost.

Prior Year Key Events

- Completed Adaptive X-ray explosives detection system (EDS) preliminary design review (PDR).
- Awarded fourteen contracts on BAA 13-05 Advanced X-ray Material Discrimination (AXMD).
- Delivered Stochastic Bag Generator by the University of Arizona.

Current Year Key Events

- Deliver X-ray diffraction based (XRD) hold baggage screening system prototype.
- Deliver Ayasdi’s System Design Document.
- Finalize Ayasdi’s Topological Data Analysis (TDA) Tool Application Tutorial document.
- Complete TeleSecurity Science’s Final Classification and Metrics Review.
- Deliver General Electric (GE) Global’s System Design Document.
- Deliver GE Global’s software tool kit.
- Complete live demonstration of Quantum Magnetic’s (QM) Partially Observable Markov Decision Process (POMDP).
- Deliver QM’s System Design Document.
- Complete QM’s Final Architecture and Critical Design Review.
- Complete AQT Critical Design Review and Final Trade Study.
- Deliver AQT System Design Document.
- Complete Rapiscan’s Critical Design Review and Final Trade Study.
- Deliver Rapiscan DHS Facility Test Plan.
- Deliver initial Nottingham Trent University (NTU) Functional Test Bed and Final Technical Report.
- Deliver initial American Science & Engineering (AS&E) Functional Test Bed and Final Technical Report.
- Deliver GE Global Research Characterization Report, Software Toolkit and Monolithic Optic Design.
- Deliver Battelle initial Test Kit Articles that will lead into manufacturing of production test sets.

Budget Year Key Events

- Release new Broad Agency Announcement, Advanced X-ray Systems Development
- Award five contracts at TRL 7-9 in FY 2017
- Deliver one Pre Prototype instrument to AS&E

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$16,697	\$21,701	\$21,700	\$20,700	\$11,069	\$9,000

Project Schedule Including Milestones

- Transition technology assessment (comparison of Advanced Technology (AT)/Explosive Detection Systems (EDS) retrofit options) (FY 2016).
- Deliver Topological Data Analysis (TDA) Tool Application Tutorial document (FY 2016).
- Deliver one test article set each for EDS and AT to the Transportation Security Laboratory (TSL) (FY 2016).

- Transition one algorithm improvement for TSA Office of Security Capabilities (OSC) False Alarm Rate (FAR) campaign (software toolkit) (FY 2016).
- Complete live demonstration of Quantum Magnetic's (QM) Partially Observable Markov Decision Process (POMDP) Risk Based Screening Tool (FY 2016).
- Transition one Next Gen Carry-on Baggage solution (TRL 6-7) to either Systems development or to TSA OSC/Office of Security Operations (OSO) (FY 2016).
- Transition one Next Gen Checked Baggage solution (TRL 6-7) to either Systems development or to TSA OSC/OSO (FY 2016).
- Deliver Advanced Algorithms for existing explosives detection systems (EDS) and advance technology (AT) systems (FY 2017).
- Release Advanced X-ray Systems Development BAA (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program plans to begin at TRL 5 and end at TRL 7.

Transition Plans

- Develop a fully functional and testable X-ray diffraction explosive detection system suitable for acquiring data at airports and government test facilities. Prototype will be subject to independent certification readiness testing and preliminary operational evaluation at TSA's Transportation Systems Integration Facility. Effectiveness of product will be proven to TSA.
- Demonstrate enhanced materials discrimination using technologies based on Defense Advanced Research Projects Agency/Knowledge Enhanced Compressive Measurement (DARPA/KECOM) and University Research Programs. Perform independent readiness testing to determine detection, identification, and false alarm performance characteristics. Complete trade study analysis of probability of detection, probability of false alarm.

Screening Training and Selection

- *Problem:* The efficiency and effectiveness of any first response or front line security screening effort is directly related to the preparedness, robustness, and adaptability of those individuals involved. Improved training and the associated materials, methods, tools and technologies used by our nation's first responders and those on the front lines in the Homeland Security Enterprise leads to increased operational capabilities in the field and results in more efficient and effective DHS end users, federal, state and local stakeholders, and the public.
- *Solution:* A set of new training methods, tools and technologies will leverage knowledge from the highest performing end users and cutting edge technologies to develop new training systems, procedures, methods, and then evaluated them through Training Effectiveness Evaluations (TEEs). This portfolio of projects addresses needs associated with primary tasks of first responders, screeners and other DHS end users that are common across the Homeland Security Enterprise such as pat downs, ID verification, tracking, screening, and suspicious behavior detection.

Expertise developed by leveraging modern technologies that complement traditional training methods, tools and techniques will allow end users to focus on each mission critical task, develop associated skills, and bolster resilience and preparedness.

- *Impact:* Providing DHS Enterprise end users and first responders with improved training methods and innovative technologies and tools will result in operational performance increases in effectiveness and efficiency. Improving training materials, methods, and tools, and maximizing the performance of individuals on the front lines of national security and involved in response to disasters, critical infrastructure protection and law enforcement such as emergency managers, first responders as well as the general public results in more resilient communities and increased operational homeland security. Performance optimization through improved training is directly correlated to increased preparedness, robustness, and adaptability resulting in more resilient first responders and a more effective and efficient homeland security enterprise. The estimated operational impact post national deployment of just one of the training tools developed under this program would result in a 45 percent reduction in search time to find threats and clear bags while maintaining threat detection accuracy. It is estimated that the corresponding increase in efficiency will result in a 2-hour reduction in training time per Transportation Security Officer that would result in a \$2.6 million annual savings, a reduction in training time for new hires to meet performance criteria, a reduction in recurrent training time for performance remediation and a 5 percent overall decrease in secondary searches nationwide which would save approximately \$5 million annually.

Prior Year Key Events

- Transitioned set of Screener’s Auto-Diagnostic Adaptive Precision Training (ScreenADAPT) Training Systems to TSA

Current Year Key Events

- Develop Pat Down Suit Training Tool
- Develop Expert Tracker/Sign Cutting Training
- Develop Medical Metrics Suite demo for FLETC

Budget Year Key Events

- Develop Training Task Module in ScreenADAPT for Suspicious Behavior Detection/Pre Assault Indicators
- Evaluate Pat Down Suit Training Effectiveness
- Evaluate Expert Tracker/Sign Cutting Training Effectiveness
- Evaluate Medical Metrics Suite Effectiveness Evaluation

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	\$500	\$500	\$1,033

Project Schedule Including Milestones

- Enhance prototype system with additional capabilities such as dual monitors and eye trackers (FY 2016).
- Transition prototype system to TSA and other appropriate component customers (FY 2016).
- Implement Suspicious Behavior Detection/Pre Assault Indicators Training Module in Screen ADAPT Software (FY 2017).
- Deliver final report from Pat Down Suit Training Effectiveness Evaluation (FY 2017).

- Deliver final report from Expert Tracker/Sign Cutting Training Effectiveness Evaluation (FY 2017).
- Deliver final report from Medical Metrics Suite Effectiveness Evaluation (FY 2017)

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program plans to begin at TRL4 and end at TRL7

Transition Plans

- Iterative annual transitions as technology is developed to the Federal Law Enforcement

Primary Screening for Passengers

- *Problem:* Current people screening technology is not fast enough nor does it automatically detect all of the threats operational components desire. Current technology and processes require people to remove items from their pockets, remove outerwear, pause, and wait for results. For example, passenger screening involving current Advanced Imaging Technology (AIT) is slow and cumbersome. It requires passengers to remove shoes, outerwear, belts, jewelry, and personal items, which must then be screened by X-ray or other screening devices or procedures. Relatively high false alarm rates result in secondary inspections such as pat-downs or trace analysis. Other issues include high operational costs, privacy concerns, and the potential dissatisfaction of the traveling public.
- *Solution:* The desired goal is to develop people screening technologies that are safe, provide higher resolution scans, and have better automated targeting algorithms. These systems will substantially reduce the need for divestiture of shoes, headwear, outerwear, and small personal items. An example is a modular, flat-panel AIT systems with dynamically upgradable automatic target recognition (ATR) software. Innovative techniques under development for AIT systems include compressive measurement at video rates, metamaterial antenna components, and agile multi-band imaging (K-band and W-band radar frequencies). Such approaches will provide higher screening throughput, improved imaging resolution, and richer signatures that enable detection at TSA's highest tier. New systems will be compatible with end-user standards and systems such as TSA's Security Technology Integration Program (STIP) and Dynamic Aviation Risk Management System (DARMS) standards.

Impact: When integrated with other advanced checkpoint technologies, these systems will provide a faster, less invasive, and less costly screening of passengers. Limited divestiture will decrease passenger inconvenience and increase checkpoint throughput. Systems with material discrimination will confirm that certain anomalous indications are benign, reducing the rate of pat-downs and other intrusive security measures.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Preliminary Design Reviews for systems selected for development for high-throughput screening at TSA’s highest security standards.
- Support TSA’s Development of Standards and Requirements including STIP & DARMS.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$9,957

Project Schedule Including Milestones

- Demonstrate a cutting-edge advanced imaging technology (AIT) prototype (FY 2016).
- Demonstrate alpha prototypes for stand-off passenger screening with reduced divestiture of clothing (FY 2017).

Delayed Milestones

The decision to move from stand-alone passenger screening components to systems that will be part of the broader Screening at Speed checkpoint plan (with additional standards and requirements) has pushed engineering prototype demonstrations back one year.

Type of Research

Applied

Technical Readiness Level

The program plans to begin at TRL 3 and end at TRL 7.

Transition Plans

- The Program team will continue working closely with customers, DHS S&T’s Integrated Product Teams (IPTs) and Joint Requirements Council (JRC) to ensure that system requirements comply with customer needs.
- Screening device development spirals will be coordinated with TSA’s recapitalization plans ensuring smooth and timely technology insertion.

Primary Screening for Carry-On Bags

- *Problem:* TSA’s primary screening of carry-on bags and other personal items is slow, labor-intensive, and subject to significant operator performance variability. Passengers must remove large electronics, liquids, and gels from their bags. As emerging threats compel TSA to add more threats to the detection requirements, the added complexity substantially increases false alarm rates. This high false alarm rate requires Transportation Security Officers (TSOs) to scrutinize on-screen images with even greater vigilance, resulting in lower passenger throughput and greater TSO fatigue.
- *Solution:* S&T will develop modular, dynamically upgradable carry-on bag screening technologies to improve detection capability and increase passenger throughput, while maintaining or improving life cycle costs. Specifically, this project will deliver carry-on bag screening systems with ATR for both explosives and other prohibited items. Technologies under development include X-ray systems that incorporate coded apertures, compressive sensing, and energy-resolved detectors for enhanced material discrimination. This project will also deliver hardware and

software to screen other carried items such as bottles and personal electronic devices. Risk- and threat-specific performance will be possible by developing carry-on screening equipment compatible with TSA’s Security Technology Integration Program (STIP) and Dynamic Aviation Risk Management System (DARMS) initiatives.

- *Impact:* The new carry-on a bag screening system will automatically and reliably identify explosives and other prohibited items, enabling TSOs to focus on resolving alarms and assisting passengers through the process. The systems will detect a wider range of explosive materials in carry-on items and have lower false alarm rates. TSA will be able to dynamically adjust the performance of the systems to address known risks or emerging threats. When integrated with other advanced checkpoint technologies, these systems will provide faster, less invasive and less costly screening of passengers and their carry-on items.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Complete Preliminary Design Reviews for systems selected for development for high-throughput screening at TSA’s highest tier security standards.
- Support TSA’s Development of Standards and Requirements including STIP & DARMS.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$6,609

Project Schedule Including Milestones

- Technology transition of Differential Phase Contrast Screening (FY 2017).
- Demonstrate Multi-Energy AT System for Tier2 threat detection (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

The program plans to begin at TRL 3 to 5 and end at TRL 7.

Transition Plans

- The Program team will continue working closely with DHS S&T’s Integrated Product Teams (IPTs) and Joint Requirements Council (JRC) to ensure that system requirements comply with customer needs.
- Screening device development spirals will be coordinated with TSA’s recapitalization plans ensuring smooth and timely technology insertion.

Secondary Screening Technology Development

- *Problem:* DHS components (i.e. TSA, U.S. Secret Service (USSS), CBP, and U.S. Coast Guard) use Explosives Trace Detectors (ETDs) as a screening tool for detection of explosives. ETDs’ ability to detect evolving explosive threats requires an expandable and upgradable explosive threat library. Current ETDs have limited ability to expand their threat libraries. Sampling efficiency of these ETDs is also limited by current Concepts of Operations (CONOPs, mostly contact sampling) and by Transportation Security Officers (TSOs) training and training curriculum.
- *Solution:* To increase ETDs’ detection capabilities, High Resolution Trace Program develops Next Generation (Next Gen) ETDs with upgradable and expandable threat library that can selectively identify current and emerging explosives. Special emphasis is placed on achieving such capabilities in a small and portable form factor with direct identification of explosive threats. Concurrently, the Program seeks to increase ETD sensitivity by developing novel sampling technologies with higher collection efficiency. Two examples of improved sampling technologies are an effort to develop a non-contact sampler using low temperature plasma and the development of Pressure Sensitive Wands (PSWs) for use in training TSOs how to best sample explosive residues from a surface.
- *Impact:* Improved sampling technologies enable ETD operators to optimize ETDs for current and future CONOPs. Short term impact includes a TSA plan to incorporate PSW training into TSO training curriculum nationwide. For mid and long term impact, Next Gen ETDs, in combination with enhanced sampling technologies, will provide TSA and other DHS components with an ability to quickly detect and identify emerging threats. These ETDs will be lighter, smaller, use fewer consumables, and have lower life-cycle costs than currently deployed ETDs.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Test and develop a retrofit ETD kit for enhanced explosives detection;
- Develop, test and evaluate Next Gen ETD prototypes;
- Fund Federally Funded Research and Development Centers and DHS Center of Excellence laboratories to conduct studies characterizing explosive threats and their signatures, and develop contact sampling tools and metrology methods to enhance and optimize explosive sampling.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$5,343

Project Schedule Including Milestones

- Review and monitor progress of four Next Gen Desktop ETD projects by conducting PDRs and CDRs (FY 2017).

- Conduct DT&E of four Next Gen Desktop ETDs (FY 2017).
- Transition these Next Gen Desktop ETDs to TSA for OT&E (FY 2017).
- Review and monitor progress of a Portable ETD project by conducting a PDR and a CDR (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

The program plans to begin at TRL 4 and end at TRL 7.

Transition Plans

The Program currently has representatives from TSA, USSS, CBP, and US Coast Guard reviewing developmental goals and progress of the BAA prototypes. Pending successful development of the BAA prototypes, the High Resolution Trace Detection Program is working to develop transition plans with these representatives.

5. Counter Terrorist – FY 2016: \$82.700 million. FY 2017 Request: \$65.707 million. The S&T Directorate invests in the R&D technologies, methods, and procedures to counter terrorists. Efforts include R&D to identify individuals or groups that intend to conduct terrorist attacks or to illicitly move weapons, dangerous goods, and contraband. It also includes providing threat assessments of the high-consequence attack methods such as CBE that terrorists may use to attack the Nation.

A. Bioagent Threat Assessment – FY 2016: \$26.400 million. FY 2017 Request: \$16.628 million. This program addresses biological and agricultural knowledge gaps and develops defensive strategies to counter potential threats. It also supports a full spectrum of knowledge products (e.g. reports/studies) to better inform policy makers on the attributes, risks, and consequences associated with the intentional release of a biological or agricultural (livestock) agent.

Bio-threat Characterization (BTC)

- *Problem:* The HSE lacks essential data on the characteristics of many biological threat agents, and the impact of technological advances on those characteristics. Improved data is needed to estimate the risk and consequences of a bioterrorist attack on the U.S., and to operationally plan for and respond to such an event.
- *Solution:* BTC projects provide knowledge products (technical reports) generated through laboratory experimentation describing the properties of potential bioterrorism agents that influence assessments of consequences and risk. Knowledge products are made available to U.S. Government biological hazard assessment, policy, and modeling communities and to operational elements for use in planning for and responding to natural and intentional disease outbreaks.

- *Impact:* The BTC project establishes and leverages innovative science-based capabilities to provide the HSE with data and knowledge products which improve pre-event planning and event-specific operational decisions. BTC provides the knowledge products and capabilities required for effective preparedness and response to current and future biological threats.

Prior Year Key Events

- Enhance Interagency and International collaboration regarding biological threat characterization.
- Develop plans and conduct experimentation to address the top ten traditional biological key threat-related knowledge gaps identified by stakeholders to provide actionable information on agent characteristics such as the fate of select bacteria, toxins, and viruses in the environment; the feasibility of agent aerosol dissemination; the requirements and limitations for an adversary's production of bacterial and viral threat agents; the survival of select deposited agents on operationally-relevant surfaces; the deposition patterns of aerosols in the respiratory system of non-human primates; development of experimental and surveillance systems to correlate animal models of infectivity and disease progression with human disease; and the development of environmental systems that will support work with animals in biocontainment in order to assess risks from zoonotic agents.
- Developed aerosol operational capability to characterize vulnerabilities associated with BSL-3 and BSL-4 agents identified as threats.
- Supported the U.S. response to the Ebola outbreak by determining the surface stability of Ebola Virus in clinical fluids, on various operational surfaces representing PPE, medical waste, hospital surfaces, and commercial airlines, and then determining protocols for effective decontamination of operationally relevant surfaces. The resulting data has been utilized by multiple agencies (FBI, USCG, and DoD) to revise and improve operational protocols.
- Initiated work to determine the risk of aerosol or droplet transmission of Ebola Virus in hospital settings to inform personal protective equipment (PPE), health care protocols, and patient and health care worker risk of infection.

Current Year Key Events

- Develop plans and experimentation to address additional traditional biological threat-related knowledge gap requirements identified by stakeholders to provide actionable information.
- Employ aerosol operational capabilities developed in FY15 to characterize vulnerabilities associated with additional threats.
- Address additional critical knowledge gaps on the production, formulation, dissemination, persistence, and virulence of Tier 1 biological threat agents to support the Biological Terrorism Risk Assessment (BTRA) program and other government stakeholders responsible for biodefense preparedness and response. Transition six knowledge products to the BTRA program for utilization in modeling bioterrorism risk.
- Develop additional capabilities to conduct relevant testing on the stability of biological agents when exposed to environmental conditions.
- Maintain existing National Biological Threat Characterization Center (NBTC) capabilities in comparative medicine, aerobiology, and bacterial/viral agent characterization required to characterize traditional, emerging, enhanced, and advanced biological threat agents in BSL-2, 3 and 4 to perform threat characterization research and respond to emerging requirements.

Budget Year Key Events

- Develop projects and experiments to address additional traditional biological threat-related knowledge gap requirements identified by stakeholders to provide actionable information.

- Address at least three critical knowledge gaps on the production, dissemination, persistence, and virulence of Tier 1 biological threat agents to inform the Biological Terrorism Risk Assessment (BTRA) program, as well as, other government stakeholders responsible for biodefense preparedness and response.
- Develop a framework to address Non-traditional Bio-threat agents.
- Utilize aerosol operational capabilities to characterize vulnerabilities associated with traditional threats.
- Develop Principle-Based Modeling for threat characteristics of Traditional Agent Characteristics.
- Maintain NBTCC capabilities in comparative medicine, aerobiology, and bacterial/viral agent characterization required to characterize traditional, emerging, enhanced, and advanced biological threat agents in BSL-2, 3 and 4 to perform threat characterization research and respond to emerging requirements.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$8,000	\$12,247	\$14,000	\$11,400	\$18,400	\$16,628

Project Schedule Including Milestones

- Address critical knowledge gaps on the production, formulation, dissemination, persistence, and virulence of Tier 1 biological threat agents to support the Biological Terrorism Risk Assessment (BTRA) program and other government stakeholders responsible for biodefense preparedness and response (FY 2016).
- Transition four knowledge products to the BTRA program to reduce uncertainty in modeling the bioterrorism risk (FY 2016).
- Develop additional biological threat characterization capabilities at NBACC required to conduct relevant testing on the production, formulation, dissemination, persistence, and virulence of Tier 1 biological threat agents and characterize the risk and vulnerabilities associated with additional threats (FY 2016).
- Develop experimental methodologies to address Non-traditional Bio-threat characterization (FY 2017).
- Develop Principle-Based Modeling of Traditional Agent Characteristics (FY 2017).
- Transition three knowledge products to the BTRA program to reduce uncertainty in modeling the bioterrorism risk (FY 2017).

Delayed Milestones

- The FY15 milestone to develop additional capabilities to conduct relevant testing on Biothreat agents was partially met. The expansion of the animal species that could be used in testing at BSL-3 and BSL-4 to assess the risk and threat posed by zoonotic agents was accomplished. Construction of an additional environmental chamber was delayed because of technical risks associated with the design of this complex and unique chamber. The technical issues were successfully addressed and the design was completed in FY 2015, with construction of the chamber expected to be completed by the end of FY 2016 at the Johns Hopkins University Applied Physics Laboratory and the Sandia National Laboratory.

Type of Research

Development

Technical Readiness Level

None

Transition Plans

- Stakeholders make final technical reports available to users across the Homeland Security Enterprise via the Bio-Defense Knowledge Center Management System, which is accessible.
- Final technical reports are made available to the Bioterrorism Risk Assessment (BTRA) to reduce uncertainty and improve confidence in their estimation of consequences and risk, and impact of specific biodefense investments and strategies.
- Results of Ebola stability, decontamination, and infection risks will be shared with HHS, CDC, and other public health groups to improve public health preparedness and response to current and future Ebola outbreaks/epidemics.

B. Chemical Threat Assessment – FY 2016: \$6.300 million. FY 2017 Request: \$5.593 million. This program researches and identifies current and potential chemical threats to understand the risk posed to the United States by their illicit use. This program encompasses risk-based, chemical threat agent characterization programs, domestic defense strategic planning, and analytical technologies, strategies, and procedures.

Chemical Security Analysis Center (CSAC)

- *Problem:* The need exists for a single centralized repository of chemical threat information (hazard and characterization data) for analysis of the nation's vulnerabilities to such chemical events to serve key customers.
- *Solution:* The Chemical Security Analysis Center (CSAC) conducts key analytical assessments, including hazard assessments and Material Threat Assessments (MTAs), and the Chemical Terrorism Risk Assessment (CTRA). In addition, CSAC develops knowledge management capabilities such as the chemical knowledge management system, the chemical agent reactions database (CARD), and several other user-specific electronic libraries. This project will also complete the analysis of the Jack Rabbit II chlorine releases. CSAC will initiate a new effort in FY 2017 to focus on measuring sensory threshold values of toxic chemicals.
- *Impact:* CSAC serves key customers such as NPPD, OHA, TSA, and I&A within DHS, as well as several Interagency partners. CSAC is the nation's only Federal studies, analysis, and knowledge management center for assessing the threat or hazard associated with an accidental or intentional large-scale chemical event in the U.S.

Prior Year Key Events

- Delivered Version 2 of the CARD system, incorporating requirements from the FBI chemical forensics program.
- Conducted 1-2 detailed risk analyses identified by stakeholders, using the Chemical Terrorism Risk Assessment.
- Conducted Phase I of Jack Rabbit II Field Trials.
- Developed Computational Toxicology Methodology for key toxidromes.

Current Year Key Events

- Deliver an updated Chemical Terrorism Risk Assessment.
- Deliver 1-2 hazard assessments or material threat assessments based on customer/stakeholder requirements.
- Deliver 4-6 chemical bulletins.
- Deliver updated human toxicity estimates for a select number of high risk toxic chemical threat materials.

- Complete all chlorine testing with larger quantity releases (phase II) of Jack Rabbit II.

Budget Year Key Events

- Deliver an MTA on pharmaceutical based agents.
- Deliver the Chemical Terrorism Risk Assessment v4.0.
- Complete Jack Rabbit II series of chlorine tests.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$4,000	\$5,250	\$7,000	\$7,000	\$6,300	\$5,593

Project Schedule Including Milestones

- Deliver 2 hazard assessments or material threat assessments based on customer/stakeholder requirements (FY 2016).
- Deliver 2 chemical bulletins (FY 2016).
- Deliver a risk based, CTRA informed methodology for improving the CFATS tiering methodology to NPPD (FY 2016).
- Initiate analysis of Jack Rabbit II (phase I) data and videos (FY 2016).
- Develop Computational Toxicology Methodology for key toxidromes (FY 2016).
- Deliver interim results for an updated Chemical Terrorism Risk Assessment (FY 2016).
- Deliver timely, complete responses to 20 customer requests for information/quick turnaround targeted studies (FY 2016).
- Integrate risk into the CTRA Desktop Tool Suite. Utilize the CTRA and the desktop tool to conduct tailored assessments for at least 4 stakeholders (FY 2017).
- Deliver report on key conclusions/data/information derived from the Jack Rabbitt II chlorine release tests (FY 2017).
- Procure necessary equipment for determining organoleptic limits for key chemicals.
- Conduct initial experiments measuring the organoleptic limits (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

The program plans to begin at TRL 5 and end at TRL 8

Transition Plans

Transitioned CTRA Desktop Version 2 to HHS, FDA, USDA, and the Infrastructure Security Compliance Division (ISCD) in FY 2015 Q4.

C. Explosives Threat Assessment – FY 2016: \$10.500 million. FY 2017 Request: \$11.100 million. This program researches and identifies current and potential explosive threats to understand the risk posed to the United States, strengthens aviation security by bolstering the international aviation security system, improves security processes and technologies, and encourages partnerships with industry. It encompasses risk-based threat characterization, attribution, strategic planning, prediction of magnitude of explosive disasters, and analytical technologies, strategies, and procedures.

Aircraft Vulnerability

- *Problem:* Vulnerability of the great variety of commercial aircraft types (e.g., wide body, narrow body, regional jet) to the broad range of conventional and emerging IED threat configurations is not thoroughly understood and/or characterized. This includes the blast effects vulnerability of new composite aircraft structures currently entering the civil transport fleet (e.g., Airbus A380, A350, and Boeing B787).
- *Solution:* Identify the minimum size of the explosive threat that would result in catastrophic aircraft loss and develop commercial aircraft blast mitigation technology that will provide protection to commercial aircraft.
- *Impact:* Commercial aircraft vulnerability data collected under this project will be used by TSA to validate and refine explosives detection standards for checkpoints, checked luggage, and air cargo. TSA will ensure that EDS threat mass detection thresholds are sufficient to prevent introduction of explosive threats onboard the aircraft that would otherwise result in catastrophic aircraft loss if detonated during operational flight. Blast mitigation efforts provide a means to reduce the vulnerability of commercial aircraft to internal explosive threats and form a basis for countermeasures that can be leveraged for non-aviation use by other DHS components. Project efforts also support test and analysis that provide information on commercial aircraft vulnerability to emerging terrorist-based explosive threats.

Prior Year Key Events

- Deliver updated DHS SharePoint-based Explosive Testing Database (ETDB) to TSA.
- Conduct explosive testing on primary structure composites used in new commercial aircraft designs (e.g. B787, A380, and A350) and deliver initial report on IED blast effects on commercial aircraft composite design vulnerability.
- Conduct preliminary (unpressurized) explosive vulnerability testing on Boeing 767 wide body commercial aircraft test asset and deliver report.
- Complete testing of Modified Least Risk Bomb Location (M-LRBL) procedure on Wide Body Commercial Aircraft and deliver report.
- Complete design, fabrication, and explosive testing of explosive Threat Mitigation Unit (TMU) for USSS Technical Security Division (USSS-TSD) customer.

Current Year Key Events

- Deliver updated (incorporating TSA User Feedback updates) DHS SharePoint-based Explosive Testing Database (ETDB) to TSA.
- Conduct follow-on explosive testing on primary structure composites (curved test panels) used in new commercial aircraft designs (e.g. B787, A380, A350) and deliver initial report on IED blast effects on commercial aircraft composite design vulnerability.
- Complete pressurized testing and deliver Wide Body Commercial Aircraft Vulnerability Report, Boeing 767 Explosive Vulnerability Testing.
- Deliver explosive TMU prototype(s) to USSS Technical Security Division (USSS-TSD) for use in operational pilot testing.

Budget Year Key Events

- Conduct pressurized explosive testing on primary structure composites (curved-complex test panels) used in new commercial aircraft designs (e.g. B787, A380, A350) and deliver initial report on IED blast effects on commercial aircraft composite design vulnerability.
- Conduct preliminary (unpressurized and pressurized) explosive vulnerability testing on Boeing 757 narrow body commercial aircraft test asset and deliver report.
- Conduct conventional Least Risk Bomb Location (LRBL) procedures live fire explosive testing against current aircraft aft-door slide pack configurations and deliver a report.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$700	\$1,242	\$1,750	\$1,750	\$1,750	\$2,550

Project Schedule Including Milestones

- Deliver updated (incorporating TSA User Feedback updates) DHS SharePoint-based Explosive Testing Database (ETDB) to TSA (FY 2016).
- Conduct follow-on explosive testing on primary structure composites (curved composite test panels) used in new commercial aircraft designs (e.g. B787, A380, A350) and deliver report (FY 2016).
- Complete passenger cabin explosive vulnerability testing on Boeing B767 test asset and deliver Wide Body Commercial Aircraft Vulnerability Report, Boeing 767 Explosive Vulnerability Testing (FY 2016).
- Complete explosive Threat Mitigation Unit (TMU) prototype development and testing and deliver report on project results and associated TMU design package to USSS Technical Security Division (USSS-TSD) (FY 2016).
- Fabricate TMU prototype(s) and deliver to USSS-TSD for their potential use in operational pilot testing (FY 2016).
- Evaluate blast effects of improvised explosive charges on curved/complex composite aircraft panel designs and report results to Transportation Security Administration (TSA) (FY 2017).
- Evaluate continued effectiveness of conventional Least Risk Bomb Location (LRBL) procedures for new aircraft aft-door configurations and deliver report to TSA (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

Completion of HULD technology at TRL7.

Transition Plans

- Planned Demos & Deliverables/Transitions
 - Deliverable of preliminary blast testing of composite aircraft panels
 - Deliverable of Final design of reduced threat composite HULD (HULD-R)

- Deliverable of prototype design of advanced composite HULD (HULD-A)
- Demo – Explosive testing of explosive TMU
- Deliverable of composite aircraft design blast testing and modeling report
- Transition Products
 - Deliver knowledge products that support requirements development, risk assessment and policy decisions (e.g. setting minimum detection requirements).
 - Deliver technology and methodologies for blast mitigation protection of commercial aircraft (e.g., Hardened Unit Load Devices, Least Risk Bomb Location Procedures).
 - DOT/FAA Airworthiness certification of finalized HULD-R design.
 - Prototype explosive TMU finalized design and full-scale prototype(s) for USSS-TSD operational pilot.

Homemade Explosives Characterization

- *Problem:* The use of homemade explosives (HMEs) creates emerging hazards for responders and new challenges to detection and intelligence organizations. A large number of fuels, oxidizers, and synthesis procedures that can be combined to form HMEs, present an enormous problem set with respect to detection, incident management, and planning for first responders.
- *Solution:* S&T investment in the HME Characterization project provides capabilities for improved prevention, detection, analysis, and decision support for homeland security operations. This project will provide HME signature data for vendor development of HME detection, threat validation data, and tools to more safely manage incidents. The HME Characterization project identifies and characterizes explosive threats and their performance; collects chemical and radiographic signatures of HMEs for use in EDS training and testing; and provides input into detection standards and certification of detection equipment for the TSA (the primary customer).
- *Impact:* Knowledge products provided by the HME Characterization project influence TSA's CONOPS and policy decisions in Checked Baggage, Air Cargo, and Primary and Secondary Screening domains and are leveraged in systems development, training, and testing. Data will have a direct impact on policy influencing the commercial availability of precursors. Pre-planning tools will help first responders and engineers more safely navigate future incidents involving HMEs.

Prior Year Key Events

- Characterized the chemical, physical, and explosive properties of HMEs and report findings to TSA and interagency partners to support requirements development.
- Delivered hydrogen peroxide/foodstuffs explosive characterization reports and monograph.
- Delivered new HME detection windows to TSA for incorporation into existing and future bulk and trace explosives screening systems in coordination with the European Civil Aviation Council.
- Delivered nitrated sugars characterization report.
- Delivered select Liquid, Military, and HME explosive data to the TSA Rapid Algorithm Development program.
- Delivered/published Improvised/Homemade Explosives (IE/HME) Safety Standards Protocols document.
- Began explosive performance signature collection effort with the Department of Justice (DOJ) for the Chemical Facility Anti-Terrorism Standards (CFATS) policy initiative and HME Desensitization Technical Reference.
- Transitioned of the Interagency HME Database to reside at the National Ground Intelligence Center.

Current Year Key Events

- Complete European-U.S. Region of Responsibility Data Collection.
- Deliver 11 Material Assessment Reports to TSA that will inform Federal decision makers on chemical explosive properties, threat intelligence, X-ray signatures and a Region of Responsibility for each of these materials. These new HME detection windows will be incorporated into existing and future bulk explosives screening systems in coordination with the European Civil Aviation Council.
- Assist in the incorporation of Region of Responsibility Recommendations for 18 materials and formulations of interest into the 2016 Detection Standards for EDS and AT.
- Deliver Homemade explosives Safety Standards to the International Homemade Explosives Working Group.
- Transition of the Interagency HME Database to reside at the Federal Bureau of Investigation's Terrorist Explosive Device Analytical Center Improvised Explosive Detection and Synthesis (TIEDS) Center.
- Deliver RDX Round Robin Test Results to the International Homemade Explosive Working Group to improve small scale safety test standards.
- Deliver 16 HME Characterization Reports which contain a full data analysis including synthesis procedures, and physical and chemical characterization for each of the HME formulations.
- Begin HME Simulant Certification and Validation Program.
- Deliver red team test articles and emerging explosive threat information to the TSA Office of Security Operations.
- Begin New Threats Detection work to lower HME False Alarm Rate in EDS.
- Deliver Explosives Terrorism Risk Assessment (ExTRA) methodology report to develop a probabilistic risk analysis for explosives.
- Provide TSA with a methodology and analysis for reviewing and updating transportation security equipment detection standards.
- Document the capability to perform dual energy basis material decomposition analysis with microCT data, and deliver source code, phantoms, and a final report to TSA

Budget Year Key Events

- Begin testing and analysis for HME and sheet blast loading data. Historical explosive tests must be validated for newer, more fuel efficient and larger capacity aircraft designs (including composite materials). Test and analysis effort to generate accurate blast loading data (blast overpressure, impulse, etc.) due to detonation of sheet explosive (such as Primasheet 1000 and Primasheet 2000) using selective physical test data and first principle codes.
- Complete first phase of Additive Manufactured/3D printed conventional explosives and/or HMEs project (FY 2016). Characterize the chemical, physical, and explosive properties of HMEs and report findings to TSA and interagency partners to support requirements development (FY 2017).
- Deliver new HME detection windows to TSA for incorporation into existing and future bulk and trace explosives screening systems (FY 2017).
- Delivery of 40 homemade explosive characterization reports under the HME Characterization work with Israel Security Agency (FY 2017).
- Delivery of six chemical analyses in support of the Chemical Facility Anti-Terrorism Standards (CFATS) project (FY 2017).
- Develop a database and report on the detection performances and false alarm rate evaluation of all vendors (MDI and Leidos) involved in the New Threats Detection project with Israel Security Agency (FY 2017).
- Develop a software training package for x-ray image recognition (FY 2017).
- Develop HME Simulant Certification Program (FY 2017).

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$9,000	\$13,787	\$10,850	\$10,350	\$8,750	\$8,550

Project Schedule Including Milestones

- Complete one Region of Responsibility Material Assessment Report (FY 2016).
- Complete European-U.S. Region of Responsibility Material Assessment Reports (FY 2016).
- Characterize the chemical, physical, and explosive properties of TSAs Threat list to inform TSA’s DSARM program/explosive detection standard requirements (FY 2016).
- Deliver the upgraded IMPACT with a training package to enable its use by the first/emergency responder community (FY 2016).
- Complete final transition of the HME Database to FBI to include DHS data upload (FY 2016).
- Complete Explosives Terrorism Risk Assessment (ExTRA) for 15 explosives (FY 2016).
- Deliver HME Safety Standards to Interagency users (FY 2016).
- Deliver Ammonium Nitrate Booster Study results to support TSA Freight and Rail Security Policy (FY 2016).
- Provide United States Secret Service (USSS) with Anomaly Detection Prescreening test report.
- Provide monthly aviation emerging threat reports, six test articles, and HME Training course for TSA-OSO (FY 2016).
- Deliver the Chemical Facility Anti-Terrorism Standards (CFATS) Materials Study to inform their Notice for Proposed Rule-Making for new chemical additions (FY 2016).
- Document the capability to perform dual energy basis material decomposition analysis with microCT data, and deliver source code, phantoms, and a final report to TSA (FY 2016).
- Deliver 10 Homemade Explosive Characterization reports to TSA (FY 2016).
- Characterize the chemical, physical, and explosive properties of HMEs and report findings to TSA and interagency partners to support requirements development (FY 2017).
- Deliver new HME detection windows to TSA for incorporation into existing and future bulk and trace explosives screening systems (FY 2017).
- Delivery of 40 homemade explosive characterization reports under the HME Characterization work with Israel Security Agency (FY 2017).
- Delivery of six chemical analyses in support of the Chemical Facility Anti-Terrorism.
- Develop a database and report on the detection performances and false alarm rate evaluation of all vendors (MDI and Leidos) involved in the New Threats Detection project with Israel Security Agency (FY 2017).
- Develop a software training package for X-ray image recognition (FY 2017).
- Develop HME Simulant Certification Program (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

The program plans to begin at TRL 6 and end at TRL 7

Transition Plans

- The development of Regions of Responsibility enables the TSA to support deployment of mature screening technology.
- Explosives characterization aids in safety information, assists with explosive detection equipment by providing data regarding explosive materials and the sensitivity of various explosive detection technologies to explosive material, and validates threats.
- The development of safety protocols will provide personnel working with and testing homemade explosives with standardized safety guidelines that will decrease the risk of accident and/or injury. This will benefit end users from the National Laboratories, Federal Bureau of Investigation, DHS, DOD, and other mission partners.
- In partnership with the FBI, and the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF), S&T will facilitate the CFATS and explosives desensitization efforts.
- The rollout of IMPACT will enhance situational awareness, communication, and collaboration during and for security events. Transition the Homemade Explosives Database to a permanent database for use by the HME community.

D. Hostile Behavior Predict and Detect - FY 2016: \$40.500 million. FY 2017 Request: \$32.386 million. This program leverages social and behavioral science research, data, and theory to understand the determinants and timing of group conversions to terrorism and the intent to engage in violence. Knowledge from this program informs analytical, operational, and policy concerns related to terrorists and terrorist activities. This program also develops and builds the capability to noninvasively detect suspicious behavior that indicates the intent to cause harm.

Actionable Indicators and Countermeasures

- *Problem:* Analyses of extremist violence are currently based on a limited number of case studies, and the effectiveness of programs developed to counter violent extremism is often not clear.
- *Solution:* S&T will collect and analyze data on extremist violence in the United States, measure the impact of Countering Violent Extremism (CVE) programs, and develop tools to support policymakers and practitioners in their efforts to counter violent extremism.
- *Impact:* New capabilities will support more efficient and accurate analysis of the threats posed by violent extremists and evidence-based CVE policies, programs, and interventions. This project improves the capability of the Office of Intelligence and Analysis (I&A), DHS Fusion Center analysts, and Federal, State, and local law enforcement to identify indicators that individuals and groups are moving toward extremist violence. It will also support the Office of Community Partnerships, Offices of the Principal Deputy Counterterrorism Coordinator, Policy, Civil Rights and Civil Liberties, and local CVE practitioners in assessing the impacts of policies and programs developed to counter violent extremism.

Prior Year Key Events

- Hosted international CVE research workshop with government representatives from Australia, Canada, New Zealand, United Kingdom, and the United States.
- Began eight new start programs to bolster the Department's ability to deliver high quality, applied social and behavioral science research, and evidence-based initiatives that support diversion, prevention, mitigation, and resilience against the threat of violent extremism to the United States.

Current Year Key Events

- Transition Terrorism and Extremist Violence in the United States (TEVUS) Database.
- Complete update of data Included in TEVUS.

Budget Year Key Events

- Deliver interim report containing statistical analysis related to DHS CVE framework on CT topics.
- Develop a data and literature library on government CVE policies, programs, and operational activities to establish an operational roadmap.
- Deliver a formative evaluation of pilot city evaluations to prepare programs for subsequent impact evaluation.
- Deliver a report detailing prioritized research areas for multinational engagement in risk and crisis communications.
- Deliver a descriptive analysis of ~100 foreign fighters, and analysis comparing attributes of foreign fighters to extremists who did not leave the US.
- Implement new operational experiments to analyze narratives/counter narratives and assist message guidance through description, analysis, and agile feedback on social and electronic media output.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	\$1,277	\$1,001	\$1,000	\$1,000	\$1,000

Project Schedule Including Milestones

- Transition Terrorism and Extremist Violence in the United States (TEVUS) Database (FY 2016).
- Complete update of data Included in TEVUS (FY 2016).
- Provide a report identifying patterns of mobilization mechanisms and outcomes. Comparative case studies of returned individual foreign fighters (FY 2017).
- Deliver comprehensive evaluation of DHS/USG pilot city program developed to counter violent extremism (FY 2016).
- Deliver CVE Landscape report containing statistical analysis related to DHS CVE framework on CT topics (FY 2016).
- Report the results, methods, and findings of the CVE Operational Roadmap review (FY 2016).
- Identify formal requirements development for CVE Working Group components and federal, state, local, and tribal stakeholders (FY 2017).
- Provide input and assistance to DHS HQ Office of Community Partnerships for new DHS CVE policy systematic literature review to categorize pre-existing CVE work into key CVE mission area (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Each project activity benefits from the direct involvement of DHS and interagency end users, who shape the project, ensure it continues to address their requirements, and provides feedback on all deliverables.
- No additional investment is required to transition the knowledge products this project produces, which are generated throughout the project and are being incorporated into official DHS analytic products and training materials.
- Tools such as databases will be maintained by the researchers who create them as they have been developed for the public good and their maintenance is essential to these entities' future research activities.

Hostile Intent Detection and Surveillance

- *Problem:* TSA screens approximately 2 million passengers daily. This number is projected to increase at a rate of approximately four percent per year and it is unclear if the number of security screeners will keep pace with the projected increase in the traveling population. With passenger volumes increasing, the challenge is to increase the scale and accuracy of the existing screening processes while continuing to secure aviation and ground transportation portals without a similar increase in the number of screening personnel.
- *Solution:* S&T will develop non-invasive technologies to enable screening at speed with an increased observation/screening area (to include the entire portal). These technologies will result in faster passenger throughput in lieu of increased volume and increased screening accuracy with fewer false positives. These solutions will also remain sensitive to the privacy concerns of the traveling public as well as their civil rights/civil liberties.
- *Impact:* Increased efficiency and effectiveness through screening higher passenger volumes with fewer operational personnel (force multiplier) and increased screening accuracies.

Prior Year Key Events

- Delivered report on the feasibility of video-based versus direct-based suspicious behavior detection (i.e. Centralized Hostile Intent).
- Data collection event at T.F. Green airport (Providence, Rhode Island) of behavioral indicators and person tracking across multiple cameras. The data collection effort utilized volunteer actors (as opposed to the public) to role play TSA specified behavioral indicators of criminal activity.
- Conducted analysis and provided a report on the outcomes of the risk reduction demonstration/pilot at the TSIF.

Current Year Key Events

- Award new contract for transition of FAST capabilities and research.

Budget Year Key Events

- Conduct of subject matter expert (SME) working group to discuss potential improvements to Advanced Screening Research (ASR) research agenda and methodology.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	\$2,644	\$4,950	\$8,700	\$4,000	\$2,000

Project Schedule Including Milestones

- Complete data ingest from collection activities at Providence International Airport (PVD) (FY 2016).
- Complete video data annotation and obtain input from Behavior Detection Officers (BDO) (FY 2016).
- Conduct Kiosk Validation Study (FY 2016).
- Field Test for BDO surveillance via telepresence/Readiness Research Field Test/operational technology presence (FY 2017).
- Operational technology demonstration and evaluation of centralized screening. Advanced Screening Research (ASR) Settling Time and Real-Time Decision Analysis Scientific Study (FY 2017).

Delayed Milestones

- Publication of scholarly article documenting results of prior years' Future Attribute Screening Technology (FAST) research protocols. This was reviewed and approved for disclosure and is being submitted for publication in January, 2016.

Type of Research:

Applied

Technical Readiness Level:

This program begins at TRL3 and ends at TRL7.

Transition Plans

- The products will be transitioned to TSA in accordance with the component's acquisition strategy and per transition agreements.

GPS Vulnerability Assessment in the Critical Infrastructure

- *Problem:* U.S. critical infrastructure is dependent on GPS for many applications to maintain operations. In addition to the use of GPS for position and navigation, timing is an essential element for many critical infrastructures such as the electric grid, telecommunications, transportation, emergency services, etc. Timing is typically derived and maintained in these networks through GPS receivers and as the threats to GPS from jamming and spoofing continue to grow, so do the vulnerabilities within our critical infrastructure. Initial testing by S&T showed that the GPS receivers used within critical infrastructure do not always behave as desired, further increasing the vulnerability.
- *Solution:* This assessment will conduct comprehensive testing on GPS receivers used within the critical infrastructure networks against various jamming and spoofing threats. The project will also engage with the receiver manufacturers and others to begin developing and fielding mitigations at low cost to the critical infrastructure owner and operators. Additionally, research will be done on possible complementary timing sources to supplement the timing from GPS to enable assured timing for critical infrastructure needs.
- *Impact:* This project will result in a much better understanding of the vulnerabilities to GPS interference (intentional and unintentional) and educate and enable critical infrastructure owners and operators to take action to mitigate and protect against these threats. With the engagement of the receiver manufacturers identified issues can be addressed and implemented on new receivers prior to being placed on the market as well as

the possibility of software or firmware upgrades to protect legacy equipment within the critical infrastructure. Additionally, alternate mitigations developed by the project will enable a layered approach to ensure robust PNT solutions to meet critical infrastructure needs.

Prior Year Key Events

- Conduct ongoing jamming and spoofing testing of GPS user equipment of priority use equipment within critical infrastructure.

Current Year Key Events

- Coordinate with private sector GPS user equipment manufacturers and vendors to recommend mitigations and/or upgrades to next-generation products and production lines.
- Transition intellectual property and/or transition paths for commercialization of new equipment or other mitigation solutions and best practices.

Budget Year Key Events

- Conduct system level testing to determine potential cascading impacts of identified vulnerabilities.
- Develop complementary sources of assured timing for critical infrastructure owners & operators.
- Transition of mitigation to the commercial sector for implementation by critical infrastructure owners & operators.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	\$3,000	\$11,000	\$4,132

Project Schedule Including Milestones

- Coordinate with private sector GPS user equipment manufacturers and vendors to recommend mitigations and/or upgrades to next-generation products and production lines (FY 2016).
- Transition intellectual property and/or transition paths for commercialization of new equipment or other mitigation solutions and best practices (FY 2016).
- Conduct analysis and research for development of mitigation designs and practices for commercialization potential and/or use by critical infrastructure to mitigate risks of jamming/spoofing (FY 2016).
- Conduct Phase I GPS operational testing; fielding appropriate mitigation equipment and TTP (FY 2017).
- Conduct system-level testing of vulnerability impacts (FY 2017).
- Development of complementary sources of assured timing (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

TRL varies 4-8. Current GPS-PNT user equipment are commercial and in use. New designs and/or other mitigation solutions for jamming/spoofing risks may vary (e.g., user equipment, antennas).

Transition Plans

- Partnership and coordination with DHS NPPD OIP for communication and dissemination of GPS knowledge products to critical infrastructure Sectors and owners/operators. Coordination with private sector manufactures and vendors for knowledge products and testing results for improvements or upgrades to product lines. Coordination with FFRDC and National Laboratories and others for opportunities for commercialization or other transition or intellectual property.

Counter Unmanned Aerial Systems (UAS) / Non-Traditional Aviation Technologies (NTAT) and Autonomous Systems (AS)

- *Problem:* DHS operating components have the responsibility to protect people and critical infrastructure against UAS/NTAT/AS systems used for nefarious purposes. Small and medium Unmanned Aerial Systems (UASs) have entered the market in the last few years and have become inexpensive, easily obtainable, and capable of performing many functions that can be used for a number of applications. These applications include law enforcement, aerial photography, agricultural inspections, firefighting and emergency response, and wildlife management just to mention a few. The use of UASs are now not limited to law enforcement and military, but the general public. Users include hobbyists, researchers, and commercial users. The FAA is in the process of setting rules for the use of UAS/NTAT/AS so that they don't interfere with general aviation. With all these continually evolving developments, UASs create a concern for their capabilities of being used for nefarious purposes.
- *Solution:* The Directorate has established an integrated program to address homeland security threats from small and medium UAS/NTAT/AS. The effort is based on a successful development and transition of a low flying/low observable aircraft detection system developed by DHS S&T, currently deployed, and used by CBP on the northern border. These efforts involve a multi-year program to address the full-range of capabilities required to mitigate this threat, including sensor development and testing existing sensors, development and use of a mobile test bed in urban environments, modeling and simulation tools, analytics, information sharing, kinetic and non-kinetic mitigation, the development of a material solution, and deployment.
- *Impact:* A combined Counter UAS/NTAT/AS sensor and mitigation system will provide DHS operating Components and Law Enforcement with an easily deployable, efficient, and capable system to protect people and critical infrastructure while protecting our civil liberties and privacy. The project will provide DHS components and the Law Enforcement community with a counter threat system operated within the national capital region (NCR) and CONUS with negligible impact to the community and risk of unintended consequences.

Prior Year Key Events

- N/A

Current Year Key Events

- Collect and measure threat signature and vulnerability data.
- Collect and measure environmental noise in the areas where the system will operate.
- Initiate counter UAS Modeling and Simulation effort to understand what combination of sensor and mitigation systems work against the threats in the environments the system will operate in.

- Develop and deploy a mobile test bed to conduct experimentation, testing, and evaluation in-situ in the actual environment where the systems will be deployed.
- Conduct workshops to identify key technology approaches and solutions from government and industry.
- Conduct analysis of countermeasure technologies for countering the threat of illicit techniques (detection, track, localization, determine intent, and threat mitigation) that enable the development and effective use of a CUAS system in an operational environments.
- Utilize data collects, modeling and simulation, and analysis to codify a system architecture.
- Assess issues and recommend solutions to address future threat issues such as cloaking and concealment, extended range and flight time, weaponing, increased payloads, and autonomous flight.
- Begin construction of system.

Budget Year Key Events

- Augment models and sensor data processing with aircraft signatures and environmental clutter.
- Assess area and terrain to determine area coverage, number of sensors needed and sensor placement.
- Experiment and test Government and industry existing and developmental subsystem elements consistent with the system architecture.
- Construct system

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	\$20,000	\$19,386

Project Schedule Including Milestones

- Collect threat and environmental data for model use and system development (FY 2016).
- Augment models and sensor data processing with aircraft signatures and environmental clutter (FY 2017).
- Develop and validate CUAS modeling and simulation system (FY 2016).
- Complete system architecture and operational concepts for CUAS system (FY 2016).
- Develop and operate mobile test bed capability (FY 2016 and FY 2017).
- Conduct joint experimentation and assessments with DHS Components and Law enforcement (FY 2016– FY 2017).
- Recommend interim sensors, command and control, and mitigation technologies consistent with the architecture development (FY 2016).
- Recommend final sensors, command and control, and mitigation technologies consistent with the architecture development (FY 2017).
- Assess area and terrain to determine area coverage, number of sensors needed and sensor placement (FY 2017 Q1).
- Assess and modify design of existing Small Dark Aircraft (SDA) system to accommodate UAS/NTAT/AS threat and NCR/CONUS areas (FY 2017).

Delayed Milestones

N/A

Type of Research

Developmental

Technical Readiness Level

Completed system TRL 6 – Fully functional in a relevant operational environment.

Transition Plans

- The project will transition a counter UAS/NTAT/AS system that detects tracks, determines intent, and mitigates small and medium sized nefarious threats while maintaining civil liberties and privacy. The system will be extensible in that its performance and coverage area can be extended and improved by adding additional units to the system. This design is the most cost effective method to minimize both initial and total ownership costs over the life of the deployment.
- The project will perform laboratory and field evaluations of system performance during the development and final system deployments. It is anticipated that several systems will be deployed by DHS USSS and other civilian agencies to protect people and critical infrastructure.
- From the beginning of this effort, we have and continue to work with our operational agency partners to develop and deploy a CUAS system that they can readily purchase, deploy, and operate when and where it is needed. Since they are part of the development, the system is being designed and built to meet necessary performance goals and their operational needs.
- Transition Barriers: FAA and DOJ restrictions on data collection and interfering with aircraft

6. Cyber Security/Information Analytics – FY 2016: \$65.026 million. FY 2017 Request: \$70.986 million. Conducts and supports RDT&E and transition for advanced cybersecurity and information assurance technologies to secure the Nation’s current and future cyber and critical infrastructures. These solutions include user identity and data privacy technologies, end system security, research infrastructure, law enforcement forensic capabilities, secure protocols, software assurance, and cybersecurity education.

- A. ***Cyber Security Research Infrastructure*** – FY 2016: \$11.000 million. FY 2017 Request: \$10.847 million. This program provides the infrastructure necessary to support the cyber R&D that is critical for matching the growing and adapting threat. Much like testing for CBE R&D, special testbeds and data sets must be made available to the cyber research community, and unlike CBE, there is not a large selection of facilities or capabilities like missile ranges or BSL-4 laboratories that can be used to safely test malicious code somewhere other than on the live Internet or on real data.

Experimental Research Testbed

- *Problem:* Due to the increasing sophistication of cybersecurity attacks, it is necessary to test new cybersecurity defenses and research in a repeatable manner at a realistic scale in order to determine the best approach. Furthermore, such research and experimentation must be conducted in a secure environment to allow for testing against “live” threats, without endangering the larger Internet.
- *Solution:* Provide the Defense Technology Experimental Research (DETER) Testbed, which provides a contained “virtual Internet” environment to conduct large scale, repeatable cybersecurity research experiments.

- *Impact:* As the only freely available testbed of this scale, DETER improves attack mitigation and confinement strategies and the quality of new cybersecurity technologies as it is used by hundreds of organizations, including other government agencies, for test and evaluation purposes. Furthermore, DETER is also used as a tool for academia to enhance the educational experience of cybersecurity students, providing a realistic “hands-on” experimentation platform for thousands of university students.

Prior Year Key Events

- Expand experiment and test tools to allow for quicker experimentation cycles and greater insight.

Current Year Key Events

- Increase overall testbed capacity and scaling capabilities.

Budget Year Key Events

- Award follow on work for next generation experimental research testbed, new experimentation tools and independent testing and evaluation services
- Expand the educational security courses and material offered through DETER

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$2,962	\$4,795	\$3,940	\$4,000	\$3,500	\$4,132

Project Schedule Including Milestones

- Increase overall testbed capacity and scaling capabilities (FY 2016).
- Award follow on work for next generation experimental research testbed, new experimentation tools and independent testing and evaluation services (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

N/A

Transition Plans

- The Experimental Research Testbed project is a resource for the cybersecurity research community and does not currently have a plan to transition but rather will exist as an enduring testing and experimentation resource for the entire cybersecurity R&D community to use.

Research Data Repository

- *Problem:* Without access to large scale, real-world data, cybersecurity technology developers and evaluators often have to determine the value of their technical solutions based on anecdotal evidence or small-scale test experiments.
- *Solution:* Further develop and maintain the Protected Repository for the Defense of Infrastructure Against Cyber Threats (PREDICT), the only freely-available, legally and ethically collected, repository of large-scale datasets containing real network traffic and system logs for use by cybersecurity researchers.
- *Impact:* PREDICT is helping users accelerate the design, production, and evaluation of next-generation cybersecurity solutions, including commercial products by allowing solutions to be based on more comprehensive real-world data. Further, PREDICT is improving the ethics of cybersecurity research on a larger scale through the development of an ethics framework and disclosure control principles available to the broader community.

Prior Year Key Events

- Developed several analytical/policy papers that address fostering Information and Communication Technology Research (ICTR) ethics from principles to practice in the form of Institute of Electrical and Electronics Engineers (IEEE) and other community working groups.
- Creation of a legal framework and infrastructure to facilitate live streaming of data sets.
- Expand mobile data availability to support context aware computing paradigms.

Current Year Key Events

- Create a program structure to support the cataloging, hosting and/or mirroring of International datasets.
- Establish agreements with the EU or individual countries in Europe.

Budget Year Key Events

- Expand legal framework to support sharing data collected internationally.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$3,500	\$3,846	\$3,515	\$4,000	\$4,000	\$3,616

Project Schedule Including Milestones

- Create a program structure to support the cataloging, hosting and/or mirroring of International datasets (FY 2016).
- Establish agreements with the EU or individual countries in Europe and Singapore (FY 2016).
- Expand legal framework to support sharing data collected internationally (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

N/A

Transition Plans

- The Research Data Repository is a resource for the cybersecurity research community and does not currently have a plan to transition, but rather an enduring infrastructure level resource.

Software Assurance Marketplace

- *Problem:* There is a need to develop more secure and resilient software code as defects in code cost billions of dollars to fix each year, particularly when these defects are not identified until late in the software development process, and introduce vulnerabilities into the systems in which the code is deployed.
- *Solution:* Maintain the Software Assurance Marketplace (SWAMP), to improve development activities by offering a collection of software quality assurance tools and assurance services for developers to test and evaluate code for weaknesses and vulnerabilities; and provide tool developers an environment where they can test, calibrate, and improve the coverage area in their tools.
- *Impact:* SWAMP will reduce the number of vulnerabilities found in software, by applying the principle of continuous assurance throughout the software development process, affording developers the opportunity to detect bugs and defects in their code before it leaves their desktops.

Prior Year Key Events

- Conducted second SWAMP Community User Meeting to improve the community's understanding of the SWAMP capability.
- Transitioned Code Pulse (developed as part of the Software Quality Assurance activity in the Improving Foundational Elements of Cybersecurity project) into the SWAMP.
- Transitioned Code Hawk (developed as part of the Software Quality Assurance activity in the Improving Foundational Elements of Cybersecurity project) into the SWAMP to measure and provide benchmark for C Source Code static analysis tools.

Current Year Key Events

- Develop, build, and test procedures for initial package/tool set and new customers.
- Deliver Version 3 of Continuous Software Assurance Laboratory (CoSALab).
- Conduct 3rd SWAMP Community User Meeting to improve the community's understanding of the SWAMP capability.
- Transition Tunable Information Flow (developed in the Software Quality Assurance project) capabilities to the SWAMP, which includes run-time analysis.
- Implement additional open source static analysis tools into the SWAMP.

Budget Year Key Events

- Integrate vulnerability report format across multiple tools.
- Conduct 4th SWAMP Community User Meeting to improve the community's understanding of the SWAMP capability.
- Test and evaluate federation capabilities to integrate with cloud computing infrastructures and other Infrastructure as a Service (IaaS) offerings.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$2,925	\$4,216	\$4,345	\$4,200	\$3,500	\$3,099

Project Schedule Including Milestones

- Deliver Version 3 of Continuous Software Assurance Laboratory (CoSALab) (FY 2016).
- Develop, build, and test procedures for initial package/tool set and new customers (FY 2016).
- Conduct 3rd SWAMP Community User Meeting to improve the community’s understanding of the SWAMP capability (FY 2016).
- Incorporate additional commercial tools into the SWAMP (FY 2016).
- Integrate vulnerability report format across multiple tools (FY 2017).
- Conduct 4th SWAMP Community User Meeting to improve the community’s understanding of the SWAMP capability (FY 2017).
- Release final version of Metronome (FY 2017).
- Test and evaluate federation capabilities to integrate with cloud computing infrastructures and other Infrastructure as a Service (IaaS) offerings (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

N/A

Transition Plans

- The SWAMP has been set up as a resource for the cybersecurity research community and thus does not currently have a plan to transition but rather is envisioned as an enduring infrastructure level resource.
- B. ***Cyber Transition and Outreach*** – FY 2016: \$6.700 million. FY 2017 Request: \$6.715 million. This program accelerates the transition of new and existing cybersecurity technologies, including open-source solutions, into commercial products and services, through robust internal assessments, evaluations, pilots, and experiments. This program also improves the human element of cybersecurity through multi-disciplinary research into workforce development, education, team and multi-team training.

Transition to Practice

- *Problem:* Each year the Federal Government spends a significant amount of money on cybersecurity research. However, only a minimal amount of that research transitions into operational and commercial products.

- *Solution:* Transition research that addresses imminent needs in cybersecurity systems that impact national security. These activities include test and evaluation of technologies, setting up forums to introduce technologies to potential transition partners, and funding pilots of technologies in a variety of operational environments.
- *Impact:* By creating a heightened focus around transition, technology that could have otherwise “sat on the shelf” is now introduced to partners and end users who can take advantage of solutions to enhance the cybersecurity of the systems the Nation relies on. S&T is leveraging millions of dollars of research investment while ensuring that technologies and solutions developed with federal research dollars meet operational needs to protect the Nation’s critical infrastructure and systems.

Prior Year Key Events

- Identified and test/pilot/deploy at least two S&T Cyber Security Division funded technologies based on customer requirements.
- Piloted three to six technologies in production environments in the HSE.
- Provided three to five red-teaming reports and vulnerabilities assessments.

Current Year Key Events

- Conduct five industry specific technology demonstrations with the public and private sectors to include the Finance and Energy sectors.
- Transition three to five technologies via license or open source in order to make commercially available.
- Pilot three to six technologies in production environments with public or private sector partners.
- Conduct a comparative analysis of past red-teaming efforts and develop cross-cutting lessons learned.
- Conduct four to six collaboration events.
- Provide two to three red-teaming reports and vulnerabilities assessments.

Budget Year Key Events

- Conduct four to six collaboration events (IT Security Entrepreneur Forums, ITSEF; Infosec Technology Transition Council, ITTC; and others).
- Transition three technologies to the commercial market.
- Pilot three to six technologies in production environments in the HSE.
- Identify six to ten technologies that are candidates for transition.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$5,338	\$10,706	\$11,108	\$7,460	\$5,000	\$5,165

Project Schedule Including Milestones

- Conduct five industry specific technology demonstrations with the public and private sectors to include the Finance and Energy sectors (FY 2016).
- Pilot three to six technologies in production environments with public or private sector partners (FY 2016).
- Conduct four to six collaboration events (FY 2016).

- Conduct four to six collaboration events (IT Security Entrepreneur Forums, ITSEF; Infosec Technology Transition Council, ITTC; and others) (FY 2017).
- Identify and test/pilot/deploy at least two CSD funded technologies based on customer requirements (FY 2017).
- Transition three technologies to the commercial market (FY 2017).
- Pilot three to six technologies in production environments in the HSE (FY 2017).
- Identify six to ten technologies that are candidates for transition (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Technologies going through the Transition to Practice project will transition in a variety of manners including commercially available products, open source, and direct use by Federal agencies depending on the technology and community need.

Cybersecurity Outreach

- *Problem:* As cybersecurity becomes significantly more important each year, there is an increasingly growing need to improve awareness, training, and education.
- *Solution:* Improve cybersecurity training and education of the cybersecurity workforce. In particular, S&T sponsors cybersecurity competitions for high school and college students.
- *Impact:* S&T's sponsored cybersecurity competitions improve the quality and skill set of the next generation of cybersecurity professionals by providing an opportunity for students in a competitive environment and exposing them to the latest defense technologies and solutions, including those developed by S&T.

Prior Year Key Events

- Delivered a series of tools and capabilities for transition to on-going DHS supported competitions.

Current Year Key Events

- Test DHS S&T funded technologies in cyber gaming challenges.

Budget Year Key Events

- Test DHS S&T funded technologies in cyber gaming challenges.
- Conduct National and Regional Collegiate Cyber Defense Competition to provide leadership in the National Initiative for Cybersecurity

Education (NICE).

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$1,000	\$1,748	\$2,481	\$1,500	\$1,700	\$1,550

Project Schedule Including Milestones

- Test DHS S&T funded technologies in cyber gaming challenges (FY 2016).
- Conduct National and Regional Collegiate Cyber Defense Competition to provide leadership in the National Initiative for Cybersecurity Education (NICE) (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- The developed CSIRT best practices and guidebook will be transitioned and available for use by all CSIRT teams. Funding for cybersecurity competitions at the high school and collegiate level is viewed as an enduring need to improve the quality of the future cybersecurity workforce and therefore there is no current plan to transition S&T’s activities in this area, however, other developed technologies and tools will continue to be deployed and used within the competition frameworks.

C. **Network and System Security and Investigations** – FY 2016: \$43.326 million. FY 2017 Request: \$43.921 million. This program produces technologies needed to secure information and software that resides on the networks and systems that make up the Internet and provide analytic tools for the law enforcement community to investigate crimes committed in cyberspace.

Cybersecurity for Law Enforcement

- *Problem:* A significant barrier for law enforcement is keeping abreast of technology changes. New technology, both hardware and software, is released into the market at a very rapid pace and used in criminal and terrorist activity almost immediately. Additionally, law enforcement agencies are involved in the investigation of cyber-crimes, frequently involving criminal use of dark web and cryptocurrencies.
- *Solution:* Develop new technologies, capabilities, and standards to assist law enforcement in investigations and the forensic analysis of technologies used in criminal activity, and to aid organizations in mitigating the potential impact and damage posed by insider threat activity, and develop solutions to enhance cyber-crime investigations.

- *Impact:* These technologies, capabilities, and standards will reduce the amount of time needed to analyze technology used in illicit activity, reduce the cost of acquisition for law enforcement agencies whose budgets are stretched thin, and narrow the technology capability gap between criminals and law enforcement.

Prior Year Key Events

- Delivered a tool capable of performing a forensic comparison of individual storage profiles across an organization to detect anomalous behavior.
- Tested and evaluate deployable cloud forensics solutions and new capabilities in partnership with law enforcement customers.

Current Year Key Events

- Completion of additional open source module development for law enforcement forensics.
- Completion of Vehicle Infotainment and Navigation Forensics project including transition of enhanced capabilities.
- Transition of hand-held hardware to law enforcement customer for operational use.
- Transition of additional protocol support capabilities.
- Completion of online fraud and illicit commerce study.
- Completion of operational pilot of Insider Threat Database Managing System Data Exfiltration Monitoring System at selected government agency.
- Transition of Insider Threat Study for DHS Office of Security.

Budget Year Key Events

- Delivery of new capability to obtain, consolidate, and analyze evidence from mobile phones obtained by multiple tools.
- Completion of privacy protecting network measurement research.
- Completion of cryptocurrency forensics tool pilot with law enforcement agencies.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$4,100	\$6,126	\$9,704	\$9,800	\$8,400	\$7,231

Project Schedule Including Milestones

- Complete additional open source module development for law enforcement forensics (FY 2016).
- Complete operational pilot of Insider Threat Database Managing System Data Exfiltration Monitoring System at selected government agency (FY 2016).
- Complete Vehicle Infotainment and Navigation Forensics project including transition of enhanced capabilities (FY 2016).
- Initiate new research and development activities in an expanded portfolio of state-of-the-art cyber forensics tools and techniques (FY 2017).
- Pilot and transition anomaly and misuse detection systems to prevent data exfiltration (FY 2017).
- Complete operational pilots of next generation technology architecture for transition to law enforcement customers (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- End-users and customers test developed tools and technologies and at times, the project provides limited hardware/software licenses to support transition. Otherwise, tools and technologies are transitioned into commercially available tools or integrated into law enforcement filed deployment.

Data Privacy and Identity Management

- *Problem:* Agencies and organizations are experiencing a lack of processes and tools to share and coordinate information effectively because of an inadequate amount of security, trust, usable tools, policies, and procedures.
- *Solution:* Enhance the security of information sharing environments and the protection of users by improving authentication for persons, hardware devices, and software applications across all levels of government.
- *Impact:* This project provides interoperable access control technologies that provide a cost effective solution to all levels of government, including State and local levels. Additionally, this work enables information sharing without compromising the privacy of individuals (i.e. Personally Identifiable Information) or organizations.

Prior Year Key Events

- Issued a BAA for specific topic areas with a focus on data privacy technologies.
- Conducted system integration and interoperability tests and evaluations for capability needs provided by local, tribal, State, and DHS operational components through the Identity Management Testbed.

Current Year Key Events

- Deliver a tool, technology or knowledge product for securing personally identifiable information (PII) within the department of homeland security.
- Transition research and development capabilities, especially using mobile devices, to the communities of interest in providing fine-grain secure information access and physical access.

Budget Year Key Events

- Transition research and development capabilities, especially using mobile devices, to the communities of interest in providing fine-grain secure information access and physical access.

- Provide Communities of Interest an identity and data privacy technology landscape to enable an understanding of areas of technology gaps and where R&D investments should be made.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$2,597	\$4,994	\$4,837	\$3,000	\$4,500	\$3,822

Project Schedule Including Milestones

- Transition research and development capabilities, especially using mobile devices, to the communities of interest in providing fine-grain secure information access and physical access (FY 2017).
- Conduct one pilot demonstrating the technology solution for fusion center requirements (FY 2017).
- Address current federal, state and local identity management requirements in line with ongoing federated activities through the Identity Management Testbed (FY 2017).

Delayed Milestones

- Transition of the Backend Attribute Exchange (BAE) from the DHS S&T R&D portfolio to DHS HQ CIO or other operational components. DHS S&T are currently working towards transitioning the BAE software and knowledge products.

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Transition plans in this project consist of a mixture of open source releases of technology and knowledge products as well as direct transitions to Federal Government agencies.

Aviation Cyber Security

- *Problem:* Detecting, identifying, and defeating the array of threats to the global airspace; preventing cyber security breaches; and mitigating a cyber-attack are national imperatives. Although a creditable cyber security breach on an aircraft has not been recognized, it is merely a matter of time before a successful breach on the avionics of an aircraft becomes a reality. A requirement exists to validate or disprove the assertion that aircraft can be penetrated via non-cooperative cyber means.
- *Solution:* The Aviation Cyber Evaluation (ACE) project will collect, map and assess existing technical capabilities as they relate to activities involving aviation cyber assets, which will serve to advance and support the development of a comprehensive plan to incorporate applicable activities that can be leveraged in developing the associated technical capabilities for civilian aviation assets.
- *Impact:* The objective of this effort is to foster an environment that examines, assesses and can demonstrate this access to the associated civilian aviation systems.

Prior Year Key Events:

N/A

Current Year Key Events:

- Complete aviation cybersecurity landscape review.
- Complete civil aviation gap analysis.
- Operational Test and Evaluation.

Budget Year Key Events:

- Expand the discovery to additional avionics equipment.
- Determine and implement mitigation strategies to discovered vulnerabilities/threats.
- Partner with government and industry to establish mitigation process and practices to defend and defeat discovered vulnerabilities/threats.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	\$3,000	\$3,000

Project Schedule Including Milestones:

- Complete aviation cybersecurity landscape review (FY 2016).
- Complete civil aviation gap analysis (FY 2016).
- Operational Test and Evaluation (FY 2016).
- Expand the discovery to additional avionics equipment (FY 2017)
- Determine and implement mitigation strategies to discovered vulnerabilities/threats (FY 2017).
- Partner with government and industry to establish mitigation process and practices to defend and defeat discovered vulnerabilities/threats (FY 2017).

Delayed Milestones:

N/A

Type of Research:

Applied

Technical Readiness Level:

N/A

Transition Plans:

- Knowledge products gained through this endeavor will be transitioned to government agencies and organizations.

Disrupting Cyber Threats and Inducing Change

- *Problem:* As cyber threats and crime have become more persistent and sophisticated, there is a need to invest in research, technologies, and solutions that address the root cause of known threats.
- *Solution:* Develop fundamentally different approaches to improving the cybersecurity of critical infrastructure with activities focused on areas such as the development of dynamic new system defenses.
- *Impact:* By disrupting the status quo through radically different techniques, S&T will be able to address some of the most difficult cybersecurity issues.

Prior Year Key Events

- Completed testing and large scale experimentation of Bio-Inspired Distributed Decision Algorithms based on social insect behavior.
- Completed transition of network traffic monitoring capability to at least one Information Sharing and Analysis Center (ISAC) member group.
- Completed development of software to tag, track, and block access to digital objects.
- Initial development of a research community oriented on the different areas of cyber economic incentives.
- Provided recommendations for policies, procedures, (and regulations) that incentivize the appropriate level of private sector cybersecurity investment.
- Developed economic models that can be transferred for use by different users and organizations.
- Completed and publish for collaboration draft Moving Target Defense (MTD) architectures.
- Prototyped hardware/software system elements to expand MTD capabilities.

Current Year Key Events

- Development of tools for the automated analysis of sensor data, strategy planning execution, human-in-the-loop components for Planning and Analysis functions, and execution based on utility measurements of actual MTD strategies.
- Release of cybercrime datasets; replication of the data in PREDICT data repository; development of specialized visual analytics capabilities for these data and their dissemination through the FBI's National Cyber-Forensics & Training Alliance (NCFTA).
- Web-enabled software releases of cybercrime indicators for use by outside law enforcement agencies.
- Transition to and commercialization by industry of specified subsystems, for example, automatically detecting websites vulnerable to cybercrime and hijacking.
- Evaluation of eight major case studies and industry survey of 200 companies using statistical and econometric methods, and delivery of the first wide-scale study of cyber security investments throughout the U.S. business community.
- Publication of new models for determining optimum levels for cyber security investment to include internal and external factors.
- Completion of capabilities for security risk assessment and prediction, cyber insurance policy design, and the creation and continued refinement of cyber-risk actuarial tables.

Budget Year Key Events

- Complete initial analysis of cause and effect relationships, between incentives inputs and changed economics outputs and ROI.

- Develop an initial coupled model of criminal and non-criminal economic behaviors.
- Develop taxonomy of behavioral tactics used by malfeasants.
- Develop data interchange standards for sharing cyber-crime data, design of a set of cyber-crime indicators.
- Complete development of Moving Target Defense architecture and systems guidelines.
- Pilot deployment of Moving Target Defense (MTD) prototype within the DHS enterprise.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$9,300	\$6,151	\$5,562	\$4,450	0	\$1,033

Project Schedule Including Milestones

- Complete initial analysis of cause and effect relationships, between incentives inputs and changed economics outputs and ROI (FY 2017).
- Develop an initial coupled model of criminal and non-criminal economic behaviors (FY 2017).
- Develop taxonomy of behavioral tactics used by malfeasants (FY 2017).
- Complete development of Moving Target Defense architecture and systems guidelines (FY 2017).
- Pilot deployment of Moving Target Defense (MTD) prototype within the DHS enterprise (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- A variety of methods will be used to transition the tools, technologies, and methods produced under this project to include commercialization, transition to specific Federal Government organizations and both limited and open source licensing, depending on the product.

Improving Foundational Elements of Cybersecurity

- *Problem:* Many of today’s networking and information technologies contain inherent vulnerabilities, a legacy of a time when systems were designed without security in mind.
- *Solution:* To focus R&D activities on the characteristics essential to the desired end states of trustworthy systems with activities that include securing cloud based systems, improving the quality of software assurance tools, and developing metrics that aid organizations in measuring the security of their cyber systems.

- *Impact:* This project will develop new cybersecurity technologies and solutions that are designed with security built in from the ground up rather than needing to secure a technology’s vulnerabilities once it is already in operational use.

Prior Year Key Events

- Developed test and evaluation facilities to investigate new and existing capabilities of software analysis.
- Developed a systematic method to map natural language security controls to Common Weakness Enumerations (CWE).
- Developed software/tools to enhance usability and security of identity and user authentication.

Current Year Key Events

- Deliver Active-defense Resilient Mission-Oriented (ARMOR) Cloud platform software, data sets, analyses, and documentation.
- Produce tools for identifying, analyzing, and rectifying latent vulnerabilities in software
- Transition Tunable Information Flow to SWAMP.

Budget Year Key Events

- Pilot tools used for identifying, analyzing, and rectifying vulnerabilities in software.
- Test and evaluate initial end-to-end secure cloud architecture.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$1,875	\$8,938	\$,159	\$5,800	\$10,000	\$15,186

Project Schedule Including Milestones

- Deliver Active-defense Resilient Mission-Oriented (ARMOR) Cloud platform software, data sets, analyses, and documentation (FY 2016).
- Produce tools for identifying, analyzing, and rectifying latent vulnerabilities in software (FY 2016).
- Identify and fund at least two new Enterprise Security Metrics and Usability Technologies (FY 2017).
- Transition technology to commercial products and integrate into existing available services (FY 2017).
- Begin test and evaluate initial end-to-end secure cloud architecture (FY 2017).
- Pilot tools used for identifying, analyzing, and rectifying vulnerabilities in software (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Developed tools, technologies, and methods will be transitioned in a number of ways to include integration into existing open source tools, release as open source resources, and commercialization.

Leap Ahead Technologies

- *Problem:* As cyber-attacks and crime are constantly evolving, Government and industry face a continuing need to respond to emerging cyber threats.
- *Solution:* Identify, incubate, and execute early research projects that may significantly advance current capabilities through moderate risk and high-payoff outcomes in areas such as Open Source technology development, mobile device security, and defense against distributed denial of service attacks.
- *Impact:* These activities give organizations the ability to quickly shift to and respond to new and potential threats by focusing attention on cutting edge issues that are not currently being addressed. For example, efforts in the area of mobile device security focus attention on the vulnerabilities this computing platform presents to an organization as their use becomes more prevalent.

Prior Year Key Events

- Completed transition of mobile security solutions initiated in FY 2013.
- Completed evaluation of existing mobile security solutions being used in the HSE.

Current Year Key Events

- Produce an inventory of key open source security technologies that are of vital interest to government and critical infrastructure systems.
- Provide a guide for helping open source developers provide cost effective security solutions to government IT managers.
- Transition Software Based Roots of Trust Mobile Device Security Technology into the Commercial Market Place.
- Demonstrate the ability to withstand a 500 Gigabits per second (Gbps) Denial of Service Attack directed at medium scale organization such as a government agency, regional bank, or other commercial organization.

Budget Year Key Events

- Demonstrate initial operating capability for continuous authentication on a government approved mobile device.
- Initiate commercialization readiness plan for software-based mobile roots of trust.
- Demonstrate operational capabilities to support licensing and commercialization for software-based mobile roots of trust.
- Pilot mobile app archiving and vetting capabilities with a large Department or Agency.
- Complete mid-term evaluation of continuous authentication R&D technologies for mobile.
- Demonstrate interoperability and access control for peripheral devices within a Virtual Mobile Infrastructure.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$2,100	\$7,735	\$7,092	\$11,500	\$15,600	\$12,648

Project Schedule Including Milestones

- Produce an inventory of key open source security technologies that are of vital interest to government and critical infrastructure systems (FY 2016).
- Provide a guide for helping open source developers provide cost effective security solutions to government IT managers (FY 2016).
- Demonstrate initial operating capability for continuous authentication on a government approved mobile device (FY 2017).
- Initiate commercialization readiness plan for software-based mobile roots of trust (FY 2017)
- Demonstrate operational capabilities to support licensing and commercialization for software-based mobile roots of trust (FY 2017).
- Pilot mobile app archiving & vetting capabilities with a large Department or Agency (FY 2017).
- Complete mid-term evaluation of continuous authentication R&D technologies for mobile (FY 2017).
- Demonstrate interoperability and access control for peripheral devices within a Virtual Mobile Infrastructure (FY 2017).
- Pilot initial mid-term research results in non-operational settings (FY 2017).
- Complete evaluation of mid-term leap-ahead technology areas (FY 2017).
- Transition of funded open source technology that fills prioritized Government security gaps (FY 2017).
- Conduct software audits of critical open source projects including those used in critical infrastructure (FY 2017 Q4).
- Develop and improve tools that enable developers to be more productive and build more secure and resilient software (FY17 Q4).
- Initiate projects to improve critical open source protocols such as OpenSSL, GnuPG, Open SSH, and the Network Time Protocol (NTP) (FY17 Q4).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- A variety of methods will be used to transition the tools, technologies, and methods produced under this project to include commercialization, transition to specific Federal Government organizations and both limited and open source licensing, depending on the product.

Security for the Internet of Things (IoT)

- *Problem:* Advances in networking, computing, sensing, and control systems have added cyber features to a broad range of new devices. These systems are being designed and deployed now, however security is often left as an additional feature that will be added later. Industry is driven by functional requirements and fast moving markets. The designs are evolving rapidly and, in most cases, design standards are only now beginning to emerge. The design choices being made today will directly impact the next several decades in areas such as automotive, aviation, maritime, medical devices, and building controls.
- *Solution:* S&T will lead and coordinate efforts to the security of Internet-connected devices by first understanding the implications and threats associated with using these unsecured devices in different environments (e.g., a Fitbit in an office setting, on an airplane, inadvertently in a SCIF, etc). S&T will also develop and deliver new technologies, tools, and techniques for critical Internet connected devices and conduct and support technology transition efforts to ensure the resulting security innovations are deployed.
- *Impact:* S&T is focused on systems that have a direct impact on government operations and immediate impact on human life. Vehicles are one example of this. Multiple Federal Government agencies depend on vehicles for mission operations and, vehicle attacks could result in loss of life. Internet connected devices can create very substantial new risks if the designs and systems-of-systems do not incorporate security and resilience/continuity of operations at the outset. Emerging designs and new functions often have not been subjected to comprehensive threat analyses, have both known and unknown vulnerabilities, and lack security as an integral part of design. As these systems become widely deployed, the security and reliability issues will correspondingly increase and the systems will need to evolve to meet these risks.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Release initial BAA topic areas.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$1,000

Project Schedule Including Milestones

- Initiate acquisition process for selected IoT Technologies (FY 2017)

Delayed Milestones

N/A

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- N/A

D. ***Trustworthy Cyber Infrastructure*** FY 2016: \$0.000 million. FY 2017 Request: \$4.503 million. This program provides security for the building blocks that comprise the infrastructure of the Internet such as routers and routing protocols.

Internet Measurement and Attack Modeling

- *Problem:* As the Internet continues to grow organically and exponentially, the protection of cyber infrastructure depends on the ability to identify critical Internet resources that are subject to attack.
- *Solution:* To measure the infrastructure as it exists today, then make periodic or continuous measurements to identify changes, recognize attacks, and provide analysis.
- *Impact:* The development and application of modeling and analysis capabilities affords the ability to predict the effects of cyber-attacks on federal government installations and other critical infrastructure through the detection of malware and botnets, situational understanding, and attack attribution.

Prior Year Key Events

- Transitioned technologies to the customer and/or end user as appropriate, examples include router traffic monitors, route tracing tools, internet traffic visualization tools, etc.

Current Year Key Events

- Continue transitioning technologies to the customer and/or end user as appropriate, examples include router traffic monitors, route tracing tools, internet traffic visualization tools, etc.

Budget Year Key Events

- Develop new tools and techniques for mapping several layers of the Internet to detect and mitigate malicious behavior
- Identification and protection of critical infrastructure, embedded devices, and other parts of cyberspace will be addressed, as well as specific items identified by customers
- Delivery of an “internet DVR” tool that enables time travel and sharing across organizations
- Delivery of a pilot Distributed Incident Management System (DIMS) to the United States Secret Service.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$3,772	\$5,435	\$5,000	\$5,500	N/A	\$4,503

Project Schedule Including Milestones

- Develop new tools and techniques for mapping several layers of the Internet to detect and mitigate malicious behavior (FY 2017).
- Identification and protection of critical infrastructure, embedded devices, and other parts of cyberspace will be addressed, as well as specific items identified by customers (FY 2017).
- Delivery of an “internet DVR” tool that enables time analysis and sharing across organizations (FY 2017).

Delayed Milestones

N/A

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects

Transition Plans

- The transition plan for the Internet Measurement and Attack Modeling project is multi-faceted with plans that are specific to each individual effort with final transitions to open source software, commercial licensing, and knowledge products.

E. Information Analytics – FY 2016: \$4.000 million. FY 2017 Request: \$5.000 million. This program researches, analyzes, and develops technologies to strengthen interoperable communications and improve effective information sharing at all levels of government.

Decision Analytics (formerly Predictive Analytics and Informatics)

- *Problem:* DHS Components have identified numerous gaps in information analytics that would vastly improve operational efficiencies and homeland security missions.
- *Solution:* S&T is leveraging academic, government, and commercial solutions as well as investing in national laboratory research to solve some of the more difficult challenges identified by DHS Components. HSARPA has developed an analytics center where operational problems identified by the DHS Components can be defined and potential solutions examined. The analytics center utilizes authorities to conduct experiments to expose key information regarding future potential architectures, system performance, as well as potential security and privacy issues.
- *Impact:* Delivery of technical and information services that assist DHS Components with key information architecture strategy, provide data for alternatives analysis, and validate vendor claims with respect to information analytics in far less time and with much greater accuracy than DHS Components.

Prior Year Key Events

- Developed and delivered cross cutting solutions for application to DHS component missions.

Current Year Key Events

- Lead Department Data Analytics Strategy Development
- Study the effectiveness of in-memory architectures for improving algorithm performance across the Department
- Document DHS High Performance Computing requirements.

Budget Year Key Events

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	\$4,000	\$5,000

Project Schedule Including Milestones

- Demonstrate the viability of distributed information analytics across DHS component storage architectures (FY 2016).
- Deliver predictive analytics capabilities to DHS components (FY 2016).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

Complete at TRL6.

Transition Plans

- Deliver targeted exploratory, developmental, and operational capabilities directly to sustained component operations. Many deliverables will be transitioned through the commercial market place in the form of commercially supported open source products.

7. First Responder/Disaster Resilience – FY 2016: \$102.446 million. FY 2017 Request: \$87.366 million. Work includes reduction of vulnerability of critical infrastructure, key leadership, and events to terrorist attacks and other hazards; working with State, local, tribal, and territorial governments to secure their information systems; working with local and regional partners to identify hazards, assess vulnerabilities, and develop strategies to manage risks associated with all hazards; increasing the state of preparedness of State, local, regional, tribal, and territorial partners, as well as nongovernmental organizations, the private sector, and the general public; advancing and improving disaster emergency and interoperable communications capabilities; and, improving the capabilities of DHS to lead in emergency management.

- A. Bioagent Attack Resiliency** – FY 2016: \$30.800 million. FY 2017 Request: \$31.803 million. This program provides advanced planning; develops CONOPS; develops and provides capabilities to support forensics, laboratory response, personnel protection, and decontamination;

and utilizes exercises and training for responding to and recovering from a biological disaster. This program includes actions to limit the spread of disease among animal species to protect the United States economy.

Agricultural Outbreak Response and Assessment Tool (ORAT)

- *Problem:* While much work has been done at the academic level to develop models analyzing disease spread, there are few tools accessible to assist emergency planners in making decisions regarding outbreak response and planning- both before and during an event.
- *Solution:* This project will leverage previous CBD investments in foreign animal disease modeling to develop scalable (local to national) simulations, analysis and modeling tools to analyze potential response and control options for FAD spread; and inform requirements for FAD countermeasures (such as Vaccinations and Ag screening tools) and post outbreak responses. The modeling tools for foreign animal disease decision support will then be leveraged to develop additional tools and direct future investments in vector-borne, emerging and zoonotic diseases.
- *Impact:* This project will provide user-friendly tools for state and local animal health first responders and emergency planners, as well as policy makers, to support planning and response options for high priority foreign animal diseases. Additionally, these tools can also be used to support training and exercises for preparedness and will help facilitate coordination among federal, state and local emergency responders during an incident.

Prior Year Key Events

N/A

Current Year Key Events

N/A

Budget Year Key Events

- Initiate stakeholder discussions to begin development of project goals and desired outcomes.
- Form Modeling Integrated Product Team composed of interagency stakeholders to inform project direction.
- Initiate process to identify, assess and prioritize key gaps (and the requirements to fill those gaps) in the needs of end-users.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$300

Project Schedule Including Milestones

- Meet with Federal, State, and industry animal health and animal emergency response officials to identify key gaps in modeling and decision making tools and the requirements to fill those gaps (FY 2017).
- Deliver final summary report of prioritized gaps in modeling and decision making tools across stakeholder communities and detailed requirements (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

TRL will be determined by results of requirements study and may vary between specific project efforts.

Transition Plans

- It is critical that any tools developed be sustainable, so the requirements study, which is the focus of our FY 2017 efforts, will not only focus on what is required to fill the capability gaps but also on what is required to ensure that the tools that are developed can be maintained after transition. This will include a consideration of which end-user community might provide the maximum support for such maintenance, or an exploration of other sustainable options for maintenance such as licensing the tools out to private companies who can administer them for a fee that is sufficient to maintain the system but nominal enough to be affordable to the end user. The final summary report will identify potential transition partners, including state, local, federal and private entities.

Bio Event Recovery

- *Problem:* Within the Emergency Responder and Recovery communities, there is a lack of well-informed guidance on procedures and evidence-based methods for clean-up and restoration of normal functions. These gaps will cause long times for recovery of critical infrastructure, such as underground transit systems, for events involving wide-spread biological agent contamination. Long recovery times will increase economic damage at the local, state and national levels while decreasing public confidence in vital services. Due to this lack of well-informed guidance on field-tested procedures and methods for clean-up, the recovery of critical infrastructure, such as transit systems, will be significantly delayed and impact the general public.
- *Solution:* This project will, through partnerships with major subway authorities, assess requirements and field-test potential technology solutions for biological agent clean-up in underground transit systems. A systems-level approach will be taken that includes field-tested strategies for rapid recovery of tunnels, stations, rolling stock and vital support infrastructure (e.g., maintenance yards, power and pumping stations). The project will demonstrate protocols and tools (materiel and non-materiel) for rapidly determining the extent of contamination to inform remediation actions and establishment of risk-based clearance goals; evaluate new sampling strategies and an analytical technique to reduce samples that require analysis; test decontamination technologies for stations, tunnels and rolling stock in operational settings; and conduct workshops and table-top exercises with transit partners to transition recovery guidance and strategies.
- *Impact:* This project will provide public health officials, transit system authorities, environmental cleanup managers, and emergency management at the federal, state, and local levels with field-tested decision-support tools, recovery strategies, and methods for decontamination of critical underground transportation infrastructure. It will deliver operational guidance that will substantially shorten time for recovery through rational planning and concept demonstration.

Prior Year Key Events

- Conducted a large field test in a major subway system to validate the ability of updated dispersion and airflow models, combined with targeted environmental sampling, to rapidly map extent of contamination following a biological agent event in the subway.

- Initiated evaluation of decontamination technologies for rolling stock recovery and area isolation methods in limited locations of a partner subway.
- Demonstrated ability of composite sampling and an improved rapid viability PCR technique to speed a clearance process through reduction and better prioritization of environmental samples requiring traditional laboratory analysis (i.e., culturing).

Current Year Key Events

- Verify ability of updated underground dispersion and airflow model, combined with targeted environmental sampling, to rapidly map extent of contamination following a biological agent event in the subway.
- Assess updated sampling and decontamination capability against customer goals (>25 percent reduction in samples for lab analysis; decontamination efficacy achieves “no detection of viable spores” to meet interim EPA/CDC clearance goal).
- Initiate evaluation of decontamination technologies for stations and tunnels, assess tunnel isolation methods in limited locations of a partner subway, or surrogate location.
- Draft interim guidance document and develop software tool to implement guidance.
- Conduct workshop with a major subway system to evaluate and improve draft interim guidance and decision-support tool for system recovery.

Budget Year Key Events

- Conduct table-top exercises with transit agency partners to demonstrate recovery guidance.
- Finalize and transition recovery guidance and software tool.
- Complete evaluation of decontamination technologies for stations and tunnels, assess tunnel isolation methods in limited locations of a partner subway, or surrogate location.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
7,147	6,261	5,000	5,000	4,000	3,611

Project Schedule Including Milestones

- Conduct workshop with a major subway system to evaluate and improve draft interim guidance and decision-support tool for system recovery (FY 2016).
- Verify ability of updated underground dispersion and airflow model, combined with targeted environmental sampling, to rapidly map extent of contamination following a biological agent event in the subway (FY 2016).
- Assess updated sampling and decontamination capability against customer goals (>25 percent reduction in samples for lab analysis; decontamination efficacy achieves “no detection of viable spores” to meet interim EPA/CDC clearance goal) (FY 2016).
- Draft interim guidance document (FY 2016).
- Complete evaluation of decontamination technologies for stations and tunnels, assess tunnel isolation methods in limited locations of a partner subway, or surrogate location (FY 2017).
- Conduct table-top exercises with selected transit agency partners to demonstrate recovery guidance and decision support tools (FY 2017).
- Finalize and transition recovery guidance and software tool (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

The project begins at TRL5, and ends at 6.

Transition Plans

- DHS will transition concepts of operation, field-tested technology solution recommendations, and SOPs to the local transportation emergency personnel, and the EPA. Transition will occur via a series of workshops held on location of the transportation systems to demonstrate and exercise use of the guidance and SOPs. A Unified Command comprised of Federal, State, local, and tribal participants will direct the implementation of remediation guidance and decision-support tools in a clean-up event.

Bio-Forensics R&D

- *Problem:* Bioforensics research and development is required to improve the ability to identify and characterize source material collected from a bio-crime in order to pursue legal prosecution against the responsible party (or parties). This research provides investigators such as FBI and USSS with critical tools that provide investigative leads for attribution.
- *Solution:* This project develops advanced forensic capabilities to determine the source and production method of biological threat agents (BTAs) collected from crime scenes. Specifically, the project develops protocols for characterization and identification of BTAs, and utilizes a robust sample management, molecular signatures, and physical/chemical analysis research program. Bioforensics R&D is currently focused on establishing a methods-based approach to BTA characterization, which does not depend on prior knowledge of the organism and can detect novel and/or emerging organisms. Establishment of this approach includes development of orthogonal approaches to agent characterization initiation of an effort to build a national sequence database for whole genome comparison and development of computational algorithms for data analysis.
- *Impact:* The Bioforensics R&D project leads national research efforts in microbial forensics and transitions analytical techniques to the National Bio-forensics Analysis Center (NBFAC) and other government stakeholders. The Bioforensics R&D project will support intelligence assessments, preparedness planning, response, emerging threat characterization, bioforensic analyses, and evidence associated with biocrime incidents.

Prior Year Key Events

- Developed and populated databases for comparative whole genome analysis and host genome subtraction of select agents for forensics characterization.
- Developed and transitioned mass spectrometry-based methods for identifying production-related signatures of organisms used in a biocrime to bioforensics operations.
- Developed and transitioned computational methods for analyzing metagenomic data.

- Identified gaps in and develop new methods for toxin detection and characterization.

Current Year Key Events

- Develop analytical standards for whole genome sequencing.
- Fill gaps in infectious organism biology and publish results to support legal admissibility of analytical results into court.
- Develop methods that support definitive bioforensics identification and characterization for emerging, enhanced, chimeric, engineered and purely synthetic threat agents to NBFAC.

Budget Year Key Events

- Fill gaps in infectious organism biology and publish results to support legal admissibility of analytical results into court.
- Develop methods that support definitive bioforensics identification and characterization for emerging, enhanced, chimeric, engineered, and purely synthetic threat agents to NBFAC.
- Establish capability for the identification and characterization of rare variants and quasi species to support bioforensic casework.
- Develop metagenomics and host based capabilities to support bioforensic casework.
- Populate comparative genomics databases with emerging agent data.
- Transition methods for ricin and abrin mass-spec-based identification and characterization to NBFAC.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$4,000	\$4,870	\$4,000	\$6,500	\$6,500	\$5,682

Project Schedule Including Milestones

- Develop analytical standards for whole genome sequencing (FY 2016).
- Fill gaps in infectious organism biology and publish results to support legal admissibility of analytical results into court (FY 2016).
- Develop methods that support definitive bioforensics identification and characterization for emerging, enhanced, chimeric, engineered, and purely synthetic threat agents to NBFAC (FY 2016).
- Provide 24/7 bioforensic casework support (FY 2016).
- Establish capability for the identification and characterization of rare variants and quasi species to support bioforensic casework (FY 2016).
- Develop metagenomics and host based capabilities to support bioforensic casework (FY 2016).
- Populate comparative genomics databases with emerging agent data (FY 2017).
- Transition methods for ricin and abrin mass-spec-based identification and characterization to NBFAC (FY 2017).
- Develop methods to identify production-related signatures that are reproducible across sample types (FY 2017).
- Fill in gaps in infectious organism biology and publish results to support legal admissibility of analytical results into court (FY 2017).
- Provide 24/7 bioforensic casework support to Federal Law Enforcement and other government agencies (FY 2017).
- Establish mass spectrometry for protein toxins and enhanced metogenomics to support bioforensic casework (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

The program plans to begin at TRL 4 and end at TRL 6.

Transition Plans

- This project provides NBFAC and law enforcement agencies with the required tools and methods to analyze bioagent samples involved in a biological terrorist attack or crime. This project also provides enhanced scientific data and analysis for legal admissibility into the U.S. courts.

National Bioforensics Analysis Center (NBFAC)

- *Problem:* The anthrax mailings of 2001, demonstrated the need for a dedicated capability to conduct the scientific analysis and support the traditional forensic analysis of evidentiary samples from biocrime and bioterror investigations or from an actual event to support attribution investigations. This capability must provide high quality, validated processes and methods that meet admissibility requirements for federal prosecution of crimes involving biological agents.
- *Solution:* The NBFAC, located at the NBACC, is the Nation's lead facility for technical analysis of samples from biocrime and bioterror investigations. NBFAC has established the necessary dedicated staff, equipment and biocontainment laboratories to provide scientific data to support attribution investigations. The NBFAC provides a 24/7 capability using ISO 17025 accredited processes, agent based assays and genomics to identify and characterize traditional, non-traditional, emerging, genetically engineered and synthetic biological agents. NBFAC's ISO 17025 accredited capabilities ensure rigorous chain-of-custody, third party review and quality-controlled procedures to ensure the integrity of evidentiary samples and their analysis.
- *Impact:* NBFAC provides Federal law enforcement agencies with centrally coordinated and validated capabilities for sample handling, sample processing, and bioforensic analyses of evidentiary material derived from biocrime and bioterror investigations or from the actual use of a biological agent.

Prior Year Key Events

- Provided 24/7 bioforensic casework support.
- Developed/demonstrated an operational capability to characterize individual components of a sample to support the analysis of: limited sample, non-cultureable agents, rare variants, and metagenomics.
- Transitioned mass spectrometer-based toxin identification capability from Bioforensics R&D project.

Current Year Key Events

- Provide 24/7 bioforensic casework support.
- Establish capability for the identification and characterization of rare variants and quasi species to support bioforensic casework.

Budget Year Key Events

- Provide 24/7 bioforensic casework support.
- Develop metagenomics and host based capabilities to support bioforensic casework.
- Establish capability for the identification and characterization of rare variants and quasi species to support bioforensic casework.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$8,333	\$8,483	\$5,875	\$6,500	\$6,500	\$6,715

Project Schedule Including Milestones

- Provide 24/7 bioforensic casework support (FY 2016).
- Develop metagenomics and host based capabilities to support bioforensic casework (FY 2016).
- Establish capability for the identification and characterization of rare variants and quasi species to support bioforensic casework (FY 2016).
- Provide operational capability that is ISO 17025 accredited capability to perform metagenomics analysis of complex samples (FY 2017).
- Provide proteomic capability to support the analysis of small molecule toxins (FY 2017).
- Establish protocols for the analysis of small molecule toxins (FY 2017).

Delayed Milestones

N/A

Type of Research

Development

Technical Readiness Level

The program plans to begin at TRL5 and at TRL8.

Transition Plans

N/A

Foreign Animal Disease Vaccines, Diagnostics, and Countermeasures

- *Problem:* Without diagnostics and countermeasures to detect, limit, and stop the spread of animal disease, a FAD outbreak may lead to massive elimination of animals and disruption of the U.S. food economy for extended periods of time, resulting in losses in billions of dollars.
- *Solution:* New and next-generation countermeasures are developed and transitioned directly to USDA and state diagnostic labs or through veterinary biologic industry partners for commercialization and access by USDA. This project directly addresses HSPD-5 and HSPD-9 by ensuring that U.S. Department of Agriculture (USDA), and other first responders in the animal agriculture community, have the countermeasure tools needed to safely and effectively respond to and recover from foreign animal, emerging and zoonotic disease outbreaks. In addition to investing in novel technologies to rapidly respond to and recover from these threats, this project works with commercial animal health industry partners to ensure completion of U.S. regulatory requirements (master-seed, pre-licensing serials, clinical trials) for high-priority

countermeasures. This project includes a significant amount of collaboration with animal health industry partners for vaccine and diagnostic candidates for FMD, African swine fever (ASF), classical swine fever (CSF); zoonotic diseases including Rift Valley fever and Henipavirus; as well as emerging disease threats.

- *Impact:* This project strengthens the defense of the U.S. agricultural infrastructure by developing new and next- generation countermeasures (vaccines and diagnostics) to protect the livestock industry against FMD, other high-consequence FADs, emerging and zoonotic diseases. Efforts to develop multi-serotype, panvalent and broad-spectrum countermeasures will provide opportunities for more rapid and earlier protection, limiting the spread and size of an outbreak. Efforts from this project will provide data to support the regulatory licensing and/or use of new countermeasures by USDA in the event of a high-consequence outbreak in the United States.

Prior Year Key Events

- Several adenovirus vectored foot & mouth disease (AdFMD) master seed viruses USDA approved.
- Initiated early development regulatory studies with animal health industry partner for two AdFMD monovalent vaccine candidates.
- Identified a rapid response FAD vaccine platform for potential application to FMD and CSF.
- Initiated country selection process for International FMD Vaccine Trial project.

Current Year Key Events

- Adenovirus vectored foot and mouth disease product licences.
- Adenovirus vectored foot and mouth disease vaccines for initiation of international field trial (vaccination of animals).

Budget Year Key Events

- Identify and initiate studies for lead biotherapeutic disease agnostic countermeasures.
- Initiate testing of African Swine Fever vaccine and associated platform.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$11,000	\$10,932	\$14,125	\$12,300	\$13,800	\$15,496

Project Schedule Including Milestones

- Obtain USDA CVB approval of up to five AdFMD master seeds for use in manufacturing of pre-licensing serials towards product licensure (FY 2016).
- Identification of FMD endemic country and finalize baseline epidemiology study plan for international FMD vaccine and diagnostic trial (FY 2016).
- Complete overseas vaccine challenge and demonstrate serological indication of immunity in test cattle (FY 2017).
- First ever ASF vaccine that prevents at least 70 percent mortality in swine (FY 2017).
- Identify lead candidate subset (2-3 candidates) of broad spectrum countermeasures to high threat virus families (FY 2017).
- Complete first set of proof of concept immunogenicity studies for mosaic panvalent foot and mouth disease vaccine (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

This project funds the development of multiple vaccine and diagnostic products, the vast majority of which start at TRL3 and end at TRL7.

Transition Plans

- Vaccines developed are transitioned to industry for commercial production in the U.S. and marketing in endemic countries to ensure availability in the United States in the event of a foreign animal disease outbreak. Commercial partners are engaged in the early stages of development to assess commercial viability.
- B. Explosives & Rad/Nuc Attack Resiliency** – FY 2016: \$2.00 million. FY 2017 Request: \$5.000 million. This program provides advanced planning, develops CONOPS, develops advanced materials, and funds exercises and training for responding to and recovering from a disaster employing explosives.

Radiological/Nuclear Response and Recovery (RNRR)

- *Problem:* The detonation of a Radiological Dispersal Device or an Improvised Nuclear Device, would pose tremendous challenges to the first responder community and HSE, and have high consequences to the economy and national security posture. The presence of radiation during an emergency drastically increases the complexity of response operations, and requires advanced data collection and specialized capabilities to ensure the safety of the public and responders.
- *Solution:* Increase responder preparedness for radiological incident response and recovery operations by working with partner agencies, Federal interagency working groups, and state and local first responders to identify impactful research and development opportunities that address technology requirements and capability needs in the areas of radiological response management, incident characterization, initial response capabilities, medical care/triage, casualty/evacuee care, impacted area stabilization/control, and site cleanup/decontamination.
- *Impact:* This research and development will improve radiological response capabilities at the local, State, and national level, improve Government understanding of the impacts and risks of radiological emergencies, and find technological solutions to radiological capability gaps and mission needs. It will also increase preparedness and responder capabilities in advance of an incident and minimize the impact of a radiological or nuclear detonation.

Prior Year Key Events

- Execute top priorities from the Rad/Nuc Response and Recovery Investment Plan and initiate the development of program/project management documents for future fiscal years based on responder and interagency priorities.
- Initiate partnerships and technical cooperation with Federal agencies responsible for Rad/Nuc operational and regulatory missions, supporting the expansion of first responder capabilities and enhancing local connections to specialized radiological response assets.

Current Year Key Events

- Continue to fund Investment Plan priorities and conduct review of existing technology used by specialized radiological response operators to identify technologies and tools with potential for increasing operational capabilities of State/local agencies.
- Work closely with the Federal interagency to ensure Rad/Nuc Response and Recovery research and development projects meet the operational requirements of end users and assist in filling identified gaps and needs.

Budget Year Key Events

- Develop tools and resources to better integrate health physics into the local decision making processes of the incident command post and emergency operations center during a radiological emergency.
- Document responder operational requirements through a technical review of recently drafted local radiological emergency response plans, radiation specific response safety tactics, and available radiological data products.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	\$4,928	\$5,000	\$3,250	\$2,000	\$5,000

Project Schedule including Milestones

- Conduct review of existing technology used by specialized radiological response operators to identify technologies and tools with potential for increasing operational capabilities of State/local agencies (FY 2016).
- Work closely with the Federal interagency to ensure Rad/Nuc Response and Recovery research and development projects meet the operational requirements of end users and assist in filling identified gaps and needs (FY 2016).
- Finalize and distribute scientific response guidance for radiological contamination containment and early phase waste management (FY 2016).
- Identify key international partners and leverage tools and technology developed by international organizations for US first responders (FY 2016).
- Research radiological response decision making requirements to better understand how technical data can be interpreted and rapidly integrated into initial decision tools for local officials (FY 2016).
- Fill identified gaps in training materials for state and local radiation subject matter experts tasked with filling the Radiological Operations Support Specialist role during an incident response (FY 2017).
- Identify gaps in decision support tool and user requirements for state and local radiation subject matter experts tasked with filling the Radiological Operations Support Specialist role during an incident response (FY 2017).
- Research potential solutions for temporary and permanent containment and storage of radiological waste, providing process guidance for local decision makers and information for public awareness of hazards (FY 2017).
- Research immediate health impacts and local responder/agency medical resource requirements for population following a rad/nuc incident (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Leverage existing radiological training and preparedness organizations to assist in distributing and integrating developed technology and knowledge products into State/local rad/nuc preparedness and response activities:
 - DOE National Laboratories
 - FEMA - Emergency Management Institute
 - Center for Radiological/Nuclear Training
 - Defense Threat Reduction Agency
- Utilize project partners to connect first responders with Federal agencies and specialized radiological assets that will assist them during a radiological response:
 - Environmental Protection Agency's Regional Field Coordinators
 - National Guard Civil Support Teams
 - Interagency Modeling and Atmospheric Assessment Center (IMAAC)
 - National Nuclear Security Administration (NNSA) – Federal Radiological Monitoring and Assessment Center (FRMAC)
- Transition Barriers:
 - Unit price
 - Life cycle cost
 - Integration of knowledge products and technology into existing plans and preparedness efforts

C. *First Responder Capability* – FY 2016: \$18.300 million. FY 2017 Request: \$19.250 million. This program develops technologies, information, procedures, and CONOPS to aid first responders, emergency managers, and incident commanders as they respond to hazardous situations. It assists the emergency response communities to establish requirements and tests technologies and assesses them for usability to help make the technologies available across all first responder communities.

First Responder Technologies

- *Problem:* The response environment that our Nation's first responders operate in on a day to day basis is constantly changing and requires an ongoing evaluation of needs, required capabilities, and potential investments and/or innovations, to allow them to conduct their missions more safely, effectively, and efficiently. Due to the lengthy process it normally takes to commercialize technology that fully meet these challenges, there is a need to rapidly develop technologies that address high priority capability gaps identified by Federal, State, local, and tribal first responders.

- *Solution:* Identify high priority needs, develop prototype solutions, and conduct operational field assessments of next generation technologies to address gaps, with the goal of rapidly developing (12 to 18 months) and transitioning (an additional 12 months) technologies that meet at least 80 percent of the operational requirement.
- *Impact:* This will strengthen the response community's ability to protect the homeland, respond to disasters, and to save lives through the increased availability and reliability of technology for first responders.

Prior Year Key Events

- Completed the development of and commercialization for an improved structural firefighter glove, to provide improved dexterity for don and doff ability.
- Completed the development of and transition of a low light covert camera for law enforcement, to provide ICE and other law enforcement agencies with a non-existent capability.
- Completed the development of and transition of an internet protocol encoder, which provides the ability to stream data from the low light camera in real time, at a low cost.
- Completed the development of and commercialization of a Radio Internet Protocol Communications Module (RIC-M) that connects radio frequency (RF) system base stations, consoles and other RF equipment – regardless of brand – over the Internet or Private Internet Protocol network.
- Transitioned a gun holder device that mimics the movements and reactions of a human firing a gun.
- Conducted a body-worn electronics study that analyzes data pertaining to the impact that a rapidly growing number of wireless devices has upon the first responder environment.
- Transitioned a low-power microwave system that assist search and rescue personnel detect and located the small movements from breathing and the heartbeat of a buried victim following disasters.
- Tested and transitioned SHOCKTUB, a render safe technology that allows State and local bomb squads to breach laminated car windows.

Current Year Key Events

- Develop a thermal imaging camera that integrates with a self-contained breathing apparatus (SCBA) mask.
- Develop a low cost wide band ranging technology that alerts responders and the command post when a team member is a defined distance (i.e. 30 feet) away from the closest team member on scene.
- Develop a protective interface and equipment technology that improve the sealing of firefighter turn-out gear to reduce the deposition of particulates and toxic chemicals on the skin of firefighters to reduce their incidence of cancers.
- Develop a multi threat base ensemble/duty uniform that provides enhanced splash, puncture, and thermal protection.
- Develop Burn Saver, a technology that alerts fire fighter first responders when temperatures reach a point that can cause their personal protective equipment (i.e. face shield of SCBA mask) to fail.
- Test and transition SPLTR, a render safe technology for improvised explosive devices that's used by state and local bomb squads.
- Transition a virtual training, high-fidelity simulation tool to support training and exercises in incident management and response.
- Complete development of X-Ray Rover which is a portable scanning technology that allows state and local bomb squads to rapidly X-ray and assess the content of small to medium size packages.
- Develop a location and tracking technology using electro quasi static fields that tracks first responders in the environments they work in.

- Develop a physiological monitoring technology that monitors a firefighters pulse, respiration, and body temperature by placing sensors in the temporal portion of an SCBA mask.

Budget Year Key Events

- Design and test gripper tools for Person Borne Improvised Explosive Device and Vehicle Borne Improvised Explosive Device.
- Collaborate with FBI ECM technologies for domestic threats in support of state and local bomb squads.
- Execute a broad agency announcement and solicit for technical and cost proposals that address high priority capability gaps identified by first responders.
- Make contract awards for the development of technologies that address the high priority needs identified by first responders.
- Perform operational field assessments in the real world environments first responders work in for those projects that produce a functioning prototype.
- Transition and commercialize first responder technologies developed by S&T’s FRG.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$4,798	\$10,947	\$7,978	\$11,400	\$14,300	\$15,000

Project Schedule including Milestones

- Conduct review of existing technology used by specialized radiological response operators to identify technologies and tools with potential for increasing operational capabilities of State/local agencies (FY 2016).
- Work closely with the Federal interagency to ensure Rad/Nuc Response and Recovery research and development projects meet the operational requirements of end users and assist in filling identified gaps and needs (FY 2016).
- Finalize and distribute scientific response guidance for radiological contamination containment and early phase waste management (FY 2016).
- Identify key international partners and leverage tools and technology developed by international organizations for US first responders (FY 2016).
- Research radiological response decision making requirements to better understand how technical data can be interpreted and rapidly integrated into initial decision tools for local officials (FY 2016).
- Design and test gripper tools for Person Borne Improvised Explosive Device and Vehicle Borne Improvised Explosive Device (FY 2017).
- Collaborate with FBI ECM technologies for domestic threats in support of state and local bomb squads (FY 2017).
- Deliver prototype technologies based on requirements obtained from the FRG’s First Responder Resource Group (FRRG) (FY 2017).
- Perform operational field assessments for the prototype technologies delivered to ensure the technology function as intended in an operational environment (FY 2017).
- Commercialize technologies developed and operationally field tested by R-Tech through partnerships formed with industry. (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program plans to begin at TRL3 and end at TRL 7.

Transition Plans

- The program's main stakeholders are Federal, State, local, tribal, and territorial first responders who do not generally make bulk group purchases or enter into technology transition agreements, due to the uncertain nature of funding availability. Therefore, the First Responders Group works with the vendor at the onset of the project to develop a commercialization plan that will require that the vendor invest its own funds to transition the technology to the first responder community.

Technology Clearinghouse

- *Problem:* S&T must maintain effective communication with the first responder and emergency preparedness and response communities in order to gather necessary information for its program and to keep those communities informed about the technologies and knowledge products the Directorate is developing on their behalf.
- *Solution:* A three-pronged communications effort that includes:
 1. FirstResponder.gov: S&T's premiere online portal for sharing information about its own projects and initiatives as well as outside technology-related programs and events of interest to first responders, this site includes articles, blog posts, grants and training information, practitioner tools, access to objective assessments and validations on commercial equipment, and the latest news from DHS. Useful resources are categorized by discipline: medical, explosives, fire, hazardous materials, law enforcement, and search and rescue. FirstResponder.gov features extensive links that allow for quick and easy access to critical information.
 2. First Responder Communities of Practice (FRCoP): a vetted online forum that enables first responders to collaborate and share best practices while also providing: 1) developers with operational requirements and information needed to design and manufacture increasingly useful tools and technologies, as well as 2) users with information related to procuring, deploying, and maintaining technologies and training for their proper use.
 3. Outreach and Engagement: an ongoing suite of communications activities that enables internal and external stakeholders in the responder community and the general public to gain a fuller understanding of the capability gaps, needs and requirements of first responders and thus strengthen its focus on essential technologies with the greatest potential for transition to use.
- *Impact:* Tech Clearinghouse increases first responder awareness of the Directorate's work, facilitates the flow of important information throughout the emergency response community, and enables the Directorate to design and manage projects that truly meet its mission. It is a cost-effective, multi-channel communications effort that steadily expands S&T's reach into stakeholder communities.

Prior Year Key Events

- ***FirstResponder.gov***
 - Refresh FirstResponders.gov website to add new pages for Anthrax Preparedness for First Responders, Next Generation First Responder, video capability through YouTube, and other enhanced pages.
 - Experiment with social media to increase traffic to FirstResponder.gov.

- Leverage new S&T Microsite on DHS.gov to promote content on FirstResponder.gov
- Support and enhance the development of FRG presence on current and future social media pages (i.e., Facebook, Twitter, YouTube, etc.) with the intent of increasing traffic to FirstResponder.gov.
- Produce project-based 100-second and other videos targeted to the first responder community.
- Implement and refine the development of partnerships with the public and private sectors to facilitate and create efficiencies to collect feedback and reviews on responder safety and knowledge products that could evolve into new requirements.
- ***First Responder Communities of Practice***
 - Conduct outreach and support for community administrators.
 - Provide reports on community and user activities.
 - Conduct outreach to academic institutions and associations to identify collaboration opportunities and prospective members.
 - Upload relevant materials, including blog posts, documents, and bookmarks, and by collaborating with community administrators to enhance or provide additional structure as needed.

Current Year Key Events

- ***FirstResponder.gov***
 - Refresh FirstResponders.gov website to add new pages and capability as needed to reach the broadest first responder audience.
 - Expand the social media experiment with Facebook, increasing traffic to FirstResponder.gov.
 - Leverage the S&T Microsite on DHS.gov to promote content on FirstResponder.gov.
 - Enhance the development of FRG presence on current and future social media pages (i.e., Facebook, Twitter, YouTube, Instagram, etc.) with the intent of increasing traffic to FirstResponder.gov.
 - Produce project-based videos targeted to the first responder community.
 - Implement and refine the development of partnerships with the public and private sectors to facilitate and create efficiencies to collect feedback and reviews on responder safety and knowledge products that could evolve into new requirements.
- ***First Responder Communities of Practice***
 - Conduct outreach and support to community administrators.
 - Provide reports on community and user activities.
 - Conduct outreach to academic institutions and associations to identify collaboration opportunities and prospective members.
 - Support the various communities on FRCoP by uploading relevant materials, including blog posts, documents, and bookmarks, and by collaborating with community administrators to enhance or provide additional structure as needed.

Budget Year Key Events

- Transition the FirstResponder.gov website to the S&T Microsite on DHS.gov to comply with the requirement to consolidate the number of DHS related websites.
- Develop FRG presence on current and future social media pages (i.e., Facebook, Twitter, YouTube, Instagram, etc.) to increase traffic to FirstResponder.gov and providing information tailored for the first responder community.
- Develop the technical framework for a new International Forum website.
- Produce 2 new NGFR Apex videos that will focus on technical integration and technology architecture.
- Create and distribute a public facing FRG Newsletter (The Siren) to better engage our first responder community

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$5,616	\$2,273	\$2,000	\$5,000	\$4,000	\$4,250

Project Schedule including Milestones

- Provide technical support to the International Forum to establish a website (FY 2016/ 2017).
- Expand the social media experiment with Facebook, increasing traffic to FirstResponder.gov and expanding engagement with local/state/tribal/regional first responders (FY 2016/ 2017).
- Transition the FirstResponder.gov website to the S&T Microsite on DHS.gov to comply with the requirement to consolidate the number of DHS related websites (FY 2016/ 2017).
- Development of FRG presence on current and future social media pages (i.e., Facebook, Twitter, YouTube, Instagram, etc.) with the intent of increasing traffic to FirstResponder.gov and providing information tailored for the first responder community (FY 2016/ 2017).
- Producing project-based videos targeted to the first responder community (FY 2016/ 2017).
- Conduct outreach and support to First Responder Community of Practice community administrators (FY 2016/ 2017).
- Provide reports on First Responder Community of Practice community and user activities (FY 2016/ 2017).
- Implement new communities and users on First Responder Community of Practice (FY 2016/ 2017).
- Conduct outreach to academic institutions and associations to identify collaboration opportunities and prospective members of First Responder Community of Practice (FY 2016/ 2017).
- Upload relevant materials, including blog posts, documents, and bookmarks, and by collaborating with community administrators to enhance or provide additional structure as needed to continue to support the various communities on FRCoP (FY 2016/ 2017).
- Update FirstResponder.gov with relevant content, including internal and external information on first responder related projects/programs and increase usage by first responders via marketing (FY 2016/ 2017).
- Increase membership in and engagement with First Responder Communities of Practice by the DHS Operational Components (e.g., FEMA, NPPD, Coast Guard, USSS, etc.) (FY 2016/ 2017).
- Support and enhance the development of FRG presence on current and future social media pages (i.e., Facebook, Twitter, LinkedIn, Instagram, Storify, and YouTube) (FY 2016/ 2017).
- Develop FRG presence on current and future social media pages (i.e., Facebook, Twitter, YouTube, Instagram, etc.) with the intent of increasing traffic to FirstResponder.gov and providing information tailored for the first responder community (FY 2017)

D. Information Sharing and Interoperability – FY 2016: \$11.000 million. FY 2017 Request: \$10.967 million. This program creates an integrated information sharing architecture and links that architecture to interagency efforts to prevent terrorism while protecting privacy, civil rights, and civil liberties.

Alert, Warnings and Notifications

- *Problem:* The HSE needs to be able to quickly generate and receive meaningful AWN messages regarding potential, impending, or ongoing threats.
- *Solution:* The AWN initiative will advance the Wireless Emergency Alerts (WEA) Research, Development, Testing and Evaluation (RDT&E) Program initiatives to identify, develop and adopt common alerting protocols and open data exchange standards. This effort will assess the necessary Essential Elements of Information (EIs) for select Critical Infrastructure and Key Resource (CIKR) domains (e.g. Financial, Energy, Telecommunications) as well as specific threat information needs (e.g. Cyber) that could be enhanced within the existing Common Alerting Protocol (CAP) exchange standards for WEA.
- *Impact:* The AWN initiative will define a set of information needs and functional data exchange requirements for each of the prioritized CIKR domains which will allow federal agencies to better share accurate and actionable threat information, ultimately helping to save lives, protect property and ensure continuity of government.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Lower Colorado River Authority Phase 1 – Finalize LCRA system that feeds lake and potential flood conditions into a database.
- Develop Internet of Things (IoT) Low-Cost Flood Inundation Sensors
- Develop and conduct operational exercise within LCRA local areas with a focus on development, test, and evaluation of LCRA alert origination software. Emphasis will be placed on geo-targeted alerts, open center evaluation and sensor performance.
- Develop Governance/Policy/Technology guidelines and best practices.
- Develop an After Action Reports and Research Summary Report, highlight recommendations.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$550

Project Schedule Including Milestones

- Refine operational and technical requirements (FY 2017).
- Facilitate interactions between LCRA and DHS components--geospatial community, hazard modeling organizations, and early warning community (FY 2017).
- Develop strategy that uses automated sensors to trigger alerts to multiple level of users—city/local/State Officials (FY 2017).

- Develop interface to FEMA’s Integrated Public Alert and Warning System (IPAWS) (FY 2017).

Delayed Milestones

- N/A

Type of Research

Developmental

Technical Readiness Level

The program plans to begin at TRL6 and end at TRL7.

Transition Plans

- Discuss results of pilot with the Texas Department of Public Safety and Emergency Management and identify any issues involving policy or governance.
- Identify industry/private sector partners on the potential use of the technology for automobile alerting.

Communications Architecture Network Interoperability

- *Problem:* Interoperability across network platforms continues to be an issue for first responders across the HSE. While the increase in data and networks capable of handling more data can be beneficial; this increase and the creation of a multi-network environments is also creating additional interoperability challenges. There is a critical need to develop protocols and open standards to address these challenges.
- *Solution:* CANI will provide the framework for integrated networking solutions to ensure interoperable communication across all network platforms (e.g., Wi-Fi, commercial 4G LTE, FirstNet, and ZigBee). The initiative will focus upon the integration of communications applications, services, infrastructure (both fixed and deployable), standards and security embedded into operational shared-capabilities for the first responder community.
- *Impact:* The effort will focus on identifying and providing the network medium(s) best suited to meet the end user and their operational environment defined requirements. Responders will be able to seamlessly go from one network to another based on the most efficient and effective use of accessible secure networks. The primary focus areas will include: Security protocols for devices and applications; Mesh network standards for voice and data; Voice-2-Text transformation; and Low Earth Orbiting satellite Internet Protocol standards.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Create an IoT Test Bed requirement for addressing public safety capability gaps.
- Identify the "thing" to be connected (a connected car, a radiological sensor, or a license plate reader, etc.).
- Establish the network or infrastructure that provide the data conduit for the connected thing (wired or wireless).

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$500

Project Schedule Including Milestones

- Meet with Public Safety stakeholder groups, including federal, state, local and tribal agencies, to define scope and requirements for Machine to Machine (M2M) and other IP-based communications (FY 2017).
- Publish technical report providing findings and data (FY 2017).

Delayed Milestones

- N/A

Type of Research

Developmental

Technical Readiness Level

The program plans to begin at TRL5 and end at TRL6.

Transition Plans

- Support the development of interoperable communications network standards to provide M2M/IOT as a service for public safety.

Emergency Response and Management Tools for First Responders

- *Problem:* First responders often lack timely access to the information they need to operate safely and enhance their ability to save lives and protect property. Whether they are not sharing due to unfamiliarity with their response partners or because their systems are not interoperable, decisions are not made in the most effective and timely manner.
- *Solution:* Develop and transition to operational use the technologies required so that emergency managers and first responders will have the incident information they require when and how they need it. In addition, this project will provide the standard operating procedures, training, and governance needed to effectively and efficiently conduct response and recovery efforts from day-to-day incidents to large-scale emergencies, including visualization, geospatial and analytics technologies. Improve the ability of DHS and its HSE partners to quickly generate and receive, respectively, meaningful alert, warning and notification (AWN) messages regarding potential, impending, or ongoing threats to the Homeland.
- *Impact:* Increased safety of U.S. citizens and first responders, more effective incident response and recovery leading to fewer lives lost, decreased property damages, and increased national resilience from incidents of all types and scales.

Prior Year Key Events

- Refined and validated the Incident Management Information Sharing/Capability Maturity Model IMIS-CMM with practitioners and publish a guide for its application within a jurisdiction to assess and augment their information sharing capabilities.

- Assisted in publishing grant funding guidance for jurisdictional recipients to augment their capabilities to conform to FRG's IMIS-CMM.
- Finalized and validated the Public Safety Cloud strategy that addresses identity management issues and computer aided dispatch (CAD to CAD) jurisdictional interoperability for information sharing.
- Developed Next Generation Incident Command System (NICS) open source licensing agreement and post as open source software to GitHub for broader public safety community involvement and use.
- Identified, validated, and prioritized public safety technology gaps through the IMIS Subcommittee and work with private industry to develop and transition solutions for operational use and commercialization.
- Delivered and posted GIRA as wiki-like community sustainable guidance with the Program Manager Information Sharing Environment (PM-ISE) and the Federal Geographic Data Committee.
- With the PM-ISE, developed geospatial enhancements to the National Information Exchange Model (NIEM) incorporating security tagging elements.
- With the PM-ISE, in support of the ISA IPC, developed RFI and Alert, Warning and Notification (AWN) Report of Findings and Recommendations.

Current Year Key Events

- Identify, validate, and prioritize public safety technology gaps and work with the private industry to develop and transition solutions for operational use and commercialization through the IMIS Subcommittee.
- Provide recommendations to the PM-ISE recommending the adoption of open standards needed to meet requirements and fill gaps from the first responders community at all levels of government via the IMIS Committee.
- Initiate the Public Cloud infrastructure leveraging federal and industry capabilities as a community of practice collaboration environment.
- Develop Essential Elements of Information as core open data exchange requirements targeted to Public Safety community and establish as National Information Exchange Model (NIEM) standards.
- Incorporate NICS as a mobile application within the DHS Geospatial Information Infrastructure as an enterprise service homeland security community.

Budget Year Key Events

- Design, develop and deliver a Data component (as opposed to just voice) into the Capability Maturity Model (CMM) and Information Sharing Continuum (ISC) and vet with the First Responder community.
- Perform a CMM / ISC adoption and assess review of select State and local first responder stakeholders to evaluate operational readiness and maturity to determine gaps and requirements for S&T FRG.
- Enhance and maintain the NICS open source code on GitHub and provide bi-annual open source code releases.
- Perform 2 updates to the NICS functionality within the DHS Geospatial Information Infrastructure (GII).
- Assess, prototype and test 2 new IoT sensor capabilities integrated within the Next Generation First Responder Apex Program Spirals.
- Integrate Unmanned Aerial Systems (UAS) and sensor identification and tracking capabilities with the NGFR Apex Program Spirals.
- Assess, prototype and test an enhanced Heads up Display functionality for integration with the NGFR Apex Program Spirals.
- Develop proof of concept for IoT Low-Cost Flood Inundation Sensor.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$2,673	\$6,953	\$2,000	\$3,000	\$4,000	\$4,206

Project Schedule including Milestones

- Deploy information sharing Capability Maturity Model (CMM) and Information Sharing Continuum (ISC) to First Responder community of practices for assessing operational readiness maturity (FY 2016).
- Design and initiate the Public Cloud infrastructure leveraging federal and industry capabilities as a community of practice collaboration environment (FY 2016).
- Develop Essential Elements of Information as core open data exchange requirements targeted to Public Safety community and establish as National Information Exchange Model (NIEM) standards (FY 2016).
- Incorporate NICS as a mobile application within the DHS Geospatial Information Infrastructure as an enterprise service homeland security community (FY 2016).
- Deploy NICS to the Federal sponsored GitHub as open source for broad first responder community deployment and adoption (FY 2016).
- Incorporate NICS within DHS Geospatial Information Infrastructure enterprise capability (FY 2016).
- Provide technical and governance support to the National Information Sharing Consortium user consortium (NISC) to advance First Responder awareness and adoption of S&T initiated services and capabilities (FY 2016).
- Deploy the S&T developed Geospatial Interoperability Reference Architecture (GIRA) on the Federal interagency Geospatial Platform as a community-based interactive reference architecture
- Enhance the DHS enterprise Request for Information (RFI) tool as Border Situational Awareness Apex Program tool for CBP and state law enforcement officials (FY 2016).
- Assess Internet of Things (IoT) sensor integration open standards (FY 2016).
- Develop Internet of Things (IoT) sensor integration open standards (FY 2016).
- Integrate Internet of Things (IoT) sensor integration open standards (FY 2016).
- Demonstrate Internet of Things (IoT) sensor integration open standards (FY 2016).
- Integrate UAS sensor subsystems for communications, indoor location and hazard detection. Test and evaluate with First Responder Search and Rescue stakeholders (FY 2016).
- Establish and execute an interagency and public sector Identity Credential Access Management (ICAM) Working Group to advance First Responder voice and data communications secure access (FY 2016).
- Design, develop and deliver a Data component (as opposed to just voice) into the Capability Maturity Model (CMM) and Information Sharing Continuum (ISC) and vet with the First Responder community (FY 2017).
 - Perform a CMM / ISC adoption and assess review of select State and local first responder stakeholders to evaluate operational readiness and maturity to determine gaps and requirements for S&T FRG (FY 2017).
 - Enhance and maintain the NICS open source code on GitHub and provide bi-annual open source code releases (FY 2017).
 - Perform 2 updates to the NICS functionality within the DHS Geospatial Information Infrastructure (GII) (FY 2017).

- Assess, prototype and test two new IoT sensor capabilities integrated within the Next Generation First Responder Apex Program Spirals (FY 2017).
- Integrate Unmanned Aerial Systems (UAS) and sensor identification and tracking capabilities with the NGFR Apex Program Spirals (FY 2017).
- Assess, prototype and test an enhanced Heads up Display functionality for integration with the NGFR Apex Program Spirals (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

The program plans to begin at TRL5 and end at TRL6

Transition Plans

- Develop transition plan for product to market for the SBIR Phase 3 for IoT Low-Cost Flood Inundation Sensor

Interoperability and Compatibility Standards

- *Problem:* The proliferation of new technologies makes it difficult for first responders to communicate with each other during emergencies. In addition, equipment manufacturers often use different technical approaches that leave their products incompatible.
- *Solution:* Identify and accelerate the development of standards essential to ensure that new technologies are interoperable as well as develop testing standards and promote the use of compliance documentation so first responder agencies can make good decisions about new technologies.
- *Impact:* These new and strengthened standards will help first responders to make smart choices of new technologies so they will be interoperable and can migrate successfully to the new nationwide public safety broadband network without putting a \$7 billion national investment at risk.

Prior Year Key Events

- Worked with Accreditation Bodies and P25 CAP Laboratories to develop the DHS OIC – P25 CAP Laboratory Policy documents.
- Updated the P25 CAP Advisory Panel (formerly known as the Governing Board) Charter.
- Transitioned the P25 CAP web site from the FEMA Lessons Learned Information Sharing site to FirstResponder.gov.

Current Year Key Events

- Reconvene the P25 CAP Advisory Panel (formerly known as Governing Board) under the existing Charter.
- Update the P25 CAP Advisory Panel (formerly known as Governing Board) Charter.
- Draft Local Control Requirements document.
- Add P25 Common Air Interface Conventional Interoperability Tests to the program.

Budget Year Key Events

- Leverage 3rd Generation Partnership Project specifications and other appropriate standards development organizations to identify and prioritize first responder broadband requirements and develop solutions for locally deployed applications.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	\$4,112	\$2,000	0	\$3,000	\$1,505

Project Schedule including Milestones

- Establish and convene the P25 CAP Advisory Panel (formerly known as Governing Board) (FY 2016).
- Update the P25 CAP Advisory Panel (formerly known as Governing Board) Charter (FY 2016).
- Develop Local Control technical report to demonstrate proof of concept of local control applications and open API (FY 2016).
- Add P25 Common Air Interface Conventional Interoperability Tests to the program (FY 2016).
- Develop first responder data interoperability standards for the nationwide public safety LTE network (FY 2016).
- Oversee P25 processes to help leadership group maintain effective user input of features and functionality requirements into the Telecommunications Industry Association (TIA) Technical Report-8 Committee (FY 2016).
- Leverage 3rd Generation Partnership Project specifications and other appropriate standards development organizations to identify and prioritize first responder broadband requirements and develop solutions for locally deployed applications (FY 2016).
- Obtain accreditation for all participating P25 CAP laboratories by international accreditation body partners (FY 2017).
- Accelerate the development of first responder interoperability standards for the nationwide public safety Long Term Evolution (LTE) network (FY 2017).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

N/A

Transition Plans

- P25 CAP will continue to update the test requirements to include P25 CAP interoperability, performance, and conformance testing so that first responder agencies can make more confident acquisition decisions for their P25 systems. Additionally, this program will continue to focus on

public safety broadband requirements as a means to accelerate the development of common standards and in an effort to enhance interoperability and compatibility among broadband systems.

Wireless Communications

- *Problem:* Technologies capable of bridging disparate but essential communications systems are not currently available, making it difficult for first responders to communicate with each other during emergencies.
- *Solution:* Conduct viable research, development, testing, and evaluation to develop capabilities to ensure first responders are able to communicate regardless of the type of network they are on.
- *Impact:* This project provides a critical testing and evaluation capability for first responders to gain knowledge on how communication devices work on broadband networks and determine how the systems will meet user needs. This project brings together public safety practitioners, Federal partners, manufacturers, and representatives of standards making bodies to improve the way in which video and other technologies serve the public safety community.

Prior Year Key Events

- Completed technical demonstrations for remaining two wireless broadband technology demonstrator solutions.
- Developed and implemented usage scenarios and metrics for the evaluation of Proximity Services (PROSE) according to the 3rd Generation Partnership Project (3GPP) evaluation methodology.
- Developed PROSE modeling and analysis framework to study the functionality defined by 3GPP Release 12.
- Developed final version of mobile application security services to support public safety’s mobile application survey report.
- Developed final version of mobile authentication solutions for different public safety disciplines survey report.

Current Year Key Events

- Conduct field demonstrations for one wireless broadband technology demonstrator solutions.
- Conduct tabletop exercise for two wireless broadband technology demonstrator solutions.
- Create extended simulation models to support additional PROSE functionality.
- Contribute results to 3GPP Release 13 & 14.
- Publish results in professional conference proceedings and journals.

Budget Year Key Events

- Identify and prioritize user challenges and requirements with the first responder community
- Develop realistic network simulation tools and interference models for cellular network planning.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$2,676	\$5,587	\$8,500	\$5,338	\$4,000	\$4,206

Project Schedule including Milestones

- Create extended simulation models to support additional PROSE functionality.
- Contribute PROSE model results to 3GPP Release 13+ (FY 2016).
- Publish PROSE results in professional conference proceedings and journals (FY 2016).
- Publish final report on extended cell testing on a 280 meter site (FY 2016).
- Complete Phase I report for two of three wireless broadband technology demonstrator solutions (FY 2016).
- Develop field measurement method by which public safety can evaluate indoor broadband coverage in Band 14 (FY 2016).
- Complete wireless broadband technology demonstrator Phase I reports (FY 2016).
- Utilize Band Class 14 LTE Test Network to test, evaluate, and demonstrate new features, services, and technologies that can be integrated into the public safety broadband network FY 2017 Q3).
- Conduct test pilot using wireless communications technologies (e.g., sensors) to help first responders meet their mission needs (FY 2017 Q4).

Delayed Milestones

None

Type of Research

Developmental

Technical Readiness Level

N/A

Transition Plans

- The maintenance of a 700MHz broadband demonstration network capable of providing first responders with a test environment, as FirstNet creates a nationwide public safety broadband network, will remain a critical resource for testing and evaluating technology solutions. In addition to aiding first responders through publishing of test results, this project will also develop knowledge products to better inform stakeholders about the state of the art technologies.
- Provide the Department of Homeland Security, including CBP up to three prototypes for public safety and DHS operational components to consider, allowing them to leverage their existing land mobile radio (LMR) assets and augment them with broadband/smart device capability.
- Publish a lessons learned document on public safety broadband performance and impacts after live test and evaluation.

E. Natural Disaster Resiliency – FY 2016: \$9.750 million. FY 2017 Request: \$13.752 million. This program develops and provides advanced planning, CONOPS, disaster management tools, and training aids for responding to and recovering from a large-scale natural disaster. This includes providing assistance to the private sector to design greater resilience for critical infrastructure and providing DHS with more robust tools for disaster response, disaster logistics, individual and public assistance programs, and national continuity programs.

Cyber Physical Security

- *Problem:* Cyber-Physical Systems (CPS) have enabled dramatic increases in productivity and efficiency in sector operations, resulting in their widespread proliferation in the Nation's Critical Infrastructure (CI). The increased integration of CPS into many critical physical infrastructure and systems including, electric, water, transportation, and more, has introduced new and unknown possible vulnerabilities within single and potentially across multiple systems. CPS components and capabilities are now embedded in a highly complex networked, web of systems with vast interdependencies within and across CI sectors. The consequences of both unintentional failures and malicious attacks could have severe impacts on national security, community functionality, human health and the environment.
- *Solution:* S&T has a principal goal of identifying and investing in technological solutions that can be transitioned to industry and DHS operational components to provide leap-ahead capability and mission improvements. Within the CPS mission space, S&T's goal is to coordinate and invest in solutions that enable systems that are trusted, hardened, and able to recover from large-scale failures. Project solutions align with government missions and present the highest risk to safety and security. Aligning to Presidential Policy Directive 21, S&T will directly fund efforts that target challenging problems faced by specific or multiple sectors that emphasize technology transition of usable products. DHS recognizes that different sectors are at varying stages and engages individual sectors based on industry and component requirements and S&T's assessment of where its investment can have the greatest impact.
- *Impact:* S&T investments in CPS, in conjunction with other Federal agencies and Industry efforts, will marshal applied R&D initiatives to achieve: enhanced security in CPS practices and designs; enhance capabilities to detect, defend, and mitigate threats related to CPS; explore recovery and reconstitution areas; and explore the development of countermeasures that will fundamentally change the way CPS risk and security is considered today. DHS intends to anticipate and combat evolving CPS threats in near-term applications as well as over the long-term.

Prior Year Key Events

- Developed initial overarching architecture for CPS analysis and experimentation with high priority sectors.
- Developed pilot plans for engaging the energy and water sector.

Current Year Key Events

- Engage key stakeholders in transportation (automotive and maritime), healthcare, and building controls.
- Develop pre-competitive research consortium with key sectors the automotive industry
- Develop systems for securely delivering firmware updates for cyber physical systems, including automobiles.

Budget Year Key Events

- Complete yearly oil and gas sector research project report and present findings to oil and gas industry. Finalize requirements for future oil and gas CPS projects
- Update firmware prototype for securely updating automobiles.
- Security framework for risk assessment of medical devices.
- Threat assessment and best practice recommendations for building control security.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
\$1,638	\$1,788	\$8,242	\$7,750	\$7,750	\$6,165

Project Schedule Including Milestones

- Complete yearly oil and gas sector research project report and present findings to oil and gas industry. Finalize requirements for future oil and gas PCS projects (FY 2017).
- Update firmware prototype for securely updating automobiles (FY 2017)
- Security framework for risk assessment of medical devices (FY 2017)
- Threat assessment and best practice recommendations for building control security (FY 2017)

Delayed Milestones

N/A

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects

Transition Plans

- Close communication and coordination have been established and will be maintained throughout the entire project with DHS NPPD.
- Solutions will be developed that are practical and able to be integrated into current systems and operations.
- Beta testing and evaluation opportunities will be investigated and determined early on and agreements will be made with partners for such.
- Once development is completed, maintaining the relationship will ensure that the developed product is acceptable and desired by the owners and operators and will be put into operation to increase security and resilience of critical infrastructure.

Regional Resilience Assessment in the Critical Infrastructure

- *Problem:* Vulnerability assessments provide a region with an awareness of threats and potential consequences from an all hazards perspective. These assessments help regions to prioritize resilience measures and mitigation strategies in order to be better prepared for disasters and ensure continuity of services for the community. Currently, the regional vulnerability assessments are conducted manually, take over a year per assessment, and are not scalable and/or repeatable.
- *Solution:* Automate the manually intensive Regional Resilience Assessment Program (RRAP), use modeling and simulation to scale the analysis of larger set of all hazard scenarios, and accelerate the national implementation of the system by transitioning capabilities from one region to another. This capability will mitigate the Nation’s risk of loss of life and physical and economic damage from natural and manmade hazards by 1) accessing critical infrastructure on a regional level, focusing on threats, vulnerabilities, and consequences from an all-hazards perspective, 2) assessing the status of the integrated preparedness and protection capabilities of critical infrastructure owners and operators,

local law enforcement, and emergency response operations, and 3) coordinating protection and response efforts to enhance resilience and address security gaps within the geographic region.

- *Impact:* The automated capability will be faster, more efficient, scalable, and will support many regions in a shorter time thereby instituting a higher level of resilience across communities in the nation. The capability will also help to establish measurable metrics to gage resiliency and determine a usable and common lexicon and/or reusable metadata so that RRAP analysis can become reusable by many stakeholders or SLTTs.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Provide Leave-behind, intuitive tools for monitoring and further analysis.
- Develop categorization of infrastructure configurations to generalize findings, improve site selection & diversity.
- Develop metrics for dependence, complexity, etc. that enable improved decision-making and monitoring.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$620

Project Schedule Including Milestones

- Provide Leave-behind, intuitive tools for monitoring and further analysis (FY 2017).
- Develop categorization of infrastructure configurations to generalize findings, improve site selection & diversity (FY 2017).
- Develop metrics for dependence, complexity, etc. that enable improved decision-making and monitoring (FY 2017).

Delayed Milestones

N/A

Type of Research

Developmental

Technical Readiness Level

The program plans to start at TRL2 and end at TRL 4.

Transition Plans

- Knowledge products and decision support tools will be transitioned to NPPD Office of Infrastructure Protection, Protective Security Coordination, for incorporation into their assessment methodologies and supporting tool suites.

Critical Infrastructure Supply Chain Interdependencies with NPPD and PPD-21

- *Problem:* Critical infrastructure is vital to our national security, economy, public health and well-being, has become increasingly global, complex, and susceptible to disruptions. DHS needs enhanced awareness of potential disruptions the ability to design in flexibility and resilience to mitigate the effects of such disruptions. Current risk assessment and management approaches often do not incorporate all relevant linkages, such as sector interdependencies and cybersecurity risk factors. As a result, formulate risk-informed designs that can incorporate proactive resilience remains a challenge. Such things as cyber intrusions, natural hazards, and a range of human factors, including inadvertent errors and malicious acts, affect resilience of critical infrastructure systems.
- *Solution:* Consistent with the National Critical Infrastructure Security and Resilience R&D Plan, develop the technical basis and analytical tools needed to support cross-domain risk assessment and identify standards of practice to support the expanded use of risk methodologies for cyber and physical systems and response planning. Work with NPPD, sector, and international partners to build on existing risk assessment tools and platforms to incorporate sector and cross-border interdependencies.
- *Impact:* The global economy has become increasingly dependent on complex systems and the infrastructure that supports them. The efficiency and reliability of these interconnected systems is an important element for maintaining American competitiveness. Enhancing and making these new risk assessment tools available to a wider user group will enable design and implementation of more effective measures to monitor and adapt critical infrastructure systems and increase resilience. Critical infrastructure will be more flexible, less susceptible to disturbances, and able to recover and resume the needed level of functionality more quickly after impacting events.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Review existing tools and methodologies for assessing risk to critical infrastructure systems.
- Examine sector and other interdependencies affecting system resilience.
- Work with NPPD, sector, and international partners to build on existing tools and platforms.

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$1,299

Project Schedule Including Milestones

- Review existing tools and methodologies for assessing risk to critical infrastructure systems (FY 2017).
- Examine sector and other interdependencies affecting system resilience (FY 2017).

-
- Work with NPPD, sector, and international partners to build on existing tools and platforms. (FY 2017).

Delayed Milestones

None

Type of Research

Applied

Technical Readiness Level

TRL will vary between specific portfolio projects

Transition Plans

- Tools and methodologies will be shared with other organizations, such as NPPD, sector, and international partners, to improve the formulation of risk-informed designs that can incorporate proactive resilience and improve DHS's awareness of potential disruptions.

Aging Infrastructure Modernization and Resilience

- *Problem:* Changes and reductions in infrastructure stability and performance capabilities due to aging are not quantitatively measureable, and verified methods and materials to increase resiliency are not fully developed. Performance level, function life, and best options and cost for mitigation of impacts are complicated by increased extreme weather events and climate changes being experienced and expected to increase. Local and State communities do not have sufficient information and risk/resilience decision support processes that effectively incorporate extreme weather, climate change, and aging effects on critical infrastructure in order to identify and prioritize modernization actions within their budgets. The business case for modernization in the face of climate change is weak compared with other compelling and pressing objectives in budgets; hence a business case for prioritizing when, what, and how to modernize is needed.
- *Solution:* 1) Develop easy to use network models of lifelines and quantitative ways to assess changes in infrastructure materials and system designs as a result of aging and weather and climate impacts. 2) A database of past performance, down time, and reliability of lifeline and supply chains to a city or critical manufacturer and demonstrate the network tool as an effective investment decision support informer. 3) a quantitative way to assess the change in infrastructure materials and systems design as a result of aging and cost effective inspection and monitoring equipment and 4) the business case for modernization in light of climate change and other new requirements for critical infrastructure such as resilience and sustainability. It will also include ways to quantify benefits both to public and social good as well as profit for the companies or owners involved for decisions on retrofit or construction methods that increase resiliency.
- *Impact:* This project will provide State, locals, and private industry with economic and engineering tools, information, and monitoring equipment to assess their infrastructure, anticipate new risks from changing climate and sustainability requirements, and prioritize potential investments for new construction and retrofit of existing infrastructure informed by the best science and engineering available at this time. These developments will better position the nation to achieve increased resilience by empowering the major investors in critical infrastructure to take informed action towards these national goals.

Prior Year Key Events

- N/A

Current Year Key Events

- N/A

Budget Year Key Events

- Expand/extend network of technical experts and stakeholders (e.g., NOAA, USCG, and more Tribal participation) to increase transparency and increase quality of existing and future data exchanges
- Establish a balanced well Council of Federal, State, local, and tribal participants and ensure funding is well-adjusted to accomplish identified tasks. Continue to work with White House Task Force in order to meet proposed targets and objectives within the Council

Funding History (thousands)

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	N/A	N/A	\$517

Project Schedule Including Milestones

- Identify opportunities to transition tools and technologies to end-users (FY 2017).
- Expand/extend network of technical experts and stakeholders to increase transparency and increase quality of existing and future data exchanges (FY 2017).

Delayed Milestones

- N/A

Type of Research

- Applied

Technical Readiness Level

Currently at TRL2.

Transition Plans

- Transition plan will establish and formalize a council of Federal, national laboratories, and private sector experts, including representatives from the White House National Security Council to analyze infrastructure vulnerabilities/disruptions from climate-related hazards and to implement potential areas of research and development in related topic areas. This will result in a long-term DHS advisory council that will address existing/future capabilities necessary to ensure involvement with all-levels of communities, including region/state/local levels and address gaps within current approaches and proper implementation of cost effective mitigation efforts.

National Hurricane Program Technology Modernization

Project Description/Justification/Scope

- *Problem:* FEMA's National Hurricane Program, mandated by *Post-Katrina Emergency Management Reform Act of 2006* (PKEMRA), provides hurricane evacuation preparedness technical assistance to State, local, and tribal governments, including the preparation of hurricane evacuation studies and technical assistance in developing evacuation plans, assessing storm surge estimates, establishing evacuation zones, evacuation clearance times, transportation capacity, and shelter capacity. In 2015, the National Hurricane Program (NHP) Technology Modernization effort began working closely with the Federal Emergency Management Administration (FEMA) and state and local Emergency Managers to improve advanced planning and real-time decision support for hurricane response. Major advances include upgrades to the existing Hurricane Evacuation Planning Tool called HURREVAC to a next generation decision support platform called HURREVAC-extended (HV-X). The new HV-X system includes evacuation decision support tools and products that will increase capabilities, preparedness and efficiency in emergency management decisions making during planning and execution of evacuations. However, these new capabilities still need to be transitioned to operations, and monitored for reliability. In addition, extensions to HV-X enable by this new technology are potential drivers of new efficiencies.
- *Solution:* This project will assist in the transition by monitoring HV-X and providing fixes to any problems that are discovered. In addition, with HV-X in place, a new mobile capability for disseminating and monitoring evacuation decisions can be moved to operations. The Local Evacuation Alert Verification (LEAV) mobile application alerts users based on GPS location if they are in an active evacuation zone. Users may also provide feedback as to their plans for responding. The Hurricane Evacuation Study (HES) modularization and automation provides a platform for improving the individual components of the HES. The Real Time Evacuation Planning Module (RtePM), which estimates the time required for evacuating vehicles, requires a series of improvements to increase its accuracy and verification analyses to improve user acceptance. Finally, a key component missing from NHP has been enabling users to monitor evacuation progress based on real-time data. This project will explore the use of real-time traffic conditions to measure evacuation progress relative to the timing produced in the HES and through RtePM. Other product needs may also be found and explored as the HV-X becomes utilized by more emergency managers.
- *Impact:* Transitioning and extending the HV-X to operational use should reduce the need for legacy software efforts, while also creating opportunities for new efficiencies and improvements in the NHP. The NHP will use these system enhancements to significantly improve the ability of the users to evaluate hurricane hazards, the forecast process, hurricane advisories, warnings and other key information products emergency management actions such as hurricane evacuation decisions and orders.

Prior Year Key Events

- Completed the technology gap analysis for existing National Hurricane Program.
- Developed pilot products as examples of improved HES capabilities, serious gaming for training, and for exploring storm surge data.
- Formed the NHP Working Group of FEMA managers, subject matter experts, and local and state emergency managers.

Current Year Key Events

- Deliver the initial operating capability of a new integrated decision support platform called HV-X. The integration improves not only the real-time decision support for EMs but also extends the platform to include innovative training capabilities and highly efficient planning tools for HES.
- Held NHP Working Group every 2-3 months to provide guidance on new features and products.
- Develop a unified Hurricane Evacuation Studies module for HV-X.
- Build immersive training and serious gaming tools for HV-X.
- Develop new emergency manager specific products and interfaces to improve decision making.

Budget Year Key Events

- Side-by-side testing of HV-X 2.0 with legacy HURREVAC system.
- Monitor and perform maintenance as necessary on HV-X.
- Provide opportunities for user to provide feedback and comments on HV-X and explore new opportunities as part of regular User Group meetings.
- Perform verification studies on RtePM software and implement upgrades based on FY 2015 analysis.
- Develop the LEAV application so that it can become an operational capability.
- Ingest and display real-time traffic into HV-X and utilize that data to provide feedback on evacuation progress.
- Extend the technical breadth of the immersive training and gaming modules.

Funding History

FY12	FY13	FY14	FY15	FY16	FY17
N/A	N/A	N/A	\$1,000	\$1,000	\$1,000

Project Schedule Including Milestones

- Deliver improvements to RtePM traffic model (FY 2017 Q1).
- Provide real-time traffic data and module for monitoring evacuation progress (FY 2017 Q3).
- Deploy LEAV application in regional setting (FY 2017 Q3).
- Operate and monitor the functional prototype during Hurricane Season side-by-side with legacy system, make improvements as necessary (FY 2017 Q1-Q4).
- Transition HV-X to O&M provider (FY 2017 Q3-Q4).

Delayed Milestones

- N/A

Type of Research

Development

Technical Readiness Level

The program plans to start at TRL4 and end at TRL7-8.

Transition Plans

- Develop transition agreements with FEMA ORR.
- Conduct side-by-side comparisons of HV-X with legacy systems.
- Operate HV-X prototype in operational environments.

**Department of Homeland Security
Science and Technology
Research, Development and Innovation
Justification of Program Changes**

Funding Profile

Program Increase/Decrease 1: Apex, Border Security, Cyber Security/Information Analysis \$36,800; CBE Defense, Counter Terrorist, First Responders/Disaster Resilience (-\$43,326)
PPA: Research, Development and Innovation
Program Decrease: _Positions 0, FTE 0, Dollars (\$6,526)

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request		
	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)
Program Increase: Apex - Research, Development and Innovation							-	-	\$6,337
Program Increase: Border Security - Research, Development and Innovation							-	-	\$23,839
Program Increase: Cyber Security/Information Analysis - Research, Development and Innovation							-	-	\$6,624
Subtotal, Program Increases							-	-	\$36,800
Program Decrease: CBE Defense R&D - Research, Development and Innovation							-	-	(\$19,684)
Program Decrease: Counter Terrorist - Research, Development and Innovation							-	-	(\$9,379)
Program Decrease: First Responders/Disaster Resilience - Research, Development and Innovation							-	-	(\$14,263)
Subtotal, Program Decreases							-	-	(\$43,326)
Total Program Changes							-	-	(\$6,526)
Total Request									\$436,860

DESCRIPTION OF ITEM:

The overall program decrease of \$6.526 million is the result of the following:

Program Increases

The program increase of \$6.337 million for Apex provides additional funding for the portfolio. Apex increased funding will enable additional work within the Apex Screening at Speed program, specifically for novel technology solutions to increase throughput and detection capabilities and develop integrated screening system architecture.

The program increase of \$23.839 million for Border Security provides funding for the Cargo and POE Security, Land Border Security and Maritime Border Security program areas. In FY 2017, S&T will expand efforts in People Screening efforts to introduce process and technology improvements to CBP traveler inspection operations in order to strengthen traveler vetting and facilitate lawful and legitimate travel in support of the President's National Travel and Tourism Strategy. S&T will also increase efforts in Port and Coastal Surveillance to improve operational effectiveness and enhance maritime domain awareness.

The program increase of \$6.624 million in Cyber Security/Information Analysis provides additional funding for the Trustworthy Cyber Infrastructure program. Increased funding in Cyber Security/Information Analysis enables additional work in the Internet Measurement and Attack Modeling project to develop new tools and techniques for mapping several layers of the Internet to detect and mitigate malicious behavior.

Program Decreases

The program decrease of \$19.684 million to CBE Defense impacts the Bioagent and Explosives Detection program areas. The decreased funding under CBE Defense is the result of the Integrated Passenger Screening Systems project ending in FY 2016 and the completion of several activities under the Biosurveillance Systems project in FY 2016. In addition, S&T will reduce funding in the GPS Vulnerability project.

The program decrease of \$9.379 million to Counter Terrorist is the result of the transfer to the new CBRNE Office.

The program decrease of \$14.263 million to First Responder/Disaster Resilience is within the Natural Disaster Resiliency program area. Decreased funding under First Responder/Disaster Resilience is the result of projects being completed in FY 2016; Resilient Structures and Facilities, and the Standard Unified Modeling Mapping Integrated Toolkit (SUMMIT).

Impact on Performance:

For the Apex program, improved detection probabilities and reduced false alarms will translate to fewer secondary inspections meaning lower per-passenger costs for TSA. This will also lessen inconvenience for airline passengers and improve customer service. Increased funding in Border Security R&D provides technologies and solutions to prevent the illicit movement and illegal entry or exit of people, weapons, dangerous goods, and contraband, and manage the risk posed by people and goods in transit. Increased funding in Cyber Security R&D provides security for the building blocks that comprise the infrastructure of the Internet such as routers and routing protocols. This nominal increase will help identify malware, botnets, and other methods of attack.

The program decrease in CBE Defense and First Responder/Disaster Resilience will have no impact on S&T performance because projects will be completed in FY 2016. The CBRNE transfer also does not impact program performance impact, since the functions are transferring to the new CBRNE office. S&T will focus available resources on projects most critical to DHS operating Components and first responders.

**Department of Homeland Security
Science and Technology
Research and Development
Research, Development and Innovation**

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 ¹ Revised Enacted				FY 2016 Enacted				FY 2017 Request				FY 2016 to FY 2017 Change			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission
*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

NARRATIVE EXPLANATION OF CHANGES – PAY COST DRIVERS:

- **FTE Change FY 2016-2017:** The FTE decrease is due to the transfer of four FTEs in support of the CBRNE Office.
- **PCB Change FY 2016-2017:** The cost change is due the FY 2017 pay increase and the annualization of the FY 2016 pay raise.
- **Average Cost Change FY 2016-2017:** An increase of \$290,000 in pay is attributed to the annual FY 2017 pay increase of 1.6 percent and annualization of the FY 2016 pay raise. In addition there is a transfer of four FTEs in support of the CBRNE Office, a reduction of \$884,000, thereby resulting in an overall pay decrease of \$593,000.

**Department of Homeland Security
Science and Technology
Research, Development and Innovation**
Cost Drivers (Non-Pay) - PPA Level (\$000s)

Appropriation - Research, Development and Innovation	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Advisory and Assistance Services	\$26,094	\$26,094	\$26,094	-
Travel	\$1,601	\$1,601	\$1,601	-
Research and Development Contracts	\$403,577	\$403,488	\$386,058	(\$17,430)
Grants, subsidies	\$1,966	\$1,966	\$1,966	-
Total	\$433,238	\$433,149	\$415,719	(\$17,430)

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

NARRATIVE EXPLANATION OF CHANGES – NON-PAY COST DRIVERS:

- **Advisory and Assistance Services Cost Change FY 2016-2017:** There are no cost changes in management and support services for R&D activities.
- **Travel Cost Change FY 2016-2017:** There are no cost changes in travel funding for federal employees supporting the R&D programs.
- **Research and Development Contracts Cost Change FY 2016-2017:** A decrease of \$17.4 million in R&D contracts from FY2016 to FY2017. \$7 million of the identified decrement is for the program funding moved for the CBRNE Office. The remaining \$10.4 million is a reduction in funding from the FY 2016 Enacted budget to the FY 2017 Request.
- **Grants, subsidies Cost Change FY 2016-2017:** N/A.

**Department of Homeland Security
Science and Technology
Research and Development
University Programs**
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)

University Programs		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	-
Base	FY 2016 Enacted	-	-	-
Current Services	Annualization of FY 2016 Pay Raise	-	-	6
	FY 2017 Pay Increase	-	-	21
	Transfer from M&A to Research & Development- UP	10	10	1,897
	Transfer from RDA&O- UP to Research & Development- UP	-	-	39,433
Program Changes	University Programs	-	-	(8,348)
Budget Year	FY 2017 Request	10	10	33,009
	Total Change from FY 2016 to FY 2017	-	-	(8,612)

PPA DESCRIPTION: University Programs

The Office of University Programs (OUP) supports critical homeland security-related research and education at U.S. colleges and universities to address high-priority DHS-related issues and to enhance homeland security capabilities over the long term. The program brings together scientists, mathematicians, and engineers from many academic disciplines and institutions. These researchers are investigating research questions important to DHS as well as developing new technologies and approaches to solve complex and challenging homeland security problems. The program focuses on building homeland security expertise in the academic community, creating strategic partnerships among universities, commercial interests, and public agencies, and developing a new science and engineering workforce dedicated to homeland security. The primary customers for OUP are S&T Directorate's divisions, DHS Components, and Federal, State, and local government agencies.

The S&T Directorate requests 10 positions, 10 FTE, and \$33.009 million for University Programs in FY 2017, a decrease of \$8.612 million from FY 2016. The 10 FTE conduct program management, execution, oversight, and analysis for S&T programs. The \$8.348 million decrease eliminates those COEs scheduled for recompetition in FY 2017.

Salaries and Benefits- FY 2016: \$1.897 million. FY 2017 Request: \$1.924 million. Research and Development appropriation request includes salaries and benefits related to 10 FTE, in support of University Programs at S&T. The 10 FTE conduct program management, execution, oversight, and analysis for S&T programs.

Centers of Excellence- FY 2016: \$27.604 million. FY 2017 Request: \$27.709 million. The Centers of Excellence (COEs) work with the S&T Directorate, the DHS Components, and State, local, and tribal first responders. COE research complements existing DHS R&D programs including those of Federal laboratories and Federally Funded Research and Development Centers (FFRDCs). The COEs take advantage of other relevant Federal agency-sponsored research and provide outcomes useful to Federal, State, and local governments, the private sector, and international partners. The selection process for the COEs is highly competitive, rigorously peer-reviewed, and merit-based.

The COEs are funded through research cooperative agreements, grants, and contracts, depending on the nature of the projects. The COEs are building expertise and reach-back capabilities in multi-disciplinary fields of study important to homeland security.

Research focuses on:

1. Areas identified as priorities in the QHSR
2. Research that is clearly within DHS's purview and closely related to DHS missions
3. Research that is not being done elsewhere
4. Research that can make a difference in operations or intelligence-gathering

OUP plans to fully fund the highest priority COEs. In addition, OUP will compete three COE topic areas addressing high priority DHS research and pilot a training institute (Quantitative Analytical Training Center). OUP will provide the final, partial year of funding to four COEs with periods of performance ending in FY 2016. This will provide newly awarded COEs with the resources required to successfully launch and to enable COEs whose grant terms are continuing beyond FY 2016 to operate at full capacity. OUP plans to continue transition-related activities, increasing resources dedicated to COE flagship End-to-End projects – larger research efforts with particular emphasis on end-user engagement from inception to product use. In addition, OUP also plans to launch three new COE topic areas addressing high priority DHS research areas.

Center for Border Security and Immigration

This Center will improve the capabilities of CBP, ICE, USCIS, USCG, and other Federal, State and local agencies to detect people and goods moving across U.S. borders (legally or illegally), using a fully integrated, system-of-systems approach. The Center will provide fundamental research in support of DHS's border security and immigration mission goals, including securing the border; facilitating lawful international trade and travel; effectively enforcing our immigration and customs laws; granting immigration and citizenship benefits; promoting an awareness and understanding of citizenship; and, ensuring the integrity of our immigration system.

Center for Awareness and Localization of Explosives-Related Threats (ALERT)

ALERT provides basic explosives-related research to advance the technical tools and information that the S&T Directorate's customers will need in the future. This Center supports the NPPD Office of Infrastructure Protection (OIP) and Office for Bombing Prevention (OBP), DHS Office of Policy, TSA, ICE, State homeland security agencies, and State and local police bomb squads by providing research and training to prepare for, prevent, mitigate, respond to, and recover from terrorist attacks involving explosives. This Center is led by Northeastern University (<http://www.northeastern.edu/alert/>).

Maritime and Arctic Security Center of Excellence (MASC)

This Center, awarded in FY 2014, conducts research and develops education to enhance USCG, CBP, FEMA, and State homeland security agencies' ability to detect and interdict threats, respond to catastrophic events, and secure marine transportation systems, particularly for U.S. ports,

islands, and extreme environments. This Center is co-led by the University of Alaska-Anchorage (Arctic security) and Stevens Institute of Technology (<http://www.stevens.edu/csr/>) (Atlantic, Pacific and Gulf maritime security). Formerly the Center of Excellence for Maritime Research (CMR).

Center of Excellence for Coastal Resilience (CRC)

This Center conducts research and education to enhance the Nation's ability to safeguard people, infrastructure and economies from coastal natural disasters such as floods and hurricanes. It also considers the impact of future climate trends on coastal resilience. This work directly addresses key challenges associated with growing coastal vulnerability and assists FEMA, U.S. Coast Guard, NPPD and local communities in coordination with NOAA, USACE, NIST, HHS, EPA and other Federal, state and local public and private sector partners. This Center is led by The University of North Carolina at Chapel Hill in partnership with Jackson State University in Jackson M.S. (<http://coastalhazardscenter.org/coastal-resilience-center-july-2015/>).

Center of Excellence for Critical Infrastructure Resilience Institute (CIRI)

This Center will conduct research and education to enhance the resiliency of the Nation's critical infrastructures, and the businesses and public entities that own and operate those assets and systems. The research will provide a better understanding of the complex business of risk management in the context of potential catastrophic disruptions to infrastructure operations. The Center will develop business cases for preparing for, and mitigating the effects of catastrophic incidents, as well as how to integrate community considerations into business decisions. The Center's work should result in data-rich quantitative analyses, technologies, and knowledge products (e.g., business case studies, policy analyses and recommendations, analytic tools and techniques, data visualizations, software, and publications) that assist in understanding threats and vulnerabilities, risk management strategies, and costs and trade-offs of risk management decisions.

Quantitative Analytical Training Center (QATC)

The Office of University Programs (OUP) will establish a new Quantitative Analytical Training Center (QATC) that will conduct training program pilots with one to three DHS Components to assess critical gaps in scientific and analytical capabilities. The Training Center will then design training tools, materials, and course work appropriate to fill these gaps and also conduct research to determine the best approaches to deliver effective training to enhance the HSE workforce's capabilities to conduct quantitative analyses in support of operations or intelligence analysis, such as risk and economic analyses, or management of the increasing volume of job-related data. FY 2017 funding of this activity is subject to FY 2015 and FY 2016 pilot results.

DHS Center for Innovation (CoI) at U.S. Air Force Academy (USAFA)

In addition to the nine COES and QATC, OUP funds the DHS Center for Innovation (CoI). This partnership initiative supports S&T, NPPD, I&A, S&T FRG, S&T COE's, as well as the CIA, DoD, and U.S. Cyber Command in conducting research leading to disruptive technologies for the DHS enterprise. Working with USAFA cadets and the other Federal Service Academies and private industry, the CoI develops innovations and capabilities for both the USG, and the HSE that are driven by the private sector and private sector R&D funding. Through the CoI, the USG has access to market-shaping technologies before these products hit the marketplace. Also through the CoI, DHS is building relationships with the Nation's future military leaders, and placing them in homeland security research and development projects. The CoI supports USAFA and other service academy cadets and midshipmen and women for summer internships at DHS Components, DHS COEs, and elsewhere in the HSE to strengthen the relationships and core knowledge between DHS and DoD. The CoI also is the program manager for S&T Accelerator Research Initiative.

3. *Minority Serving Institutions* - FY 2016: \$3.396 million. FY 2017 Request: \$3.396 million.

This program enhances the capabilities of MSIs to develop homeland security-related STEM research and curricula and move MSI students into successful HSE careers. Current MSI programs, including the Scientific Leadership Award program and the Summer Research Team program, are developing course content and training in areas critical to homeland security, while they also build enduring partnerships with the COEs. With small investments, S&T expects to realize significant returns in the development of a new generation of scientists and engineers focused on homeland security. In addition, the programs can increase diversity and representation within the future homeland security science and engineering workforce.

**Department of Homeland Security
Science and Technology
University Programs
Justification of Program Changes**
(Dollars in Thousands)

Program Decrease 1: University Programs
PPA: University
Programs
Program Decrease: Positions 0, FTE 0,
Dollars (\$8,348)

Funding Profile

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request		
	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)
Current Services: University Programs - University Programs							10	10	\$41,357
Subtotal, Current Services							10	10	\$41,357
Program Decrease: University Programs - University Programs							-	-	(\$8,348)
Subtotal, Program Decreases							-	-	(\$8,348)
Total Request							10	10	\$33,009

DESCRIPTION OF ITEM:

The program decrease of \$8.328 million will be taken from COEs that are eligible for re-competition in FY 2017. The decrease may delay the launch of one of the new COEs recently submitted for leadership approval, and/or decrease funding to the rest of the COEs.

Justification:

It takes 12-18 months for S&T's OUP to compete and award a new COE. S&T will decrease funding to COEs eligible for re-compete in FY 2018, one of which is the START COE.

Impact on Performance:

The COEs have evolved into productive and cost-effective developers of knowledge products, tools, technologies, and analyses in support of pressing homeland security problems. With the current level of funding, eight COEs are able to provide research of critical homeland security issues.

**Department of Homeland Security
Science and Technology
Research and Development
University Programs**

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				FY 2016 to FY 2017 Change			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	10	10	\$1,872	\$186	10	10	\$1,897	\$189	10	10	\$1,924	\$191	-	-	\$27	2
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS Pay Cost Drivers Exhibit may reflect a higher average FTE Cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

NARRATIVE EXPLANATION OF CHANGES – PAY COST DRIVERS:

- **FTE Change FY 2016-2017:** There is no change in FTE.
- **PCB Change FY 2016-2017:** The cost change in FTE is due the FY 2017 pay increase and the annualization of the FY 2016 pay raise.
- **Average Cost Change FY 2016-2017:** An increase of \$27,000 in pay is attributed to the annual FY 2017 pay increase of 1.6 percent and annualization of the FY 2016 pay raise.

**Department of Homeland Security
Science and Technology
University Programs
Cost Drivers (Non-Pay) - PPA Level (\$000s)**

Appropriation - University Programs	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Travel	\$364	\$364	\$364	-
Advisory and Assistance services	\$1,820	\$1,820	\$1,820	-
Grants Subsidies and Contributions	\$37,540	\$37,540	\$28,901	(\$8,639)
Total	\$39,724	\$39,724	\$31,085	(\$8,639)

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

NARRATIVE EXPLANATION OF CHANGES – NON-PAY COST DRIVERS:

- **Grants Subsidies and Contributions Cost Change FY 2016-2017:** There is a decrease of \$8.6 million is due to the funding reductions for the COEs being re-competed in FY 2017.
- **Advisory and Assistance Services Cost Change FY 2016-2017:** There are no cost changes in management and support services for University Programs.
- **Travel Cost Change FY 2016-2017:** There are no cost changes in travel funding for Federal employees supporting the University Programs.

Schedule III – Other Exhibits

Exhibit E. Justification of Proposed Legislative Language

**Department of Homeland Security
Science and Technology
Research and Development**
Justification of Proposed Legislative Language

Language Provision	Explanation
For necessary expenses for science and technology research and development, including advanced research projects as authorized by title III of the Homeland Security Act of 2002 (6 U.S.C. 181 et seq.), \$469,869,000 to remain available until September 30, 2019.	The legislative language associated with this account has been updated and streamlined to reflect the Department’s new Common Appropriations Structure. Funding amounts have been updated to reflect the FY 2017 President’s Budget.

Exhibit F. Summary of Fee Collections and Carryover

**Department of Homeland Security
Science and Technology
Research and Development**
Summary of Fee Collections and Carryover
(Dollars in Thousands)

N/A

Exhibit G. Summary of Reimbursable Resources

**Department of Homeland Security
Science and Technology
Research and Development
Summary of Reimbursable Resources
(Dollars in Thousands)**

Collections by Source:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Office of the Director of National Intelligence	-	-	\$3,664	-	-	\$4,000	-	-	\$4,000	-	-	-
Department of Agriculture	-	-	\$1,500	-	-	\$1,500	-	-	\$1,500	-	-	-
DHS - United States Coast Guard	-	-	\$375	-	-	\$500	-	-	\$500	-	-	-
Customs & Border Protection	-	-	\$4,534	-	-	\$4,500	-	-	\$4,500	-	-	-
Canada	-	-	\$100	-	-	\$1,000	-	-	\$1,000	-	-	-
United Kingdom	-	-	\$4,126	-	-	\$4,000	-	-	\$4,000	-	-	-
DHS - Federal Emergency Management Agency	-	-	\$5,008	-	-	\$5,000	-	-	\$5,000	-	-	-
DHS - Transportation and Security Administration	-	-	\$2,000	-	-	\$2,000	-	-	\$2,000	-	-	-
DHS - National Protection & Programs Directorate	-	-	\$1,800	-	-	\$2,000	-	-	\$2,000	-	-	-
07. Department of Justice	-	-	\$750	-	-	\$1,000	-	-	\$1,000	-	-	-
01. Department of Homeland Security	-	-	\$705	-	-	\$750	-	-	\$750	-	-	-
02. Department of Defense	-	-	\$1,230	-	-	\$1,500	-	-	\$1,500	-	-	-
Domestic Nuclear Detection Office	-	-	\$225	-	-	\$250	-	-	\$250	-	-	-
Total Budgetary Resources	-	-	\$26,017	-	-	\$28,000	-	-	\$28,000	-	-	-

Obligations by Program/Project Activity:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
University Programs	-	-	\$3,744	-	-	\$4,000	-	-	\$4,000	-	-	-
Research, Development, and Innovation	-	-	\$22,273	-	-	\$24,000	-	-	\$24,000	-	-	-
Total Obligations	-	-	\$26,017	-	-	\$28,000	-	-	\$28,000	-	-	-

Exhibit H. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

N/A

Exhibit I. Capital Investment and Construction Initiative Listing

**Department of Homeland Security
Science and Technology
Research and Development
Capital Investment and Construction Initiative Listing**

N/A

Exhibit J. Object Class Breakout by Appropriation

**Department of Homeland Security
Science and Technology
Research and Development
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$15,638	\$14,782	\$14,216	(\$566)
11.3 Other than Full-Time Permanent	\$1,480	\$1,480	\$1,480	-
11.5 Other Personnel Compensation	-	-	-	-
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	-	-	-	-
12.1 Civilian Personnel Benefits	\$5,668	\$5,668	\$5,668	-
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	\$22,786	\$21,930	\$21,364	(\$566)
Other Object Classes				
21.0 Travel and Transportation of Persons	\$1,965	\$1,965	\$1,965	-
22.0 Transportation of Things	-	-	-	-
23.1 Rental Payments to GSA	-	-	-	-
23.2 Rental Payments to Others	-	-	-	-
23.3 Communications, Utilities, and Misc. Charges	-	-	-	-
24.0 Printing and Reproduction	-	-	-	-
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$27,914	\$27,914	\$27,914	-
25.2 Other Services from Non-Federal Sources	-	-	-	-
25.3 Other Goods and Services from Federal Sources	\$1,134	\$1,134	\$1,134	-
25.4 Operation and Maintenance of Facilities	\$63	\$63	\$63	-
25.5 Research and Development Contracts	\$403,577	\$403,488	\$386,058	(\$17,430)
25.6 Medical Care	-	-	-	-
25.7 Operation and Maintenance of Equipment	\$29	\$29	\$29	-
25.8 Subsistence & Support of Persons	-	-	-	-
26.0 Supplies and Materials	\$413	\$413	\$413	-
31.0 Equipment	\$62	\$62	\$62	-
32.0 Land and Structures	-	-	-	-
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	\$39,506	\$39,506	\$30,867	(\$8,639)
42.0 Insurance Claims and Indemnities	-	-	-	-
43.1 Interest and Dividends	-	-	-	-
43.2 Immigration Fees	-	-	-	-
44.0 Refunds	-	-	-	-
91.0 Unvouchered	\$23,711	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$498,374	\$474,574	\$448,505	(\$26,069)
Total, Direct Obligations	\$521,160	\$496,504	\$469,869	(\$26,635)
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$521,160	\$496,504	\$469,869	(\$26,635)

Exhibit K. Object Class Breakout by PPA

**Department of Homeland Security
Science and Technology
Research and Development
Research, Development and Innovation**
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$14,186	\$13,305	\$12,712	(\$593)
11.3 Other than Full-Time Permanent	\$1,480	\$1,480	\$1,480	-
12.1 Civilian Personnel Benefits	\$5,248	\$5,248	\$5,248	-
Total, Personnel and Compensation Benefits	\$20,914	\$20,033	\$19,440	(\$593)
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$1,601	\$1,601	\$1,601	-
25.1 Advisory and Assistance Services	\$26,094	\$26,094	\$26,094	-
25.3 Other Goods and Services from Federal Sources	\$1,134	\$1,134	\$1,134	-
25.4 Operation and Maintenance of Facilities	\$63	\$63	\$63	-
25.5 Research and Development Contracts	\$403,577	\$403,488	\$386,058	(\$17,430)
25.7 Operation and Maintenance of Equipment	\$29	\$29	\$29	-
26.0 Supplies and Materials	\$413	\$413	\$413	-
31.0 Equipment	\$62	\$62	\$62	-
41.0 Grants, Subsidies, and Contributions	\$1,966	\$1,966	\$1,966	-
91.0 Unvouchered	\$23,711	-	-	-
Total, Other Object Classes	\$458,650	\$434,850	\$417,420	(\$17,430)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$479,564	\$454,883	\$436,860	(\$18,023)
Full Time Equivalents	114	106	102	(4)

Summary Justification and Explanation of Changes

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
11.1 Full-time Permanent	\$14,186	\$13,305	\$12,712	\$(593)
11.3 Other than Full-Time Permanent	\$1,480	\$1,480	\$1,480	-
12.1 Civilian Personnel Benefits	\$5,248	\$5,248	\$5,248	-
Total, Salaries & Benefits	\$20,914	\$20,033	\$19,440	\$(593)

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
25.5 Research and Development Contracts	\$403,577	\$403,488	\$386,058	(\$17,430)

**Department of Homeland Security
Science and Technology
Research and Development
University Programs**
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$1,452	\$1,477	\$1,504	\$27
12.1 Civilian Personnel Benefits	\$420	\$420	\$420	-
Total, Personnel and Compensation Benefits	\$1,872	\$1,897	\$1,924	\$27
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$364	\$364	\$364	-
25.1 Advisory and Assistance Services	\$1,820	\$1,820	\$1,820	-
41.0 Grants, Subsidies, and Contributions	\$37,540	\$37,540	\$28,901	(\$8,639)
Total, Other Object Classes	\$39,724	\$39,724	\$31,085	(\$8,639)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$41,596	\$41,621	\$33,009	(\$8,612)
Full Time Equivalents	10	10	10	-

Summary Justification and Explanation of Changes

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
11.1 Full-time Permanent	\$1,452	\$1,477	\$1,504	\$27
12.1 Civilian Personnel Benefits	\$420	\$420	\$420	-
Total, Salaries & Benefits	\$1,872	\$1,897	\$1,924	\$27

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
41.0 Grants, Subsidies, and Contributions	\$37,540	\$37,540	\$28,901	(\$8,639)

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
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Exhibit L. Permanent Positions by Grade

**Department of Homeland Security
Science and Technology
Research and Development**
Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES	-	-	5	-
GS-15	-	-	57	(4)
GS-14	-	-	8	-
GS-13	-	-	2	-
GS-12	-	-	2	-
GS-11	-	-	1	-
GS-4	-	-	1	-
Other Graded Positions	-	-	36	-
Total Permanent Positions	-	-	112	(4)
Unfilled Positions EOY	-	-	-	-
Total Permanent Employment EOY	-	-	-	-
Headquarters	-	-	112	(4)
Total, Research and Development:	-	-	112	(4)
	-	-		
Full Time Equivalent	-	-	112	(4)
Average ES Salary	-	-	173,322	173,322
Average GS Salary	-	-	145,059	145,059
Average Grade	-	-	15	15

Exhibit M. Changes in Full Time Employment

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>
Increases			
Transfer from M&A to Research & Development- RD&I	-	-	106
Transfer from M&A to Research & Development- UP	-	-	10
Decreases			
Transfer to CBRNE	-	-	(4)
Year End Actuals/Estimated FTEs:	-	-	112

**Department of
Homeland Security**
*Science & Technology
Management and Administration*



Fiscal Year 2017
Congressional Justification

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II. Summary of FY 2017 Budget Estimates by Program/Project Activity (PPA)

**Department of Homeland Security
Science & Technology
Management and Administration:**
Summary of FY 2017 Budget Estimates by Program Project Activity

**FY 2017 Request
(Dollars in Thousands)**

Program Project Activity	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017								
	Revised Enacted ¹			Enacted			Request			Total Changes			Program Changes			Adjustments-to-Base		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Salaries and Expenses	337	337	\$129,993	344	344	\$131,531	-	-	-	-	-	-	-	-	-	(344)	(344)	(\$131,531)
Total, Management and Administration:	337	337	\$129,993	344	344	\$131,531	-	-	-	-	-	-	-	-	-	(344)	(344)	(\$131,531)
Subtotal, Enacted Appropriations & Budget Estimates	337	337	\$129,993	344	344	\$131,531	-	-	-	-	-	-	-	-	-	(344)	(344)	(\$131,531)
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-4	-	-	(500)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-113	-	-	-	-	-	(285)	-	-	-	-	-	-	-	-	-	-	-	285-
Less: 505 Rescissions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	337	337	\$129,493	344	344	\$131,246	-	-	-	-	-	-	-	-	-	(344)	(344)	(\$131,246)

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

III. Current Services Program Description by PPA

**Department of Homeland Security
Science & Technology
Salaries and Expenses
Program Performance Justification**
(Dollars in Thousands)

PPA: Salaries and Expenses

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	337	337	\$129,993
FY 2016 President's Budget	344	344	\$131,531
2017 Adjustments-to-Base	(344)	(344)	(\$131,531)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	(344)	(344)	(\$131,531)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out of Management and Administration appropriation to the following appropriations: Operations and Support (O&S), Procurement, Construction and Improvements (PC&I) and Research and Development (R&D).

Salaries and Expenses		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	337	337	129,993
Base	FY 2016 Enacted	344	344	131,531
	Transfer from M&A to Operation & Support- AOA	(81)	(81)	(14,860)
	Transfer from M&A to Operation & Support- M&A	(134)	(134)	(88,787)
	Transfer from M&A to Procurement, Construction, & Improvement-AOA	(13)	(13)	(1,658)
	Transfer from M&A to Research & Development-Research, Development, & Innovation	(106)	(106)	(24,802)
	Transfer from M&A to Research & Development-University Programs	(10)	(10)	(1,424)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	(344)	(344)	(131,531)

V. Exhibits and Other Supporting Material

B. FY 2016 to FY 2017 Budget Change

**Department of Homeland Security
Science & Technology
Management and Administration:
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)**

	Pos.	FTE	Amount
FY 2015 Revised Enacted	337	337	\$129,993
FY 2016 Enacted	344	344	\$131,531
Adjustments-to-Base			
Transfers to and from other accounts:			
Transfer from M&A to Operation & Support-AOA	(81)	(81)	(\$14,860)
Transfer from M&A to Operation & Support-M&A	(134)	(134)	(\$88,787)
Transfer from M&A to Procurement, Construction, & Improvement-AOA	(13)	(13)	(\$1,658)
Transfer from M&A to Research & Development-Research, Development, & Innovation	(106)	(106)	(\$24,802)
Transfer from M&A to Research & Development-University Programs	(10)	(10)	(\$1,424)
Total Transfers	(344)	(344)	(\$131,531)
Total Adjustments-to-Base	(344)	(344)	(\$131,531)
FY 2017 Current Services	(344)	(344)	(\$131,531)
FY 2017 Request	-	(344)	(\$131,531)
FY 2016 to FY 2017 Change	(344)	(688)	(\$263,062)

D. Summary of Reimbursable Resources

Department of Homeland Security
 Science & Technology
 Management and Administration:
 Summary of Reimbursable Resources
 (Dollars in Thousands)

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Collections by Source:												
07. Department of Justice	-	-	\$1	-	-	\$250	-	-	-	-	-	(\$250)
01. Department of Homeland Security	-	-	\$42	-	-	-	-	-	-	-	-	-
02. Department of Defense	-	-	-	-	-	\$250	-	-	-	-	-	(\$250)
Total Budgetary Resources	-	-	\$43	-	-	\$500	-	-	-	-	-	(\$500)

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Obligations by Program/Project Activity:												
Management and Administration	-	-	\$43	-	-	\$500	-	-	-	-	-	(\$500)
Total Obligations	-	-	\$43	-	-	\$500	-	-	-	-	-	(\$500)

E. Summary of Requirements by Object Class

**Department of Homeland Security
Science & Technology
Management and Administration:
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$42,950	\$43,500	-	(\$43,500)
11.3 Other than Full-Time Permanent	\$3,575	\$3,575	-	(\$3,575)
11.5 Other Personnel Compensation	\$1,508	\$1,508	-	(\$1,508)
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	-	-	-	-
12.1 Civilian Personnel Benefits	\$12,485	\$12,722	-	(\$12,722)
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	\$60,518	\$61,305	-	(\$61,305)
Other Object Classes				
21.0 Travel and Transportation of Persons	\$532	\$532	-	(\$532)
22.0 Transportation of Things	-	-	-	-
23.1 Rental Payments to GSA	-	-	-	-
23.2 Rental Payments to Others	-	-	-	-
23.3 Communications, Utilities, and Misc. Charges	-	-	-	-
24.0 Printing and Reproduction	-	-	-	-
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$22,322	\$22,322	-	(\$22,322)
25.2 Other Services from Non-Federal Sources	\$800	\$800	-	(\$800)
25.3 Other Goods and Services from Federal Sources	\$40,994	\$41,591	-	(\$41,591)
25.4 Operation and Maintenance of Facilities	\$156	\$156	-	(\$156)
25.5 Research and Development Contracts	-	-	-	-
25.6 Medical Care	-	-	-	-
25.7 Operation and Maintenance of Equipment	\$2,464	\$2,464	-	(\$2,464)
25.8 Subsistence & Support of Persons	-	-	-	-
26.0 Supplies and Materials	\$500	\$500	-	(\$500)
31.0 Equipment	\$1,861	\$1,861	-	(\$1,861)
32.0 Land and Structures	-	-	-	-
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	-	-	-	-
42.0 Insurance Claims and Indemnities	-	-	-	-
43.1 Interest and Dividends	-	-	-	-
43.2 Immigration Fees	-	-	-	-
44.0 Refunds	-	-	-	-
91.0 Unvouchered	(\$154)	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$69,475	\$70,226	-	(\$70,226)
Total, Direct Obligations	\$129,993	\$131,531	-	(\$131,531)
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$129,993	\$131,531	-	(\$131,531)

F. Permanent Positions by Grade

Department of Homeland Security Science & Technology Management and Administration:

Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES	20	20	-	(20)
Total, EX	1	1	-	(1)
GS-15	130	138	-	(138)
GS-14	55	57	-	(57)
GS-13	39	39	-	(39)
GS-12	26	26	-	(26)
GS-11	14	14	-	(14)
GS-9	9	9	-	(9)
GS-8	2	2	-	(2)
GS-7	8	8	-	(8)
Other Graded Positions	33	30	-	(30)
Total Permanent Positions	337	344	-	(344)
Unfilled Positions EOY	-	-	-	-
Total Permanent Employment EOY	-	-	-	-
Headquarters	337	344	-	(344)
Total, Management and Administration::	337	344	-	(344)
Full Time Equivalents	337	344	-	(344)
Average ES Salary	178,817	180,605	-	(180,605)
Average GS Salary	117,913	119,092	-	(119,092)
Average Grade	15	15	-	(15)

H. PPA Budget Justifications

**Department of Homeland Security
Science & Technology
Management and Administration:
Salaries and Expenses**
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$42,950	\$43,500	-	(\$43,500)
11.3 Other than Full-Time Permanent	\$3,575	\$3,575	-	(\$3,575)
11.5 Other Personnel Compensation	\$1,508	\$1,508	-	(\$1,508)
12.1 Civilian Personnel Benefits	\$12,485	\$12,722	-	(\$12,722)
Total, Personnel and Compensation Benefits	\$60,518	\$61,305	-	(\$61,305)
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$532	\$532	-	(\$532)
25.1 Advisory and Assistance Services	\$22,322	\$22,322	-	(\$22,322)
25.2 Other Services from Non-Federal Sources	\$800	\$800	-	(\$800)
25.3 Other Goods and Services from Federal Sources	\$40,994	\$41,591	-	(\$41,591)
25.4 Operation and Maintenance of Facilities	\$156	\$156	-	(\$156)
25.7 Operation and Maintenance of Equipment	\$2,464	\$2,464	-	(\$2,464)
26.0 Supplies and Materials	\$500	\$500	-	(\$500)
31.0 Equipment	\$1,861	\$1,861	-	(\$1,861)
91.0 Unvouchered	(\$154)	-	-	-
Total, Other Object Classes	\$69,475	\$70,226	-	(\$70,226)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$129,993	\$131,531	-	(\$131,531)
Full Time Equivalents	337	344	-	(344)

I. Changes in Full Time Employment

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>
BASE: Year End Actual from Prior Year	334	337	344
Increases			
Increase in FTE	-	7	-
Subtotal, Increases	-	7	-
Decreases			
1. Transfer Follow-On	-	-	(344)
Subtotal, Decreases	-	-	(344)
Year End Actuals/Estimated FTEs:	334	344	-
Net Change from prior year base to Budget Year Estimate:	-	7	(344)

J. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

Department of Homeland Security
 Science & Technology
 Management and Administration:
 (Dollars in Thousands)

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Salaries and Expenses	\$40,579	\$40,102	-	(\$40,102)
Total Working Capital Fund	\$40,579	\$40,102	-	(\$40,102)

Department of Homeland Security

Science and Technology

Research, Development, Acquisitions, and Operations



Fiscal Year 2017
Congressional Justification

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II. Summary of FY 2017 Budget Estimates by Program/Project Activity (PPA)

Department of Homeland Security
Science & Technology
Research, Development, Acquisitions, and Operations
 Summary of FY 2017 Budget Estimates by Program Project Activity

FY 2017 Request
(Dollars in Thousands)

Program Project Activity	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017								
	Revised Enacted			Enacted			Request			Total Changes			Program Changes			Adjustments-to-Base		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Acquisition and Operations Support	-	-	\$41,703	-	-	\$47,102	-	-	-	-	-	-	-	-	-	-	-	(\$47,102)
Research, Development, and Innovation	-	-	\$458,649	-	-	\$434,850	-	-	-	-	-	-	-	-	-	-	-	(\$434,850)
University Programs	-	-	\$39,724	-	-	\$39,724	-	-	-	-	-	-	-	-	-	-	-	(\$39,724)
Laboratory Facilities	130	130	\$434,989	136	136	\$133,731	-	-	-	-	-	-	-	-	-	(136)	(136)	(\$133,731)
Total, Research, Development, Acquisitions, and Operations	130	130	\$975,065	136	136	\$655,407	-	-	-	-	-	-	-	-	-	(136)	(136)	(\$655,407)
Subtotal, Enacted Appropriations & Budget Estimates	130	130	\$975,065	136	136	\$655,407	-	-	-	-	-	-	-	-	-	(136)	(136)	(\$655,407)
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: 505 Rescissions	-	-	(16,627)	-	-	(10,000)	-	-	-	-	-	-	-	-	-	-	-	10,000
Net, Enacted Appropriations and Budget Estimates:	130	130	\$958,438	136	136	\$645,407	-	-	-	-	-	-	-	-	-	(136)	(136)	(645,407)

Reflects reprogrammings/transfers, as applicable, and actual FTE.

III. Current Services Program Description by PPA

**Department of Homeland Security
Science & Technology
Acquisition and Operations Support
Program Performance Justification**
(Dollars in Thousands)

PPA: Acquisition and Operations Support (AOS)

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	-	-	\$41,703
FY 2016 President's Budget	-	-	\$47,102
2017 Adjustments-to-Base	-	-	(\$47,102)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$47,102)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out of Management and Administration appropriation to the following appropriations: Operations and Support (O&S), Procurement, Construction and Improvements (PC&I) and Research and Development (R&D).

Acquisition and Operations Support		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	41,703
Base	FY 2016 Enacted	-	-	47,102
	Transfer from RDA&O-AOS to Operations & Support M&A (Financial System Modernization)	-	-	(584)
	Transfer from RDA&O-AOS to Operations & Support-AOA	-	-	(39,458)
	Transfer from RDA&O-AOS to PC&I-AOA	-	-	(7,060)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(47,102)

**Department of Homeland Security
Science & Technology
Laboratory Facilities
Program Performance Justification**
(Dollars in Thousands)

PPA: Laboratory Facilities

	Perm. Pos.	FTE	Amount
FY 2015 Revised Enacted	130	130	\$434,989
FY 2016 President's Budget	136	136	\$133,731
2017 Adjustments-to-Base	(136)	(136)	(\$133,731)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	(136)	(136)	(\$133,731)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds for Lab Facilities will be transferred out to the Operations and Support (O&S) and Procurement Construction and Improvements (PC&I) Appropriation.

Laboratory Facilities		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	130	130	434,989
Base	FY 2016 Enacted	136	136	133,731
	Transfer from RDA&O-Lab Facilities to Operations & Support M&A (Financial System Modernization)	-	-	(1,114)
	Transfer from RDA&O-Lab Facilities to Operations & Support-Lab Facilities	(136)	(136)	(124,298)
	Transfer from RDA&O-Lab Facilities to PC&I-Lab Facilities	-	-	(8,319)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	(136)	(136)	(133,731)

**Department of Homeland Security
Science & Technology
Research Development and Innovation
Program Performance Justification**
(Dollars in Thousands)

PPA: Research Development and Innovation (RD&I)

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	-	-	\$458,649
FY 2016 President's Budget	-	-	\$434,850
2017 Adjustments-to-Base	-	-	(\$434,850)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$434,850)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds for Research Development and Innovation will be transferred out to the Research and Development (R&D) Appropriation.

Research Development and Innovation		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	458,649
Base	FY 2016 Enacted	-	-	434,850
	Transfer from RDA&O-RD&I to Operations & Support M&A (Financial System Modernization)	-	-	(3,903)
	Transfer from RDA&O-RD&I to Research and Development-RD&I	-	-	(430,947)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(434,850)

**Department of Homeland Security
Science & Technology
University Programs
Program Performance Justification**
(Dollars in Thousands)

PPA: University Programs (UP)

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	-	-	\$39,724
FY 2016 President's Budget	-	-	\$39,724
2017 Adjustments-to-Base	-	-	(\$39,724)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$39,724)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds for University Programs will be transferred out to the Research and Development (R&D) Appropriation.

University Programs		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	39,724
Base	FY 2016 Enacted	-	-	39,724
	Transfer from RDA&O-UP to Operations & Support M&A (FSM)	-	-	(291)
	Transfer from RDA&O-UP to Research & Development-UP	-	-	(39,433)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(39,724)

V. Exhibits and Other Supporting Material

B. FY 2016 to FY 2017 Budget Change

**Department of Homeland Security
Science & Technology
Research, Development, Acquisitions, and Operations
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)**

	Pos.	FTE	Amount
FY 2015 Revised Enacted	130	130	\$975,065
FY 2016 Enacted	136	136	\$655,407
Adjustments-to-Base			
Transfers to and from other accounts:			
Transfer from RDA&O-AOS to Operations & Support M&A (Financial System Modernization)	-	-	(\$584)
Transfer from RDA&O-AOS to Operations & Support-AOA	-	-	(\$39,458)
Transfer from RDA&O-AOS to PC&I-AOA	-	-	(\$7,060)
Transfer from RDA&O-RD&I to Operations & Support M&A (Financial System Modernization)	-	-	(\$3,903)
Transfer from RDA&O-RD&I to Research & Development-RD&I	-	-	(\$430,947)
Transfer from RDA&O-UP to Operations & Support M&A (Financial System Modernization)	-	-	(\$291)
Transfer from RDA&O-UP to Research & Development-UP	-	-	(\$39,433)
Transfer from RDA&O-Lab Facilities to Operations & Support M&A (Financial System Modernization)	-	-	(\$1,114)
Transfer from RDA&O-Lab Facilities to Operations & Support-Lab Facilities	(136)	(136)	(\$124,298)
Transfer from RDA&O-Lab Facilities to PC&I-Lab Facilities	-	-	(\$8,319)
Total Transfers	(136)	(136)	(\$655,407)
Total Adjustments-to-Base	(136)	(136)	(\$655,407)
FY 2017 Current Services	(136)	(136)	(\$655,407)
FY 2017 Request	-	(136)	(\$655,407)
FY 2016 to FY 2017 Change	(136)	(272)	(\$1,310,814)

D. Summary of Reimbursable Resources

Department of Homeland Security
Science & Technology
Research, Development, Acquisitions, and Operations
Summary of Reimbursable Resources
(Dollars in Thousands)

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Collections by Source:												
Office of the Director of National Intelligence	-	-	\$3,664	-	-	-	-	-	-	-	-	-
Department of Agriculture	-	-	\$1,743	-	-	\$1,000	-	-	-	-	-	(\$1,000)
Department of Energy	-	-	\$800	-	-	-	-	-	-	-	-	-
Central Intelligence Agency	-	-	-	-	-	\$3,000	-	-	-	-	-	(\$3,000)
DHS - United States Coast Guard	-	-	\$2,633	-	-	\$4,000	-	-	-	-	-	(\$4,000)
DHS - Secret Service	-	-	\$3,823	-	-	-	-	-	-	-	-	-
Customs & Border Protection	-	-	\$19,946	-	-	\$20,000	-	-	-	-	-	(\$20,000)
Canada	-	-	\$100	-	-	-	-	-	-	-	-	-
United Kingdom	-	-	\$4,126	-	-	\$5,000	-	-	-	-	-	(\$5,000)
DHS – U.S. Citizenship & Immigration Service (CIS)	-	-	\$3,690	-	-	\$4,000	-	-	-	-	-	(\$4,000)
DHS - Federal Emergency Management Agency	-	-	\$5,233	-	-	\$6,000	-	-	-	-	-	(\$6,000)
DHS - Immigration and Customs Enforcement	-	-	\$4,763	-	-	\$2,000	-	-	-	-	-	(\$2,000)
DHS - Transportation and Security Administration	-	-	\$13,964	-	-	\$27,000	-	-	-	-	-	(\$27,000)
Department of Homeland Security – U.S. Visit	-	-	\$1,869	-	-	-	-	-	-	-	-	-
DHS - National Protection & Programs Directorate	-	-	\$23,480	-	-	\$23,000	-	-	-	-	-	(\$23,000)
07. Department of Justice	-	-	\$4,249	-	-	\$5,000	-	-	-	-	-	(\$5,000)
01. Department of Homeland Security	-	-	\$18,574	-	-	\$13,000	-	-	-	-	-	(\$13,000)
02. Department of Defense	-	-	\$2,677	-	-	\$6,000	-	-	-	-	-	(\$6,000)
Domestic Nuclear Detection Office	-	-	\$1,967	-	-	\$4,000	-	-	-	-	-	(\$4,000)
Office of Health Affairs	-	-	-	-	-	\$2,000	-	-	-	-	-	(\$2,000)
Total Budgetary Resources			\$117,301			\$125,000						(\$125,000)

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Obligations by Program/Project Activity:												
University Programs	-	-	\$3,744	-	-	\$4,375	-	-	-	-	-	(\$4,375)
Laboratory Facilities	-	-	\$5,190	-	-	\$10,625	-	-	-	-	-	(\$10,625)
Acquisition and Operations Support	-	-	\$86,094	-	-	\$68,700	-	-	-	-	-	(\$68,700)
Research, Development, and Innovation	-	-	\$22,273	-	-	\$41,300	-	-	-	-	-	(\$41,300)
Total Obligations			\$117,301			\$125,000						(\$125,000)

E. Summary of Requirements by Object Class

Department of Homeland Security
Science & Technology
Research, Development, Acquisitions, and Operations
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$13,893	\$14,208	-	(\$14,208)
11.3 Other than Full-Time Permanent	-	-	-	-
11.5 Other Personnel Compensation	-	-	-	-
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	\$1,561	\$1,561	-	(\$1,561)
11.8 Special Personal Services Payments	-	-	-	-
12.1 Civilian Personnel Benefits	\$4,026	\$4,026	-	(\$4,026)
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	\$19,480	\$19,795	-	(\$19,795)
Other Object Classes				
21.0 Travel and Transportation of Persons	\$2,905	\$2,905	-	(\$2,905)
22.0 Transportation of Things	-	-	-	-
23.1 Rental Payments to GSA	\$1,250	\$1,250	-	(\$1,250)
23.2 Rental Payments to Others	-	-	-	-
23.3 Communications, Utilities, and Misc. Charges	\$12,804	\$12,804	-	(\$12,804)
24.0 Printing and Reproduction	-	-	-	-
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$40,468	\$40,468	-	(\$40,468)
25.2 Other Services from Non-Federal Sources	-	-	-	-
25.3 Other Goods and Services from Federal Sources	\$5,915	\$5,915	-	(\$5,915)
25.4 Operation and Maintenance of Facilities	\$55,596	\$60,742	-	(\$60,742)
25.5 Research and Development Contracts	\$449,684	\$454,994	-	(\$454,994)
25.6 Medical Care	-	-	-	-
25.7 Operation and Maintenance of Equipment	\$649	\$649	-	(\$649)
25.8 Subsistence & Support of Persons	-	-	-	-
26.0 Supplies and Materials	\$5,641	\$5,641	-	(\$5,641)
31.0 Equipment	\$1,871	\$1,871	-	(\$1,871)
32.0 Land and Structures	\$315,230	\$8,320	-	(\$8,320)
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	\$31,329	\$40,053	-	(\$40,053)
42.0 Insurance Claims and Indemnities	-	-	-	-
43.1 Interest and Dividends	-	-	-	-
43.2 Immigration Fees	-	-	-	-
44.0 Refunds	-	-	-	-
91.0 Unvouchered	\$32,243	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$955,585	\$635,612	-	(\$635,612)
Total, Direct Obligations	\$975,065	\$655,407	-	(\$655,407)
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$975,065	\$655,407	-	(\$655,407)

F. Permanent Positions by Grade

Department of Homeland Security
Science & Technology
Research, Development, Acquisitions, and Operations
 Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES	1	1	-	(1)
GS-15	23	28	-	(28)
GS-14	41	42	-	(42)
GS-13	21	21	-	(21)
GS-12	17	17	-	(17)
GS-11	5	5	-	(5)
GS-9	10	10	-	(10)
GS-8	1	1	-	(1)
GS-7	11	11	-	(11)
Total Permanent Positions	130	136	-	(136)
Unfilled Positions EOY	-	-	-	-
Total Permanent Employment EOY	-	-	-	-
Headquarters	130	136	-	(136)
Total, Research, Development, Acquisitions, and Operations:	130	136	-	(136)
Full Time Equivalents	130	136	-	(136)
Average ES Salary	-	-	-	-
Average GS Salary	-	-	-	-
Average Grade	-	-	-	-

H. PPA Budget Justifications

**Department of Homeland Security
Science & Technology
Research, Development, Acquisitions, and Operations
Acquisition and Operations Support
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$711	\$711	-	(\$711)
25.1 Advisory and Assistance Services	\$1,602	\$1,602	-	(\$1,602)
25.3 Other Goods and Services from Federal Sources	\$170	\$170	-	(\$170)
25.4 Operation and Maintenance of Facilities	\$10	\$10	-	(\$10)
25.5 Research and Development Contracts	\$38,839	\$44,237	-	(\$44,237)
25.7 Operation and Maintenance of Equipment	\$4	\$4	-	(\$4)
26.0 Supplies and Materials	\$65	\$65	-	(\$65)
31.0 Equipment	\$9	\$9	-	(\$9)
41.0 Grants, Subsidies, and Contributions	\$294	\$294	-	(\$294)
91.0 Unvouchered	(\$1)	-	-	-
Total, Other Object Classes	\$41,703	\$47,102	-	(\$47,102)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$41,703	\$47,102	-	(\$47,102)
Full Time Equivalents	-	-	-	-

Department of Homeland Security
Science & Technology
Research, Development, Acquisitions, and Operations
Research Development and Innovation
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$1,601	\$1,601	-	(\$1,601)
25.1 Advisory and Assistance Services	\$26,094	\$26,094	-	(\$26,094)
25.3 Other Goods and Services from Federal Sources	\$1,134	\$1,134	-	(\$1,134)
25.4 Operation and Maintenance of Facilities	\$63	\$63	-	(\$63)
25.5 Research and Development Contracts	\$402,426	\$403,488	-	(\$403,488)
25.7 Operation and Maintenance of Equipment	\$29	\$29	-	(\$29)
26.0 Supplies and Materials	\$413	\$413	-	(\$413)
31.0 Equipment	\$62	\$62	-	(\$62)
41.0 Grants, Subsidies, and Contributions	\$1,966	\$1,966	-	(\$1,966)
91.0 Unvouchered	\$23,711	-	-	-
Total, Other Object Classes	\$457,499	\$434,850	-	(\$434,850)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$457,499	\$434,850	-	(\$434,850)
Full Time Equivalents	-	-	-	-

Department of Homeland Security
Science & Technology
Research, Development, Acquisitions, and Operations
University Programs
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$136	\$136	-	(\$136)
25.1 Advisory and Assistance Services	\$1,795	\$1,795	-	(\$1,795)
41.0 Grants, Subsidies, and Contributions	\$29,069	\$37,793	-	(\$37,793)
91.0 Unvouchered	\$8,724	-	-	-
Total, Other Object Classes	\$39,724	\$39,724	-	(\$39,724)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$39,724	\$39,724	-	(\$39,724)
Full Time Equivalents	-	-	-	-

Department of Homeland Security
Science & Technology
Research, Development, Acquisitions, and Operations
Laboratory Facilities
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$13,893	\$14,208	-	(\$14,208)
11.7 Military Personnel	\$1,561	\$1,561	-	(\$1,561)
12.1 Civilian Personnel Benefits	\$4,026	\$4,026	-	(\$4,026)
Total, Personnel and Compensation Benefits	\$19,480	\$19,795	-	(\$19,795)
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$457	\$457	-	(\$457)
23.1 Rental Payments to GSA	\$1,250	\$1,250	-	(\$1,250)
23.3 Communications, Utilities, and Misc. Charges	\$12,804	\$12,804	-	(\$12,804)
25.1 Advisory and Assistance Services	\$10,977	\$10,977	-	(\$10,977)
25.3 Other Goods and Services from Federal Sources	\$4,611	\$4,611	-	(\$4,611)
25.4 Operation and Maintenance of Facilities	\$55,523	\$60,669	-	(\$60,669)
25.5 Research and Development Contracts	\$7,269	\$7,269	-	(\$7,269)
25.7 Operation and Maintenance of Equipment	\$616	\$616	-	(\$616)
26.0 Supplies and Materials	\$5,163	\$5,163	-	(\$5,163)
31.0 Equipment	\$1,800	\$1,800	-	(\$1,800)
32.0 Land and Structures	\$315,230	\$8,320	-	(\$8,320)
91.0 Unvouchered	(\$191)	-	-	-
Total, Other Object Classes	\$415,509	\$113,936	-	(\$113,936)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$434,989	\$133,731	-	(\$133,731)
Full Time Equivalents	130	136	-	(136)

I. Changes in Full Time Employment

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>
BASE: Year End Actual from Prior Year	123	130	136
Increases			
Actual FTE Adjustment	7	6	-
Subtotal, Increases	7	6	-
Decreases			
1. Transfer Follow-On	-	-	(136)
Subtotal, Decreases	-	-	(136)
Year End Actuals/Estimated FTEs:	130	136	-
Net Change from prior year base to Budget Year Estimate:	7	6	(136)

J. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

N/A

Department of Homeland Security

Science & Technology Directorate



Fiscal Year 2017
Strategic Context
Congressional Submission

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A. Component Overview

The Science & Technology Directorate (S&T) is comprised of the following mission-oriented programs that support achievement of the DHS strategic missions, goals, and objectives.

Acquisition and Operations Analysis: Acquisition and Operations Analysis provides expert assistance to entities across the homeland security enterprise (HSE) to ensure that the transition, acquisition, and deployment of technologies, information, and procedures improve the efficiency and effectiveness of the operational capabilities across the HSE mission. The five thrust areas of Acquisition and Operations Analysis are: Operations Research and Analysis; SAFETY Act (Support Anti-terrorism by Fostering Effective Technologies Act of 2002); Standards; Technology Transition Support; and Testing and Evaluation.

Laboratory Facilities: Laboratory Facilities provides a coordinated, enduring core of productive science, technology and engineering laboratories, organizations and institutions, which can provide the knowledge and technology required to secure our homeland. The laboratories' critical missions include the following: (1) assess and identify vulnerabilities and respond to potential chemical threats and hazards; (2) characterize biological threats and bio forensic analysis to support attribution of the planned or actual use of biological weapons; (3) support first responders by conducting tests, evaluations, and assessments of technologies and systems; (4) serve as the front line of the nation's defense against diseases that could impact livestock, meat, milk, and other animal products; and (5) provide a continuously available national capability to mature, evaluate, and certify emerging explosives detection technologies.

Research, Development, and Innovation: Research, Development, and Innovation is a portfolio of customer-focused and output-oriented research, development, testing and evaluation (RDT&E) programs that balance risk, cost, impact, and time to delivery. These RDT&E programs support the needs of the operational components of the Department and the first responder community and address crosscutting areas such as standards and interoperability.

University Programs: University Programs supports critical homeland security-related research and education at U.S. colleges and universities to address high-priority, DHS-related issues and to enhance homeland security capabilities over the long term. The mission is carried out through activities under the S&T Directorate's University Centers of Excellence (COEs) and the Minority Serving Institutions (MSIs) Program. The program brings together scientists, mathematicians, and engineers from many academic disciplines and institutions. These researchers are investigating research questions important to DHS and developing new technologies and approaches to solve complex and challenging homeland security problems. The program focuses on building homeland security expertise in the academic community, creating strategic partnerships among universities and public agencies, and developing a new scientific workforce of homeland security experts.

Management and Administration: This program captures activities that provide enterprise leadership, management, and/or business administration services and describes the capabilities and activities that support the day-to-day management and back office functions enabling the Department to operate efficiently and effectively. Key capabilities include conducting agency planning and performance management, managing finances, managing agency workforce, providing physical and personnel security, acquiring goods and services, managing information technology, managing agency property and assets, managing agency communications, managing legal affairs, and providing general management and administration.

FY 2017 Budget Request

The table below shows S&T’s FY 2017 Budget request by its mission-oriented programs.

Program	FY 2017 Request	
	FTE	Dollars (in thousands)
Acquisition and Operations Analysis	94	65,889
Laboratory Facilities	141	133,942
Research, Development, and Innovation	102	436,860
University Programs	10	33,009
Management and Administration	134	89,043
Total Budget Request	481	758,743

B. Component Contributions to Achieving Departmental Missions

The table below shows the alignment of S&T’s programs to the DHS Missions and Mature and Strengthen Homeland Security.

Programs	DHS Missions					Mature and Strengthen Homeland Security
	Prevent Terrorism and Enhance Security	Secure and Manage Our Borders	Enforce and Administer Our Immigration Laws	Safeguard and Secure Cyberspace	Strengthen National Preparedness and Resilience	
Acquisition and Operations Analysis					13%	87%
Laboratory Facilities						100%

Programs	DHS Missions					Mature and Strengthen Homeland Security
	Prevent Terrorism and Enhance Security	Secure and Manage Our Borders	Enforce and Administer Our Immigration Laws	Safeguard and Secure Cyberspace	Strengthen National Preparedness and Resilience	
Research, Development, and Innovation	33%	21%		20%	25%	1%
University Programs						100%
Management and Administration						100%

Mission 1: Prevent Terrorism and Enhance Security

Resources Requested

S&T resources supporting *Prevent Terrorism and Enhance Security* are provided in the table below.

\$ in thousands

Program	FY 2015 Revised Enacted		FY 2016 Enacted		FY 2017 Request	
	\$	FTE*	\$	FTE	\$	FTE
Research, Development, and Innovation	\$192,314	38	\$183,541	39	\$145,578	34
Total	\$192,314	38	\$183,541	39	\$145,578	34

*Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ submission.

Performance Measures

S&T contributes to this mission, but does not have performance measures in this area.

Mission 2: Secure and Manage Our Borders

Resources Requested

S&T resources supporting *Secure and Manage Our Borders* are provided in the table below.

\$ in thousands

Program	FY 2015 Revised Enacted		FY 2016 Enacted		FY 2017 Request	
	\$	FTE*	\$	FTE	\$	FTE
Research, Development, and Innovation	\$80,965	21	\$64,522	21	\$90,014	21
Total	\$80,965	21	\$64,522	21	\$90,014	21

*Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ submission.

Performance Measures

S&T contributes to this mission, but does not have performance measures in this area.

Mission 4: Safeguard and Secure Cyberspace

Resources Requested

S&T resources supporting *Safeguard and Secure Cyberspace* are provided in the table below.

\$ in thousands

Program	FY 2015 Revised Enacted		FY 2016 Enacted		FY 2017 Request	
	\$	FTE*	\$	FTE	\$	FTE
Research, Development, and Innovation	\$87,618	22	\$82,542	21	\$88,896	21
Total	\$87,618	22	\$82,542	21	\$88,896	21

*Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ submission.

Performance Measures

For *Safeguard and Secure Cyberspace*, strategic performance measures are presented. Strategic Measures represent measures that gauge achievement for this mission area, and are considered to be our Government Performance and Results Act Modernization Act (GPRAMA) performance measures.

Strategic Measures

Measure: Percent of planned cyber security products and services transitioned to government, commercial and open sources

Description: This measure reflects the percent of identified and completed planned transitions of cybersecurity products and/or services (e.g. technologies, tools, capabilities, standards, knowledge products) within Science & Technology Directorate’s Cyber Security Division projects to government, commercial, or open sources. The percent reported refers to the number of planned transition milestones stated in the Cyber Security Division's budget execution plan for the fiscal year, and the explanation that is provided in each quarterly performance data call. The Program coordinates cyber security research and development resulting in deployable security solutions. These solutions include user identity and data privacy technologies, end system security, research infrastructure, law enforcement forensic capabilities, secure protocols, software assurance, and cybersecurity education.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	N/A	60%	65%	80%	73%	80%
Result:	N/A	89%	93%	60%*	N/A	N/A

* This target was not met due to the Computer Security Incident Response Team milestone. The publication of the handbook was delayed in order to incorporate feedback from training sessions that are planned for several stakeholder organizations.

Mission 5: Strengthen National Preparedness and Resilience

Resources Requested

S&T resources supporting *Strengthen National Preparedness and Resilience* are provided in the table below.

\$ in thousands

Program	FY 2015 Revised Enacted		FY 2016 Enacted		FY 2017 Request	
	\$	FTE*	\$	FTE	\$	FTE
Acquisition and Operations Analysis	\$8,801	5	\$8,811	5	\$8,823	5
Research, Development, and Innovation	\$112,426	33	\$120,048	25	\$107,139	26
Management and Administration	\$18,093	0	\$16,595	0	\$17,108	0
Total	\$139,320	38	\$145,454	30	\$133,070	31

*Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ submission.

Performance Measures

S&T contributes to this mission, but does not have performance measures in this area.

Mature and Strengthen Homeland Security

Resources Requested

S&T resources supporting *Mature and Strengthen Homeland Security* are provided in the table below.

\$ in thousands

Program	FY 2015 Revised Enacted		FY 2016 Enacted		FY 2017 Request	
	\$	FTE*	\$	FTE	\$	FTE
Acquisition and Operations Analysis	\$48,789	77	\$55,537	89	\$57,066	89
Laboratory Facilities	\$434,989	130	\$133,731	136	\$133,942	141
Research, Development, and Innovation	\$0	0	\$4,230	1	\$5,233	1
University Programs	\$41,596	10	\$41,621	10	\$33,009	10
Management and Administration	\$73,227	131	\$75,760	134	\$71,935	134
Total	\$598,601	348	\$310,879	370	\$301,185	375

*Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ submission.

Performance Measures

For *Mature and Strengthen Homeland Security*, two types of performance measures are presented. Strategic Measures represent S&T's measures that gauge achievement for this mission area, and are considered to be our Government Performance and Results Act Modernization Act (GPRAMA) performance measures. Additional Management Measures are displayed, as appropriate, to provide a more thorough context of expected performance results.

Strategic Measures

Measure: Percent of Apex technologies or knowledge products transitioned to customers for planned improvements in the Homeland Security Enterprise
Description: This measure gauges the transition of high priority, and high value research and

development projects known as Apex projects. Apex technologies and knowledge products are quickly delivered to improve homeland security operations. Apex products consist of cross-cutting, multi-disciplinary efforts which employ 3 to 5 year innovation cycles from project inception through operational testing.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	N/A	N/A	N/A	80%	80%	80%
Result:	N/A	N/A	N/A	82%	N/A	N/A

Management Measures

Measure: Number of SAFETY Act "transition" (new, highly innovative) technologies awarded						
Description: In order to stay up to date with the continually changing nature of terrorism, the Office of SAFETY (Support Anti-Terrorism by Fostering Effective Technologies) Act Implementation (OSAI) will seek out those evolving technologies that can serve a homeland security mission and provide coverage to enable their transition into the commercial market, at a rate of 20 percent a year. A "transition" technology is defined as any technology that is awarded Developmental Testing and Evaluation (DTE) Designation, and those that can be considered new and innovative (i.e. a new technological application in the homeland security arena). OSAI is actively seeking out these technologies in an effort to address the ever-changing nature of terrorism. The SAFETY Act program is the only federal program that attempts to help industry transition these developmental technologies into the commercial marketplace.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	21	21	21	21	21	21
Result:	21	11	22	17*	N/A	N/A

*This is a stretch target, and meeting it is dependent on the submission of new/innovative technology applications by the private sector and a successful subject matter expert review of those applications. S&T expects to see more during FY 2016 due in part to the increased interest in cybersecurity applications and the commencement of the DHS Integrated Product Teams (IPTs), which should increase the program's visibility.

Measure: Percent of Capabilities Development Support Group program milestones that are met, as established in the fiscal year's budget execution plan						
Description: This measure reflects the Capabilities Development Support Group (CDSG) program milestones that meet their fiscal year budget execution and five - year plan goals. These milestones reflect the programmatic and technical events, accomplishments, or intermediate goals in the life of projects and programs. These milestones indicate satisfactory progress toward achieving long - term program performance goals and Department - wide goals and objectives. Milestones are defined as significant events, accomplishments, or intermediate goals in the life of projects, programs, etc. used to indicate satisfactory progress toward achieving long - term program performance goals and Department - wide goals and objectives. They help identify specific and established criteria for measuring incremental progress associated with long - term activities and program outcomes.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	75%	75%	75%	75%	75%	75%
Result:	100%	100%	87%	100%	N/A	N/A

Measure: Percent of fiscal year milestones met for the Administration and Support Division governed by applicable laws, regulations and management directives						
Description: This measure reflects the Administration and Support Division milestones identified in the Future Years Homeland Security Program (FYHSP), Program Data Module (PDM) and are governed by applicable laws, regulations and management directives. These milestones reflect the business and administrative requirements of DHS S&T including facilities, property, administration, audits and assessments, physical and information security, information technology, human capital, occupational health and safety, environment and energy, and readiness and operations coordination. Milestones are defined as significant events, accomplishments, or intermediate goals in the activities of the administrative support functions used to indicated satisfactory progress toward achieving long-term performance goals and Department-wide goals and objectives. They help identify specific and established criteria for measuring incremental progress associated with long-term activities and program outcomes.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	75%	75%	75%	75%	75%	75%
Result:	100%	100%	100%	100%	N/A	N/A

Measure: Percent of Homeland Security Advanced Research Projects Agency (HSARPA) program milestones that are met, as established in the fiscal year's budget execution plan						
Description: This measure reflects the Homeland Security Advanced Research Projects Agency (HSARPA) program milestones that meet their fiscal year budget execution and five-year plan goals. HSARPA manages a portfolio of highly innovative programs that are transforming the future mission space for Homeland Security. Complementary to the S&T Directorate's other programs and projects, HSARPA projects push scientific limits to address customer-identified						

gaps in areas where current technologies and R&D are inadequate or non-existent. HSARPA program managers lead teams of national experts in the development of new homeland security technologies, demonstrations and applications that offer significant breakthroughs for DHS operations. These milestones reflect the programmatic and technical events, accomplishments, or intermediate goals in the life of HSARPA projects and programs.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	75%	75%	75%	75%	75%	75%
Result:	85%	62%	77%	62%*	N/A	N/A

*The Homeland Security Advanced Research Projects Agency (HSARPA) program did not meet its fiscal year performance target. S&T reprioritized many projects within the HSARPA resilience portfolio, many of the missed milestones were related to these canceled projects. HSARPA is currently on track to meet the FY 2016 target of 75%.

Measure: Percent of Research and Development Partnerships (RDP) program milestones that are met, as established in the fiscal year's budget execution plan

Description: This measure reflects the Research and Development Partnerships (RDP) Group program milestones that meet their fiscal year budget execution and five-year plan goals. Milestones include X, Y, Z. RDP conducts extensive outreach efforts with members of the HSE based on the strategic and programmatic needs of the Department and S&T. The R&D Partnerships Group assists in both “transmitting and receiving information” to stakeholders across the HSE. The R&D Partnerships Group enables opportunities for evaluating, expediting, and monitoring the execution of programs with an increased speed-of-execution compared to “in-house only” activities. Our Group maintains extensive contacts and key references to conduct outreach, and provide research and funding opportunities to the public and private sectors both domestically and internationally.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	75%	75%	75%	75%	75%	75%
Result:	91%	95%	77%	80%	N/A	N/A

Measure: Percent of the Homeland Security Enterprise and First Responders Group program milestones that are met, as established in the fiscal year's budget execution plan

Description: This measure reflects the Homeland Security Enterprise and First Responders Group (FRG) program milestones that meet their fiscal year budget execution and five-year plan goals. Milestones include X, Y, Z. FRG identifies, validates, and facilitates the fulfillment of First Responder capability gaps through the use of existing and emerging technologies, knowledge products, and the acceleration of standards. FRG manages working groups, teams, and other stakeholder outreach efforts in order to better understand the needs and requirements of Federal, state, local, and tribal First Responders.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	75%	75%	75%	75%	75%	75%

Science & Technology Directorate - Strategic Context

Result:	83%	77%	78%	85%	N/A	N/A
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Measure: Percent of University Programs milestones that are met, as established in the fiscal year's budget execution plan

Description: This measure reflects the percent of University Programs milestones that meet their fiscal year budget execution and five-year plan goals. University Programs works closely with its stakeholders to identify requirements, set goals for milestones and deliverables, discuss the status of projects, and plan for the allocation of resources.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	75%	75%	75%	75%	75%	75%
Result:	85%	100%	86%	82%	N/A	N/A

Department of Homeland Security

Chemical, Biological, Radiological, Nuclear and Explosives Office Budget Overview



Fiscal Year 2017
Congressional Justification

i. Summary of FY Budget Estimates by Appropriation without Emergency Funding

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Summary of FY 2017 Budget Estimates by Appropriation**

**Total Appropriations
(Dollars in Thousands)**

Appropriation	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017								
	Revised Enacted ¹			Enacted			Request			Total Changes			Program Changes			Adjustments-to-Base		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Operations & Support	158	151	\$175,707	161	154	\$172,416	169	169	\$180,033	169	169	\$180,033	-	-	(\$230)	169	169	\$180,263
Federal Assistance	19	19	\$49,144	19	19	\$52,308	47	43	\$65,947	47	43	\$65,947	-	-	(\$500)	47	43	\$66,447
Procurement, Construction, and Improvements	6	6	\$53,571	7	7	\$90,866	8	8	\$103,860	8	8	\$103,860	-	-	\$14,400	8	8	\$89,460
Research and Development	50	50	\$158,778	53	53	\$156,899	56	56	\$151,605	56	56	\$151,605	-	-	(\$3,000)	56	56	\$154,605
Subtotal, Discretionary	233	226	\$437,200	240	233	\$472,489	280	276	\$501,445	280	276	\$501,445	-	-	\$10,670	280	276	\$490,775
Total, Chemical, Biological, Radiological, Nuclear and Explosives Office	233	226	\$437,200	240	233	\$472,489	280	276	\$501,445	280	276	\$501,445	-	-	\$10,670	280	276	\$490,775
Subtotal, Enacted Appropriations and Budget Estimates	233	226	\$437,200	240	233	\$472,489	280	276	\$501,445	280	276	\$501,445	-	-	\$10,670	280	276	\$490,775
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	233	226	\$437,200	240	233	\$472,489	280	276	\$501,445	280	276	\$501,445	-	-	\$10,670	280	276	\$490,775

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission *FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

ii. FY 2017 Investment Summary

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations and Support
 FY 2017 Investment Summary- Appropriation Level
 (Dollars in Thousands)

Investment Name	PPA(s)	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
Financial, Acquisition, and Asset Management Solution (FAAMS)	Management & Administration	\$5,733	\$3,172	\$2,686
Total		\$5,733	\$3,172	\$2,686

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

iii. Status of Congressionally Requested Studies, Reports and Evaluations

Fiscal Year	Due Date	Reference/Citation	Requirement	Status
FY 2016	3/31/2016	Section 1907 of the Homeland Security Act of 2002 (6 U.S.C. 101 et seq.)	Global Nuclear Detection Architecture Joint Annual Interagency Review	Pending
FY 2016	3/31/2016	Section 1036 of the National Defense Authorization Act for Fiscal Year 2010 (P.L. 111-84) (Oct. 28, 2009)	Joint Interagency Annual Review of the National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States	Pending
FY 2016	Not later than 15 days before transferring funds pursuant to subsection (b) [CBRNE Re-organization]	Consolidated Appropriations Act of 2016 (Rules Committee Print 114-39 Text of House Amendment #1 to the Senate Amendment to H.R. 2029, Military Construction and Veterans Affairs and Related Agencies Appropriations Act, 2016)	CBRNE Transition Plan	Pending

iv. Schedule of Authorized/Unauthorized Appropriations by PPA

Budget Activity	Last Year of Authorization	Authorized Level	Appropriation in Last Year of Authorization	FY 2017 Request
	Fiscal Year	Amount	Amount	Amount
Operations and Support	N/A	N/A	N/A	\$180,033
Management and Administration	N/A	N/A	N/A	\$41,561
Chemical, Biological, and Emerging Infectious Diseases Capability	N/A	N/A	N/A	\$117,920
Rad/Nuc Detection, Forensics and Prevention Capability	N/A	N/A	N/A	\$20,552
Procurement, Construction, and Improvements	N/A	N/A	N/A	\$103,860
Rad/Nuc Detection, Forensics and Prevention Capability	N/A	N/A	N/A	\$103,860
Research and Development	N/A	N/A	N/A	\$151,605
Rad/Nuc Detection, Forensics and Prevention Capability	N/A	N/A	N/A	\$151,605
Federal Assistance	N/A	N/A	N/A	\$65,947
Rad/Nuc Detection, Forensics and Prevention Capability	N/A	N/A	N/A	\$51,684
Bombing Prevention	N/A	N/A	N/A	\$14,263
Total Direct Authorization/Appropriation	N/A	N/A	N/A	\$501,445

Department of Homeland Security

Chemical, Biological, Radiological, Nuclear and Explosives Office

Operations & Support



Fiscal Year 2017

Congressional Justification

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Schedule I – Executive Summary of Appropriation Exhibits

Summary of Budget Estimates by Program Project Activity- Appropriation Level

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support**

Summary of FY 2017 Budget Estimates by Program Project Activity

**FY 2017 Request
(Dollars in Thousands)**

Program Project Activity	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017		
	Revised Enacted			Enacted			Request			Total Changes		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Chemical, Biological, and Emerging Infectious Diseases Capability	63	63	\$115,378	60	60	\$111,859	68	68	\$117,920	8	8	\$6,061
Chemical and Biological Capability	14	14	\$91,805	12	12	\$86,681	17	17	\$94,862	5	5	\$8,181
Health and Emerging Infectious Diseases	28	28	\$9,135	27	27	\$10,166	29	29	\$9,951	2	2	(\$215)
Integrated Operations	21	21	\$14,438	21	21	\$15,012	22	22	\$13,107	1	1	(\$1,905)
R/N Detection, Forensics, and Prevention Capability	21	21	\$20,848	24	24	\$21,291	25	25	\$20,552	1	1	(\$739)
Architecture Planning and Analysis	21	21	\$20,848	24	24	\$21,291	25	25	\$20,552	1	1	(\$739)
Management & Administration	74	67	\$39,481	77	70	\$39,266	76	76	\$41,561	(1)	6	\$2,295
Total, Operations & Support	158	151	\$175,707	161	154	\$172,416	169	169	\$180,033	8	15	\$7,617
Subtotal, Enacted Appropriations & Budget Estimates	158	151	\$175,707	161	154	\$172,416	169	169	\$180,033	8	15	\$7,617
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-			
Net, Enacted Appropriations and Budget Estimates:	158	151	\$175,707	161	154	\$172,416	169	169	\$180,033	8	15	\$7,617

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

Overview

Operations and Support (O&S) funds necessary operations, mission support, and associated management and administration (M&A) costs in support of the following mission programs:

Chemical, Biological and Emerging Infectious Diseases Capability: Coordinate and maintain DHS-wide chemical, biological, and emerging infectious disease-related strategy, policy, situational awareness, periodic threat and risk assessments, and contingency planning, and elements of Presidential Policy Directive 8, National Preparedness. These programs support the President's Global Health Security Agenda and prioritization of activities to counter biological threats. This work also complements the capability-building and sustainment efforts managed by the Federal Emergency Management Agency (FEMA). The Chemical, Biological, and Emerging Infectious Disease programs support response operations of DHS components and helps integrate Federal interagency response operations.

Rad/Nuc Detection, Forensics, and Prevention Capability: Established to prevent radiological and nuclear (rad/nuc) attacks against the United States or its interests. The Rad/Nuc Detection, Forensics and Prevention Capability Program serves as the primary entity of the United States Government (USG) to further develop, acquire, and support the deployment of an enhanced system to detect and report on attempts to import, possess, store, transport, develop, or use an unauthorized nuclear explosive device, fissile material, or radiological material in the United States and improve that system over time. The Rad/Nuc Detection, Forensics and Prevention Capability Program supports response operations of DHS components and helps integrate Federal interagency response operations. The Rad/Nuc Detection, Forensics and Prevention Capability Program leads the USG with development of the Global Nuclear Detection Architecture (GNDA) and its implementation. The included mission area is Architecture Planning and Analysis.

Management and Administration: Captures activities that provide enterprise leadership, management and business administration services and describes the capabilities and activities that support the day-to-day management and back office functions that enable the CBRNE Office to operate efficiently and effectively. Key capabilities include strategic direction and integration across Chemical, Biological, Radiological, Nuclear, Explosives, and Health Affairs-related activities, White House and interagency policy development and liaison, conducting agency planning and performance management, managing finances, managing agency workforce, providing physical and personnel security, acquiring goods and services, managing information technology, managing agency property and assets, managing agency communications, managing legal affairs, and providing general management and administration.

B. FY 2016 to FY 2017 Budget Change - Appropriation Level

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
 FY 2016 to FY 2017 Budget Change
 (Dollars in Thousands)

	Pos.	FTE	Amount
Adjustments-to-Base			
Transfers to and from other accounts:			
From OHA BioWatch to CBRNE O&S - CBC	-	-	\$82,078
From OHA Chemical Defense Program to CBRNE O&S - CBC	-	-	\$824
From OHA S&E to CBRNE O&S - CBC	12	12	\$3,779
From OPS to CBRNE O&S - Chemical & Biological Capability	1	1	\$149
From S&T to CBRNE O&S - Chemical & Biological Capability	4	4	\$7,884
WCF Transfer from Chemical & Biological Capability	-	-	(\$1,903)
From OHA P&C to CBRNE O&S - Health & Emerging Inf. Dis.	-	-	\$4,495
From OHA S&E to CBRNE O&S - Health & Emerging Inf. Dis.	27	27	\$5,671
From OPS to CBRNE O&S - Health & Emerging Inf. Dis.	2	2	\$350
WCF Transfer from Health & Emerging Inf. Dis.	-	-	(\$195)
Transfer From NBIC to Integrated Operations	-	-	\$10,500
Transfer From OPS to Integrated Operations	1	1	\$149
Transfer From P&C to Integrated Operations	-	-	\$462
Transfer From S&E to Integrated Operations	21	21	\$4,050
WCF Transfer from Integrated Operations	-	-	(\$269)
From CBRNE O&S R/NDFPC to Working Capital Fund	-	-	(\$168)
From DNDO M&A to CBRNE O&S - R/NDF&PC	24	24	\$5,091
From DNDO RD&O - SA to CBRNE O&S - R/NDF&PC	-	-	\$16,200
From CBRNE O&S M&A to Working Capital Fund	-	-	(\$1,103)
From DNDO M&A to CBRNE O&S - M&A	34	34	\$18,580
From DNDO RD&O - Assessments to CBRNE O&S- M&A	-	-	\$870
From DNDO RD&O - Operations Support to CBRNE O&S - M&A	-	-	\$805
From DNDO RD&O - Nuclear Forensics to CBRNE O&S- M&A	-	-	\$451
From DNDO RD&O - SA to CBRNE O&S - M&A	-	-	\$800
From DNDO RD&O - SD to CBRNE O&S - M&A	-	-	\$402
From DNDO RD&O - TR&D to CBRNE O&S - M&A	-	-	\$1,554
From DNDO Sys Acq - RDE Acquisition to CBRNE O&S - M&A	-	-	\$1,718
From DNDO Sys Acq - STC to CBRNE O&S- M&A	-	-	\$576
From OHA S&E to CBRNE O&S- M&A	43	36	\$13,510
From Policy to CBRNE O&S - M&A	4	4	\$980
Total Transfers	173	166	\$178,290
Increases			
2017 Pay Increase	-	-	\$395
Annualization of 2016 Pay Raise	-	-	\$105
Chemical & Biological Capability	-	-	\$194
DHS Balanced Workforce Strategy	3	3	\$286

	Pos.	FTE	Amount
Financial System Modernization	-	-	\$1,685
Management and Administration	-	-	\$327
Total, Increases	3	3	\$2,992
Decreases			
Architecture Planning and Analysis	-	-	(\$105)
BioWatch Reduction	-	-	(\$200)
FTP Adjustment	(7)	-	-
Integrated Operations Program Reduction	-	-	(\$124)
Program Reduction	-	-	(\$470)
Reduced Contract Support	-	-	(\$20)
Working Capital Fund	-	-	(\$100)
Total, Decreases	(7)	-	(\$1,019)
Total Other Adjustments	(4)	3	\$1,973
Total Adjustments-to-Base	169	169	\$180,263
FY 2017 Current Services	169	169	\$180,263
Program Changes			
Increases			
Integrated Consortium of Laboratory Networks	-	-	\$770
Integrated Terrorism Risk Assessment	-	-	\$2,000
Total, Increases	-	-	\$2,770
Decreases			
Architecture Planning and Analysis	-	-	(\$500)
National Biosurveillance Integration Center	-	-	(\$2,500)
Total, Decreases	-	-	(\$3,000)
Total Program Changes	-	-	(\$230)
FY 2017 Request	169	169	\$180,033
FY 2016 to FY 2017 Change	8	15	\$7,617

C. FY 2017 Investment Summary - Appropriation Level

**Department of Homeland Security
 Chemical, Biological, Radiological, Nuclear and Explosives Office
 Operations and Support
 FY 2017 Investment Summary- Appropriation Level
 (Dollars in Thousands)**

Investment Name	PPA(s)	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
Financial, Acquisition, and Asset Management Solution (FAAMS)	Management & Administration	\$5,733	\$3,172	\$2,686
Total		\$5,733	\$3,172	\$2,686

Schedule II – Program, Project, Activity (PPA) Exhibits

Exhibit D. FY 2016 to FY 2017 Budget Change- PPA Level

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)**

Chemical, Biological, and Emerging Infectious Diseases Capability		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	177
	Annualization of 2016 Pay Raise	-	-	49
	BioWatch Reduction	-	-	(200)
	Chemical & Biological Capability	-	-	194
	From OHA BioWatch to CBRNE O&S - CBC	-	-	82,078
	From OHA Chemical Defense Program to CBRNE O&S - CBC	-	-	824
	From OHA P&C to CBRNE O&S - Health & Emerging Infection Diseases	-	-	4,495
	From OHA S&E to CBRNE O&S - CBC	12	12	3,779
	From OHA S&E to CBRNE O&S - Health & Emerging Infection Diseases	27	27	5,671
	From OPS to CBRNE O&S - Chemical & Biological Capability	1	1	149
	From OPS to CBRNE O&S - Health & Emerging Infection Diseases	2	2	350
	From S&T to CBRNE O&S - Chemical & Biological Capability	4	4	7,884
	Integrated Operations	-	-	(124)
	HEID	-	-	(470)

Chemical, Biological, and Emerging Infectious Diseases Capability		Positions	FTE	Amount
	Transfer From NBIC to Integrated Operations	-	-	10,500
	Transfer From OPS to Integrated Operations	1	1	149
	Transfer From P&C to Integrated Operations	-	-	462
	Transfer From S&E to Integrated Operations	21	21	4,050
	WCF Transfer from Chemical & Biological Capability	-	-	(1,903)
	WCF Transfer from Health & Emerging Infection Diseases	-	-	(195)
	WCF Transfer from Integrated Operations	-	-	(269)
Program Changes	Integrated Consortium of Laboratory Networks	-	-	770
	Integrated Terrorism Risk Assessment	-	-	2,000
	National Biosurveillance Integration Center	-	-	(2,500)
Budget Year	FY 2017 Request	68	68	117,920
	Total Change from FY 2016 to FY 2017	8	8	6,061

PPA Description

CBRNE requests \$117.92 million and 68 FTE within Chemical, Biological, and Emerging Infectious Disease Capability (CB&EIDC) for FY 2017.

Adjustments-to-base include:

- Transfer in of \$82.078 million from BioWatch to CB&EIDC
- Transfer in of \$10.500 million from NBIC to CB&EIDC Transfer in of \$4.4957 million from P&C to CB&EIDC
- Transfer in of \$0.824 million from CDP to CB&EIDC
- Transfer in of \$13.500 million and 60 FTP/60 FTE from S&E to CB&EIDC Transfer in of \$0.648 million and 4 FTP/4 FTE from OPS to CB&EIDC Transfer in of \$7.884 million and 4 FTP/4 FTE from S&T to CB&EIDC
- Transfer out of \$1.903 million from Bio & Chem. Cap. to Working Capital Fund
- Transfer out of \$0.195 million from Health & Emerging Infect. Dis. to Working Capital Fund
- Transfer out of \$0.269 million from Integrated Ops. to Working Capital Fund
- Increase of \$0.049 million to annualize the 2016 pay increase
- Increase of \$0.177 million for 2017 pay increase

- Increase of \$0.194 million for Chem. & Bio Capability, Chemical Defense
- Decrease of \$0.200 million for Chem. & Bio. Cap., BioWatch
- Decrease of \$0.470 million for Health & Emerging Infectious Diseases
- Decrease of \$0.124 million for Integrated Operations Program Reduction

Program Changes Include:

- Increase of \$2.000 million for Integrated Terrorism Risk Assessment
- Increase of \$0.770 million for Integrated Consortium of Laboratory Networks
- Decrease of \$2.500 million for National Biosurveillance Integration Center

CB&EIDC programs coordinate and maintain DHS-wide chemical, biological, and emerging infectious disease-related strategy, policy, situational awareness, periodic threat and risk assessments, contingency planning, and all elements of Presidential Policy Directive 8, National Preparedness. These programs support the President's Global Health Security Agenda and prioritization of activities to counter biological threats. This work also complements the capability-building and sustainment efforts managed by FEMA.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Justification of Program Changes
(Dollars in Thousands)

Program Increases: Integrated Consortium of Laboratory Networks and Integrated Terrorism Risk Assessment

PPA: Chemical, Biological, and Emerging Infectious Diseases Capability

Program Increases: FTP 0, FTE 0, Dollars \$270

Funding Profile

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request		
	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)
Current Services: National Biosurveillance Integration Center - Integrated Operations							10	10	\$12,336
Subtotal, Current Services							10	10	\$12,336
Program Increase: Integrated Terrorism Risk Assessment - Chemical and Biological Capability							-	-	\$2,000
Program Increase: Integrated Consortium of Laboratory Networks - Integrated Operations							-	-	\$770
Subtotal, Program Increases							-	-	\$2,770
Program Decrease: National Biosurveillance Integration Center - Integrated Operations							-	-	(\$2,500)
Subtotal, Program Decreases							-	-	(\$2,500)
Total Request							10	10	\$12,606

DESCRIPTION OF ITEM: Integrated Consortium of Laboratory Networks (ICLN)

The Integrated Consortium of Laboratory Networks (ICLN), established in 2005, provides for a coordinated and interoperable system of laboratory networks that provide timely, credible, and interpretable data in support of surveillance, early detection, and effective consequence management for acts of terrorism and other major incidents requiring laboratory response capabilities. The 2011 *Food Safety Modernization Act* directs DHS to lead this effort. The Memorandum of Agreement that established the ICLN was signed in 2005 and renewed in 2013 by DHS, USDA, Department of Commerce, DOD, DOE, HHS, DOI, Department of Justice, DOS, and the Environmental Protection Agency. Signatory agencies and their respective laboratory networks agreed to create and support an integrated and operational system promoting laboratory response.

ICLN Justification:

CBRNE will maintain the program management function for the ICLN. Recovery from large-scale chemical, biological, or radiological contamination and disease events can require the collection and analysis of very large numbers of samples. The laboratory capacity available in the United States to accommodate this load of samples limits the rate of resolution of these samples and inhibits the return of contaminated spaces to normal condition. ICLN develops operational procedures and information technology systems to enable joint action of the several federally-sponsored laboratory response networks for both intentional and naturally evolving events of sufficient scale to over-run the resources of any one network. Effective laboratory capacity is increased through the organized sharing of resources rather than investment of new funding. The optimized action of six laboratory response networks comprising 450 laboratories across the United States will greatly decrease the time to return to normal state after an event.

ICLN Impact on Performance:

The ICLN Program ensures Federal lab capability following CBRNE contamination and disease events. The FY 2017 request allows the ICLN program to:

- Develop an exercise structure to test the ICLN capability with all stakeholders and incorporate the ICLN into existing interagency and national level exercises.
- Maintain and enhance the ICLN portal. This will include improving the incident management tools on the portal and continuing to develop the minimum actionable data elements to allow participating networks to submit data in their native network data format.
- Convene the Joint Leadership Council and Network Coordination Group meetings with the goal of strengthening the ICLN response capability.

DESCRIPTION OF ITEM: Integrated Terrorism Risk Assessment (ITRA)

The Integrated Terrorism Risk Assessment is a systematic, scientifically-defensible product that provides insights into likelihoods, consequences, and relative risks of terrorism. The ITRA complements the Chemical, Biological, and Rad/Nuc Terrorism Risk Assessments.

ITRA Justification

Homeland Security Presidential Directive-18 requires the Secretary of Homeland Security to “develop a strategic, integrated all-CBRN risk assessment that integrates the findings of the intelligence and law enforcement communities with input from the scientific, medical, and public health communities.” ITRA informs the Department of Health and Human Services’ resource allocation for medical countermeasures and will be used by a broader range of Federal decision makers to support development of risk management strategies that have tangible operational impact on cross-CBRNE terrorism risks such as prevention, protection, mitigation, surveillance and detection, and response and recovery activities. Prior to the transfer of these risk assessments to the CBRNE Office, they were conducted by the Science and Technology Directorate and the Domestic Nuclear Detection Office.

ITRA Impact on Performance

Specifically, the FY 2017 request allows the ITRA program to:

- Address stakeholder comments and deliver the Integrated CBRNE Terrorism Risk Assessment 4.0 report
- Gather requirements from external and internal stakeholders for next generation ITRA
- Establish an independent DHS CBRNE risk assessment modeling repository
- Continue development of the Integrated CBRNE Countermeasure Assessment and Planning Tool for the evaluation of CBRNE risks and strategies for reducing those risks.

DESCRIPTION OF ITEM: National Biosurveillance Integration Center (NBIC)

NBIC integrates and analyzes information and provides surveillance of biological threats to provide critical situational awareness to national decision-makers to help ensure rapid and well-informed responses. NBIC’s integrated biosurveillance information helps

develop a more comprehensive picture of the bio-threat landscape to help the Nation anticipate biological threats and emerging infectious diseases to better prepare, protect, and respond. The threat of bioterrorism and the global reach of emerging diseases like Ebola, Foot and Mouth Disease, and Avian Flu require decision-makers to have timely, accurate, and actionable information.

NBIC Justification

The requested funding will allow NBIC to continue monitoring biological events on a 24/7 basis for early warning and shared situational awareness. In addition, funding is included to support operationalization of a limited number of existing successful analytic development projects designed to evaluate opportunities to identify and use potential novel data sets and information as well as advanced analytic approaches and tools.

NBIC projects are routinely assessed and evaluated to appropriately determine which projects will be most operationally valuable and effective. Projects that prove successful will be integrated into normal operations; if deemed unsuccessful, projects will be discontinued. Decisions of which projects to fund and operationalize will be made based on the outcome of these evaluations and the availability of funding.

NBIC Impact on Performance

NBIC will absorb the reduction in funding through cost sharing of interagency liaisons, reduction in partnership funding, and continuation of a limited number of analytic development projects.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	63	63	\$11,380	\$180	60	60	\$11,406	\$189	68	68	\$14,449	\$211	8	8	\$3,043	\$22
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

- **FTE Change FY 2016-2017**

The FY 2017 request reflects the transfer of 8 FTE to CBEID activities.

- **Personnel Compensation and Benefits Change FY 2016-2017**

Reflects pay inflation.

- **Average Cost Change FY 2016-2017**

The average cost change reflects pay inflation and an increase to Public Health Service Officers.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Cost Drivers (Non-Pay) - PPA Level (\$000s)

Appropriation - Chemical, Biological, and Emerging Infectious Diseases Capability	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
BioWatch Jurisdictional Support	\$44,725	\$56,380	\$59,147	\$2,767
National BioWatch Coordination	\$30,350	\$19,608	\$19,575	(\$33)
Biodefense	-	-	\$6,860	\$6,860
NBIC Partnerships and Analytics	\$7,051	\$7,051	\$4,490	(\$2,561)
NBIC Innovation	\$3,551	\$3,551	\$3,205	(\$346)
Total	\$85,677	\$86,590	\$93,277	\$6,687

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

PPA JUSTIFICATION:

- **BioWatch Jurisdictional Support**

The FY 2016 to FY 2017 change of \$2,767,000 reflects an increase in the cost of activities that support the BioWatch Jurisdictions, including State and local Cooperative Agreements, Laboratory Support, Consumables, Jurisdiction Coordinators.

- **National BioWatch Coordination**

The FY 2016 to FY 2017 reduction of \$33,000 reflects a small change to the national support system for BioWatch Operations.

- **Biodefense**

This cost driver consists of the activities of Bioterrorism Risk Assessment, Biodefense Knowledge Center, and Integrated Terrorism Risk Assessment project transferring to CBRNE in FY 2017 for an increase of \$6,686,000.

- **NBIC Partnerships and Analytics**

The FY 2016 to FY 2017 change is a decrease of \$2,561,000 to reflect reduced funding through cost sharing of interagency liaisons and reevaluating the analytic development projects.

- **NBIC Innovation**

The FY 2016 to FY 2017 change is a decrease of \$346,000.

FY 2016 to FY 2017 Budget Change- Sub-PPA Level

Summary Tables of Sub-PPA
Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Chemical and Biological Capability
 FY 2016 to FY 2017 Budget Change- PPA Level
 (Dollars in Thousands)

Chemical and Biological Capability		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	45
	Annualization of 2016 Pay Raise	-	-	12
	BioWatch Reduction	-	-	(200)
	Chemical & Biological Capability	-	-	194
	From OHA BioWatch to CBRNE O&S - CBC	-	-	82,078
	From OHA Chemical Defense Program to CBRNE O&S - CBC	-	-	824
	From OHA S&E to CBRNE O&S - CBC	12	12	3,779
	From OPS to CBRNE O&S - Chemical & Biological Capability	1	1	149
	From S&T to CBRNE O&S - Chemical & Biological Capability	4	4	7,884
	WCF Transfer from Chemical & Biological Capability	-	-	(1,903)
Program Changes	Integrated Terrorism Risk Assessment	-	-	2,000
Budget Year	FY 2017 Request	17	17	94,862
	Total Change from FY 2016 to FY 2017	5	5	8,181

PPA Description:

CBRNE requests \$94.862 million and 17 FTE within Chemical and Biological Capability for FY 2017.

Adjustments-to-base include:

- Transfer in of \$82.078 million from BioWatch to CB&EID
- Transfer in of \$0.824 million from CDP to CB&EID
- Transfer in of \$3.779 million and 12 FTP/12 FTE from S&E to CB&EID Transfer in of \$0.149 million and 1 FTP/1 FTE from OPS to CB&EID Transfer in of \$7.884 million and 4 FTP/4 FTE from S&T to CB&EID
- Transfer out of \$1.903 million from Chemical and Biological Capability to Working Capital Fund
- Increase of \$0.012 million to annualize the 2016 pay increase
- Increase of \$0.045 million for 2017 pay increase
- Increase of \$0.194 million for Chemical and Biological Capability, Chemical Defense
- Decrease of \$0.200 million for Chemical and Biological Capability, BioWatch

Program Changes Include:

- Increase of \$2.000 million for Integrated Terrorism Risk Assessment

CURRENT SERVICES SUBPROGRAM DESCRIPTION: CHEMICAL AND BIOLOGICAL CAPABILITY

Chemical and Biological Capability programs and activities encompass BioWatch, the Chemical Defense Program, and Biological, Chemical, and Integrated Terrorism Risk Assessments. These programs inform national policy, provide detection of select aerosolized biological agents, and support State and local preparedness for biological and chemical events.

\$94.987 million of the requested CB&EIDC funding will support the Chemical and Biological Capability subprogram, enabling continued operations in all jurisdictions where the BioWatch system is presently deployed; work with communities to enhance their chemical defense capabilities by developing guidance tools and implement the best practices; develop reports for anticipating, preventing, characterizing, and responding to an attack using biological warfare agents; and continue biological and chemical risk assessment work within the CBRNE Office.

BioWatch

BioWatch detection and preparedness activities are designed to enable early detection and community response against aerosolized biological threats. The program links detection technology and analysis with preparedness and response capacity-building in over 30 jurisdictions across the country. Early warning of a biological attack, combined with rapid, coordinated public health response, can eliminate or substantially minimize the consequences to the Nation.

BioWatch is the Nation's only detection system that provides early warning for aerosolized biological threats. BioWatch detection technology is deployed in major metropolitan areas nationwide. The BioWatch network links State, local, tribal and territorial public health officials and emergency planners at every level of government and builds a coordinated response through guidance exercises and information sharing.

BioWatch serves as the cornerstone in the Department's layered approach to bioterrorism. Early detection is central to the Nation's ability to protect its population from the effects of deliberate biological attacks.

In FY 2015, BioWatch continued supporting its current detection technology in more than 30 jurisdictions. The program completed an operational demonstration that verified the capabilities of the current technology to detect and identify biological agents. BioWatch worked with Federal interagency partners to identify upgrades to its laboratory analysis technology as part of the equipment recapitalization funded by Congress. The program also worked with S&T to identify five technology areas for near-term enhancement. BioWatch issued requests for information from industry stakeholders to begin a market survey and feasibility analysis of these technologies. The Institutes of Medicine, at the request of the Office of Health Affairs, is reviewing the reports of findings in the Bio-terrorism areas that have been produced recently to inform the path forward for the BioWatch program.

BioWatch continued to conduct tabletop and full-scale exercises for jurisdictions and updated and shared Indoor and Outdoor Guidance documents with stakeholders.

The program also supported multiple National Special Security Events and other high-profile activities. In FY 2015, BioWatch deployed a network of detectors to the Super Bowl, the Rose Parade, the Grand Prix, and the Papal visit. BioWatch also enhanced its collaboration with National Biosurveillance Integration Center (NBIC) to give State and local decision-makers richer context to use for interpreting biological threat information.

The FY 2017 funding for BioWatch will enable the continuation of current operations in all jurisdictions where the BioWatch system is presently deployed, analyzing over 200,000 samples a year across jurisdictions. The program will continue to coordinate over five full-scale annual BioWatch exercises and more than 25 limited-participation exercises to improve jurisdictional preparedness. BioWatch will also continue to coordinate integrated environmental assessments to foster consistency across jurisdictions and provided decision-makers with more information about the circumstances surrounding a biological incident.

BioWatch will continue working with S&T to test, acquire, and potentially deploy new biodetection technologies.

Chemical Defense Program (CDP)

CDP helps first responders and emergency workers coordinate with public health, emergency management, and other officials to assess the local risk and develop plans for high consequence chemical incidents.

CDP specialists are experts in medical toxicology, emergency medicine, and public health. They advise DHS and government leaders about chemical threats and their potential policy and planning consequences. CDP also advises communities about chemical event preparedness by helping identify distinct risks and local vulnerabilities, evaluate relevant protective actions, and understand the decisions and resources needed to respond.

In FY 2015, CDP completed phase one of a demonstration project capstone exercise in three out of the five identified cities, with additional exercises to follow into the next fiscal year. The second phase of the demonstration projects begins in the Spring of 2016 and will involve developing the final report identifying lessons learned from the entire project.

CDP released a joint guidance document to be used to assist emergency planners and public health officials assess the medical resources needed to respond to mass casualties from a catastrophic chemical incident.

In FY 2016 and FY 2017, CDP will continue working with communities to enhance their chemical defense capabilities by developing guidance tools and implementing the best practices and lessons learned from demonstration project capstone exercises. CDP experts will continue to provide medical toxicology and chemical defense expertise to DHS and Component leadership and Federal Government partners.

Biodefense Knowledge Center (BKC)

- The BKC is an enduring DHS center of expertise, with knowledge products that bridge science, technology, intelligence, health threats, and law enforcement. BKC provides customer requested bio-threat and science assessments as well as in-depth analyses of biodefense issues and biotechnologies. Its key assessments and analytical products include: biological threat agent fact books; material threat assessments;

Bioterrorism Risk Assessment (BTRA)

In accordance with HSPD-10, the BTRA informs decision-making and resource allocations across Federal agencies, such as investment decisions for the Department of Health and Human Services (HHS) stockpile of medical countermeasures. BTRA develops probabilistic risk assessments and alternative methodologies for comparison and verification. These assessments estimate terrorism risk as the probability of an attack occurring and the consequences of an attack should it occur. BTRA assessments incorporate the judgments of the intelligence and law enforcement communities with input from the scientific, medical, and public health communities to integrate risk as a function of threat, vulnerability, and consequences.

In FY 2015, BTRA continued to develop a Countermeasure Assessment and Planning Tool, which will inform assessment of the relative importance and value of various defensive options (e.g., detectors, medical countermeasures) to reduce risk associated with bioattack scenarios. Rapid analysis tools are being developed to allow users to explore a variety of concepts of operation (CONOPS) and make judgments regarding which scenarios merit further investment.

BTRA projects continually evolve to respond to the needs of its interagency partners, helping refine and frame the problem space for strategic guidance and redesigning the analytic process to incorporate interagency contributions and update and validate BTRA models.

BTRA will apply FY 2017 resources to continue risk assessment work within the CBRNE Office.

Chemical Terrorism Risk Assessment (CTRA)

In accordance with HSPD-22, the CTRA provides decision makers and emergency management planners with the ability to assess the risk and impact of highly toxic chemical materials, such as toxic industrial chemicals, chemical warfare agents, and emerging chemical threats.

CTRA is an end-to-end assessment of chemical risk, incorporating intelligence information and assessments of terrorist ability to access and release toxic chemicals, the ability of law enforcement to interdict planned attacks, the consequences of a successful attack, and the ability of current countermeasures (medical, detectors, and physical methods) to mediate or mitigate those consequences.

CTRA products examine the highest risk chemicals and venues. The CTRA Desktop Tool conducts tailored assessments to assess the effectiveness of different mitigation measures, the impact on different venues, and how better scientific information helps to refine the risk estimates. In FY 2015, CTRA and the Desktop Tool were used to plan for national security events and the preplacement of countermeasures and to assess risk and consequences during actual events, such as large chemical accidents. CTRA tools are used by Federal agencies, State and local authorities, international partners, and chemical industry stakeholders.

The FY 2017 request will support ongoing CTRA initiatives in the CBRNE Office. CTRA will apply the requested funds to update and refine its chemical risk assessments to support the CBRNE mission space.

Integrated Terrorism Risk Assessment (ITRA)

The ITRA informs resource allocation for medical countermeasures and will be used by a broader range of Federal decision makers to support development of risk management strategies that have tangible operational impact on cross-CBRNE terrorism risks such as prevention, protection, mitigation, surveillance and detection, response, and recovery activities.

HSPD-18 requires the Secretary of Homeland Security to “develop a strategic, integrated all-CBRN risk assessment that integrates the findings of the intelligence and law enforcement communities with input from the scientific, medical, and public health communities.”

This project supports national preparedness initiatives by providing a systematic, scientifically-defensible integrated CBRNE terrorism risk assessment product. ITRA provides insights into likelihoods, consequences, and relative risks of terrorism, which complements individual class-specific terrorism risk assessments.

The FY 2017 funding request will enable ITRA to address stakeholder comments and deliver the Integrated CBRNE Terrorism Risk Assessment 4.0 report; gather requirements from external and internal stakeholders for next generation ITRA; establish an independent DHS CBRNE risk assessment modeling repository; and continue development of the Integrated CBRNE Countermeasure Assessment and Planning Tool for the evaluation of CBRNE risks and strategies for reducing those risks.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Chemical and Biological Capability
Cost Drivers (Pay & Benefits) – Sub-PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	14	14	\$3,627	\$258	12	12	\$3,576	\$297	17	17	\$4,404	\$258	5	5	\$828	(\$39)
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS Pay Cost Drivers Exhibit may reflect a higher average FTE Cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

- **FTE Change FY 2016-2017**

The FY 2017 request reflects the transfer of 4 FTE from S&T to support BTRA, CTRA, and ITRA and 1 FTE from Operations to support Chemical Defense. A major cost driver includes the Public Health Service Officers who support Chemical and Biological Capability.

- **Personnel Compensation and Benefits Change FY 2016**

The FY 2017 budget request reflects the transfer of 5 FTE from S&T and Operations.

- **Average Cost Change FY 2016-2017**

The average cost reflects pay inflation, a reduced number of Public Health Service Officers, and the 5 additional FTE transferred from S&T and Operations.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Chemical and Biological Capability
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - Chemical and Biological Capability	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
BioWatch Jurisdictional Support	\$44,725	\$56,380	\$59,147	\$2,767
National BioWatch Coordination	\$30,350	\$19,608	\$19,575	(\$33)
Chemical Defense	\$824	\$824	\$2,755	\$1,931
Biodefense	-	-	\$6,860	\$6,860
BioWatch Tech Refresh	\$2,600	\$2,200	\$1,000	(\$1,200)
Total	\$78,499	\$79,012	\$89,337	\$10,325

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Summary Tables of Sub-PPA
Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Health and Emerging Infectious Diseases
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)

Health and Emerging Infectious Diseases		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	78
	Annualization of 2016 Pay Raise	-	-	22
	From OHA P&C to CBRNE O&S - Health & Emerg. Inf. Dis.	-	-	4,495
	From OHA S&E to CBRNE O&S - Health & Emerg. Inf. Dis.	27	27	5,671
	From OPS to CBRNE O&S - Health & Emerg. Inf. Dis.	2	2	350
	Program Reduction	-	-	(470)
	WCF Transfer from Health & Emerg. Inf. Dis.	-	-	(195)
Budget Year	FY 2017 Request	29	29	9,951
	Total Change from FY 2016 to FY 2017	2	2	(215)

PPA Description:

CBRNE requests \$9.951 million and 29 FTE within Health and Emerging Infectious Disease for FY 2017.

Adjustments-to-base include:

- Transfer in of \$4.495 million from P&C to Chem., Bio. and Emerging Infectious Dis. Cap.
- Transfer in of \$5.671 million and 27 FTP/27 FTE from S&E to Chem., Bio. and Emerging Infectious Dis. Cap.
- Transfer in of \$0.350 million and 2 FTP/2 FTE from OPS to Chem., Bio. and Emerging Infectious Dis. Cap.

- Transfer out of \$0.195 million from Health & Emerging Infect. Dis. to Working Capital Fund
- Increase of \$0.022 million to annualize the 2016 pay increase
- Increase of \$0.078 million for 2017 pay increase
- Decrease of \$0.470 million for Health & Emerging Infectious Diseases

CURRENT SERVICES SUBPROGRAM DESCRIPTION: HEALTH AND EMERGINF INFECTIOUS DISEASES

The CBRNE Office’s Health and Emerging Infectious Disease programs help build connections between current and emerging health and medical issues and contribute to CBRNE decision analysis. The Office’s highly skilled health and medical experts help advance the DHS end-to-end planning for CBRNE threats, as well as provide expertise on medical and health issues impacting the DHS workforce and those under the care and custody of DHS. CBRNE analyses, assessments, detectors, and surveillance data integration help inform the health security of the DHS workforce and the Nation.

\$9.951 million of the requested CB&EIDC funding will support the Health and Emerging Infectious Disease subprogram, enabling CBRNE to continue its support for State, local, and the Department’s EMS systems; continue funding its senior medical advisors and liaison officers in DHS Components; identify DHS-wide health information assets and gaps; support DHS Components with occupational health guidance and advice and continue to provide antibiotic and antiviral medications; continue animal and food emergency planning collaborations; and test and validate United States-Canada cross-border health security related plans.

Medical First Responder Coordination (MFRC)

MFRC programs help strengthen the EMS system at DHS and nationwide to prepare for, respond to, and recover from emergencies.

The DHS EMS system comprises EMS programs in eight Components, each developed separately before joining DHS from their legacy agencies. MFRC works with DHS EMS programs to standardize EMS practices and protocols; centralize patient care reporting, data analysis, and equipment purchasing; and promote efficiencies by sharing best practices across the Department. In addition, MFRC manages an EMS system for DHS, overseeing a DHS-wide EMS advisory committee, credentials program, patient recordkeeping system, and training standards. The program also collaborates with EMS organizations and Federal Government entities to help identify EMS system needs and possible solutions.

In June 2015, MFRC released *First Responder Guide for Improving Survivability in IED and/or Active Shooter Incidents*, a set of best practices identified by DHS, the Departments of Defense, Health and Human Services, Justice, and Transportation.

In MFRC is also developing an Anthrax Vaccine Pilot, based on the results of previous years' engagements with State and local first responder stakeholders.

MFRC will use FY 2017 resources to continue its support for State, local, and the Department's EMS systems. MFRC also plans to complete the replacement of an electronic patient care record system for DHS EMS providers and support the completion of the Anthrax Vaccine Pilot for the First Responder Vaccine Initiative.

Medical Liaison Officers (MLO)

The MLO program provides experienced physicians to serve as Senior Medical Advisors embedded with DHS Operational Components. These highly experienced medical professionals represent the Chief Medical Office (CMO) and provide unified subject matter expertise and medical advice to Component leadership. The program also provides a link between the Component and the CMO on health and medical issues related to policy, planning, mitigation, response, and the DHS workforce.

The MLO program has four board-certified physicians in three Operational Components: Customs and Border Protection (CBP), FEMA, and Immigration and Customs Enforcement (ICE). One Liaison Officer supports TSA.

The MLO program serves as a vital connection between the CMO and support for Component medical needs during responses to incidents. For example, the physicians assisted with planning annexes, screening procedures, PPE recommendations, and medical standards for Ebola and day-to-day emergencies and issues.

The program also supports the occupational health policy needs of ICE. In FY 2015, the MLO physician at ICE refined fit-for-duty processes and developed support resources to help law enforcement officers manage work-related stress. The MLO embedded physician and staff at TSA are revising the medical standards for Transportation Security Officers and continuing planning and support for a periodic medical recertification program.

Medical Quality Management (MQM)

MQM provides expert guidance to DHS Components to continually improve the consistency and quality of DHS provided health and medical services. MQM also develops administrative tools and guidance to help Components manage medical information, such as the credentials of healthcare providers, documentation of unexpected events, and performance measures. All DHS Components and HQ offices are represented on the MQM-chartered DHS Health Care Quality Committee. The committee meets quarterly to discuss best practices, lessons learned, and standards for continuous quality improvement.

In FY 2015, MQM verified the credentials of more than 80 licensed or privileged healthcare providers and holding its first Quality Management Showcase to support information sharing between Component health and medical service programs.

In FY 2017, MQM will use requested resources to identify DHS-wide health information assets and gaps (the DHS Health Information Technology Portfolio) in collaboration with the Office of the Chief Information Officer Enterprise Architecture. The DHS Health Information Technology Initiative is intended to promote information technology solutions, capabilities, and collaborations to support DHS health and medical programs and institute knowledge management of the DHS Health Information Technology (HIT) ecosystem, creating efficiencies, improved data access and use. Areas of interest include health care providers credentialing, fitness-for-duty, and workforce medical.

Occupational Health

Occupational Health programs support the DHS workforce by anticipating health threats, helping it respond to health security incidents, and providing expert medical guidance on all aspects of employee personal protection. Physicians, nurses, project managers, and medical supply chain experts manage the Department's medical countermeasures, alert employees to emerging infectious disease threats, and build tools to strengthen employee resilience.

In FY 2015, health and medical specialists coordinated DHS employee protection from the Ebola outbreak. Their management of the Ebola Coordination Group ensured DHS employees received the most relevant and timely Federal guidance on personal protection.

The Medical Countermeasures (MCM) program started a phase-down of antiviral stockpiles for the DHS workforce, based on CDC recommendations.

The DHSTogether (DHST) program released the DHSTogether Resilience Profile, an individual resilience assessment tool with tailored resilience-strengthening suggestions for employees. The program also supported Component initiatives and training programs to enhance employee resilience and suicide prevention

In FY 2015, Train-the-Trainer classes were provided to representatives from FEMA, USCIS, CBP, TSA, ICE, USCG, and NPPD in Psychological First Aid; Resilience Capacity Building for Individuals; and Peer Support Coordinator Training.

In FY 2017, DHST will use resources to establish Peer Resilience and Individual Stress Management Project (peer support program) for USCIS and USSS and to take initial steps in establishing Peer Resilience and Individual Stress Management Project (peer support program) for TSA.

Food, Agriculture and Veterinary Defense (FAVD)

FAVD experts are veterinarians with experience in emergency planning, food regulation and safety, and infectious disease. They help Federal, State, local, and tribal officials address the complex security issues that underlie public health, food, and animal and plant agriculture. FAVD also supports the health and safety of animals working in critical jobs at DHS, such as detecting bombs in Federal buildings, finding hidden contraband at borders, and locating people missing after natural disasters.

In FY 2015, FAVD assisted DHS to respond to infectious disease outbreaks such as Ebola and Highly Pathogenic Avian Influenza. FAVD veterinarians helped refine screening criteria for CBP identification of bushmeat arriving at U.S. ports of entry. FAVD also continued food and animal emergency planning and exercise activities with FEMA and the U.S. Department of Agriculture (USDA).

FY 2017 activities will include the continuation of animal and food emergency planning collaborations with FEMA and USDA and the maturation of an initiative to support the health and medical needs of DHS working dogs and horses. Plans include data collection on working dog and horse health records and first aid training for DHS EMS providers who are called to care for injured working animals or their handlers.

Global Health Security (GHS)

GHS leads the USG efforts for health security for the President's Beyond the Border Initiative, the Department's Northern Border Strategy, and the U.S.-Canada Agreement on Emergency Management Cooperation.

The GHS project also represents the Department on the Senior Coordinating Body for the North American Plan for Animal and Pandemic Influenza (NAPAPI) to lead trilateral pandemic response planning with Canada and Mexico.

In FY 2015, GHS advisers facilitated high level discussions on policy, planning and response activities for pandemic influenza with international partners. Activities include advancing a strategic work plan on health security information sharing, collaboration, interoperability, and best practices.

GHS plans to apply its FY 2017 request to complete an exercise program to test and validate health United States-Canada cross-border health security related plans. GHS initiatives will also continue to develop and test work plans and frameworks with international partners for the Beyond the Border and NAPAPI efforts.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Health and Emerging Infectious Diseases
Cost Drivers (Pay & Benefits) – Sub-PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	28	28	\$4,515	\$160	27	27	\$4,559	\$168	29	29	\$5,320	\$182	2	2	\$761	\$15
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS Pay Cost Drivers Exhibit may reflect a higher average FTE Cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

NARRATIVE EXPLANATION OF CHANGES:

- **FTE Change FY 2016-2017**

The FY2017 request reflects the transfer of 2 FTE from Operations. The total cost in FY 2017 also includes pay for Public Health Service Officers supporting Health and Emerging Infectious Diseases.

- **Personnel Compensation and Benefits Change FY 2016-2017**

The FY2017 request reflects the transfer of 2 FTE from Operations.

- **Average Cost Change FY 2016-2017**

The average cost reflects pay inflation, additional Public Health Service Officers, as well as an increase of 2 FTE.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Health and Emerging Infectious Diseases
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - Health and Emerging Infectious Diseases	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Workforce Health and Medical Support	\$1,737	\$1,662	\$1,638	(\$24)
Medical Countermeasures	\$1,900	\$1,900	\$1,850	(\$50)
External 1st Responder Coordination	\$384	\$459	\$492	\$33
Food, Agriculture & Veterinary Defense	\$474	\$474	\$225	(\$249)
Total	\$4,495	\$4,495	\$4,205	(\$290)

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Summary Tables of Sub-PPA
Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Integrated Operations
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)

Integrated Operations		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	54
	Annualization of 2016 Pay Raise	-	-	15
	Integrated Operations Program Reduction	-	-	(124)
	Transfer From NBIC to Integrated Operations	-	-	10,500
	Transfer From OPS to Integrated Operations	1	1	149
	Transfer From P&C to Integrated Operations	-	-	462
	Transfer From S&E to Integrated Operations	21	21	4,050
	WCF Transfer from Integrated Operations	-	-	(269)
	Program Changes	Integrated Consortium of Laboratory Networks	-	-
National Biosurveillance Integration Center		-	-	(2,500)
Budget Year	FY 2017 Request	22	22	13,107
	Total Change from FY 2016 to FY 2017	1	1	(1,905)

PPA Description:

CBRNE requests \$13.107 million and 22 FTE within Integrated Operations for FY 2017.

Adjustments-to-base include:

- Transfer in of \$10.500 million from NBIC to Chem., Bio. and Emerging Infectious Dis. Cap.
- Transfer in of \$4.050 million and 21 FTP/21 FTE from S&E to Chem., Bio. and Emerging Infectious Dis. Cap.
- Transfer in of \$0.149 million and 1 FTP/1 FTE from OPS to Chem., Bio. and Emerging Infectious Dis. Cap.

- Transfer in of \$0.462 million from P&C to Chem., Bio. and Emerging Infectious Dis. Cap
- Transfer out of \$0.269 million from Integrated Ops. to Working Capital Fund
- Increase of \$0.015 million to annualize the 2016 pay increase
- Increase of \$0.054 million for 2017 pay increase
- Decrease of \$0.124 million for Integrated Operations Program Reduction

Program Changes Include:

- Increase of \$0.770 million for Integrated Consortium of Laboratory Networks
- Decrease of \$2.500 million for National Biosurveillance Integration Center

CURRENT SERVICES SUBPROGRAM DESCRIPTION: INTEGRATED OPERATIONS

The CBRNE Office’s Integrated Operations subprograms support the Department’s work preparing for and responding to threats and hazards across the CBRNE mission space. These programs also support CBRNE and all-hazards preparedness activities of State, local, tribal, and territorial government partners.

\$13.107 million of the requested CB&EIDC funding will support Integrated Operations, enabling CBRNE to continue support for the Department’s planning and exercise activities; pursue strategic partnerships with national associations to enhance State and local health preparedness efforts; continue NBIC’s technical support services, information technology operations, and improvements; support the ongoing development of the integrated laboratory network; and continue incident management, operations coordination, continuity of government, and integration to respond to emerging threats.

Planning and Exercise Support

Planning and Exercise Support activities provide the medical interface between the CBRNE Office and DHS Components’ contingency and operational planning cells. These activities also support the development of Federal plans and policies related to natural and man-made events having catastrophic consequences on human, agricultural, and animal health.

State and Local Initiatives (S&L)

S&L projects and initiatives help integrate public health partners into fusion centers—State and regional hubs for analyzing and sharing information about threats and hazards. S&L assistance, guidance, and tools help fusion centers and health officials develop information sharing requirements, processes, and procedures. Strategic guidance documents, technical assistance workshops,

classified briefings, and a monthly teleconference help public health and health care communities build productive information sharing relationships with law enforcement and security communities.

S&L launched a training program for public health and health care partners as part of the Nationwide Suspicious Activity Reporting (SAR) Initiative. The training helps health professionals distinguish between illegal and suspicious activities and understand the critical role health care partners play in identifying and reporting suspicious activity.

The FY 2017 funding will enable S&L to pursue strategic partnerships with national associations to enhance State and local health preparedness efforts. S&L will focus on strengthening the relationship between Federal biosurveillance programs and the State and local jurisdictions in which these programs operate.

National Biosurveillance Integration Center (NBIC)

NBIC integrates and analyzes information about and provides surveillance of biological threats to provide critical situational awareness to national decision-makers to help ensure rapid and well-informed responses. NBIC's integrated biosurveillance information helps develop a more comprehensive picture of the bio-threat landscape to help the Nation anticipate biological threats and emerging infectious diseases to better prepare, protect, and respond.

NBIC organizes Federal interagency collaboration to integrate information about threats to human, animal, plant, and environmental health from thousands of sources. NBIC monitors and reports daily on the status of emerging infectious diseases and develops periodic analytic reports on special topics and events. NBIC also develops new analytic tools, incorporates new data sources, and proactively seeks to identify connections and patterns that may provide advanced notice of emerging biological threats. NBIC shares its analyses with Federal, State, local, tribal, and territorial officials.

NBIC provides both routine reporting and short turnaround, expert assessments by request to analyze potential impacts of biological events on U.S. interests. The reports are available to more than 900 Federal Government and 1,500 State, local, tribal, and territorial officials nationwide. In FY 2015, NBIC redesigned and improved its biosurveillance reports in response to stakeholder feedback and evolving needs.

NBIC's collaboration with Federal partners—14 Federal agencies known as the National BioSurveillance Integration System (NBIS)—helps continually improve data sources, integration methods, and resulting products. In FY 2015, NBIC initiated a partnership with the Department of Defense (DOD) to develop a collaborative analytic tool. NBIC also began a project with the Department of Veterans Affairs (VA) to share and integrate surveillance information on antimicrobial resistant disease threats and dengue fever.

NBIC enhanced its support to the BioWatch program through targeted participation in BioWatch jurisdiction exercises and by providing information from the affected jurisdiction to help inform its response actions.

NBIC continues to work toward operationalization of prior analytic development projects. In FY 2015, NBIC integrated the social media algorithms developed in a pilot funded in prior fiscal years into a functional prototype for monitoring open source media. This prototype tool, Biofeeds, underwent initial operational testing and evaluation by NBIC in late FY 2015 for planned deployment by the end of FY 2016.

NBIC will use the FY 2107 requested resources to continue its technical support services, information technology operations, and improvements. The requested funding will support the maturation and operational testing of the DOD analytic workbench for use by NBIC analysts, continued data integration and analytics projects with NBIC partners, and anticipated operations and maintenance costs for the deployed Biofeeds system. The resulting data feeds and biosurveillance analytic workbench will facilitate greater collaboration between NBIC and NBIS partners to support national biosurveillance needs.

Integrated Consortium of Laboratory Networks (ICLN)

ICLN provides a venue for the efficient coordination of analytical laboratory services for CBRNE events through inter-network strategic and operational planning, identification of accountabilities, communication and information sharing, resource optimization, and resource and response coordination. ICLN advances a coordinated and interoperable laboratory network to give decision-makers timely, credible, and interpretable data to support surveillance, detection, and incident management.

ICLN's Memorandum of Agreement between the interagency partners was renewed in 2013. The network is structured around two principal categories: the Joint Leadership Council (JLC) and the Network Coordination Group (NCG), both chaired by DHS. The NCG meets once per month and is composed of three technical work groups to support small term projects. The JLC meets twice a year.

ICLN representatives are working toward standard methods for risk-based prioritization and identifying and addressing key gaps. The ICLN is also addressing the need to improve surge response requirements and efficiencies in laboratory method development and validation. Members of the ICLN focus on developing standards in quality assurance, proficiency testing, training, and information management and flow among networks. An overarching goal is to establish enduring governance policies that facilitate a coordinated and operational system of laboratory response networks.

The FY 2017 funding will support the ongoing development of the integrated laboratory network. The requested resources will help consolidate DHS leadership of the ICLN within the single CBRNE Office. ICLN priorities are to:

- Develop an exercise structure to test the ICLN capability with all stakeholders and incorporate the ICLN into existing interagency and national level exercises.
- Maintain and enhance the ICLN portal. This will include improving the incident management tools on the portal and continuing to develop the minimum actionable data elements to allow participating networks to submit data in their native network data format.
- Convene the Joint Leadership Council and Network Coordination Group meetings with the goal of strengthening the ICLN response capability.

Health Incident Surveillance (HIS)

HIS connects the CBRNE Office to DHS operations and other Federal, State, and local developments and enables continued CBRNE, health, and medical support for the DHS mission in the event of a major incident. The program provides continuous situational awareness and an information exchange mechanism and delivers critical information to the decision makers in timely manner.

HIS maintains a presence for the CBRNE Office at the National Operations Center (NOC) and a robust continuity plan to continue high-level support for DHS Operational Components and interagency partners. HIS provides a process to incorporate health and medical expertise into incident coordination.

The program is staffed by public health service officers who provide operational support for a Watch Desk at the NOC to provide incident monitoring and situational awareness around the clock. HIS also supports CBRNE coordination with DHS operations and intelligence.

HIS played a crucial role during the Department's response to Ebola, ensuring that the DHS, Federal, and national leaders were coordinated. HIS worked with the TSA operations center to cross train Watch Desk staff to gain a better understanding of Department operations and integrate health and medical expertise into the center's operations.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Integrated Operations
Cost Drivers (Pay & Benefits) – Sub-PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	21	21	\$3,238	\$153	21	21	\$3,271	\$155	22	22	\$4,725	\$214	1	1	\$1,454	\$59
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

NARRATIVE EXPLANATION OF CHANGES:

- **FTE Change FY 2016-2017**

The FY 2017 request reflects the one FTE transferred from Operations to Integrated Operations. The total FY2017 cost includes the addition of Public Health Service Officers supporting Integrated Operations.

- **Personnel Compensation and Benefits Change FY 2016-2017**

The FY 2017 request reflects one FTE transferred from Operations to Integrated Operations.

- **Average Cost Change FY 2016-2017**

The average cost change reflects pay inflation, an increase of Public Health Service Officers and the transfer of 1 FTE

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
Integrated Operations
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - Integrated Operations	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
NBIC Partnerships and Analytics	\$7,051	\$7,051	\$4,490	(\$2,561)
NBIC Innovation	\$3,200	\$3,200	\$3,205	\$5
Planning and State and Local Initiatives	\$500	\$462	\$1,298	\$836
Total	\$11,102	\$11,064	\$8,993	(\$2,071)

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

FY 2016 to FY 2017 Budget Change- PPA Level

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Rad/Nuc Detection, Forensics and Prevention Capability
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)**

R/N Detection, Forensics, and Prevention Capability		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	49
	Annualization of 2016 Pay Raise	-	-	12
	Architecture Planning and Analysis	-	-	(105)
	DHS Balanced Workforce Strategy	1	1	73
	From CBRNE O&S R/NDFPC to Working Capital Fund	-	-	(168)
	From DNDO M&A to CBRNE OS - R/NDF&PC	24	24	5,091
	From DNDO RD&O - SA to CBRNE OS - R/NDF&PC	-	-	16,200
	Working Capital Fund	-	-	(100)
Program Changes	Architecture Planning and Analysis	-	-	(500)
Budget Year	FY 2017 Request	25	25	20,552
	Total Change from FY 2016 to FY 2017	1	1	(739)

PPA Description

CBRNE requests \$20.552 million and 25 FTE within R/NDF&PC for FY 2017.

Adjustments-to-base include:

- Transfer in of \$5.091 million and 24 FTP/24 FTE from DNDO M&A
- Transfer in of \$16.200 million from DNDO RD&O Systems Architecture

- Transfer out of \$0.168 million from CBRNE O&S R/NDFPC to Working Capital Fund
- Increase of \$0.073 million and 1 FTP/1 FTE for the DHS Balanced Workforce Strategy
- Increase of \$0.049 million for 2017 pay increase
- Increase of \$0.012 million to annualize the 2016 pay increase
- Decrease of \$0.105 million for Architecture Planning and Analysis
- Decrease of \$0.100 million for Working Capital Fund Adjustment

Program Changes Include:

- Decrease of \$0.500 million for Architecture Planning and Analysis: GNDA

Rad/Nuc Detection, Forensics and Prevention Capability Program serves as the primary entity of the USG to further develop, acquire, and support the deployment of an enhanced system to detect and report on attempts to import, possess, store, transport, develop, or use an unauthorized nuclear explosive device, fissile material, or radiological material in the United States, and improve that system over time. The Rad/Nuc Detection, Forensics and Prevention Capability Program leads the USG with development of the GNDA and its domestic implementation. The included mission area is Architecture Planning and Analysis (APA).

SUB-PPA DESCRIPTION: ARCHITECTURE PLANNING AND ANALYSIS

The CBRNE Office APA mission sub-program (under the Rad/Nuc Detection, Forensics, and Prevention Capability PPA) coordinates the development of an enhanced GNDA and implementation of its domestic component. These efforts enable DHS to determine and address gaps and vulnerabilities in existing rad/nuc detection capabilities. This is accomplished through a continuous process of stakeholder engagement involving the operational components of the Department, other Federal agencies, and our state, local, tribal, and territorial partners to formulate and adjust program plans and investment options, on an annual basis, to address the threat of nuclear terrorism across the Nation’s homeland security enterprise.

APA programs advance the capability to understand, anticipate, and reduce the threat of nuclear terrorism. Each of the following contributes to the development of strategies for implementing the GNDA.

Planning and Reporting Program

The GNDA Planning and Reporting Program coordinates engagement with a variety of interagency partners for strategic and implementation planning, summarizing the accomplishments through reporting, and promoting interagency dialogue and engagement.

GNDA Planning

As the planning and coordinating function, this project provides the framework upon which all other GNDA-related programs are justified and employed, including the Solution Development Process (SDP). Recurring or annual planning processes include office-level, Department, and interagency engagement.

GNDA Reporting

The GNDA Annual Report is a critical, periodic snapshot of the GNDA, summarizing the requirement for the joint interagency annual review of the GNDA. Accomplished through intensive interagency collaboration, this document is provided to the Congress each year, as required by Section 1907 of the *Homeland Security Act of 2002* (6 U.S.C. 101 et seq.) as amended by Section 1103 of the *Implementing Recommendations of the 9/11 Commission Act of 2007* (P.L. 110-53). This annual submission is jointly prepared by the Secretaries of Homeland Security, State, Defense, and Energy; the Attorney General; the Director of National Intelligence; and the U.S. Nuclear Regulatory Commission. The Annual Report is unique in compiling all the USG programs, assets, and capabilities that contribute to the GNDA. The Annual Report summarizes the results and analyses of progress in implementing the GNDA and constitutes a reference for future activities.

As part of the reporting efforts, the Department is also responsible for coordinating and managing performance measure development. These activities are pursued to assist DHS and the interagency in meeting its requirements to baseline the existing GNDA, identify potential gaps and vulnerabilities, and formulate recommendations and plans to address those gaps and vulnerabilities.

GNDA Analysis Program

The Department is responsible for conducting periodic, in-depth analysis of the GNDA to inform strategic, budgetary, and operational decisions across the Federal Government. Strategic planning and risk assessments provide both the status of current detection architecture capabilities as well as further assess and prioritize proposed enhancements across the architecture. An effective planning, modeling, and analysis function directly contributes to programming and budgeting for the GNDA that enables effective implementation of improved detection capabilities.

Architecture Development Project

The Architecture Development Project produces and maintains a model to support our ability to analyze current GNDA capabilities, identify vulnerabilities and gaps, and inform our planning to develop future GNDA capabilities. It ensures the use of common terminology, capability sets, assumptions, and constraints to support risk assessments, CBAs, and cost-benefit analyses of proposed GNDA portfolios.

Adversary Threat Project

Planning for the GNDA requires an understanding of the adversary's capabilities and intent and the availability of materials that may be utilized in a rad/nuc attack. DHS continually seeks to refine the basis for planning, through collaboration with experts within the USG intelligence community and national laboratories, into a suite of improved adversary and weapons models that can be used to produce risk assessments of the GNDA or evaluate proposed technologies or concept of operations (CONOPS).

The CBRNE Office elicits input from the intelligence community regarding a wide range of adversary characteristics to inform the risk analysis of the GNDA and develop an adversary model. In addition, DHS facilitates discussions within the interagency about weapon type and yield characteristics for input into the weapons model. The weapons model will be updated to accommodate an expanded threat definition and higher fidelity handling of threat signatures. Using this information, the CBRNE Office will continue to apply the threat definition to relevant programs, to support risk assessments, and to conduct cost trade studies for individual enhancements to the GNDA or implementation of capabilities.

Risk Project

To analyze and enhance the effectiveness of GNDA implementation, DHS uses risk assessments that measure the combined effect of threat, vulnerability, and consequences. This process allows us to evaluate the effectiveness of currently deployed systems and plan for future technology development using a cost-benefit methodology. The CBRNE Office will produce a suite of modeling, simulation, and assessment tools to calculate the risk from particular pathways, particular transport modes, particular threat objects, or adversaries.

Capabilities-Based Planning Project

At the core of all DHS rad/nuc detection programs is the Systems Architecture function: determining gaps and vulnerabilities and then formulating recommendations and plans to mitigate them. To accomplish these analytical tasks, the CBRNE Office organizes and facilitates collaborative activities with domestic and international partners and stakeholders in the GNDA. This is achieved through a structured collaborative assessment of current capabilities followed by the application of systems engineering principles as we seek to implement a balanced architecture. The Capabilities-Based Planning Project includes two primary categories of tasks. The first is an enterprise-wide assessment of the GNDA, which provides DHS and the interagency with a broad assessment of risks and gaps across the architecture. The second is a set of individual focus areas based on sound analytic principles for evaluating specific portions of the GNDA in conjunction with our operational partners. These CBAs, in turn, feed strategic and operational planning to ensure the most cost-effective use of limited resources to address gaps in existing rad/nuc detection capabilities.

In FY 2016, focus areas for CBAs included Maritime Non-Containerized Cargo, and a Federal Force Multiplier (non-traditional GNDA partner) Functional Area Analysis. In FY 2017, the CBRNE Office plans to conduct one CBA that focuses on the capability gaps associated with U.S. territories, Alaska, and Hawaii, and plans to conduct an Improvised Nuclear Device (IND) assessment in coordination with FEMA, unifying prevention and response operations. These focus areas better capture the individual limiting factors associated with key gaps, as well as investment options to mitigate areas of risk. The CBRNE Office will utilize the results to inform budgetary prioritization and early stage solution management.

GNDA Solutions Management Program

The GNDA Solutions Management Program works with stakeholders to develop materiel and non-materiel solutions to reduce risk within the GNDA. Following the SDP, the program leverages the outputs of CBAs and other analyses to identify GNDA capability gaps and engages stakeholders, end-users, technology developers, and systems developers to capture requirements and develop actionable programmatic documents, such as Mission Needs Statements (MNS) or other documentation. These efforts focus on specific pathways, operating environments, modes of transportation, and/or specific threats.

Aviation Solutions Management Project

The Aviation Solutions Management Project examines ways to reduce risks from adversarial use of commercial and general aviation to conduct a rad/nuc attack against the United States.

To support the interagency International General Aviation (IGA) efforts, in FY 2016 DNDO will continue analysis of operational alternatives to reduce identified IGA vulnerabilities, as well as coordinate with Federal partners to develop guidelines and CONOPS for surge operations. In FY 2017, the new CBRNE Office will work with partners to support implementation of those guidelines and surge operations CONOPS and, where applicable, steady state operations.

In FY 2016, DNDO will continue to collaborate with Federal partners to refine the International Commercial Air Cargo (ICAC) Insider Threat Operational Process model and develop a tool for end users, such as policy makers and operational planners, to assess insider risk within their systems, with a focus on foreign last points of departure. In FY 2017, the CBRNE Office will work with partners to implement the air cargo insider threat tool. In addition, in FY 2017, the CBRNE Office will work with partners to analyze existing detection systems (non-rad/nuc and rad/nuc systems) in air cargo pathways at international points of departure to identify how those systems could be leveraged during surge operations to detect rad/nuc threats.

Leveraging initial FY 2015 analysis, in FY 2016, DNDO, with U.S. Customs and Border Protection (CBP), will continue analysis of specific operational systems that could potentially be used in Airports of Entry (APOE) air cargo surge operations, including evaluation of test results of CBP non-rad/nuc equipment for potential rad/nuc detection capabilities and analysis of operational and detection impacts if such systems were to be deployed for surge operations. In FY 2017, the CBRNE Office will coordinate with Federal partners to support development of guidelines and CONOPS for surge operations.

In FY 2015, DNDO, with its Domestic General Aviation (DGA) Federal partners, identified DGA surge-specific capabilities and gaps related to rad/nuc threats. In FY 2016 a final report documenting operational strengths and recommended improvements will be completed. In FY 2017, the CBRNE Office will continue to work with partners to enhance capabilities and reduce risks in DGA operational environments.

Interior Solutions Management Project

The Interior Solutions Management Project examines the GNDA interior layer's FSLTT detection capabilities and program development. Overarching efforts focus on characterization, gathering interior layer requirements, and improving stakeholder planning and coordination.

In FY 2016 DNDO, and in FY 2017 the combined CBRNE Office, will continue to characterize the interior layer by improving the Capabilities Development Framework (CDF) assessment flexibility and placing the CDF on a web-enabled platform to improve nationwide stakeholder access to the tool. In FY 2017, the CBRNE Office will add state and regional-level analysis capabilities to the tool.

In FY 2016 DNDO, and FY 2017 the CBRNE Office, will improve planning and coordination within the interior layer of the GNDA by developing rad/nuc-specific guidance materials and modules to assist state and local jurisdictions with evaluating and prioritizing the rad/nuc threat and identifying target detection capabilities within the Threat and Hazard Identification and Risk Assessment (THIRA) process required for access to grant funds. In FY 2016 DNDO, and FY 2017 the CBRNE Office, will continue to update the annual Rad/Nuc Detection Guidance for FEMA Preparedness Grants. In FY 2017, the CBRNE Office will develop rad/nuc detection baseline capability metrics to measure the development of capabilities within the GNDA domestic layer.

Beginning in FY 2016 DNDO, and continuing in FY 2017 the CBRNE Office, will facilitate the Interior Stakeholder Meeting (formerly the Interior Focus Group), a Federal, State, and local working group that collects interior rad/nuc detection stakeholder requirements and helps to develop CBRNE analyses and products. Interior Stakeholder Meeting efforts include the collection of user needs to drive future capability development, identification of areas of interest for future CBRNE studies, and roundtable discussions to review proposed ideas and identify future initiatives to address domestic rad/nuc detection gaps. In FY 2017, the CBRNE Office will facilitate these working groups in order to continue to collect state and local needs and requirements.

Land Border Solutions Management Project

The Land Border Solutions Management Project gathers requirements and develops solutions to address rad/nuc detection deficiencies and vulnerabilities at and between land border POEs.

Beginning in FY 2016, DNDO, and concluding in FY2017, the CBRNE Office, and CBP will co-develop the Joint Requirements Council documents, such as the Capability Analysis Report and Capability Analysis Study Plan, and systems engineering documents (operational requirements document, mission needs statements and concept of operations) required for the RPM Program (RPMP).

In FY 2016, DNDO began a detailed, incremental international rail (IRAIL) commerce stream pathway analysis to identify risk mitigation activities and potential vulnerabilities. Working with CBP, DNDO will use these results to investigate solutions to further reduce risk and, in FY 2017, IRAIL efforts will focus on developing and implementing effective rad/nuc risk reduction solution(s). These may include sponsoring new technologies, maturation/testing of new and/or improved systems, supporting system procurement, and developing new techniques, procedures and protocols to further mitigate rad/nuc risk without interfering with the stream of commerce.

In FY 2015 and 2016, DNDO is developing an improved rad/nuc detection solution for U.S. Border Patrol (USBP) checkpoints. In FY 2017, the CBRNE Office will begin a detailed solutions analysis that will support future procurement, deployment, testing and acceptance activities.

In FY 2016, DNDO analyzed impacts of various solutions for on-dock rail (ODR) port operations and subsequent GNDA risk reduction. In FY 2017, these results will be used to support systems engineering process initiation and detailed analysis and solution(s) selection to meet all stakeholder requirements.

Maritime Solutions Management Project

The Maritime Solutions Management Project addresses ways to reduce the risk of an adversary using navigable waterways to conduct a rad/nuc attack against the United States. It also provides information to facilitate and support opportunities to advocate for the enhancement of Maritime Domain Awareness with FSLTT stakeholders and partners.

In FY 2015, DNDO completed a Small Maritime Vessel (SMV) pathway decomposition study that detailed rad/nuc material delivery threat scenarios vis-à-vis adversary and security forces activities, including a process flow visual representation that depicts the perceived difficulty by task and phase for illicit rad/nuc smuggling. Results of the SMV study will be incorporated into FY 2016 and 2017 efforts to increase the likelihood of successful detection of illicitly trafficked rad/nuc materials. This will be accomplished by leveraging materiel and non-materiel recommendations including: the expansion of existing non-technical detection training curricula and greater cross training opportunities, information sharing agreements, and joint operations planning efforts amongst stakeholders in the law enforcement community.

In FY 2015 and FY 2016, DNDO and partners conducted a CBA of the Maritime Non Containerized Cargo (MNCC) pathway. In FY 2017, the CBRNE Office will use the results of the CBA to specify the detection needs for MNCC and identify potential materiel and non-materiel solutions that would further enhance the GNDA and reduce the threat of rad/nuc smuggling through the global maritime supply chain.

In FY 2017, the CBRNE Office will continue efforts to increase the likelihood of successful detection of illicitly trafficked rad/nuc material by working with partners to enhance maritime domain awareness for SMVs with the primary goal of increasing rates of encounter and detection in both steady state and enhanced steady state operations.

Cross Cutting

Cross Cutting efforts address operational gaps and vulnerabilities common to multiple mission areas and pathways.

Airborne Radiation Detection (ARD), a new initiative in FY 2016, evaluated the merit of rad/nuc detectors on various aerial platforms. Traditional fixed and rotary wing aircraft were considered, along with unmanned aerial systems of differing sizes. In FY 2017, the mission needs and capability gaps to be addressed will be documented and an analysis of potential solutions begun.

With the finalization of Helium-3 Alternative Implementation Backpack project requirements definition in FY 2016, acquisition of backpack detectors that do not contain helium-3 will proceed in FY2017.

Beginning in FY 2015 and completing in FY 2016, the development of requirements for Personal Radiation Detectors used by CBP, TSA, and USCG, will result in a strategic sourcing strategy that will support evaluation of suitable alternatives in FY 2017.

International Program

The GNDA is multi-layered in nature and the enhancement of the exterior layer plays a crucial role in the USG nuclear security risk mitigation strategy. Development of the GNDA requires a comprehensive understanding of existing international partner rad/nuc detection in order to better inform capacity-building efforts to fill gaps in the architecture. The CBRNE Office's International Program leads USG efforts in assisting international partners in developing their own national-level architectures, resulting in a cost-effective approach to enhancing the exterior layer of the GNDA. The CBRNE Office's coordination of the development of the exterior layer of the GNDA centers on both characterization and prioritization of rad/nuc detection capabilities worldwide. These efforts include targeted bilateral and multilateral outreach to foreign counterparts to raise situational awareness and enhance broader national-level rad/nuc detection capacity building efforts.

Analysis & Reporting of GNDA Exterior Layer Capabilities Project

The CBRNE Office conducts international studies and analyses to characterize the gaps, identify options, evaluate the advantages and disadvantages of alternative solutions, and formulate time-phased plans to reduce risks to the exterior layers of the GNDA. Ongoing development of the GNDA must involve analyses of all potential pathways, suggest technologies or programs to address any identified vulnerabilities, and strive for stronger partner connectivity at every point in the architecture. This effort includes performing international geographical architectural analyses and investigation of key relationships with international partners to enhance national-level detection capacity in their respective countries.

International Development & Outreach Project

A significant portion of the development of the external layer of the GNDA is dependent on the sovereign decisions of foreign partners to enhance their own national and regional-level detection architectures and capabilities. Through both bilateral and multilateral (e.g., GICNT and IAEA) discussions and engagement efforts, the CBRNE Office works with foreign counterparts to further develop the exterior layer of the GNDA by providing them the awareness and tools necessary to develop indigenous capabilities that work towards enhancing the GNDA. Of note, DNDO led the development of the four-volume *Developing a Nuclear Detection Architecture Series* through the GICNT and assisted in the development of IAEA publications related to nuclear security. These guidance documents are a cost effective mechanism to provide international partners the framework necessary for planning and implementation of their own national-level architectures.

The CBRNE Office participates in workshops and conducts training courses to facilitate the continued development and application of nuclear detection architecture best practices and planning and implementation tools within bilateral or multilateral constructs. In FY 2016, DNDO will continue to work with international counterparts on developing and implementing detection strategies and guidelines, focusing on promoting national-level capacity building and sustainment while leveraging lessons learned and best practices from domestic application.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
R/N Detection, Forensics, and Prevention Capability
Justification of Program Changes
(Dollars in Thousands)

Program Decrease: Architecture Planning and Analysis
PPA: R/N Detection, Forensics, and Prevention Capability
Program Decrease: FTP 0, FTE 0, Dollars (\$500)

Funding Profile

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request		
	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)
Current Services: Architecture Planning and Analysis - Architecture Planning and Analysis							25	25	\$21,052
Subtotal, Current Services							25	25	\$21,052
Program Decrease: Architecture Planning and Analysis - Architecture Planning and Analysis							-	-	(\$500)
Subtotal, Program Decreases							-	-	(\$500)
Total Request							25	25	\$20,552

DESCRIPTION OF ITEM: Architecture Planning and Analysis: GNDA

Within the Rad/Nuc Detection, Forensics and Prevention Capability PPA is the Architecture Planning and Analysis sub PPA. Architecture Planning and Analysis programs advance the capability to understand, anticipate, and reduce the threat of nuclear terrorism.

Architecture Planning and Analysis: GNDA

Architecture Planning & Analysis supports the coordination of an enhanced Global Nuclear Detection Architecture (GNDA), the analyses to determine gaps and vulnerabilities in existing nuclear detection capabilities, and formulating mitigation programs and investment recommendations. Architecture Planning & Analysis also supports the internal planning, programming, budgeting and execution (PPBE) process and the development of Congressionally-mandated interagency annual reports.

Justification:

Architecture Planning & Analysis is primarily comprised of fixed costs for recurring services. Examples of activities include the congressionally-mandated GNDA Joint Annual Interagency Review, DHS-directed capabilities based assessments (CBA), and related coordination of GNDA partners for planning and risk analysis. CBA's in particular have proven to be an effective and efficient way to collect data on the state of the GNDA and to coordinate with our mission partners. In this regard, the GNDA CBA series provides a valuable mechanism for Federal GNDA stakeholders to perform and integrate their self-assessments required by the Implementing Recommendations of the 9/11 Commission Act of 2007 (Public Law 110-53, Sect 1103).

Impact on Performance:

The change in funding profile will result in reduced means for DNDO to engage the broader GNDA community to assess and evaluate GNDA capabilities, determine gaps and vulnerabilities, and develop and identify solutions to strengthen our capabilities and reduce the risk of an act of nuclear terrorism. Specifically, Capabilities Based Assessments on certain parts of the GNDA would be delayed, and affect the ability of leadership to accurately prioritize gaps and deficiencies. The first areas impacted would likely be official ports of entry (either land, maritime or both), or Interior Surface Transportation. Delaying these activities will affect the following:

- Identification and prioritization of capability gaps and shortfalls to determine root causes of key architecture vulnerabilities would be reduced, influencing decisions for future capability development programs and investment. Activities such as risk analysis and modeling, which contribute to these decisions, will also be impacted, as they rely on the CBAs for critical inputs.
- Further development of an integrated GNDA portfolio management approach will be affected due to the reduced resource allocations. The ability to assess the impact across the GNDA will result in investment decisions being made on a less informed basis.

- The identification of capability gaps at ports of entry or interior surface transportation will be delayed by one year. The cycle to complete assessments of all areas of the GNDA will move from an estimated five year cycle to an eight year cycle.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Rad/Nuc Detection, Forensics and Prevention Capability
Cost Drivers (Pay & Benefits) – Sub-PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	21	21	\$3,432	\$162	24	24	\$4,103	\$170	25	25	\$4,313	\$172	1	1	\$210	\$2
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

NARRATIVE EXPLANATION OF CHANGES:

- **FTE Change FY 2016-2017**

The FY 2017 budget request reflects changes to our FTE counts from two sets of position conversions. In FY 2014 DNDO completed the conversion of 8 positions from contractors to Federal employees. These conversions focused on staffing to address the most critical vulnerabilities in business areas where “Nearly Inherent Government Functions” are performed by Federal employees; specifically, ensuring that financial operations are being handled by Federal employees. In FY 2015, DNDO converted an additional 10 positions to achieve an expected savings of \$377K in the FY 2016 budget. The budget request also includes the anticipated changes in accounts and FTE from the conversion of 9 positions to be completed in FY 2016.

- **Personnel Compensation and Benefits Change FY 2016-2017**

The change reflects one position conversion and pay inflation.

- **Average Cost Change FY 2016-2017**

The average cost change reflects pay inflation.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Rad/Nuc Detection, Forensics and Prevention Capability
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - R/N Detection, Forensics, and Prevention Capability	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
GNDA Analysis	\$5,818	\$5,799	\$7,352	\$1,553
GNDA Solutions Management Program	\$5,918	\$5,502	\$4,052	(\$1,450)
International Program	\$2,719	\$2,692	\$2,589	(\$103)
GNDA Planning and Reporting	\$1,314	\$1,765	\$1,079	(\$686)
Total	\$15,769	\$15,758	\$15,072	(\$686)

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

FY 2016 to FY 2017 Budget Change- PPA Level

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Management & Administration
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)**

Management & Administration		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	169
	Annualization of 2016 Pay Raise	-	-	44
	DHS Balanced Workforce Strategy	2	2	213
	FTP Adjustment	(7)	-	-
	Financial System Modernization	-	-	1,685
	From CBRNE O&S M&A to Working Capital Fund	-	-	(1,103)
	From DNDO M&A to CBRNE O&S - M&A	34	34	18,580
	From DNDO RD&O - Assessments to CBRNE O&S - M&A	-	-	870
	From DNDO RD&O – Operations Support to CBRNE O&S - M&A	-	-	805
	From DNDO RD&O - Nuclear Forensics to CBRNE O&S - M&A	-	-	451
	From DNDO RD&O – Systems Architecture to CBRNE O&S - M&A	-	-	800
	From DNDO RD&O – Systems Development to CBRNE O&S - M&A	-	-	402
	From DNDO RD&O - TR&D to CBRNE O&S - M&A	-	-	1,554
	From DNDO Sys Acq - RDE Acquisition to CBRNE O&S - M&A	-	-	1,718
	From DNDO Sys Acq - STC to CBRNE O&S - M&A	-	-	576
	From OHA S&E to CBRNE O&S- M&A	43	36	13,510
	From Policy to CBRNE O&S - M&A	4	4	980

Management & Administration		Positions	FTE	Amount
	Management and Administration	-	-	327
	Reduced Contract Support	-	-	(20)
Budget Year	FY 2017 Request	76	76	41,561
	Total Change from FY 2016 to FY 2017	(1)	6	2,295

PPA Description

CBRNE requests \$41.561 million and 76 FTE within Management and Administration for FY 2017.

Adjustments-to-base include:

- Transfer in of \$18.580 million and 34 FTP/FTE from DNDO M&A
- Transfer in of \$13.510 million and 43 FTP/36 FTE from OHA S&E
- Transfer in of \$0.980 million and 4 FTP/FTE from Policy M&A
- Transfer in of \$0.800 million from DNDO RD&O - Systems Architecture
- Transfer in of \$0.402 million from DNDO RD&O - Systems Development
- Transfer in of \$1.554 million from DNDO RD&O - Transformational R&D
- Transfer in of \$0.870 million from DNDO RD&O - Assessments
- Transfer in of \$0.805 million from DNDO RD&O - Operations Support
- Transfer in of \$0.451 million from DNDO RD&O - Nuclear Forensics
- Transfer in of \$0.576 million from DNDO Systems Acquisition - Securing the Cities
- Transfer in of \$1.718 million from DNDO Systems Acquisition - RDE Acquisition
- Transfer out of \$1.103 million from CBRNE O&S M&A to Working Capital Fund
- Increase of \$0.213 million and 2 FTP/FTE for the DHS Balanced Workforce Strategy
- Increase of \$0.169 million for 2017 pay increase
- Increase of \$0.044 million to annualize the 2016 pay increase
- Increase of \$1.685 million for Financial System Modernization
- Increase of \$0.327 million for Management and Administration
- Decrease of 7 FTP for FTP Adjustment

- Decrease of \$0.020 million for Reduced Contract Support

SUB-PPA DESCRIPTION: M&A

The CBRNE Office M&A program captures activities that provide enterprise leadership, management and/or business administration services and describes the capabilities and activities that support the day-to-day management and back office functions enabling the CBRNE Office to operate efficiently and effectively. Key capabilities include conducting agency planning and performance management, managing finances, managing agency workforce, providing physical and personnel security, acquiring goods and services, managing information technology, managing agency property and assets, managing agency communications, managing legal affairs, and providing general management and administration.

The M&A PPA funds the administration of the CBRNE Office and provides for the execution of Salaries, Benefits, and Expenses for FTE/FTP assigned to oversee and execution mission support functions. Expenses directly attributable to the program execution including accounting and procurement systems and support, as well as Information Technology expenses are distributed to this program and mission. Funds are provided to the Working Capital Fund, which provides such services as rent, acquisition support from Office of Procurement Operations, and Information Technology infrastructure support.

CBRNE Office Organization

The functional expertise within the office will be designated into threat/hazard-focused organization for the policy, planning, capability development, operations support, acquisition, and other functions necessary to oversee the Department's CBRNE Mission.

Office of the Assistant Secretary

This office provides the A/S and Deputy A/S with the necessary to support for the dissemination of information and communications of the organization's plans, strategies and activities to the DHS Secretary involving Biological, Chemical, Radiological/Nuclear and Explosives threats and hazards, other Executive Branch agencies, Congress, international partners, and the American public.

Health & Emerging Infectious Diseases

This capability directs and coordinates the legacy OHA Health Threats Resilience (HTR) and Workforce Health and Medical Support personnel and programs.

Biological Threats/Hazards

This capability directs and coordinates the legacy OHA National Biosurveillance Integration Center, BioWatch Program, and the transferred Biological Terrorism Risk Assessment personnel and programs.

Chemical Threats/Hazards

This capability directs and coordinates the legacy OHA Chemical Defense and the transferred Chemical Terrorism Risk Assessment personnel and programs.

Radiological/Nuclear Threats/Hazards

This capability directs and coordinates the legacy DNDO personnel and programs.

Explosives Threats/Hazards

This capability directs and coordinates the personnel and programs from the legacy National Protection and Programs Directorate Office of Bombing Prevention.

MAJOR ACQUISITIONS:

DNDO Financial, Acquisition, and Asset Management Solution (FAAMS)

The purpose of the Financial, Acquisition, and Asset Management Solution (FAAMS) program is to operate a business management solution. The FAAMS program provided DNDO with a fully integrated procurement and asset management system that seamlessly integrated into DNDO’s financial record system.

FAAMS Table		
Investment Name	Financial, Acquisition, and Asset Management Solution	
Unique Investment Identifier (UII)	024-000005964	
FY 2015 Activity Funding (\$\$\$ thousands)	FY 2016 Activity Funding (\$\$\$ thousands)	FY 2017 Activity Request (\$\$\$ thousands)
\$5,733	\$3,172	\$2,686

Funding for the implementation of this contract in FY 2016 is from multiple sources, not limited to DNDO appropriations. The implementation costs include contract labor, Federal labor, service provider system and labor, and for the FY 2017 O&M.

**Department of Homeland Security
Operations & Support
Management & Administration**

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	74	67	\$11,622	\$172	77	70	\$12,570	\$179	76	76	\$13,085	\$171	(1)	6	\$515	(\$7)
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

FTE Change FY 2016-2017

The FY 2017 budget request reflects changes to our FTE counts from two sets of position conversions. In FY 2014 DNDO completed the conversion of 8 positions from contractors to Federal employees. These conversions focused on staffing to address the most critical vulnerabilities in business areas where “Nearly Inherent Government Functions” are performed by Federal employees; specifically, ensuring that financial operations are being handled by Federal employees. In FY 2015, DNDO converted an additional 10 positions to achieve an expected savings of \$377K in the FY 2016 budget. The budget request also includes the anticipated changes in accounts and FTE from the conversion of 9 positions to be completed in FY 2016.

The total FY17 cost includes \$817,000 in pay for Public Health Service Officers supporting Management and Administration. In addition, the total included two transferred FTEs totaling \$313,000.

Personnel Compensation and Benefits Change FY 2016-2017

The change reflects two position conversions and pay inflation.

Average Cost Change FY 2016-2017

The average cost change reflects pay inflation. The average cost difference is due to Public Health Service Officers and an increase of 4 FTE in Management and Administration.

Performance Awards and Bonuses

FY 2017 request estimates \$7,000 bonuses and \$218,000 for performance awards. This request remains in line with OPM Awards Guidance on Spending Limitation.”

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Management & Administration
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - Management & Administration	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Purchases of goods & services from government accounts	\$13,233	\$10,918	\$11,712	\$794
GSA rent	\$9,071	\$9,274	\$9,458	\$184
Advisory and Assistance Services	\$3,857	\$5,066	\$5,692	\$626
Total	\$26,161	\$25,258	\$26,862	\$1,604

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Schedule III – Other Exhibits

Exhibit E. Justification of Proposed Legislative Language

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support**

For necessary expenses of the Chemical, Biological, Radiological, Nuclear and Explosives Office, , \$180,033,000, of which \$41,561,000 is for management and administration, of which \$20,552,000, to remain available until September 30, 2019, is for programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats, and of which \$117,920,000, to remain available until September 30, 2018, is for programs and operations in support of the surveillance, detection, and response to chemical, biological, and emerging infectious disease threats: Provided, That not to exceed \$4,500 shall be for official reception and representation expenses.

Language Provision	Explanation
For necessary expenses of the Chemical, Biological, Radiological, Nuclear and Explosives Office, , \$180,033,000, of which \$41,561,000 is for management and administration, of which \$20,552,000, to remain available until September 30, 2019, is for programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats, and of which \$117,920,000, to remain available until September 30, 2018, is for programs and operations in support of the surveillance, detection, and response to chemical, biological, and emerging infectious disease	The Department of Homeland Security proposes to consolidate the functions, operations, and budget requirements of the Domestic Nuclear Detection Office, Office of Health Affairs, Office of Bombing Prevention, and elements of the Science and Technology Directorate, Office of Policy, and Office of Operations into a single entity named the Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Office. All activities, responsibilities, and authorities from these organizations are transferred to this new organization.

threats: Provided, That not to exceed \$4,500 shall be for official reception and representation expenses.	
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Exhibit F. Summary of Fee Collections and Carryover

N/A

Exhibit G. Summary of Reimbursable Resources

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
 Summary of Reimbursable Resources
 (Dollars in Thousands)

Collections by Source:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Department of Homeland Security, OPO	-	-	\$177	-	-	-	-	-	-	-	-	-
Science & Technology	-	-	\$374	-	-	\$321	-	-	\$327	-	-	\$6
Various	-	-	\$3	-	-	-	-	-	-	-	-	-
DHS - Federal Emergency Management Agency	-	-	\$1,500	-	-	\$1,083	-	-	\$1,104	-	-	\$21
DHS - Immigration and Customs Enforcement	-	-	\$41,000	-	-	\$42,036	-	-	\$42,878	-	-	\$842
DHS - Transportation and Security Administration	-	-	-	-	-	\$765	-	-	\$780	-	-	\$15
02. Department of Defense	-	-	\$3,000	-	-	\$2,500	-	-	\$2,550	-	-	\$50
Customs and Border Protection	-	-	\$150	-	-	\$491	-	-	\$501	-	-	\$10
Total Budgetary Resources	-	-	\$46,204	-	-	\$47,196	-	-	\$48,140	-	-	\$944

Obligations by Program/Project Activity:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Management and Administration	-	-	\$3,000	-	-	\$2,500	-	-	\$2,550	-	-	\$50
Chemical, Biological, and Emerging Infectious Diseases Capability - CBRNE O&S	-	-	\$43,204	-	-	\$44,696	-	-	\$45,590	-	-	\$894
Total Obligations	-	-	\$46,204	-	-	\$47,196	-	-	\$48,140	-	-	\$944

Exhibit H. FY 2017 Schedule of Working Capital Fund by Program/Project/Activity

Department of Homeland Security
 Chemical, Biological, Radiological, Nuclear and Explosives Office
 Operations & Support
 (Dollars in Thousands)

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Chemical and Biological Capability	\$2,291	\$1,628	\$194	(\$1,434)
Architecture Planning and Analysis	1,006	\$1,038	\$792	(\$246)
Health and Emerging Infectious Diseases	395	\$340	\$331	(\$9)
Integrated Operations	483	\$400	\$251	(\$149)
Management & Administration	17,021	\$14,776	\$14,359	(\$417)
Total Working Capital Fund	\$21,196	\$18,182	\$15,927	(\$2,255)

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Exhibit I. Capital Investment and Construction Initiative Listing

N/A

Exhibit J. Object Class Breakout by Appropriation

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
 Summary of Requirements by Object Class
 (Dollars in Thousands)

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$17,890	\$18,668	\$21,055	\$2,387
11.5 Other Personnel Compensation	\$236	\$200	\$225	\$25
11.8 Special Personal Services Payments	\$2,840	\$2,955	\$4,072	\$1,117
12.1 Civilian Personnel Benefits	\$5,468	\$6,256	\$6,495	\$239
Total, Personnel and Other Compensation Benefits	\$26,434	\$28,079	\$31,847	\$3,768
Other Object Classes				
21.0 Travel and Transportation of Persons	\$1,225	\$1,199	\$949	(\$250)
23.1 Rental Payments to GSA	\$9,071	\$9,274	\$9,458	\$184
23.3 Communications, Utilities, and Misc. Charges	\$20	\$20	\$20	-
24.0 Printing and Reproduction	\$53	\$47	\$46	(\$1)
25.1 Advisory and Assistance Services	\$51,586	\$53,944	\$57,627	\$3,683
25.2 Other Services from Non-Federal Sources	\$1,621	\$951	\$627	(\$324)
25.3 Other Goods and Services from Federal Sources	\$31,875	\$27,172	\$31,667	\$4,495
25.7 Operation and Maintenance of Equipment	\$405	\$289	\$399	\$110
26.0 Supplies and Materials	\$16,034	\$15,883	\$14,607	(\$1,276)
31.0 Equipment	\$3,808	\$3,549	\$2,001	(\$1,548)
41.0 Grants, Subsidies, and Contributions	\$33,575	\$32,009	\$30,785	(\$1,224)
Total, Other Object Classes	\$149,273	\$144,337	\$148,186	\$3,849
Total, Direct Obligations	\$175,707	\$172,416	\$180,033	\$7,617
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$175,707	\$172,416	\$180,033	\$7,617

Exhibit K. Object Class Breakout by PPA

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Chemical, Biological, and Emerging Infectious Diseases Capability
 Summary of Requirements by Object Class
 (Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$7,369	\$7,441	\$8,537	\$1,096
11.8 Special Personal Services Payments	\$1,720	\$1,651	\$3,255	\$1,604
12.1 Civilian Personnel Benefits	\$2,291	\$2,314	\$2,657	\$343
Total, Personnel and Compensation Benefits	\$11,380	\$11,406	\$14,449	\$3,043
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$625	\$617	\$576	(\$41)
23.3 Communications, Utilities, and Misc. Charges	\$20	\$20	\$20	-
24.0 Printing and Reproduction	\$13	\$15	\$15	-
25.1 Advisory and Assistance Services	\$40,157	\$38,447	\$41,928	\$3,481
25.2 Other Services from Non-Federal Sources	\$114	\$124	\$46	(\$78)
25.3 Other Goods and Services from Federal Sources	\$10,352	\$10,470	\$14,260	\$3,790
25.7 Operation and Maintenance of Equipment	\$20	-	-	-
26.0 Supplies and Materials	\$15,513	\$15,351	\$14,091	(\$1,260)
31.0 Equipment	\$3,609	\$3,400	\$1,750	(\$1,650)
41.0 Grants, Subsidies, and Contributions	\$33,575	\$32,009	\$30,785	(\$1,224)
Total, Other Object Classes	\$103,998	\$100,453	\$103,471	\$3,018
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$115,378	\$111,859	\$117,920	\$6,061
Full Time Equivalents	63	60	68	8

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
R/N Detection, Forensics, and Prevention Capability
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$2,649	\$2,990	\$3,309	\$319
12.1 Civilian Personnel Benefits	\$783	\$1,113	\$1,004	(\$109)
Total, Personnel and Compensation Benefits	\$3,432	\$4,103	\$4,313	\$210
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$312	\$285	\$231	(\$54)
24.0 Printing and Reproduction	\$8	-	-	-
25.1 Advisory and Assistance Services	\$7,572	\$10,431	\$10,007	(\$424)
25.2 Other Services from Non-Federal Sources	\$1,234	\$677	\$306	(\$371)
25.3 Other Goods and Services from Federal Sources	\$8,290	\$5,784	\$5,695	(\$89)
26.0 Supplies and Materials	-	\$11	-	(\$11)
Total, Other Object Classes	\$17,416	\$17,188	\$16,239	(\$949)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$20,848	\$21,291	\$20,552	(\$739)
Full Time Equivalents	21	24	25	1

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
Management & Administration
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$7,872	\$8,237	\$9,209	\$972
11.5 Other Personnel Compensation	\$236	\$200	\$225	\$25
11.8 Special Personal Services Payments	\$1,120	\$1,304	\$817	(\$487)
12.1 Civilian Personnel Benefits	\$2,394	\$2,829	\$2,834	\$5
Total, Personnel and Compensation Benefits	\$11,622	\$12,570	\$13,085	\$515
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$288	\$297	\$142	(\$155)
23.1 Rental Payments to GSA	\$9,071	\$9,274	\$9,458	\$184
24.0 Printing and Reproduction	\$32	\$32	\$31	(\$1)
25.1 Advisory and Assistance Services	\$3,857	\$5,066	\$5,692	\$626
25.2 Other Services from Non-Federal Sources	\$273	\$150	\$275	\$125
25.3 Other Goods and Services from Federal Sources	\$13,233	\$10,918	\$11,712	\$794
25.7 Operation and Maintenance of Equipment	\$385	\$289	\$399	\$110
26.0 Supplies and Materials	\$521	\$521	\$516	(\$5)
31.0 Equipment	\$199	\$149	\$251	\$102
Total, Other Object Classes	\$27,859	\$26,696	\$28,476	\$1,780
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$39,481	\$39,266	\$41,561	\$2,295
Full Time Equivalents	67	70	76	6

Exhibit L. Permanent Positions by Grade

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Operations & Support
 Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES	8	9	11	2
Total, EX	2	2	2	-
GS-15	49	47	53	6
GS-14	44	49	45	(4)
GS-13	22	21	33	12
GS-12	11	11	6	(5)
GS-11	9	11	9	(2)
GS-9	4	3	2	(1)
GS-3	1	1	1	-
Other Graded Positions	8	7	7	-
Total Permanent Positions	158	161	169	8
Unfilled Positions EOY	23	-	-	-
Total Permanent Employment EOY	135	161	169	8
Headquarters	158	161	169	8
Total, Operations & Support:	158	161	169	8
Full Time Equivalent	151	154	169	15
Average ES Salary	174,475	176,198	178,872	2,674
Average GS Salary	115,779	117,090	129,057	11,967
Average Grade	14	14	14	-

Exhibit M. Changes in Full Time Employment

Department of Homeland Security Chemical, Biological, Radiological, Nuclear and Explosives Office Operations & Support

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
Increases			
From OHA S&E to CBRNE O&S - Chemical & Biological Capability	-	-	12
From OPS to CBRNE O&S - Chemical & Biological Capability	-	-	1
From S&T to CBRNE O&S - Chemical & Biological Capability	-	-	4
From OHA S&E to CBRNE O&S - Health & Emerg. Inf. Dis.	-	-	27
From OPS to CBRNE O&S - Health & Emerg. Inf. Dis.	-	-	2
From OPS to CBRNE O&S - Integrated Operations	-	-	1
From S&E to CBRNE O&S - Integrated Operations	-	-	21
From DNDO M&A to CBRNE O&S - R/NDF&PC	-	-	24
From DNDO M&A to CBRNE O&S - M&A	-	-	34
From OHA S&E to CBRNE O&S - M&A	-	-	36
From Policy to CBRNE OS - M&A	-	-	4
DHS Balanced Workforce Strategy	-	-	3
Decreases			
Year End Actuals/Estimated FTEs:	151	154	169

Department of Homeland Security

Chemical, Biological, Radiological, Nuclear and Explosives Office

Procurement, Construction and Improvements



Fiscal Year 2017

Congressional Justification

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Schedule I – Executive Summary of Appropriation Exhibits

Summary of Budget Estimates by Program Project Activity- Appropriation Level

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Procurement, Construction, and Improvements
Summary of FY 2017 Budget Estimates by Program Project Activity**

**FY 2017 Request
(Dollars in Thousands)**

Program Project Activity	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase(+) or Decrease(-) for FY 2017 Total Changes		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
R/N Detection, Forensics, and Prevention Capability	6	6	\$53,571	7	7	\$90,866	8	8	\$103,860	1	1	\$12,994
Radiological/Nuclear Detection Equipment Acquisition	6	6	\$53,571	7	7	\$90,866	8	8	\$103,860	1	1	\$12,994
Total, Procurement, Construction, and Improvements	6	6	\$53,571	7	7	\$90,866	8	8	\$103,860	1	1	\$12,994
Subtotal, Enacted Appropriations & Budget Estimates	6	6	\$53,571	7	7	\$90,866	8	8	\$103,860	1	1	\$12,994
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	6	6	\$53,571	7	7	\$90,866	8	8	\$103,860	1	1	\$12,994

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission *FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Overview

Procurement, Construction, and Improvements (PC&I) provide funds necessary for the planning, operational development, engineering, and purchase of one or more assets (which hereinafter also refers to end items) prior to sustainment. Information Technology (IT) - related PC&I may consist of one or more end items which provide useful software and/or hardware in an operational (production) environment, including non-tangible assets.

Unless otherwise stipulated by regulation or statute, an end item, or improvement project, purchased with PC&I funding has:

- Personal Property, a unit cost of greater than \$250,000, or
- Real Property, a unit cost of greater than \$2 million.

Procurement, Construction, and Improvements (PC&I) funds necessary operations and mission in support of the following PPAs:

Rad/Nuc Detection, Forensics, and Prevention Capability: Acquires rad/nuc detection equipment (RDE) for other DHS Components, including the U.S. Coast Guard (USCG), U.S. Customs and Border Protection (CBP), and the Transportation Security Administration (TSA).

B. FY 2016 to FY 2017 Budget Change - Appropriation Level

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Procurement, Construction, and Improvements
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)**

	Pos.	FTE	Amount
Adjustments-to-Base			
Transfers to and from other accounts:			
From CBRNE PC&I R/NDFPC to Working Capital Fund	-	-	(\$1,027)
From DNDO M&A to CBRNE Procurement, Construction, and Improvements - R/NDFPC	7	7	\$1,573
From DNDO System Acquisition - RDE Acquisition to CBRNE PC&I - R/NDFPC	-	-	\$89,293
Total Transfers	7	7	\$89,839
Increases			
2017 Pay Increase	-	-	\$16
Annualization of 2016 Pay Raise	-	-	\$4
DHS Balanced Workforce Strategy	1	1	\$105
Total, Increases	1	1	\$125
Decreases			
RDE Acquisition	-	-	(\$483)
Working Capital Fund	-	-	(\$21)
Total, Decreases	-	-	(\$504)
Total Other Adjustments	1	1	(\$379)
Total Adjustments-to-Base	8	8	\$89,460
FY 2017 Current Services	8	8	\$89,460
Program Changes			
Increases			
Radiological and Nuclear Detection Equipment Acquisition	-	-	\$14,400
Total, Increases	-	-	\$14,400
Total Program Changes	-	-	\$14,400
FY 2017 Request	8	8	\$103,860
FY 2016 to FY 2017 Change	8	8	\$103,860

C. FY 2017 Investment Summary - Appropriation Level

N/A

Schedule II – Program, Project, Activity (PPA) Exhibits

Exhibit D. FY 2016 to FY 2017 Budget Change- PPA Level

Summary Tables of Sub-PPA
Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Procurement, Construction and Improvements
R/N Detection, Forensics, and Prevention Capability
Radiological/Nuclear Detection Equipment Acquisition
 FY 2016 to FY 2017 Budget Change- PPA Level
 (Dollars in Thousands)

R/N Detection, Forensics, and Prevention Capability		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	16
	Annualization of 2016 Pay Raise	-	-	4
	DHS Balanced Workforce Strategy	1	1	105
	From CBRNE PC&I R/NDFPC to Working Capital Fund	-	-	(1,027)
	From DNDO M&A to CBRNE Procurement, Construction, and Improvements - R/NDFPC	7	7	1,573
	From DNDO System Acquisition - Radiological and Nuclear Detection Equipment (RDE) Acquisition to CBRNE PC&I - R/NDFPC	-	-	89,293
	RDE Acquisition	-	-	(483)
	Working Capital Fund	-	-	(21)
Program Changes	RDE Acquisition	-	-	14,400
Budget Year	FY 2017 Request	8	8	103,860
	Total Change from FY 2016 to FY 2017	8	8	103,860

PPA Description:

CBRNE requests \$103.860 million and 8 FTE within R/NDFPC for FY 2017.

Adjustments-to-base include:

- Transfer in of \$1.573 million and 7 FTP/7 FTE from DNDO M&A
- Transfer in of \$89.293 million from DNDO System Acquisition RDE Acquisition
- Transfer out of \$1.027 million from CBRNE PC&I R/NDFPC to Working Capital Fund
- Increase of \$0.105 million and 1 FTP/1 FTE for the DHS Balanced Workforce Strategy
- Increase of \$0.016 million for 2017 pay increase
- Increase of \$0.004 million to annualize the 2016 pay increase
- Decrease of \$0.483 million for RDE Acquisition
- Decrease of \$0.021 million for Working Capital Fund Adjustment

Program Changes Include:

- Increase of \$14.400 million for Radiological and Nuclear Detection Equipment Acquisition

RAD/NUC DETECTION, FORENSICS, AND PREVENTION CAPABILITY:

The Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Office Rad/Nuc Detection, Forensics and Prevention Capability Program leads the U.S. Government (USG) with development of the Global Nuclear Detection Architecture (GNDA) and its domestic implementation. The mission area is to integrate interagency efforts to develop nuclear detection technologies, evaluate detector performance, and ensure effective response to detection alarms.

The CBRNE Office was established in part to protect against radiological and nuclear (rad/nuc) threats directed against the United States or its interests. The CBRNE Office serves as the primary entity of the USG to further develop, acquire, and support the deployment of an enhanced system to detect and report on attempts to import, possess, store, transport, develop, or use an unauthorized nuclear explosive device, fissile material, or radiological material in the United States, and improve that system over time.

To fulfill the mandates of the authorizing legislation, the Rad/Nuc Detection, Forensics and Prevention Capability Program activities are focused on coordinating the GNDA and implementing rad/nuc detection. This program seeks to make radiological and nuclear terrorism prohibitively difficult for our adversaries through the acquisition of an adaptable and agile detection architecture that can readily surge in response to intelligence cues.

The Rad/Nuc Detection, Forensics and Prevention Capability Program acquire RDE for other DHS Components, including the USCG, CBP, and TSA.

Recognizing the rapid advancement of technology and innovation, constrained budgets, and market forces, the Rad/Nuc Detection, Forensics and Prevention Capability Program has shifted focus from government-sponsored development of materiel solutions to a “Commercial First” approach. To address capability gaps and by using a “Commercial First” approach, the CBRNE Office can leverage important industry-led innovations and technologies.

The “Commercial First” approach is based on the principle that all Rad/Nuc Detection, Forensics and Prevention Capability programs will first engage the private sector to determine whether or not adequate solutions exist to address capability gaps before pursuing new development. There are several “Commercial First” pathways that a program can follow depending on the defined gap, the technical maturity, and the commercial availability of potential materiel solutions that may be able to address that gap. These pathways include:

- Commercial-off-the-Shelf (COTS)
- Customized COTS: COTS modified by the government or industry partner
- Commercialization (e.g., Commercial Development): Industry-developed solutions using industry internal research and development (R&D) funding
- Government-sponsored development

The CBRNE Office continues to foster open communications with industry partners to share key aspects of future requirements and projected quantities of planned procurements.

The Rad/Nuc Detection, Forensics and Prevention Capability Program, Radiological and Nuclear Detection Equipment (RDE) Acquisition mission sub-program includes resources to procure and deploy human portable and large-scale radiation detections equipment (RDE) to DHS operational end-users.

This mission includes the procurement and/or deployment of RDE systems at land border crossings, seaports, international airports (including international preclearance sites), and international mail and express consignment courier facilities, and provides the scientific and technical expertise to design, acquire, and deploy these systems. In FY 2016, the PPAs for the Radiation Portal Monitor Program (RPMP) and Human Portable Radiation Detection Systems (HPRDS) were combined into a single, unified PPA for RDE equipment, which will allow the CBRNE Office to manage all equipment acquisition programs together. This ensures that funding is allocated in an integrated and balanced manner. It further enables the CBRNE Office to be more responsive to emerging operational needs. The CBRNE Office will continue to coordinate with operational partners to refine and prioritize equipment requirements.

The CBRNE Office conducts research, development, and test and evaluation activities necessary to mature and/or select radiation detection equipment for procurement that meets end-user needs and fills gaps in the GNDA. The CBRNE Office acquires radiation detection equipment for DHS Components, including the USCG, CBP, and TSA. The CBRNE Office also supports state and local users with acquisition of radiation detection

equipment for the Mobile Detection Deployment Units (MDDUs). Through strategic sourcing initiatives, the CBRNE Office is also able to achieve better buying power for Department resources by expanding the volume of RDE purchases. Strategic sourcing initiatives are finding even greater success through the CBRNE Office’s efforts to include the requirements from DHS components for which the legacy DNDO has not historically procured RDE in planned procurements. The RDE Acquisition PPA facilitates the Department’s ability to define the required capabilities, solution deployment, operational costs, and acceptable risk that must be considered across pathways for radiation detection equipment.

Radiological and Nuclear Detection Equipment Acquisition – Mission Sub-Program Overview

Program	Project	Level of Effort	General Description
RPM Program	RPM	Ongoing	Support CBP’s efforts to maintain scanning coverage at previously deployed sites. Decommission low-use/no-use RPMs and reconfigure sites as required. Deploy new RPMs and redeploy previously decommissioned RPMs as necessary to address required level of scanning capability at sites, to potentially include land border crossings, seaports, international airports (including international preclearance sites), and international mail and express consignment courier facilities. Deploy additional large-scale systems at ports of entry (POEs) or between POEs in the vicinity of the border. Deploy improvements to fielded systems. Conduct test and evaluation of improvements, as necessary.
HPRDS Program	CBP- Joint Acquisition Strategy (JAS)	Ongoing	Per the cooperatively developed JAS, the CBRNE Office coordinates with CBP for the deployment of human portable systems for CBP officers and agents to scan people, cargo, and privately owned vehicles at and between POEs. CBP requirements include Personal Radiation Detectors (PRDs), Advanced Handheld Radiation Isotope Identification Devices (RIIDs), Radiation Detection Backpacks, Basic Handheld RIIDs, and Human Portable Tripwire (HPT) devices.
	USCG-JAS	Ongoing	Per the cooperatively developed JAS, the CBRNE Office procures rad/nuc detection systems to satisfy USCG requirements and recapitalize equipment to maintain the current capability. Required equipment includes PRDs, Advanced and Basic Handheld RIIDs, Linear and Handheld Radiation Monitors, Backpack systems, and HPT devices.

Program	Project	Level of Effort	General Description
	Visible Intermodal Prevention and Response (VIPR) Sustainment	Ongoing	The CBRNE Office supports the needs of TSA VIPR teams for RDE by providing teams with PRDs, Basic Handheld RIIDs, Radiation Detection Backpacks and HPT devices.
	Mobile Detection Deployment Program (MDDP)	Ongoing	The CBRNE Office acquires rad/nuc detection systems to meet the needs of the MDDP. MDDUs are deployable, mobile trailer packages, containing RDE for up to 40 public safety professionals allowing the Department to surge rad/nuc detection capabilities based on threats. The equipment includes portable rad/nuc detection Backpacks, Basic and Advanced Handheld RIIDs, and PRDs. HPRDS FY 2017 funding will be used to sustain the equipment of the existing MDDU.

Radiation Portal Monitor (RPM) Program

The RPM Program is a post-Acquisition Decision Event (ADE) 3¹ program which supports CBP’s efforts to maintain scanning coverage at previously completed POEs (e.g., sustainment of existing POEs) to meet the *SAFE Port Act* mandates. As POEs are reconfigured, RPMs must be relocated, decommissioned, and/or additional RPM systems must be deployed to maintain current scanning capabilities.

In addition, improvements aimed at extending the service life of RPMs, as well as detection efficacy and operational performance, will be deployed to fielded systems. Additional large-scale scanning systems will be deployed at POEs or between POEs in the vicinity of the border.

Historically, the RPM Program has been the source of funding for the acquisition and deployment of RPMs at land and sea POEs. The CBRNE Office will continue to manage the deployment of the remaining poly-vinyl toluene (PVT)-based systems in its inventory and will deploy selected improvements that have been projected to enhance operational or threat detection performance for fielded systems in FY 2017.

Human Portable Radiation Detection Systems (HPRDS) Program

The HPRDS program is a post ADE 3 program, which supports multiple DHS components whose mission is to detect and identify rad/nuc threats. HPRDS devices are those that can be worn, carried, or moved by a person. These systems are relatively lightweight, easy to use, and of sufficiently low

¹ Level 3 equals non-major decision with a life cycle cost less than \$300 million, and an acquisition decision authority that is the Component Head, or the Component Acquisition Executive, Department of Homeland Security. DHS Directives System Directive Number: 1 02~1 Revision Number: 01, Acquisition Management Directive

cost to support widespread deployment. The objectives of the HPRDS program are to provide more capable systems and address different types of conveyances and cargo to be scanned for rad/nuc material.

The devices procured under the HPRDS program are:

- Personal Radiation Detectors (PRD)
 - Pager-size devices to detect rad/nuc materials. The PRDs are typically clipped to a uniform or belt. PRDs detect both gamma (general purpose) and gamma/neutron (maritime environment) rad/nuc sources. They automatically monitor the environment and alert the user if rad/nuc material is detected. PRDs are continuously worn by operators for rad/nuc detection and personal protection.
- Human Portable Tripwire (HPT)
 - Small/wearable systems that provide next-generation capabilities to detect, identify, communicate, and adjudicate rad/nuc threats. HPTs will also function as personal protective equipment to warn operators of potential exposure to harmful levels of radiation.
- Basic Handheld RIIDs
 - Designed for search, detection, localization, and identification of radionuclide composition of rad/nuc materials and for quick and accurate measurement of dose rate and count rate. Used to support secondary screening and small-area searches.
- Advanced Handheld RIIDs
 - Often used as the final arbiter in situations where illicit trafficking is suspected due to their superior capability for rad/nuc detection and identification. They are also used in laboratory settings as reference detectors.
- Radiation Detection Backpack
 - Used in situations where a wide-area rad/nuc detection capability is necessary, potentially in covert operations. They are used to quickly detect and locate a radiation threat in public, wide-area search, or maritime (e.g., small vessel standoff) environments.
- Linear Radiation Monitor (LRM)
 - Provide both gamma and neutron detection capabilities, and are specifically designed in a rope configuration to be lowered into small spaces, such as in between large stacks of intermodal shipping containers.
- Handheld Radiation Monitor (HRM)
 - Used to quickly and discreetly detect and locate a radiation threat. The HRM can also be used to detect rad/nuc sources underwater, such as underneath a boat or large ship.

Today, legacy handheld RDE, particularly Basic Handheld RIIDs used by CBP, USCG, and TSA, have reached or exceeded their expected service life and are in need of immediate replacement. In FY 2017, the CBRNE Office will continue recapitalization efforts to maintain current capability. This recapitalization through strategic sourcing will provide Department-wide cost savings by replacing antiquated equipment, which has higher Operations and Maintenance (O&M) costs, with modernized replacement Basic Handheld RIID systems with greater capability and lower O&M costs.

FY 2017 Human Portable Radiation Detection Procurement Plan by DHS Component

Activity	FY 2017 Planned Procurement
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	Units
USCG	
Backpacks	61
Basic Handheld RIIDs	154
HPTs	246
PRDs	1,152
CBP	
Basic Handheld RIIDs	611
PRDs	6,390
Advanced Handheld Germanium RIIDs	2
HPTs	326
Backpacks	6
TSA (VIPR Teams)	
No HPRDS equipment is planned to be procured for TSA VIPR teams in FY17	
MDDP	
Basic Handheld RIIDs	13
Backpacks	36
PRDs	79
Advanced Handheld Germanium RIIDs	7
HPTs	59

Notes: Numbers of units are approximate as they are planning numbers

FY 2017 DHS-Wide Human Portable Radiation Detection Procurement Plan

Activity	FY 2017 Planned Procurement
	Units
DHS	
Basic Handheld RIIDs	778
Advanced Handheld RIIDs	9
PRDs	7,621
HPTs	631

Backpacks	103
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U.S. Customs and Border Protection (CBP)

CBP provides America’s frontline capability to protect the Nation from threats to public safety and economy. On a typical day, CBP processes over 1,000,000 passengers and pedestrians at air ports of entry, over 70,000 pieces of cargo and conveyances at land, rail, and sea POEs, and over 300,000 privately owned vehicles. The CBP Office of Field Operations (OFO) supports the CBP rad/nuc mission at land, sea, and air POEs. Section 121 of the SAFE Port Act requires that “all containers entering the United States through the 22 ports through which the greatest volume of containers enters the United States by vessel shall be scanned for radiation.” A risk-informed approach to scanning for rad/nuc material is applied to other POEs. CBP U.S. Border Patrol (USBP) Agents currently use PRDs and handheld RIIDs for rad/nuc detection, enhanced steady state scanning operations, and safety where contact is anticipated with cargo and conveyances. USBP radiation detection equipment capability is focused on station and checkpoint operations; no radiation detection equipment capability for line watch operations is currently planned. CBP Air and Marine Operations (AMO) is a critical component of CBP's risk-based and layered approach for border security. With 1,200 Federal agents, more than 250 aircraft, and over 280 marine vessels operating from 91 locations throughout the United States and Puerto Rico, AMO detects, intercepts, and apprehends criminals in diverse environments at and beyond U.S. borders. CBP Laboratories and Scientific Services Directorate provides spectroscopic analysis and technical reach back support for CBP, USCG, TSA, and other operational personnel.

U.S. Coast Guard (USCG)

RDE is provided to USCG law enforcement personnel, inspectors, and marine investigators to increase the probability of rad/nuc detection across the USCG mission space. There are more than 13 million recreational vessels, 97,000 fishing vessels, and 100,000 other commercial small vessels registered or operating in U.S. waters. Seven hundred large commercial vessels (both U.S. and foreign flagged) arrive at U.S. ports daily, and 8,000 foreign flagged vessels enter U.S. ports annually with an average of 10 port calls per vessel. All boarding’s of vessels (small and large) are conducted by USCG personnel with radiation detection equipment. Additionally, USCG Deployable Specialized Forces have been equipped with RDE to conduct advanced rad/nuc operations.

Transportation Security Administration (TSA)

TSA Visible Intermodal Prevention and Response (VIPR) teams have been equipped with RDE (including PRDs, basic handheld RIIDs, and radiation detection backpacks) to conduct rad/nuc mission for the interior layer. VIPR teams deploy for steady state and enhanced steady state operations. VIPR teams are uniquely equipped to support the rad/nuc detection mission, because they can deploy to key transportation facilities around the country and have law enforcement authority within their jurisdiction.

CBRNE Mobile Detection Deployment Units (MDDU)

The CBRNE Office's MDDUs provide surge capability during National Special Security Events (NSSEs), Special Event Assessment Rating (SEAR) Level 1-5 events, and a surge capability during enhanced steady state operations of our Federal, state, local, tribal, and territorial partners. MDDUs are equipped with RDE that supplements existing rad/nuc detection resources in support of special events and intelligence-driven operations. MDDUs are housed regionally across the United States and maintained by the U.S. Department of Energy (DOE) Radiological Assistance Program teams through an interagency agreement with the CBRNE Office. Two large-capacity MDDUs and four small-capacity MDDUs operate currently. Each large-capacity MDDU is configured to support up to 40 personnel and each small-capacity MDDU is configured to support up to 20 personnel.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Procurement, Construction and Improvements
R/N Detection, Forensics, and Prevention Capability
Justification of Program Changes
(Dollars in Thousands)

Funding Profile

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request		
	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)
Current Services: Radiological and Nuclear Detection Equipment Acquisition - Radiological/Nuclear Detection Equipment Acquisition							8	8	\$89,460
Subtotal, Current Services							8	8	\$89,460
Program Increase: Radiological and Nuclear Detection Equipment Acquisition - Radiological/Nuclear Detection Equipment Acquisition							-	-	\$14,400
Subtotal, Program Increases							-	-	\$14,400
Total Request							8	8	\$103,860

DESCRIPTION OF ITEM:

Within the Rad/Nuc Detection, Forensics and Prevention Capability PPA is the RDE Acquisition sub PPA. The RDE sub PPA includes resources to procure and deploy human portable and large-scale radiation detections systems to DHS operational end-users.

RDE is split out into two categories: Human Portable Radiation Detection Systems (HPRDS) and large scale RDE, such as Radiation Portal Monitors (RPM).

HPRDS are relatively light weight and easy to use and provide Operators the ability to detect, localize, and/or identifies radiological material. DHS Operators, to include CBP, USCG, and TSA use a variety of HPRDS devices across their mission space, to include personal radiation detectors (PRD), handheld RIIDs, HPT systems, radiation detection backpacks, LRMs and HRMs.

Large-Scale RDE is used by CBP to scan cargo and conveyances for the presence of nuclear and other radioactive materials at land border crossings, seaports, international airports, and international mail and express consignment courier facilities with little or no impact on the flow of commerce.

Justification:

The additional funding in FY 2017 will accelerate the replacement of the oldest RPMs with currently available technology to address performance issues at land border sites, and provide the ability to deploy Revised Operational Settings (ROS), which cannot be deployed on the oldest systems. Included in the funding is provision to procure additional RPMs with currently available technology to support these deployments, as necessary.

Impact on Performance:

By accelerating the RPM conversions, the ROS will be deployed earlier at land and sea POEs. At CBP POEs, ROS has reduced nuisance alarms by approximately 75 percent. This reduction not only enables faster processing of traffic but also reduces the number of CBP officers needed to perform manual alarm adjudication with a handheld device, thereby freeing them to perform other law enforcement duties.

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Procurement, Construction, and Improvements
R/N Detection, Forensics, and Prevention Capability**

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	6	6	\$980	\$162	7	7	\$1,197	\$170	8	8	\$1,378	\$171	1	1	\$181	\$1
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS Pay Cost Drivers Exhibit may reflect a higher average FTE Cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

FTE Change FY 2016-2017

The FY 2017 budget request reflects changes to our FTE counts from two sets of position conversions. In FY 2014 DNDO completed the conversion of 8 positions from contractors to Federal employees. These conversions focused on staffing to address the most critical vulnerabilities in business areas where “Nearly Inherent Government Functions” are performed by Federal employees; specifically, ensuring that financial operations are being handled by Federal employees. In FY 2015, DNDO converted an additional 10 positions to achieve an expected savings of \$377,000 in the FY 2016 budget. The budget request also includes the anticipated changes in accounts and FTE from the conversion of 9 positions to be completed in FY 2016.

Personnel Compensation and Benefits Change FY 2016-2017

The change reflects one position conversion and pay inflation.

Average Cost Change FY 2016-2017

The average cost change reflects pay inflation.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Procurement, Construction, and Improvements
R/N Detection, Forensics, and Prevention Capability
Cost Drivers (Non-Pay) - PPA Level (\$000s)

Appropriation - R/N Detection, Forensics, and Prevention Capability	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Human Portable Rad/Nuc Systems Acquisition	\$46,777	\$51,762	\$48,644	(\$3,118)
Radiation Portal Monitor	\$4,812	\$36,527	\$53,709	\$17,182
Total	\$51,589	\$88,289	\$102,353	\$14,064

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

Schedule III – Other Exhibits

Exhibit E. Justification of Proposed Legislative Language

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Procurement, Construction and Improvements**

For necessary expenses of the Chemical, Biological, Radiological, Nuclear and Explosives Office, \$103,860,000, to remain available until September 30, 2019, for programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats.

Language Provision	Explanation
<p>For necessary expenses of the Chemical, Biological, Radiological, Nuclear, and Explosives Office, \$103,860,000, to remain available until September 30, 2019, for programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats.</p>	<p>The Department of Homeland Security proposes to consolidate the functions, operations, and budget requirements of the Domestic Nuclear Detection Office, Office of Health Affairs, Office of Bombing Prevention, and elements of the Science and Technology Directorate, Office of Policy, and Office of Operations into a single entity named the Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Office. All activities, responsibilities, and authorities from these organizations are transferred to this new organization.</p>

Exhibit F. Summary of Fee Collections and Carryover

N/A

Exhibit G. Summary of Reimbursable Resources

N/A

Exhibit H. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

Department of Homeland Security
 Chemical, Biological, Radiological, Nuclear and Explosives Office
 Procurement, Construction, and Improvements
 (Dollars in Thousands)

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Radiological and Nuclear Detection Equipment Acquisition			\$364	(\$886)
Total Working Capital Fund			\$364	(\$886)

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Exhibit I. Capital Investment and Construction Initiative Listing

N/A

Exhibit J. Object Class Breakout by Appropriation

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Procurement, Construction, and Improvements
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$757	\$872	\$1,057	\$185
11.3 Other than Full-Time Permanent	-	-	-	-
11.5 Other Personnel Compensation	-	-	-	-
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	-	-	-	-
12.1 Civilian Personnel Benefits	\$223	\$325	\$321	(\$4)
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	\$980	\$1,197	\$1,378	\$181
Other Object Classes				
21.0 Travel and Transportation of Persons	-	-	-	-
22.0 Transportation of Things	-	-	-	-
23.1 Rental Payments to GSA	-	-	-	-
23.2 Rental Payments to Others	-	-	-	-
23.3 Communications, Utilities, and Misc. Charges	-	-	-	-
24.0 Printing and Reproduction	-	-	-	-
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$1,112	\$476	\$2,036	\$1,560
25.2 Other Services from Non-Federal Sources	\$16	\$27	-	(\$27)
25.3 Other Goods and Services from Federal Sources	\$3,663	\$578	\$1,382	\$804
25.4 Operation and Maintenance of Facilities	-	-	-	-
25.5 Research and Development Contracts	-	-	-	-
25.6 Medical Care	-	-	-	-
25.7 Operation and Maintenance of Equipment	-	-	-	-
25.8 Subsistence & Support of Persons	-	-	-	-
26.0 Supplies and Materials	-	-	-	-
31.0 Equipment	\$47,800	\$88,588	\$99,064	\$10,476
32.0 Land and Structures	-	-	-	-
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	-	-	-	-
42.0 Insurance Claims and Indemnities	-	-	-	-
43.1 Interest and Dividends	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
43.2 Immigration Fees	-	-	-	-
44.0 Refunds	-	-	-	-
91.0 Unvouchered	-	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$52,591	\$89,669	\$102,482	\$12,813
Total, Direct Obligations	\$53,571	\$90,866	\$103,860	\$12,994
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$53,571	\$90,866	\$103,860	\$12,994

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

Exhibit K. Object Class Breakout by PPA

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Procurement, Construction, and Improvements
R/N Detection, Forensics, and Prevention Capability
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$757	\$872	\$1,057	\$185
12.1 Civilian Personnel Benefits	\$223	\$325	\$321	(\$4)
Total, Personnel and Compensation Benefits	\$980	\$1,197	\$1,378	\$181
Other Object Classes	-	-	-	-
25.1 Advisory and Assistance Services	\$1,112	\$476	\$2,036	\$1,560
25.2 Other Services from Non-Federal Sources	\$16	\$27	-	(\$27)
25.3 Other Goods and Services from Federal Sources	\$3,663	\$578	\$1,382	\$804
31.0 Equipment	\$47,800	\$88,588	\$99,064	\$10,476
Total, Other Object Classes	\$52,591	\$89,669	\$102,482	\$12,813
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$53,571	\$90,866	\$103,860	\$12,994
Full Time Equivalents	6	7	8	1

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only

Exhibit L. Permanent Positions by Grade

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Procurement, Construction, and Improvements
 Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
GS-15	5	5	5	-
GS-13	1	1	1	-
GS-12	-	1	2	1
Total Permanent Positions		7	8	1
Unfilled Positions EOY	-	-	-	-
Total Permanent Employment EOY	6	7	8	1
Headquarters	6	7	8	1
Total, Procurement, Construction, and Improvements:	6	7	8	1
Full Time Equivalents	6	7	8	1
Average ES Salary			-	-
Average GS Salary	146,000	138,000	132,396	(5,604)
Average Grade	15	15	15	-

Exhibit M. Changes in Full Time Employment

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Procurement, Construction, and Improvements**

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
Increases			
From DNDO M&A to CBRNE Procurement, Construction, and Improvements - R/NDFPC	-	-	7
DHS Balanced Workforce Strategy	-	-	1
Decreases			
Year End Actuals/Estimated FTEs:	6	7	8

Department of Homeland Security

Chemical, Biological, Radiological, Nuclear and Explosives Office

Research and Development



Fiscal Year 2017

Congressional Justification

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Schedule I – Executive Summary of Appropriation Exhibits

Summary of Budget Estimates by Program Project Activity- Appropriation Level

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development**

Summary of FY 2017 Budget Estimates by Program Project Activity

**FY 2017 Request
(Dollars in Thousands)**

Program Project Activity	FY 2015			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017		
	Revised Enacted			Enacted			Request			Total Changes		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
R/N Detection, Forensics, and Prevention Capability	50	50	\$158,778	53	53	\$156,899	56	56	\$151,605	3	3	(\$5,294)
Nuclear Forensics	8	8	\$21,919	8	8	\$20,928	8	8	\$20,576	-	-	(\$352)
Transformational Research and Development	13	13	\$69,539	14	14	\$67,945	15	15	\$64,771	1	1	(\$3,174)
Detection Capability Assessments	23	23	\$45,186	24	24	\$45,202	25	25	\$44,722	1	1	(\$480)
Detection Capability Development	6	6	\$22,134	7	7	\$22,824	8	8	\$21,536	1	1	(\$1,288)
Total, Research and Development	50	50	\$158,778	53	53	\$156,899	56	56	\$151,605	3	3	(\$5,294)
Subtotal, Enacted Appropriations & Budget Estimates	50	50	\$158,778	53	53	\$156,899	56	56	\$151,605	3	3	(\$5,294)
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-			
Net, Enacted Appropriations and Budget Estimates:	50	50	\$158,778	53	53	\$156,899	56	56	\$151,605	3	3	(\$5,294)

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission *FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Overview

Research and Development (R&D) funds necessary operations, mission support, and associated costs in support of the following mission programs:

- Radiological and Nuclear Detection Forensics and Prevention Capability:** The Radiological and Nuclear Detection, Forensics and Prevention Capability PPA leads the U.S. Government (USG) with development of the Global Nuclear Detection Architecture (GNDA) and its implementation, as well as coordination and stewardship of USG technical nuclear forensics efforts. Mission areas include Transformational Research and Development, Nuclear Forensics, Detection Capability Development, and Detection Capability Assessments.

B. FY 2016 to FY 2017 Budget Change - Appropriation Level

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)**

	Pos.	FTE	Amount
Adjustments-to-Base			
Transfers to and from other accounts:			
From CBRNE R&D R/NDFPC Nuclear Forensics to Working Capital Fund	-	-	(\$203)
From DNDO M&A to CBRNE Research & Development – Radiological/Nuclear Detection, Forensics, and Prevention Capability (R/NDFPC)	53	53	\$8,773
From DNDO RD&O - Nuclear Forensics to CBRNE Research & Development - R/NDFPC	-	-	\$19,549
From CBRNE R&D R/NDFPC Transformational R&D to Working Capital Fund	-	-	(\$691)
From DNDO RD&O - Transformational R&D to CBRNE Research & Development -R/NDFPC	-	-	\$66,446
From CBRNE R&D R/NDFPC Detection Capability Assessments to Working Capital Fund	-	-	(\$423)
From DNDO RD&O - Assessments to CBRNE Research & Development -R/NDFPC	-	-	\$37,130
From DNDO RD&O - Operations Support to CBRNE Research & Development -R/NDFPC	-	-	\$3,403
From CBRNE R&D R/NDFPC Detection Capability Development to Working Capital Fund	-	-	(\$214)
From DNDO RD&O - Systems Development to CBRNE Research & Development - R/NDFPC	-	-	\$21,598
Total Transfers	53	53	\$155,368
Increases			
2017 Pay Increase	-	-	\$111
Annualization of 2016 Pay Raise	-	-	\$27
DHS Balanced Workforce Strategy	3	3	\$335
Total, Increases	3	3	\$473
Decreases			
Detection Capability Assessments	-	-	(\$150)
Detection Capability Development	-	-	(\$174)
Nuclear Forensics	-	-	(\$133)
Transformational R&D	-	-	(\$620)
Working Capital Fund	-	-	(\$159)
Total, Decreases	-	-	(\$1,236)
Total Other Adjustments	3	3	(\$763)
Total Adjustments-to-Base	56	56	\$154,605
FY 2017 Current Services	56	56	\$154,605
Program Changes			
Decreases			
Detection Capability Development: Long Range Radiation Detection	-	-	(\$1,000)
Transformational R&D: Advanced Technology Demonstrations	-	-	(\$2,000)
Total, Decreases	-	-	(\$3,000)
Total Program Changes	-	-	(\$3,000)
FY 2017 Request	56	56	\$151,605
FY 2016 to FY 2017 Change	3	3	(\$5,294)

C. FY 2017 Investment Summary - Appropriation Level

N/A

Schedule II – Program, Project, Activity (PPA) Exhibits

Exhibit D. FY 2016 to FY 2017 Budget Change- PPA Level

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)**

R/N Detection, Forensics, and Prevention Capability		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	111
	Annualization of 2016 Pay Raise	-	-	27
	DHS Balanced Workforce Strategy	3	3	335
	Detection Capability Assessments	-	-	(150)
	Detection Capability Development	-	-	(174)
	From CBRNE R&D R/NDFPC Detection Capability Assessments to Working Capital Fund	-	-	(423)
	From CBRNE R&D R/NDFPC Detection Capability Development to Working Capital Fund	-	-	(214)
	From CBRNE R&D R/NDFPC Nuclear Forensics to Working Capital Fund	-	-	(203)
	From CBRNE R&D R/NDFPC Transformational R&D to Working Capital Fund	-	-	(691)
	From DNDO M&A to CBRNE Research & Development - R/NDFPC	53	53	8,773
	From DNDO RD&O - Assessments to CBRNE Research & Development -R/NDFPC	-	-	37,130
	From DNDO RD&O - Nuclear Forensics to CBRNE Research & Development - R/NDFPC	-	-	19,549
	From DNDO RD&O - Operations Support to CBRNE Research & Development -R/NDFPC	-	-	3,403

R/N Detection, Forensics, and Prevention Capability		Positions	FTE	Amount
	From DNDO RD&O - Systems Development to CBRNE Research & Development - R/NDFPC	-	-	21,598
	From DNDO RD&O - Transformational R&D to CBRNE Research & Development -R/NDFPC	-	-	66,446
	Nuclear Forensics	-	-	(133)
	Transformational R&D	-	-	(620)
	Working Capital Fund	-	-	(159)
	Detection Capability Development: Long Range Radiation Detection	-	-	(1,000)
	Transformational R&D: Advanced Technology Demonstrations	-	-	(2,000)
Budget Year	FY 2017 Request	56	56	151,605
	Total Change from FY 2016 to FY 2017	3	3	(5,294)

PPA Description:

CBRNE requests \$151.605 million and 56 FTE within R/NDF&PC for FY 2017.

Adjustments-to-base include:

- Transfer in of \$8.773 million and 53 FTP/53 FTE from DNDO M&A
- Transfer in of \$21.598 million from DNDO RD&O Systems Development
- Transfer in of \$37.130 million from DNDO RD&O Assessment
- Transfer in of \$19.549 million from DNDO RD&O Nuclear Forensics
- Transfer in of \$66.446 million from DNDO RD&O Transformational R&D
- Transfer in of \$3.403 million from DNDO RD&O Operations Support
- Transfer out of \$1.531 million from CBRNE PC&I R/NDFPC to Working Capital Fund
- Increase of \$0.335 million and 3 FTP/3 FTE for the DHS Balanced Workforce Strategy
- Increase of \$0.111 million for 2017 pay increase
- Increase of \$0.027 million to annualize the 2016 pay increase
- Decrease of \$0.174 million for Detection Capability Development
- Decrease of \$0.150 million for Detection Capability Assessments
- Decrease of \$0.620 million for Transformational R&D

- Decrease of \$0.133 million for Nuclear Forensics
- Decrease of \$0.159 million for Working Capital Fund Adjustment

Program Changes Include:

- Decrease of \$1.000 million for Detection Capability Development: Long Range Radiation Detection
- Decrease of \$2.000 million for Transformational R&D: Advanced Technology Demonstrations

Radiological and Nuclear Detection, Forensics and Prevention Capability PPA

The Radiological and Nuclear Detection, Forensics and Prevention Capability PPA leads the USG with development of the GNDA and its implementation, as well as coordination and stewardship of USG technical nuclear forensics efforts. Mission areas include:

Transformational Research and Development Program

The CBRNE Office’s Transformational R&D mission sub-program seeks to identify, explore, develop, and demonstrate scientific and technological approaches that address gaps in the GNDA; significantly improve the performance of rad/nuc detection and nuclear forensics methods, components, and systems; and/or significantly reduce the operational burden of these technologies. The CBRNE Office works closely with partners to transition technologies from research to the field, including the transfer of technologies to the commercial sector for development and commercialization. Projects in the Transformational Research and Development Program fall between Technology Readiness Level (TRL) one through seven.

Nuclear Forensics Program

The Nuclear Forensics Program advances the science of nuclear forensics, the examination of materials recovered from radiological or nuclear events of an illicit or hostile nature in order to determine their character and origin. Together, the GNDA and nuclear forensics efforts strengthen the detection of nuclear or other radioactive materials that are out of regulatory control;¹ enable the identification and closure of illicit radiological and nuclear trafficking networks; promote nuclear security; and deter potential adversaries by increasing their perceived risk of failure, and the prospect of being held accountable for planned and executed attacks. This mission is executed through the CBRNE Office’s National Technical Nuclear Forensics Center (NTNFC), which implements the National Nuclear Forensics Expertise Development Program and the *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States*.

¹ The term “out of regulatory control” refers to materials that are being imported, possessed, stored, transported, developed, or used without authorization of the appropriate regulatory authority, either inadvertently or deliberately.

Detection Capability Development Program

The Detection Capability Development Program incorporates the user requirements of DHS's operational components into rad/nuc detection systems. It achieves this by coordinating its systems engineering lifecycle activities with the end-user community and managing the task execution of the CBRNE Office's Solution Development Process (SDP).

Recognizing that innovation can originate in a variety of sectors, the CBRNE Office has adopted a "Commercial First" approach that gives preference for solutions available in the private sector marketplace. Using this approach, the CBRNE Office can leverage industry-led innovations and developments, resorting to a federally-sponsored and managed development and acquisition process when no commercial solution is feasible or private industry chooses not to commercialize a product.

Detection Capability Assessments Program

The CBRNE Office's research, development, and acquisition process is anchored by rigorous assessments of mission-related technologies as they are developed and deployed. These technologies are supported by test and evaluation (T&E) campaigns to characterize, verify, and validate technical performance and assess the operational effectiveness and suitability of technologies under development, as well as that of commercially available systems prior to deployment. The CBRNE Office utilizes test instrumentation and automated data collection systems to enable its test teams to rapidly verify and validate data, thus ensuring that analysts have quality data sets.

Rigorous and scientifically defensible testing requires a team of trained and experienced subject matter experts, including nuclear physicists, statisticians, analysts, and testers. The Red Team (RT) Project evaluates deployed systems and operations and their associated tactics, techniques and procedures, in as-close-to-realistic-environments as possible. The RT Project presents adversary tactics and radiological signature training devices to Federal, State, local, tribal, and territorial (FSLTT) rad/nuc detection and interdiction operations. These presentations can either be covert or overt in nature. In conjunction with FSLTT user groups, RT pilots new operating concepts or emerging rad/nuc detection technologies in existing operational environments or, alternately, existing operating concepts or technologies in new operational environments.

The Information Sharing Support Program (ISSP) is responsible for managing planning, preparation, and execution of information sharing support activities. The program ensures that rad/nuc detection and nuclear forensics mission support information technology (IT) resources and assets align with information security policies, practices, strategies, and plans. It provides technology support and facilitates collaboration on the development and implementation of standards, conventions, and agreements among GNDA FSLTT and commercial partners.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Justification of Program Changes
(Dollars in Thousands)

Funding Profile

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request		
	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)
Current Services: Transformational R&D: Advanced Technology Demonstrations - Transformational Research and Development							15	15	\$66,771
Current Services: Detection Capability Development: Long Range Radiation Detection - Detection Capability Development							8	8	\$22,536
Subtotal, Current Services							23	23	\$89,307
Program Decrease: Transformational R&D: Advanced Technology Demonstrations - Transformational Research and Development							-	-	(\$2,000)
Program Decrease: Detection Capability Development: Long Range Radiation Detection - Detection Capability Development							-	-	(\$1,000)
Subtotal, Program Decreases							-	-	(\$3,000)
Total Request							23	23	\$86,307

DESCRIPTION OF ITEM: Transformational R&D: Advanced Technology Demonstrations

The Advanced Technology Demonstration (ATD) Program transitions promising laboratory technology into performance test units that can be characterized in simulated and controlled operational environments. This program decrease will come from the High-throughput Integrated Rail Scanner (HIRS) project, which aims to develop technology to scan rail cargo at high-throughput rates using advanced non-intrusive inspection technology.

Justification:

This decrease allows the CBRNE Office to focus efforts on basic and applied research as well as longer standing technology development projects.

Impact on Performance:

To absorb the reduction in funding, the time to study the problem and potential solutions leading to a preliminary design review will be extended into the next fiscal year. This will delay the timeline to find a solution to detect potential nuclear threats in rail cargo by one year to FY 2022.

DESCRIPTION OF ITEM: Detection Capability Development: Long-Range Radiation Detection (LRRD)

Within the Rad/Nuc Detection, Forensics and Prevention Capability PPA is the Detection Capability Development and Assessments sub PPA. The Detection Capability Development and Assessment sub PPA - Systems Development activities are primarily focused on conducting systems engineering lifecycle activities to ensure the delivery of high-quality systems to DHS's operational components.

Long-Range Radiation Detection (LRRD)

The LRRD program addresses existing gaps in the GNDA and an operational need for enhanced standoff rad/nuc detection capability. The goal is to detect, identify, locate, and track rad/nuc threats at standoff distances greater than is currently commercially available, enabling more effective interdiction.

The LRRD capability would support search, survey/sweep, and monitor missions as part of the efforts such as:

- Screen, search, and detect rad/nuc threats in Maritime Non-Containerized Cargo at seaports of entry,
- Detect and deter attacks on population centers, critical infrastructure and key resources, and at special events, and
- Monitor and detect illicit radiological/nuclear materials in-transit, particularly along domestic transportation corridors, or when conducting wide-area search operations.

The LRRD program is a continuation of efforts to assess and enhance the performance of long-range radiation detection technologies developed under multiple transformational research and development projects. The technology base was characterized as part of a DNDO research and development Advanced Technology Demonstration (ATD).

Justification:

This technology is transitioning from research and development to systems development as a potential solution to address several focus areas in the GNDA. The next steps are to document common requirements from across the possible user communities and based on recommendations from the ATD. The program will conduct market research to identify commercial products that meet these requirements. Upon validation of the requirements, should sufficient, suitable commercial products not be available, the program intends to pursue system development activities to produce a solution based on the technologies developed in the ATD with form, fit and function that meets the common set of requirements with the intention to pilot it with the various potential user groups.

Impact on Performance:

Should a Government development program be pursued, the LRRD program is currently planning to complete a development of any final solution for a particular user or set of users in FY 2019. The funding reduction to this program would delay the completion of T&E activities and a final solution by one year to FY 2020.

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development**

R/N Detection, Forensics, and Prevention Capability

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	50	50	\$8,169	\$163	53	53	\$9,060	\$171	56	56	\$9,902	\$177	3	3	\$842	\$6
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS Pay Cost Drivers Exhibit may reflect a higher average FTE Cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

FTE Change FY 2016-2017

The FY 2017 budget request reflects changes to our FTE counts from two sets of position conversions. In FY 2014 DNDO completed the conversion of 8 positions from contractors to Federal employees. These conversions focused on staffing to address the most critical vulnerabilities in business areas where “Nearly Inherent Government Functions” are performed by Federal employees; specifically, ensuring that financial operations are being handled by Federal employees. In FY 2015, DNDO converted an additional 10 positions to achieve an expected savings of \$377K in the FY 2016 budget. The budget request also includes the anticipated changes in accounts and FTE from the conversion of 9 positions to be completed in FY 2016.

Personnel Compensation and Benefits Change FY 2016-2017

The change reflects three position conversions and pay inflation.

Average Cost Change FY 2016-2017

The average cost change reflects pay inflation and the impact of the converted positions on the average.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - R/N Detection, Forensics, and Prevention Capability	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Exploratory Research	\$29,438	\$26,548	\$26,099	(\$449)
Advanced Technology Demonstration	\$25,127	\$25,078	\$24,136	(\$942)
Test & Evaluation Program	\$19,709	\$17,749	\$17,765	\$16
Academic Research Initiative	\$11,736	\$13,058	\$11,793	(\$1,265)
Technology Advancement	\$10,794	\$9,851	\$9,617	(\$234)
Total	\$96,804	\$92,284	\$89,410	(\$2,874)

* FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

FY 2016 to FY 2017 Budget Change- Sub-PPA Level

**Summary Tables of Sub-PPA
Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Nuclear Forensics
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)**

Nuclear Forensics		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	15
	Annualization of 2016 Pay Raise	-	-	3
	From CBRNE R&D R/NDFPC Nuclear Forensics to Working Capital Fund	-	-	(203)
	From DNDO M&A to CBRNE Research & Development - R/NDFPC	8	8	1,379
	From DNDO RD&O - Nuclear Forensics to CBRNE Research & Development - R/NDFPC	-	-	19,549
	Nuclear Forensics	-	-	(133)
	Working Capital Fund	-	-	(34)
Budget Year	FY 2017 Request	8	8	20,576
	Total Change from FY 2016 to FY 2017	-	-	(352)

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Nuclear Forensics

Cost Drivers (Pay & Benefits) – Sub-PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	8	8	\$1,119	\$140	8	8	\$1,191	\$149	8	8	\$1,333	\$167	-	-	\$142	\$18
Civilian Total	8	8	\$1,119	\$139	8	8	\$1,191	\$148	8	8	\$1,333	\$166	-	-	\$142	\$18
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS Pay Cost Drivers Exhibit may reflect a higher average FTE Cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Nuclear Forensics
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - Nuclear Forensics	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Technology Advancement	\$10,794	\$9,851	\$9,617	(\$234)
National Nuclear Forensics Expertise Development Program	\$5,598	\$4,863	\$5,035	\$172
Operational Readiness	\$3,651	\$4,317	\$4,186	(\$131)
Total	\$20,043	\$19,031	\$18,838	(\$193)

* FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

CURRENT SERVICES PROGRAM DESCRIPTIONS: NUCLEAR FORENSICS

The Nuclear Forensics Program is organized into three mission areas: Operational Readiness, Technology Advancement, and Nuclear Forensics Expertise Development.

The CBRNE Office programs and activities focused on nuclear forensics are also aligned with the goals and investment priorities delineated in the *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States*.

Nuclear Forensics – Mission Sub-Program Overview

Program	Project	Level of Effort	General Description
Operational Readiness	Assessments and Analysis	Ongoing	Strengthen nuclear forensics capability through regular evaluations.
	Centralized Planning	Ongoing	Conduct efficient interagency program planning and integration of respective agency nuclear forensics capabilities and resources.

Program	Project	Level of Effort	General Description
	Exercises	Ongoing	Strengthen nuclear forensics capability and readiness through multi-agency exercises.
	International Engagements	Ongoing	Facilitate multilateral and bilateral collaborations to advance international nuclear forensics core capabilities, build partnerships, and establish an international framework to facilitate cooperation.
Technology Advancement	Data Evaluation Tools	Ongoing	Develop and demonstrate the next generation of tools for pattern analysis and methods to articulate whether or not measurements from questioned samples can be linked and included or excluded from specific families of signatures.
	Material Characterization	Ongoing	Allows for operational use of validated analytical methods, to inform and support signature development.
	Methodology Benchmarking	Ongoing	Evaluate and benchmark laboratory capability to perform specific analyses and methods.
	New Methodology Development	Ongoing	Advance the speed, accuracy, and precision of measurement techniques.
	New Signature Development	Ongoing	Perform studies to determine material and statistical population characteristics that can uniquely identify linkages with known or predicted material characteristics.
	Plutonium Processing Signatures	Ongoing	Develop a capability to simulate industrial-scale plutonium materials processing on a much smaller, laboratory scale.
	Reference Material Development	Ongoing	Prepare reference materials and standard tracers to support the schedule of the Methodology Benchmarking project, exercises, and operational quality assurance activities.
	Uranium Processing Signatures	Ongoing	Develop a capability to simulate industrial-scale uranium materials processing on a much smaller, laboratory scale.
Expertise Development	Academics	Ongoing	Implement academic and workforce initiatives designed to ensure a robust and enduring nuclear forensics workforce.
	Assessments	Ongoing	Maintain a current assessment of the needs and status of the nuclear forensics workforce and pipeline.
	Laboratories	Ongoing	Support post-doctorate fellowships, early-career awards, expert courses, and nuclear forensics training for the Federal

Program	Project	Level of Effort	General Description
			workforce.

OPERATIONAL READINESS PROGRAM

As the USG’s National Technical Nuclear Forensics (NTNF) program integrator, the CBRNE Office provides centralized planning, evaluation, and stewardship of nuclear forensics capabilities through interagency coordination and integration; international collaboration; and leading joint exercises, assessments, and corrective actions. The CBRNE Office leads the development of foundational planning documents that establish interagency strategic goals, objectives, requirements, processes, plans, and operational procedures for the NTNF mission. CBRNE Office sponsors and leads assessments to evaluate these efforts and improve the NF capability across the mission spectrum from pre- to post-detonation, both within the United States and abroad. The CBRNE Office also coordinates partner agency budgets to facilitate program alignment and eliminate duplication. In FY 2017, the CBRNE Office will continue to advance interagency coordination and integration by leading the *Joint Interagency Annual Review of the National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States FY 2015-2019*. The CBRNE Office will also continue to lead the renewed interagency effort on weapons of mass destruction (WMD) attribution, developing and executing an interagency tabletop exercise (in close coordination with NTNF partners) to test the newly codified WMD attribution framework and associated processes.

Another key component of ensuring operational readiness, as emphasized by the National Academy of Sciences, in their 2010 report on the state of the nuclear forensics enterprise is the conduct of regular, rigorous nuclear forensics exercises. Such exercises assess multiagency integration, readiness, field sampling techniques, laboratory analysis, and data evaluation and reporting, and communication flow. The major exercises alternate between pre- and post-detonation scenarios involving nuclear materials. These exercises focus on the continuous improvement of operations across the NTNF community. Exploring the technical and operational shortcomings and gaps enable the CBRNE Office and its partners to identify corrective actions based on after-action reports and lessons learned. In FY 2017, the CBRNE Office will coordinate, plan, and assess a pre-detonation materials exercise that assesses the nuclear forensics portion of the USG response to an interdicted nuclear device as well as a post-detonation material and debris exercise.

Assessments and Analysis Project

The Assessments and Analysis Project strengthens nuclear forensics capability through regular evaluations and assesses processes and capabilities to ensure readiness and to identify lessons learned, best practices, capability strengths, and areas needing improvement. An important aspect of the Assessments and Analysis project is the Nuclear Forensics Science Panel (NFSP). The NFSP comprises experts in technical fields with relevance to nuclear forensics, such as nuclear weapons design and testing, analytical and radio-chemistry, statistics, nuclear production processes, and modeling

and simulation of nuclear processes. At the request of the CBRNE Office and our interagency partners, the NFSP strives to assess various aspects of NTNF and answer technical questions that may guide operational or R&D activities in the future.

Centralized Planning Project

The Centralized Planning Project conducts efficient interagency program planning and integration of respective agency nuclear forensics capabilities and resources. This involves working closely with partners across six departments and agencies – as well as the White House – to effectively coordinate and align USG technical capabilities and operational activities while leveraging interagency investment in R&D to address priority needs and ensure unity of effort. The CBRNE Office accomplishes this integration through its leadership of the Nuclear Forensics Executive Council, NTNF Steering Committee, and issue-specific working groups.

Exercises Project

The Exercises Project strengthens nuclear forensics capability through jointly planned and executed exercises across the entire nuclear forensics mission space and inclusive of all partner agencies. Of most importance are well-documented lessons learned and a robust corrective actions program to improve the collective nuclear forensics capabilities and future exercise planning and execution. This includes the conduct of rigorous full-scale interagency exercises regularly to rehearse, evaluate, identify gaps, and improve the nuclear forensics capabilities.

International Engagements Project

The International Engagements Project facilitates multilateral and bilateral collaborations in a strategic, cost-effective manner that supports the USG national objective to advance international nuclear forensics capabilities and build foreign partner capacity. The CBRNE Office activity in this area involves subject matter expert contributions to multilateral initiatives and organizations, such as the Nuclear Security Summits, Global Initiative to Combat Nuclear Terrorism, International Atomic Energy Agency, and the Nuclear Forensics International Technical Working Group, to develop key technical and policy-oriented guidance documents, focused training courses, table-top and comparative material exercises, practical development and implementation of national nuclear forensics libraries, and frameworks for sharing nuclear forensics information as part of an evolving and maturing international community. Bilateral work features direct collaboration between the CBRNE Office and foreign governments on pre-detonation nuclear forensics and related technical projects. These activities are prioritized based on the CBRNE Office R&D interests and the concurrent benefits of building relationships and strengthening partner nations' capabilities.

Prior Year Key Events

- Led the revision and publication of the interagency *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States* for FY 2015-2019, which was approved by the senior executive-level Nuclear Forensics Executive Council and by the White House-led Countering Nuclear Threats Interagency Policy Committee.
- Advanced multilateral nuclear forensics efforts through the Nuclear Forensics International Technical Working Group (ITWG). DNDO led the execution of the fourth Collaborative Materials Exercise among 16 partner nations to improve international understanding of nuclear forensic analysis and interpretation capabilities.
- Advanced international nuclear forensics collaboration through bilateral work with Sweden. DNDO conducted joint R&D with the Swedish Defense Research Agency on the characterization of top priority certified reference materials (trace elements in uranium) via the newly finalized U.S.-Sweden Project Arrangement on Cooperation and Information Exchange in Radiological and Nuclear Forensics and Detection.
- Led the development of the NTNF Public Affairs Information Guide 2014 and the associated NTNF Interagency/Laboratory Public Affairs Standard Operating Procedure, which were finalized and approved by the senior executive-level Nuclear Forensics Executive Council and by the White House-led Countering Nuclear Threats Interagency Policy Committee. DNDO also authored or contributed to twelve press releases, blog posts, and articles on the Nation's nuclear forensics program.
- Led, in partnership with the Defense Threat Reduction Agency, the planning and evaluation for MIGHTY SABER, a DOD technology demonstration and evaluation event.
- In partnership with the Departments of Defense (DOD), Energy (DOE), and Justice (DOJ), successfully led the planning and evaluation of the PROMINENT HUNT (PH) 15-2 exercise of the NTNF Ground Collections Task Force (GCTF) in Los Angeles/Long Beach/Los Alamitos, California. The GCTF operated in coordination with other DOD assets, DOE capabilities, and other Federal, state, and local organizations in a land and maritime domain, while employing ground, maritime, and aerial platforms for nuclear detonation debris collection.

Current Year Key Events

- Lead the development of the Joint Interagency Annual Review of the *National Strategic Five-Year Plan* as well as the annual update of the *NTNF Implementation Plan* and the NTNF Budget Crosscut.
- Continue to advance international NF efforts through participating in and contributing to activities of the key multilateral nuclear forensics initiatives, to include the Global Initiative to Combat Nuclear Terrorism (GICNT), International Atomic Energy Agency (IAEA), Nuclear Forensics International Technical Working Group (ITWG), and the 2016 Nuclear Security Summit, as well as to bilateral work with the United Kingdom, Sweden, and Canada.
- Continue to enhance interagency coordination through leadership of the NTNF Steering Committee, Executive Council, and issue-specific working groups.

- Coordinate the planning and execution of one pre-detonation materials exercise, one pre-detonation device exercise and two GCTF post-detonation collections exercises.
- Lead a renewed interagency effort to develop a streamlined framework and process for WMD attribution, in close coordination with the law enforcement and intelligence communities as well as the National Security Council.

Budget Year Key Events

- Lead the development of the Joint Interagency Annual Review of the National Strategic Five-Year Plan as well as the annual update of the NTNF Implementation Plan and the NTNF Budget Crosscut.
- Continue to advance international NF efforts through participating in and contributing to activities of the key multilateral nuclear forensics initiatives, to include the GICNT, IAEA, ITWG, and bilateral collaborations with partner nations.
- Continue to enhance interagency coordination through leadership of the NTNF Steering Committee, Executive Council, and issue-specific working groups.
- Lead the development and execution of an interagency tabletop exercise, in close coordination with NTNF partners, to test the newly codified WMD Attribution Framework and associated processes.
- Coordinate the planning and execution of one pre-detonation materials exercise, one pre-detonation device exercise and two GCTF post-detonation collections exercises.

TECHNOLOGY ADVANCEMENT PROGRAM

The CBRNE Office leads activities that advance the USG capability to rapidly, accurately, and credibly characterize and identify the nature, origin, and history of nuclear materials interdicted before a detonation. These techniques allow experts to reach technical conclusions about interdicted material based on known signatures, comparative samples of materials, and modeling of manufacturing processes. The Technology Advancement program benchmarks and advances forensics methodologies to provide results with well-understood and develops signatures and data evaluation tools to support attribution assessments. These methods and signatures are provided to operators in the FBI, DOD, DOE, and intelligence community. In FY 2017, the program will begin benchmarking a trace elements in uranium methodology to determine what laboratory method improvements might be needed. The program will also continue efforts to process of uranium and plutonium on a laboratory scale to identify new signatures. Such a capability will enable experts to link nuclear materials to fuel cycle processes.

In a collaborative effort, the CBRNE Office will address Technology Advancement of the nuclear forensics mission within the NTNFC's New Methodology Development and New Signature Development Projects and Transformational R&D Exploratory Research (ER) Program. ER will direct efforts at the technology readiness levels (TRLs) 1-6, while NTNFC will continue to direct activities at TRLs 5-8, prior to transition to our operational partners in the interagency. While aligning priorities, the CBRNE Office leverages the expertise in both directorates to achieve significant advances with a longer-term view of filling the most crucial capability gaps.

Data Evaluation Tools Project

The Data Evaluation Tools Project will develop and demonstrate the next generation of tools for pattern analysis and methods to assess whether or not measurements from samples can be linked and included or excluded from specific families of signatures.

Material Characterization Project

The Material Characterization Project allows for operational use of validated analytical methods, to inform and support signature development and to provide information to the Nuclear Materials Information Program. As new signatures are developed, materials will be characterized to support development and validation of those signatures. This is a continuing effort, coordinated with DOE and the New Methodology Development, New Signature Development, and Data Evaluation Tools projects.

Methodology Benchmarking Project

The Methodology Benchmarking Project will evaluate and benchmark laboratory capabilities to perform specific analytical methods. This project identifies the most accurate, precise, and timely methods available and appropriate for operational use and identify gaps where improved methods are needed. Improved methods are then transitioned to the operational laboratories through a technology transfer workshop.

New Methodology Development Project

The New Methodology Development Project is advancing the accuracy, precision, and timeliness of measurement techniques. In this project area, the CBRNE Office's NTNFC will focus on activities at TRLs 5-8, while Transformational and Applied R&D in the ER Program will address efforts at TRLs 1-6.

New Signature Development Project

The New Signature Development Project determines material and statistical population characteristics that can uniquely identify linkages with known or predicted material characteristics. In this project area, the CBRNE Office's NTNFC will focus on activities at TRLs 5-8, while Transformational and Applied R&D in the ER Program will address efforts at TRLs 1-6.

Plutonium Processing Signatures Project

The Plutonium Processing Signatures Project is developing a capability to simulate industrial production-scale plutonium materials processing on a much smaller, laboratory scale. The produced materials are analyzed for discriminating signatures and are also used for creating well-characterized reference materials for methodology validation.

Reference Material Development Project

Reference materials serve as the “gold standard” for assessing forensic analysis methods. The Reference Material Development project prepares certified reference materials and other well-characterized materials to support the Methodology Benchmarking project, exercises, and operational quality assurance activities, such as validating measurement methods and operational laboratory proficiency testing, performed by the interagency Bulk Special Nuclear Materials Analysis Program. A schedule for production of nuclear forensics certified reference materials extends for the next 20 years, given national laboratory capacity to perform the requisite certification.

Uranium Processing Signatures Project

The Uranium Processing Signatures Project is developing a capability to simulate industrial production-scale uranium materials processing on a much smaller, laboratory scale. The materials are analyzed for discriminating signatures and are also used for creating well-characterized reference materials for methodology validation.

Prior Year Key Events

- Produced two certified reference materials for forensic method improvement and quality assurance purposes.
- Operated the laboratory-scale uranium processing capability to produce uranium materials for signature development.
- Completed development of the laboratory-scale plutonium processing capability to produce plutonium materials for signature development.
- Began transition to operational use of an improved methodology for the forensic characterization of trace elements in uranium and plutonium.
- Commenced method development of a new characterization methodology, Resonance Ionization Mass Spectrometry, to improve the speed of nuclear forensics analyses.

Current Year Key Events

- Produce two certified reference materials for forensic method improvement and quality assurance purposes.
- Operate the laboratory-scale uranium and plutonium processing capabilities to produce uranium and plutonium materials for signature development.
- Continue transition to operational use of improved methodology for characterization of trace elements in uranium and plutonium.
- Complete benchmarking study for improving measurements of trace actinides in plutonium, and begin transition to operational use.
- Continue method development of a new characterization methodology, Resonance Ionization Mass Spectrometry, to improve the speed of nuclear forensics analyses.

Budget Year Key Events

- Produce two certified reference materials for forensic method improvement and quality assurance purposes.
- Operate the laboratory-scale uranium and plutonium processing capabilities to produce uranium and plutonium materials for signature development.
- Complete transition to operational use of an improved methodology for characterization of trace elements in uranium and plutonium.
- Continue method development of a new characterization methodology, Resonance Ionization Mass Spectrometry, to improve the speed of nuclear forensics analyses.
- Commence benchmarking study for improving measurements of trace elements in uranium.

NATIONAL NUCLEAR FORENSICS EXPERTISE DEVELOPMENT PROGRAM

The NNFEDP is the comprehensive USG effort to address the enduring challenge of sustaining a preeminent workforce of scientists educated and trained in nuclear forensics-related specialties. NNFEDP initiatives aim to maintain the technical expertise required to execute the Nation's nuclear forensics mission through interdisciplinary R&D collaboration among students, academic departments, universities, and national laboratories. Initiatives include graduate and undergraduate scholarships, fellowships, and internships; faculty R&D support; post-doctoral fellowships; early-career awards; expert courses in nuclear forensics-related operational and research topics; and outreach activities.

The CBRNE Office continuously evaluates the state of the workforce within the national laboratory system relative to USG NTNF mission requirements in order to appropriately scale and scope the NNFEDP into future years. In addition, the CBRNE Office chairs the NTNF Expertise Development Committee in order to ensure cross-agency integration and participation in the NNFEDP. The committee provides a forum to plan, coordinate, and execute joint initiatives within the NNFEDP, facilitating collaborative efforts among nuclear forensics interagency partners, avoiding duplication, leveraging funding, and ensuring robust Federal support and unity of effort. Along with DHS, active participants include DOE, DOD, and the FBI.

Academics Project

The Academics Project supports a current DHS management performance measure for the CBRNE Office. National Strategic Five-Year Plan activities and investment areas under this goal include the implementation of academic and workforce programs designed to ensure a robust and enduring nuclear forensics workforce. Initiatives included in this project are graduate and undergraduate scholarships, fellowships, and internships, and faculty R&D support. Additionally, the Academics Project supports planned outreach and recruitment activities to potential university and student participants.

Assessments Project

The Assessments Project maintains a current assessment of the needs and status of the nuclear forensics workforce.

Laboratories Project

The Laboratories Project supports post-doctorate fellowships and early-career awards at the national laboratories. This project area also funds laboratories to develop in-depth courses in nuclear forensics-related research and operational topics to enhance training of junior scientists (typically those with 0-5 years professional experience). Additionally, the Laboratories project supports development and presentation of curricula related to nuclear forensics training for the Federal workforce, which is a specified element of the 2010 *Nuclear Forensics and Attribution Act*

Prior Year Key Events

- Supported 10 Seaborg Institute Nuclear Science Summer Interns; five undergraduate scholars; 22 graduate fellows; 16 post-doctorate fellowship positions; four university education awards; four junior faculty awards; one minority serving institution award; and dedicated one-on-one senior scientist/student mentoring at the national laboratories.
- Sponsored three nuclear forensics courses as part of the Federal Expertise Development Program (FEDP): “Introduction to Nuclear Forensics for the Federal Workforce” at Oak Ridge National Laboratory, and two iterations of “Nuclear Testing, Diagnostics, Forensics, and Stockpile Stewardship” at Lawrence Livermore National Laboratory and the Nevada National Security Site (NNSS).

Current Year Key Events

- Support 10 Seaborg Institute Nuclear Science Summer Interns; five undergraduate scholars; 16 graduate fellows; 16 post-doctorate fellowship positions; one university education award; four junior faculty awards; one minority serving institution award; and dedicated one-on-one senior scientist/student mentoring at the national laboratories.
- Evaluate the state of the nuclear forensics workforce within the DOE national laboratories to inform and guide expertise development program efforts.
- Continue to sponsor the following nuclear forensics courses for the Federal workforce: “Introduction to Nuclear Forensics for the Federal Workforce” and “Nuclear Testing, Diagnostics, Forensics, and Stockpile Stewardship.”

Budget Year Key Events

- Implement four new initiatives supporting universities and students, as well as scientific staff at the DOE national laboratories, focused on strengthening and sustaining the nuclear forensics workforce.
- Support 10 Seaborg Institute Nuclear Science Summer Interns; two research awards, to include one dedicated to a minority serving institution; two undergraduate scholarships; 10 graduate fellowships; 15 post-doctorate fellowship positions; one early-career award; one in-depth, expert course; and dedicated one-on-one senior scientist/student mentoring at the national laboratories.
- Continue to sponsor the following nuclear forensics courses for the Federal workforce: “Introduction to Nuclear Forensics for the Federal Workforce” and “Nuclear Testing, Diagnostics, Forensics, and Stockpile Stewardship.”

Summary Tables of Sub-PPA
Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Transformational Research and Development
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)

Transformational Research and Development		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	29
	Annualization of 2016 Pay Raise	-	-	7
	DHS Balanced Workforce Strategy	1	1	125
	From CBRNE R&D R/NDFPC Transformational R&D to Working Capital Fund	-	-	(691)
	From DNDO M&A to CBRNE Research & Development - R/NDFPC	14	14	1,499
	From DNDO RD&O - Transformational R&D to CBRNE Research & Development -R/NDFPC	-	-	66,446
	Transformational R&D	-	-	(620)
	Working Capital Fund	-	-	(24)
Program Changes	Transformational R&D: Advanced Technology Demonstrations	-	-	(2,000)
Budget Year	FY 2017 Request	15	15	64,771
	Total Change from FY 2016 to FY 2017	1	1	(3,174)

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Transformational Research and Development

Cost Drivers (Pay & Benefits) – Sub-PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	13	13	\$2,047	\$157	14	14	\$2,313	\$165	15	15	\$2,542	\$169	1	1	\$229	\$4
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS Pay Cost Drivers Exhibit may reflect a higher average FTE Cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Transformational Research and Development
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - Transformational Research and Development	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Exploratory Research	\$29,438	\$26,548	\$26,099	(\$449)
Advanced Technology Demonstration	\$25,127	\$25,078	\$24,136	(\$942)
Academic Research Initiative	\$11,736	\$13,058	\$11,793	(\$1,265)
Total	\$66,301	\$64,684	\$62,028	(\$2,656)

* FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

CURRENT SERVICES PROGRAM DESCRIPTIONS: TRANSFORMATIONAL RESEARCH AND DEVELOPMENT (R&D)

The CBRNE Office’s Transformational R&D seeks to identify, explore, develop, and demonstrate scientific and technological approaches that address gaps in the GNDA; significantly improve the performance of rad/nuc detection and nuclear forensics methods, components, and systems; and/or significantly reduce the operational burden of these technologies. The CBRNE Office works closely with partners to transition technologies from research to the field, including transfer of technologies to the commercial sector for development and commercialization.

R&D investments are made based on competitive awards open to investigators from all sectors: government laboratories, academia, and private industry. The transformational research efforts leverage the qualities and advantages of all three sectors to develop products. Teaming is encouraged across the sectors. Transformational R&D is carried out within four major programs: Advanced Technology Demonstration (ATD); Exploratory Research (ER); Academic Research Initiative (ARI); and the Small Business Innovation Research (SBIR) program. Each program is described in detail below along with the corresponding projects and research areas. Many research areas remain consistent from year-to-year, with ongoing work for multiple projects.

The Transformational R&D programs and activities that address nuclear forensics gaps and improvements are also aligned with the goals and investment priorities delineated in the *Nuclear Defense Research and Development Roadmap, Fiscal Years 2013 – 2017* and the *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States*.

ADVANCED TECHNOLOGY DEMONSTRATION (ATD) PROGRAM

The ATD program performs accelerated development, characterization, and demonstration of leading-edge technologies that address critical gaps in nuclear detection capabilities. It builds on technology concepts previously demonstrated under the ER program, research conducted by our interagency partners, or privately funded research. Through the ATD program, technology concepts are developed into prototype systems called Performance Test Units (PTU), which provide reliable and scalable performance measurements in a challenging and realistic simulated or controlled operational environment. Through this characterization process, sufficient understanding of the technology is obtained to recommend a technology transition path for the PTU to a government acquisition program, commercial system development, or additional basic and applied research.

New ATD projects are initiated approximately yearly based on: 1) prioritized gaps in the GNDA; and 2) technological successes from the ER program, the ARI, or other private or public research programs that support the prioritized gaps. Multiple research projects are being monitored for potential transition to an ATD. The ongoing and planned ATD projects for each fiscal year are summarized in the table below followed by a brief description of each project:

ATD Project Name	Abbreviation	Initiation Year	Completion Year	Technologies Characterized
Advanced Radiation Monitoring Devices	ARMD	2010	2015	2
Long Range Radiation Detection	LRRD	2011	2015	4
Shielded Nuclear Alarm Resolution	SNAR	2008	2016	3
Airborne Radiological Enhanced-sensor System	ARES	2012	2016	3
Nuclear and Radiological Imaging Platform	NRIP	2012	2017	3
Radiation Awareness and Interdiction Network	RAIN	2013	2017	3
Enhanced Radiological Nuclear Inspection and Evaluation	ERNIE	2014	2017	1
Wearable Interdiction Nuclear Detection	WIND	2015	2018	TBD
Mobile Urban Radiation Search	MURS	2015	2019	1
High-Throughput Integrated Rail Scanner	HIRS	2017	2021	TBD

Advanced Radiation Monitoring Device (ARMD) Project

The ARMD Project builds upon advances in new technology discovered under previous ER projects utilizing advanced scintillator materials and neutron detection techniques. Two materials of particular interest are strontium iodide (SrI₂) and cesium lithium yttrium chloride (CLYC). SrI₂ has demonstrated exceptional performance as a gamma-ray detector with excellent energy resolution and a potentially lower cost due to favorable growth characteristics. CLYC has demonstrated excellent performance for detecting both gamma rays and neutrons. In addition, CLYC material provides a

cost-effective alternative to helium-3 neutron detectors. This project concluded in FY 2015 with a final report and the complete characterization of two PTUs. The crystal materials are now commercially available and are being integrated into detector systems by commercial entities.

Long Range Radiation Detection (LRRD)

DNDO initiated the Long Range Radiation Detection (LRRD) demonstration in FY 2011 to continue research efforts to assess and enhance the performance of long-range radiation detection technologies developed under the Road Side Tracker (RST), Target Linked Radiation Imaging (TLRI) and Standoff Radiation Detection System (SORDS) transformational R&D projects. This demonstration was a spiral development process with the goal of optimizing the detection system algorithms for use in realistic mission scenarios conducted in actual urban environments. The final reports have been completed for these R&D efforts and the technologies transitioned both to the project of the same name under the Detection Capability Development Program and the MURS and RAIN ATDs.

Shielded Nuclear Alarm Resolution (SNAR) Project

The SNAR Project develops and characterizes advanced technologies required to resolve alarms and to detect SNM, even when heavily shielded or masked. The project has two principal applications: 1) dramatic performance enhancement to commercially or near-commercially available x-ray nonintrusive inspection screening systems by integrating solutions directly into hardware and software to substantially reduce the number of manual inspections while increasing probability of SNM detection; and 2) targeted and chokepoint screening in multiple venues, including vehicle border crossings, checkpoints, rail, air cargo, and general aviation with rapidly relocatable inspection systems. Technologies of interest include induced fission, high energy backscatter, advanced radiography, and nuclear resonance fluorescence. By the end of the project, three separate PTUs will be built and characterized. The final report for the first PTU was completed in FY 2013 and the technology has transitioned to the NRIP project (see below). The final report for the second PTU will be completed in early FY 2016. In collaboration with the United Kingdom Home Office, the final report for the third PTU will be completed in FY 2016.

Airborne Radiological Enhanced-sensor System (ARES) Project

The ARES Project develops and characterizes standoff radiation measurement technology for the detection of radiological material from an airborne platform. The test bed system will demonstrate the technology to locate point-like sources in a complex and dynamic background. This technology could be used in urban, maritime, and costal environments with a concept of operations (CONOPS) more in line with law enforcement practices rather than past radiological mapping operations. The prototype system will be deployable on rotary winged aircraft. The system will record data that will be resampled and replayed in a computer simulation environment to characterize advanced algorithms. The algorithms will determine the presence, location, and identification of radioactive isotopes. The technology is enabled by the fusion of radiation detection with other sensing modalities (e.g., multispectral imaging, GPS, altimetry, etc.). Utilizing scintillating materials, innovative packaging, and algorithm improvements, the ARES systems will offer greater detection sensitivity, lower nuisance alarms, and simultaneously provide a greater range of operation. A technology demonstration and characterization will be completed in FY 2016 to assess technology transition potential.

Nuclear and Radiological Imaging Platform (NRIP) Project

The NRIP Project leverages recent advancements in the commercial sector as well as prior Transformational R&D work. By combining the merits of passive and active technologies, new systems are being developed so that a single system is able to detect radiological and nuclear threats, regardless of the amount of shielding or the complexity of cargo, in primary mode with minimal impact to the flow of commerce. The technologies being investigated include muon tomography, which use muons to image cargo without requiring a man-made radiation source; radiation detectors integrated into commercially available radiographic imaging systems; and radiation detectors integrated into a previously demonstrated Shielded Nuclear Alarm Resolution (SNAR) PTU that utilizes high energy backscatter and photo fission. By looking at unique data signatures and methodologies for fusing active interrogation signatures with the passive detection capabilities, the holistic system has advanced detection capabilities to potentially solve the shielded SNM problem at chokepoints. In addition to the regular ATD characterization in a simulated operational environment, these systems will also undergo testing in a controlled, but realistic, operational environment. This will provide a unique data set to better estimate nuisance alarm rates and additionally provide data on operational utility. The demonstration and characterization of the commercial PTU was completed in FY 2014; the muon tomography-based PTU evaluation was completed in 2015. The characterization of the SNAR-inspired PTU will be completed in FY 2017.

Radiation Awareness and Interdiction Network (RAIN) Project

The RAIN Project, an initiative closely tied to the Securing the Cities (STC) program, is intended to develop and characterize technologies for monitoring free-flowing traffic on highways and on-ramps for nuclear or other radioactive threat materials. RAIN technologies will couple networked radiation sensors with vehicle detection and identification systems to allow monitoring and tracking of vehicles passing by the systems at highway speeds. Multiple technical approaches are being explored and integrated during the effort, ranging from sophisticated networked radiation detection arrays combined with machine vision to the integration of radiation detectors into all-electronic highway tolling systems. In FY 2013 and early FY 2014, the technical support team consisting of government and national laboratory scientists worked with the New York Police Department (NYPD) to gather the operational requirements, conditions and constraints in monitoring traffic and vessels approaching a protected city via highways, bridges, and tunnels. Analysis of these vignettes helped generate the required performance and suitability requirements for the ATD systems. Early in FY 2014, a solicitation was issued for proposed research and development of these technologies. Three technologies were subsequently selected, with three awards made in FY 2014. The system developers recently completed critical design reviews of their approaches, and are now developing their PTUs that will be used in government characterization in FY 2017. The effort will culminate in an operational demonstration of one or more of the technologies at a location(s) as determined by the user group, potentially extending into FY 2018.

Enhanced Radiological Nuclear Inspection and Evaluation (ERNIE) Project

The ERNIE system is a computer-based analysis system that uses advanced signal processing, statistical analysis, multi-regression, and statistical machine learning (ML) algorithms to analyze RPM scans. Scan data is ingested in either real-time from an RPM or batch processed from historical records, and key features are extracted. These features are supplied to the ML algorithms which are trained through repeated exposure to sample incidents and are subsequently able to return an assessment (classification) of whether the conveyance should be released or inspected. A preliminary operational assessment of the ERNIE prototype was conducted in FY 2014 at the Port of Tacoma with impressive results in reduced nuisance alarm rates. ERNIE development was transferred to an ATD program in FY 2015, where a formal operational assessment is now in planning for FY 2016 and FY 2017. The operational assessment will assess ERNIE's performance against the Revised Operational Settings (ROS) that was implemented on

RPMs in 2015, as well as ERNIE's ability to support secondary inspection. In parallel, other activities necessary to assess the operational utility of ERNIE and requirements for eventual fielding are being investigated.

Wearable Intelligent Nuclear Detection (WIND) Project

The ability to interdict a moving threat or localize an emplaced threat during wide area search missions is a major technical challenge. The WIND Project will develop and characterize a highly-modular, multi-purpose, and human-portable (e.g., backpack or vest) system that greatly advances the ability to detect and interdict threats during wide area search missions. The technical approach will merge two major sources of information to develop the design specifications. The first approach will utilize threat analysis to compare several critical design options, including the enhanced sensitivity of state-of-the-art radiation anomaly detection algorithms. The second approach will survey end users to gather initial requirements and then will proceed to spiral development getting end user input along the way to develop a balanced and flexible system. To achieve the objective, a number of advanced capabilities will be fully characterized, to include spectral anomaly detection, spatial mapping/tracking, sophisticated background subtraction, and sensor fusion. In FY 2016, a solicitation will be issued for the proposed research and development. By FY 2018, the final performance test units will be demonstrated and characterized for technology transition potential.

Mobile Urban Radiation Search (MURS) Project (*This project replaced the High Accuracy and Resolution Pager Project listed last year.*)

The goal of the MURS Project is to efficiently migrate the knowledge and technology of previous Transformational R&D stand-off and long range detection projects into a production-ready, compact, and modular radiation imager for a van-based platform coupled to an advanced contextual sensor package. The program will emphasize the required operational performance and suitability assessment of technology rather than traditional technology characterization. The MURS Project will leverage the Defense Advanced Research Projects Agency (DARPA) SIGMA Program to facilitate spiral development and system integration within a network of detectors. This will enable planning for future developmental programs in support of CBRNE Office missions such as the Mobile Detection Deployment Units (MDDUs) and other inter-agency surge capabilities. Technology development began in FY 2015 with demonstration of the first spiral prototype in FY 2017. The project will conclude in FY 2019 with the demonstration and operational assessment of the optimized prototype.

High-Throughput Integrated Rail Scanner (HIRS) Project

The planned HIRS Project will investigate the technologies required to enable high throughput non-intrusive inspection of rail cargo with improved performance over currently deployed systems. These technologies will enable higher penetration of cargo while minimizing radiation dose without hindering rail operating environments. Automated algorithms with material discrimination for detection of SNM in this scanning environment will also be developed and evaluated. It is anticipated that the results from this program will be leveraged by U.S. Customs and Border Protection (CBP) for future rail scanning operations. This project will initiate in FY 2017 with the release of a solicitation. Prototypes will be characterized in FY 2020 leading to a technology transition potentially in FY 2021.

Prior Year Key Events

- ARMD Project: Completed the final report of the characterization of new scintillating materials.
- LRRD Project: Completed the final report for the Stand-Off Radiation Detection based system. The technology transitioned both to the project of the same name under the Detection Capability Development Program and the MURS and RAIN ATDs.
- ARES Project: Completed the ARES hardware system and data collection campaigns. The prototype system has been flown over the Baltimore/Washington, Las Vegas, and San Francisco Bay areas.
- NRIP Project: Completed government analysis of the muon tomography system and the CBP cargo scanning systems. Began construction of the high-energy backscatter (HEB)-based NRIP system at the Conley Terminal in Boston.
- RAIN Project: Conducted preliminary design and critical reviews for three selected vendors and assessed worthiness to move on to vendor development and test stage.
- WIND Project: Completed derivation of R&D requirements, goals, and use concepts; initiated R&D solicitation.
- MURS Project: Began the MURS ATD, stood up the end-user panel, and completed the development and integration of the first MURS prototype radiation detection module.

Current Year Key Events

- SNAR Project: Complete the final report of the second SNAR system.
- NRIP Project: Complete the final characterization report on the Multi-Mode Passive Detection System (MMPDS). Begin the Technology Demonstration and Characterization of the high-energy backscatter based NRIP performance test unit at Conley Terminal in Boston.
- RAIN Project: Complete vendor development and test phase and conduct characterization readiness review for the three developed technologies. Select and prepare a site for government characterization activities. Coordinate with New York Police Department stakeholders on the operational demonstrations of the systems.
- MURS Project: Complete integration of first MURS prototype. Deploy MURS prototype in approximately four different end-user exercises.
- WIND Project: Execute kick-off with selected vendor(s) and begin work towards concept preliminary design. Conduct first spiral development phase with vendors to facilitate early incorporation of end-user feedback.
- HIRS Project: Initiate project planning and the derivation of the R&D requirements for next generation rail cargo scanning non-intrusive inspection (NII) technologies enabling increased penetration and high throughput without impeding rail operations.
- ARES Project: Complete government characterization of ARES system algorithms being run on aerial data collected by the ARES prototype system in FY 2015. Generate the final characterization report.

Budget Year Key Events

- NRIP Project: Complete HEB characterization report. Complete final NRIP technology comparison report.

- RAIN Project: Conduct government characterization of RAIN performance test units that successfully complete a characterization readiness review. Work with stakeholders to plan and execute an operational demonstration of the systems around New York City.
- HIRS Project: Initiate two or more contracts to develop next-generation rail cargo scanning non-intrusive inspection (NII) technologies, enabling increased penetration and high throughput without impeding rail operations.
- MURS Project: Complete development and integration of revised MURS prototype. Participate in approximately four different end-user exercises.
- WIND Project: Complete supporting Systems Threat Review to evaluate effectiveness of proposed vendor designs in detecting threats. Complete critical design reviews with WIND vendors. Finalize analysis and characterization plans to evaluate prototype performance, to occur in FY 2018.

EXPLORATORY RESEARCH (ER) PROGRAM

The ER program explores innovative, high-risk, early to later-stage technologies. Specifically, the ER program researches technologies and techniques that:

- Address capability gaps and weaknesses in the GNDA;
- Provide substantial performance improvement and/or cost reduction of rad/nuc detection capabilities; and
- Improve nuclear forensics capabilities.

Efforts under the ER program are intended to transform the basic building blocks of rad/nuc detection technology and supporting fields, with the research generally culminating in a feasibility evaluation or proof-of-concept demonstration in a laboratory setting. Successful ER technologies and concepts may then transition to support subsequent ATD projects or directly spur commercial development. ER projects also provide performance modeling, improved algorithm development, and other support capabilities for the broader CBRNE Office mission. The ER program is divided into the five project areas (or portfolios) described below, many of which remain consistent from year to year. The CBRNE Office anticipates having 45 open ER activities during FY 2017. Twenty-one of these will be on-going efforts listed under the five projects areas below. Twenty-four of these will be new competitive awards described in the “Solicitation for New ER Activities” section below.

Materials Research and Support Technology (Materials) Project (*Remaining Neutron Detection Including ³He Alternative Project activities from last year were merged into this project.*)

The Materials Project has the technical objective of discovering new gamma-ray and neutron sensing materials, significantly improving existing materials and improving or developing new signal readout methods for these materials. As sensing materials are at the core of most radiation detectors, improvements in this area can have broad impact across the GNDA. These materials could enable the next generation of passive or active threat-sensing technologies, to include RPMs, backpacks, hand-held radiation isotope identification devices (RIID), pagers, radiography systems, and a range of other detection technologies.

Currently-deployed radiation sensors are limited in sensitivity and selectivity for detecting, identifying, and locating nuclear and radiological threats, and have other operational limitations to include high cost, inadequate reliability, or complex operation. These limitations often are related directly to

the material used to sense gamma and neutron radiation. Desired materials must be low-cost, sensitive, provide adequate performance, and be available in large volumes to enable widely deployable sensors. In particular, they must provide good gamma-ray energy resolution to differentiate threat from benign radioactive materials or, in the case of neutrons, provide high sensitivity while at the same time being insensitive to gamma radiation. Detector materials must also be rugged, stable, nonhazardous, and operate at room temperature. In addition, sometimes they must be light weight, low power, low voltage, and compact. This project pursues the development of low cost gamma-sensitive scintillator and semiconductor materials, sensitive neutron detectors for personal radiation detectors and for active interrogation technologies, and the unique electronics required to read out and process the signal from these detectors.

The table below lists the ongoing Materials activities for FY 2017 as recorded at the end of FY 2015. Additional activities will be added in FY 2016 and FY 2017 based on the “Solicitation for New ER Activities” described below.

ER: Materials Activity	Sector	State	Initiation Year	Completion Year
High-Throughput Discovery of Scintillation Materials Using Automated Processing	Laboratory	CA	2006	2018
Discovery of Single Crystal and Ceramic Forms of Large Scintillators and Integration into Detectors	Laboratory	CA	2006	2018
Large Area Plastic Scintillators for Delayed Neutron/Gamma Detection	Industry	MA	2015	2018
Bandgap Engineered Sensor for Active Interrogation of Cargo in Transit	Industry	MA	2015	2017
Low-Cost Industrial Production of Halide Crystals	Industry	MA	2015	2018
Ceramic Scintillators for Transmission Radiography	Industry	MA	2015	2017
Large Scale Solid-State Organic Scintillators for Fission Neutron Detection	Laboratory	CA	2015	2017
Performance Guided Development of Low Cost Detector Materials	Industry	CA	2015	2018

Radiation Detection Technology (Radiation) Project

The Radiation Project emphasizes investigating novel approaches to greatly improve the ability to detect, identify, and locate threat materials based on their intrinsic radiological signatures. The primary emphasis is in next-generation gamma-ray and neutron detection systems that support agile, mobile, and multi-modal detection of threats. Research in this project leverages new materials developed under the Materials Project integrated with advanced electronics, new detector configurations, ancillary or orthogonal sensors, and specialized algorithms to greatly improve detection sensitivity and selectivity while also minimizing operational burdens and costs associated with deployment of these systems. Specific technical approaches that have previously been examined in this project area included advanced concepts in radiation imaging such as Compton and coded-aperture imaging. Current research expands the use of auxiliary sensor data such as three-dimensional electro-optical, Light Detection and Ranging (LIDAR), and short-wave infrared sensing to enhance performance of networked and radiation imaging sensors. Performance benefits to be derived from this research include greater situation awareness through the integration and fusion of different sensor data streams, longer-range standoff detection of threat materials,

improved differentiation of threat materials from environmental background and benign sources of radioactivity, decreased nuisance alarms, and enhanced ability to locate and track radiation sources.

There is one activity expected to continue through FY 2017 under the Radiation Project. Additional activities will be added in FY 2016 and FY 2017 based on the “Solicitation for New ER Activities” described below.

ER: Radiation Detection	Sector	State	Initiation Year	Completion Year
Accurate Radiological Background Estimation Through Semantic Mapping and Classification of Environments Using Geo-Referenced	Laboratory and Industry	CA/MA	2013	2017

Shielded SNM (Shielding) Project

The Shielding Project addresses the critical challenge of being able to detect SNM and other threats even when heavily shielded or masked. Radiation signatures from SNM can be shielded, making passive detection difficult, if not impossible in some scenarios. This project strongly focuses on active interrogation (AI) techniques, including advanced radiography and particle interrogation, to produce unique signatures from SNM to greatly improve detection performance. AI detection methods typically employ x-rays, gamma-rays, or neutrons to penetrate shielding and the normal cargo found in containers, trucks, rail, airplanes, or vehicles. Specific research includes advanced x-ray systems that employ sophisticated algorithms to detect high mass and atomic number objects, which can be an indicators of SNM or the shielding used to conceal SNM or other radiological sources. Research also includes neutron and photon interrogation approaches that detect SNM by inducing fission or nuclear resonance fluorescence. Other techniques of interest use natural fields such as cosmic ray-generated muons and gravity fields without any man-made radiation to sense within large cargo volumes and detect the presence of objects with high mass density. Finally, this project focuses on advanced source technologies that can be used to minimize dose to the environment, and to be deployed in human-portable, mobile, and re-locatable applications.

The table below lists the ongoing Shielding activities for FY 2017 as recorded at the end of FY 2015. Additional activities will be added in FY 2016 and FY 2017 based on the “Solicitation for New ER Activities” described below.

ER: Shielded SNM Activities	Sector	State	Initiation Year	Completion Year
Multi-Source Rail Cargo Inspection System	Industry	CA	2013	2017
Modular Active Interrogation and fast Radiography Optimization Software (MACROS)	Industry	CA	2015	2017
Inexpensive, High Performance Betatron X-Ray Source	Industry	CA	2015	2017

Radar Container Inspection System	Industry	CA	2015	2018
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Advanced Analytics (Analytics) Project (This project was formerly known as the Modeling and Algorithms Project.)

The Analytics Project utilizes advanced signal processing and cutting-edge analyses to greatly enhance the ability to detect, locate, track, and identify potential threat materials and devices across a broad range of environments. The challenge to current detection systems is that background radiation and other commonly occurring non-threat sources may result in nuisance alarms that otherwise limit their detection sensitivity to true threats and consume staff time. To address this challenge, this project strives to expand our understanding of the background and the observed threat signatures and then exploit them with machine learning, novel signal filtering, Bayesian statistics, and principal component analysis to both improve threat detection performance and enable broader operational agility. The project area leverages the rapidly growing computational capabilities that can be either embedded within instruments, or attached to instruments through smart phones and tablets.

This project area also emphasizes development of predictive modeling and simulation capabilities for current and future detection concepts. These models help guide research efforts, support capability-based design of advanced detection concepts, enable understanding of how new or existing detection assets may be best employed, and support trade analyses in detection approaches for new missions. The desired goal of the model and simulation projects is to develop effective and accurate software tools to support the spectrum from GNDA planning to end-user operations. Through greater understanding enabled by predictive modeling, that understanding can be adapted to optimize and further benefit the ability to detect and discriminate threats from non-threats.

As the technology and its associated data and signals become increasingly more complex, there is a need to translate this to benefit the detection mission with actionable information for the operators. The desired goal of current analytics projects is to use a greater portion of the detector system information as well as the high-fidelity predictive models to then translate into actionable analyses for the operator or decision-maker.

The table below lists the ongoing Algorithm activities in FY 2017 as recorded at the end of FY 2015. Additional activities will be added in FY 2016 and FY 2017 based on the “Solicitation for New ER Activities” described below.

ER: Advanced Analytics	Sector	State	Initiation Year	Completion Year
Monte Carlo N-Particle (MCNP) Physical Model	Laboratory	NM	2012	2018
SoftWare for Optimization of Radiation Detectors (SWORD) Upgrades	Laboratory	DC	2013	2017
Robust Network Fusion Algorithms for Detection and Localization	Laboratory	TN	2013	2017
Nuclear Inspection Node Event SIMulator (NINESIM) Tool for GNDA Node Simulation	Laboratory	NM	2015	2019

Nuclear Forensics (Forensics) Project

Nuclear Forensics is an emerging discipline that aims to become a robust capability similar to conventional forensics science that may provide defensible measurements to inform both intelligence activities and law enforcement investigations. The Forensics Project directly coordinates with the CBRNE Office's NTNFC mission to execute game-changing research and development to discover new forensics signatures of rad/nuc material and to also develop the tools enabling comprehensive and timely analytical results. The goal is to use quantifiable, actionable, and defensible technical information to help link places, people, objects, and events related to that material. Specifically, analytical methodologies are required to characterize materials, samples, devices, constituent parts, output signals, and other related items resulting from the illicit use or intended illicit use (e.g., in trafficking) of nuclear and other radioactive material.

This project area seeks to develop laboratory analytical techniques that improve on existing methods to determine physical, chemical, radiological, or morphological properties of sample material that may link it to a specific type of production process as well as when and where the material was produced. The desired goal of the Forensics Project is to improve or replace current analytic measurement methodologies and tools with ones that achieve greater accuracy and precision for the interagency technical nuclear forensics mission.

The table below lists the ongoing Forensics activities in FY 2017 as recorded at the end of FY 2015. Additional activities will be added in FY 2016 and FY 2017 based on the "Solicitation for New ER Activities" described below.

ER: Forensics Activity	Sector	State	Initiation Year	Completion Year
Synthesis and Characterization and Isotope Separation of Volatile Actinide Compounds	Laboratory	ID	2015	2018
Bonding and Distribution as a Function of Depth in Pu and U Forensic Samples	Laboratory	NM	2015	2018
Chemical Forensic Science of Plutonium Oxides	Laboratory	NM	2015	2019
Development of mass bias/nonlinearity correction software for ICP-QMS	Laboratory	IL	2015	2019

Solicitation for New ER Activities

New ER activities are initiated through an annual Broad Agency Announcement (BAA) for industry and academia and a Call for Proposals (CFP) for national and government Laboratories. Topic areas for this research are defined from prioritized gaps in the GNDA and the NTNFC Strategic Plan. These topic areas may be refined or influenced from technology needs as defined by the CBRNE Office, other DHS Components, other Federal departments and agencies, or State and local law enforcement. Topics may also originate from remaining technology hurdles discovered or not fully addressed in prior research. In FY 2015, a BAA / CFP was released for award in FY 2016 that covered the following topic areas:

- Optimization for Low-Cost, Post-Growth, Processing and Packaging of Scintillators and Semiconductor Crystals
- Strategies, Techniques, Tools and Concepts of Operations for Enhanced Steady State Operations
- Radiographic Platform Agnostic Automatic Threat Detection Algorithms
- Energy Calibration Software Development (ECSD) for Spectroscopic Gamma-Ray Detectors (CFP only)
- Modeling and Simulation of Special Nuclear Material Production (CFP only)

White papers submitted in response to these topic areas were received towards the latter part of FY 2015 with proposals due early FY 2016. A similar solicitation is expected in FY 2016 for contract award in FY 2017 with topics developed based on the most recent GNDA and nuclear forensics gap analyses, the technical grand challenges, on-going research results, current operational issues, and the results of the FY 2014 CFP studies. Such topics may include:

- Degradation free, low cost, large area spectroscopic capable plastics
- Novel semiconductor and scintillator materials
- New approaches to rad/nuc trafficking detection at non-official ports-of-entry (POE) via ancillary, correlated, or orthogonal signatures and pattern-of-life analysis
- Assessing uncertainty in nuclear data (branching ratios and lifetimes) and how it may impact isotopic signatures in the nuclear fuel cycle
- Use of encounter dynamics for optimal use in detection, localization, and tracking
- High-efficiency and high-resolution detection systems for cost effective deployment
- Risk-informed beam targeting for detection of shielded threats

Prior Year Key Events

- **Materials Project:** Completed two breakthroughs in radiation detection using solid-state detectors. First, achieved 50 percent intrinsic thermal neutron detection sensitivity in a bulk semiconductor material (lithium indium di-selenide) that has the potential to provide extremely low power and efficient neutron detection capability for personal radiation detectors. Second, thallium bromide (TlBr) achieved over two-year stable operation at resolution better than one percent without any cooling. Current advanced hand-held detectors require cooling, which make them more expensive and operationally cumbersome.
- **Radiation Project:** Demonstrated a proof-of-concept of compact, hybrid neutron and gamma ray detection and imaging system and demonstrated the ability to track vehicles even in low-light, poor-weather conditions.
- **Shielding Project:** Demonstrated proof-of-concept of an algorithm for improved material discrimination in X-ray cargo inspection systems by measuring statistical noise. It was determined that this technique could be used to differentiate nuclear and other high atomic number materials that could be used as shielding (e.g., lead and tungsten) from all other materials typically found in cargo.

- Algorithms Project: Completed a study of research strategies that would support improvements in domain awareness to enhance the likelihood of rad/nuc encounter in U.S. non-official POE domains. Also, initiated effort to develop advanced, comprehensive model to quantify cost-to-benefit for GNDA nodes.
- Forensics Project: Expanded nuclear forensics image quantification tool to include additional features and support the ingestion of other nuclear forensics R&D projects including morphological and microstructural feature discrimination.
- Solicitation for New ER Activities: Initiated activities through a new BAA and CFP resulting in 17 new awards.

Current Year Key Events

- Materials Project: Based on the advances made in plastic-based radiation detectors, demonstrate the proof-of-concept of large, low-cost detector materials with high sensitivity and good (i.e., medium energy resolution) selectivity for radionuclide identification.
- Shielding Project: Complete the proof-of-concept of enabling technologies for low dose radiographic applications to include a source developed utilizing laser-driven X-rays that is capable of reducing the dose to cargo by at least an order of magnitude while maintaining performance. Also, complete proof-of-concept for use of highly-sensitive gravitational gradiometry sensors for passive, rapid imaging of shielded threats within personally owned vehicles.
- Radiation Project: Complete proof-of-concept on use of 3D optical cameras/LIDAR data and short-wave infrared imaging to estimate background radiation environments and improve threat detection sensitivity.
- Algorithm Project: Release 6.2.0 version of Monte Carlo N-Particle (MCNP) modeling tool to include six new radiation transport features and fifty new test sets. Finish the technical feasibility study to describe how other contraband detection technologies could be integrated into rad/nuc detection systems.
- Forensics Project: Complete proof-of-concept demonstration for using a focused ion beam to develop three-dimensional images of forensics samples of plutonium and uranium metals.
- Solicitation for New ER Activities: Conduct feasibility evaluation reviews and preliminary design reviews of the activities awarded in FY 2015 to determine worthiness to proceed to a critical design review. Initiate activities through a new BAA/CFP resulting in approximately 10 new awards.

Budget Year Key Events

- Materials Projects: Complete feasibility evaluations on composite plastic scintillators for improved gamma (and neutron) sensitivity and evaluations on improvements to post-growth methods at reduced costs.
- Shielding Projects: Complete proof-of-concept of a low dose radiation source developed for rail scanning. This source could be an enabling technology for the HIRS ATD to be released in FY 2017.
- Radiation Project: Initiate new research to detect indicators of rad/nuc trafficking or smuggling using novel sensing approaches, analytics, and other information gathering.

- Analytics Project (successor to the Algorithm Project): Complete advanced threat identification software and radionuclide analysis kit (RNAK) and make available to independent system developers.
- Forensics Project: Initiate new thrust to identify and prioritize nuclear forensics signatures resulting from advanced morphological and microstructural imaging.
- Solicitation for New ER Activities: Conduct critical design reviews of the activities awarded in FY 2015 to determine worthiness to proceed to a proof-of-concept demonstration. It is estimated that approximately 50 percent of the initial awards will move on to the proof-of-concept demonstrations.
 - Conduct feasibility evaluation reviews and preliminary design reviews of the activities awarded in FY 2016 to determine worthiness to proceed to a critical design review.
 - Initiate activities through a new BAA and CFP resulting in about 15 new awards. Topics to be based on the newly published CBRNE Office Transformational and Applied Research (TAR) R&D Roadmap.

ACADEMIC RESEARCH INITIATIVE

The ARI Program has two primary objectives: 1) Engage the academic community to advance fundamental knowledge for rad/nuc threat detection and related sciences with emphasis on fundamental research to solve long-term, high-risk challenges; and 2) Develop human capital in the nuclear science and engineering professions and related fields. Further, the program works to sustain a long-term commitment to basic research in these fields and coordinates these research efforts with other federally sponsored research in industry and at the national laboratories. In addition to its focus on basic and fundamental radiation detection science, the ARI funds students and scholars in academic disciplines traditionally not associated with rad/ nuc detection, such as social sciences, deterrence theory, and applied mathematics.

Since inception in FY 2007, 77 grants have been awarded to more than 47 academic institutions across the country. In FY 2015, the ARI program sponsored 46 grants to 34 universities, a total which includes five collaborations between 12 university partners. ARI supported 150 students and 58 faculty members. Their research efforts resulted in 80 papers and 130 conference presentations. Similar statistics will be maintained in FY 2016 and FY 2017. In FY 2015, ARI also began a summer internship program with the United States Naval Academy with the focus of developing intellectual capacity in fields relevant to nuclear detection and forensics and to develop new capabilities to combat the threat of nuclear terrorism through advanced technology and techniques.

The ARI encompasses five research categories as described below.

Materials Research and Support to Technology Project (*Remaining Alternative Neutron Detection Technologies Project activities from last year were merged into this project.*)

Research in this area focuses on high-risk, long-term research aimed at developing greatly improved radiation detector materials for gammas and neutrons that are highly sensitive, selective, low-cost, and rugged. This research encompasses a family of investigations to understand the fundamental properties of radiation sensing materials, to include the mechanisms of light production in scintillator materials and charge mobility and lifetimes in

semiconductor materials. Research also includes efforts to conduct predictive modeling of materials properties, novel synthesis and growth techniques for materials, and advanced material analysis and characterization techniques. The goals of this research include discovery and development of scintillator materials that have faster response, higher light output, better linearity, and improved yields during growth; semiconductor materials that have optimized charge transport and collection properties, room-temperature operation, and excellent sensitivity and energy resolution. It also seeks to greatly improve neutron detection capabilities in general with performance that would provide substantial improvements over existing ^3He technologies. This includes development and improvement of neutron sensitive semiconductor materials with the goals of excellent efficiency and excellent ability to discriminate neutrons from gamma rays.

The table below lists the ongoing activities in FY 2017 as recorded at the end of FY 2015. Additional activities may added in FY 2016 based on the “Solicitation for New ARI Activities” described below.

ARI: Materials Research and Support to Technology	Sector	State	Initiation Year	Completion Year
Physics Driven Scintillator Design (collaborative)	Academia	NC TN AR	2013	2018
Scintillating Conjugated Polymers	Academia	CA	2013	2017
Organic Field Effect Transistor Solid-State Photomultiplier	Academia	NE	2013	2018
Developing Low Cost Scintillators with Excellent Energy Resolution	Academia	TN	2014	2019
Chalcogenide Semiconductors for Gamma-ray Detection from Earth Abundant Elements	Academia	IL	2014	2019
Low Cost Glass Ceramic Scintillator Materials for Neutron and Gamma Ray Detection	Academia	GA	2014	2019
Fabrication of Solid-State Large Area Thermal Neutron Detectors at a Low Cost	Academia	NY	2013	2017
High Sensitivity Low Cost Solid State Neutron Detectors	Academia	NC	2014	2017

Radiation Detection Project

The Radiation Detection Project explores radically new approaches to threat detection, eventually leading to sensor or detection system concepts that are highly sensitive to rad/nuc signatures and selective in their ability to distinguish and locate these materials from naturally occurring background radiation. This includes fundamental research into new detection system concepts that provide new insights in how threat materials can be detected even in challenging pathways.

The table below lists the ongoing activities in FY 2017 as recorded at the end of FY 2015. Additional activities may added in FY 2016 based on the “Solicitation for New ARI Activities” described below.

ARI: Radiation Detection	Sector	State	Initiation Year	Completion Year
Radiological Source Detection and Tracking Based on Multi-Sensor Data Fusion	Academia	FL	2014	2017
Wearable High Resolution Radiation Detection via Flexible, Nano Semiconductor Composites	Academia	MI	2015	2020
Detectors, Algorithms, and Systems for Wearable Intelligent Nuclear Detection	Academia	TN	2015	2020

Shielded SNM Project

This research area includes investigations to overcome the challenge of detecting shielded SNM, principally through advanced or enhanced nonintrusive inspection or active interrogation approaches for cargo scanning, vehicle scanning, and human-portable scanning applications. Fundamental research in this area addresses a range of studies to augment conventional nonintrusive inspection approaches including: 1) transformational low-power, low-weight, high-yield neutron and gamma-ray producing sources; 2) high-efficiency, fast-recovery, low-cost detectors for active detection; 3) novel active interrogation inspection concepts; and 4) investigations into unique signatures and fundamental data associated with active detection methods such as nuclear resonance fluorescence.

The table below lists the ongoing activities in FY 2017 as recorded at the end of FY 2015. Additional activities may be added in FY 2016 based on the “Solicitation for New ARI Activities” described below.

ARI: Shielded SNM	Sector	State	Initiation Year	Completion Year
Low-Dose Inspection for Nuclear Threats Using Monochromatic Gamma-Rays (collaborative)	Academia	MA PA GA	2014	2018
ATensioned Metastable Fluid Detectors for Shielded SNM Detection	Academia	IN	2014	2019
All Optical Generation of MeV Photons for Nuclear Materials Detection	Academia	CA	2014	2019
Multimodal Imaging in Active Interrogation	Academia	GA	2015	2020
Multi-Dimensional Neutron Source Geometries for SNM Detection	Academia	WI	2015	2020
Laser-Electron-Interaction Region for Monoenergetic Sources	Academia	IL	2015	2020

Advanced Analytics Project (*This project was formerly known as the Modeling and Algorithms Project.*)

This project investigates innovative data processing and analysis techniques that will lead to major performance improvements through state-of-the-art computational methodologies. Current and prior research in this area has included algorithm development for simultaneous real-time gamma-ray imaging and radionuclide identification and application of machine learning (supervised detection, supervised classification, and anomaly detection) to facilitate mobile search/detection performance. The research also includes advances in simulation and modeling techniques to provide early understanding of the operational benefits of new threat detection approaches or background suppression.

The table below lists the ongoing activities in FY 2017 as recorded at the end of FY 2015. Additional activities may be added in FY 2016 based on the “Solicitation for New ARI Activities” described below.

ARI: Modeling and Algorithms	Sector	State	Initiation Year	Completion Year
GND A Deterrence Theory (collaborative)	Academia	MD WI	2013	2018
Multimodal Data Fusion Using Low Count Spectrometry	Academia	PA	2014	2019
Improving Source Detection in Changing Area Background	Academia	CO	2014	2018

Nuclear Forensics Project

This project investigates advanced analytical techniques used to determine the processing history and transit route of pre-detonation nuclear materials. Research emphasis includes identifying ways to improve analytical techniques and methodologies (e.g., speed, accuracy, and precision) for determining the physical, chemical, radiological, or morphological properties of nuclear or other radioactive materials. Objectives include determining the specific processing the material underwent, geographic origins, transport pathways, and intended use. It also includes improving the separation or analysis of nuclear and nonnuclear material constituents of forensics materials. Finally, it includes both discovery and characterization of new signatures associated with the processing history of materials as they progress through the nuclear fuel cycle.

The table below lists the ongoing activities in FY 2017 as recorded at the end of FY 2015. Additional activities may be added in FY 2016 based on the “Solicitation for New ARI Activities” described below.

ARI: Nuclear Forensics	Sector	State	Initiation Year	Completion Year
Structure Property Relationships of Metal Actinide Alloys	Academia	GA	2013	2018
Advancing Special Nuclear Materials Detection Through Novel Temporal Gamma-Ray Spectroscopy	Academia	OR	2014	2019

Advancement of Nuclear Forensics	Academia	IN	2014	2019
Investigation of Morphological Characteristics of Uranium Materials	Academia	UT	2015	2020
Conductivity, Radiolytic Effects, and Diffusion Measurements of Metallic Signatures	Academia	TN	2015	2020
Experimental and Computational Assessment of Fission Product Residue Plutonium from Low Burn Up Fuel	Academia	TX	2015	2020

Solicitation for New ARI Activities

The ARI program refreshes its research portfolio every year through an annual solicitation. Topic areas for this research solicitation must address gaps in the GNDA or nuclear forensics while developing students and academic programs. The FY 2015 solicitation resulted in 44 proposals across four topic areas:

- GNDA Modeling and Studies
- Advanced Analytics and Radiation Detection System Concepts and Approaches
- Science and Engineering of Nuclear Forensics
- Approaches to Detect SNM

Eight new research grants were awarded based on these topics at the end of FY 2015. A solicitation with revised topic areas is expected to be released in FY 2016 and FY 2018. A solicitation will not be released in FY 2017 because the program will have reached its full capacity.

Prior Year Key Events

- Issued Notices of Funding Opportunities for ARI Activities, resulting in eight new activities that address gaps in the GNDA and Technical Nuclear Forensics (TNF).
 - Three grants were awarded for research in TNF;
 - Two grants were awarded for research in algorithms and radiation detection; and
 - Three grants were awarded for research in the detection of shielded SNM.
- Completed first year evaluation of the 11 new activities awarded the previous year.
- Currently funding 46 research efforts at 34 universities in the following areas of emphasis:
 - Radiation detector materials development and supporting technology;
 - Radiation detection concepts, approaches, and architectures;
 - Shielded SNM detection, sources, and signature technology;
 - Advanced analytics and data processing; and
 - Nuclear forensics.

Current Year Key Events

- Issue Notice of Funding Opportunity for New ARI Activities: Complete second year evaluation of the 11 new activities awarded two years prior and complete first year evaluation of the approximately eight new activities awarded the previous year. Initiate approximately 10 new activities that address gaps in the GNDA and TNF.

Budget Year Key Events

- Complete second year evaluation of the eight new activities awarded in FY 2015, and complete first year evaluation of the approximately 10 new activities awarded in FY 2016.

SMALL BUSINESS INNOVATION RESEARCH (SBIR)

The statutory purpose of the SBIR Program is to stimulate technological innovation by strengthening the role of innovative small business concerns (SBCs) in federally funded R&D. This program is administered by the Small Business Administration (SBA). Currently, 11 Federal agencies participate in the SBIR program. The goals of the program include:

- Stimulate technological innovation
- Meet Federal research and development needs
- Foster and encourage participation in innovation and entrepreneurship by socially and economically disadvantaged persons
- Increase private-sector commercialization of innovations derived from Federal research and development funding

The CBRNE Office SBIR Program includes funding across all PPAs that perform R&D per guidance of the SBA. Because the majority of the SBIR funding comes from the Transformational R&D mission sub-program, it is included in this section.

The CBRNE Office SBIR program transitions near-term solutions, supporting the technical gaps in the GNDA, into a commercial product or service. The gaps are addressed through technical topics in a joint annual solicitation for the DHS SBIR program, typically 2-4 topics. These topics are developed by program managers across the CBRNE Office Divisions identifying technical needs. Successful SBIR technologies ultimately transition their technologies into the market covering a broad range of applications. At the beginning of FY 2017, the SBIR program will support 13 projects. The current ongoing activities under the CBRNE Office SBIR program follow a rigid phase and funding structure is broken down as follows:

Phase I: Feasibility Demonstration

The proposed effort will demonstrate a proof-of-feasibility towards objectives listed in the solicitation topic. The following projects are currently in a SBIR Phase I addressing the need for a novel passive detector for mass shielding approaches without the use of irradiation technologies and advanced core modules for the next generation radiation pager detectors.

SBIR Phase I	State	Initiation Year	Completion Year
Shielded SNM Detection with Gravity Gradiometry	CA	2015	2018
Personal Neutron Detector Based on Cadmium Telluride	OH	2015	2018
Next Generation Scalable Solid State Thermal Neutron Detector	NY	2015	2018
Compact Boron-Filled 3D Semiconductor Neutron Detector Module	MA	2015	2018
Personal Semiconductor Neutron Detector Based on Lithium Indium Diselenide	MA	2015	2018
Stable Tl-Based Semiconductor Modules for Radiation Detection	MA	2015	2018
Thallium Bromide Detectors for Radiation Pagers	MA	2015	2018

Phase II: Research and Development

The effort will perform the full R&D scope of activities to develop and demonstrate a prototype. The following projects are currently in Phase II developing a gamma/neutron detector leveraging smart-device technology for reach back applications and compact, high-energy source replacement technologies for shielded SNM approaches. The current projects were initiated in FY 2014 are expected be completed in FY 2017, and potentially transition to product development or follow-on R&D.

SBIR Phase II	State	Initiation Year	Completion Year
Smartphone Enabled Spectroscopic Gamma-Neutron Radiation Sensor	MA	2014	2017
Portable High-Intensity X-Ray Source Based on a 10 MeV Superconducting Electron Linac	MI	2014	2017
Miniaturized High Energy X-ray Source for Mobile Non-Intrusive Inspection Systems	CA	2014	2017

Phase III: Commercialization

The effort will be conducting the final R&D to transition the prototype into a commercial product or service. The following transition activities shall lead towards a license or service of a novel purification process for large, crack-free crystal growth of SrI₂ and CLYC scintillators, the development of an advanced semiconductor material for gamma spectroscopy, and radiation localizing and tracking algorithms for personal radiation detectors.

SBIR Phase III	State	Initiation Year	Completion Year
High Purity Precursor Materials for Growth of Large Single Crystals	MA	2015	2017
Thallium Bromide (TlBr) Crystal Modules for Room and Near Room-Temperature Gamma Radiation Detection	MA	2015	2017
Embedded Algorithms for Localization and Tracking	MA	2016	2018

New SBIR Activities

The CBRNE Office SBIR Program issues an annual solicitation. Each solicitation generally receives approximately 25 proposals and results in 4-6 new SBIR projects in Phase I. The program further conducts outreach through annual national SBIR conferences for all SBIR-participating Federal agencies.

**Summary Tables of Sub-PPA
Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Detection Capability Development**

FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)

Detection Capability Development		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	15
	Annualization of 2016 Pay Raise	-	-	4
	DHS Balanced Workforce Strategy	1	1	105
	Detection Capability Development	-	-	(174)
	From CBRNE R&D R/NDFPC Detection Capability Development to Working Capital Fund	-	-	(214)
	From DNDO M&A to CBRNE Research & Development - R/NDFPC	7	7	1,226
	From DNDO RD&O - Systems Development to CBRNE Research & Development - R/NDFPC	-	-	21,598
	Working Capital Fund	-	-	(24)
Program Changes	Detection Capability Development: Long Range Radiation Detection	-	-	(1,000)
Budget Year	FY 2017 Request	8	8	21,536
	Total Change from FY 2016 to FY 2017	1	1	(1,288)

**Department of Homeland Security
 Chemical, Biological, Radiological, Nuclear and Explosives Office
 R/N Detection, Forensics, and Prevention Capability
 Detection Capability Development**

Cost Drivers (Pay & Benefits) – Sub-PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	6	6	\$1,043	\$174	7	7	\$1,267	\$181	8	8	\$1,378	\$172	1	1	\$111	(\$9)
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS Pay Cost Drivers Exhibit may reflect a higher average FTE Cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Detection Capability Development
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - Detection Capability Development	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
On Dock Rail	-	\$5,414	\$4,539	(\$875)
International Rail	-	\$1,646	\$3,140	\$1,494
Aerial Detection	-	\$1,793	\$3,101	\$1,308
Long Range Radiation Detection (LRRD)	-	\$2,758	\$2,617	(\$141)
RPM Replacement	-	\$4,105	\$2,355	(\$1,750)
Total	-	\$15,716	\$15,752	\$36

* FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

CURRENT SERVICES PROGRAM DESCRIPTIONS: DETECTION CAPABILITY DEVELOPMENT

The Detection Capability Development Program incorporates the user requirements of DHS’s operational components into rad/nuc detection systems. It achieves this by coordinating its systems engineering lifecycle activities with the end-user community and managing the task execution of the CBRNE Office’s Solution Development Process (SDP).

Recognizing that innovation can originate in a variety of sectors, the CBRNE Office has adopted a “Commercial First” approach that gives preference for solutions available in the private sector marketplace. Using this approach, the CBRNE Office can leverage industry-led innovations and developments, resorting to a federally-sponsored and managed development and acquisition process when no commercial solution is feasible or private industry chooses not to commercialize a product.

Detection Capability Development - Mission Sub-Program Overview

Program	Level of Effort	General Description
Human Portable Radiation Detection Systems (HPRDS) Helium-3 (³He) Alternative Implementation Program	Ongoing	The HPRDS ³ He Alternative Implementation Program is a pre-Acquisition Decision Event (ADE) 2a program which utilizes the results of test and evaluation performed under the ³ He Shortage Mitigation Program to work with industry to integrate alternative technologies for neutron detection into detection systems and to evaluate these systems for future deployment. The program will address form, fit, and function of alternative technologies into backpack detectors.
Radiation Portal Monitor (RPM) Replacement	Ongoing	The RPM Replacement Program is a pre-ADE 2a program. ² The objectives are: 1) to identify solutions that positively impact GNDA risks which will result in a full or partial replacement of fixed RPM capabilities; and 2) to identify improved technology solutions as replacements for the currently deployed fixed RPMs.
On Dock Rail (ODR)	Ongoing	The ODR Program is a pre-ADE 2a program. The objective is to provide more efficient scanning to detect and classify rad/nuc threat sources and weapon components that may be smuggled in Intermodal Cargo Containers (IMCC) that are transferred directly from ship to rail car at container seaports.
International Rail (IRAIL)	Ongoing	The International Rail program is a pre-ADE 2a program. The objective is to detect and identify nuclear or other radioactive materials out of regulatory control entering the United States via freight rail cargo through the 27 currently active POEs out of the 31 identified in the <i>Trade Act of 2002</i> (P.L. 107-210).
Long-Range Radiation Detection (LRRD)	Ongoing	The LRRD Program is a pre-ADE 2a program. The objective is to provide enhanced standoff rad/nuc detection capability as a potential solution to address several focus areas of the GNDA.
U.S. Border Patrol (USBP) Checkpoint	Ongoing	The USBP Checkpoint Program is a pre-ADE 2a program. The objective is to address rad/nuc scanning in the vicinity of the border between land border POEs for large-scale conveyance, including a move away from exclusive use of equipment and technology worn by agents.

² Pre ADE-2a: the Analyze/Select Phase which includes, "Identify the Alternatives, Operational Requirements, and Resource Requirements." DHS Directives System Directive Number: 1 02~1 Revision Number: 01, Acquisition Management Directive, Instruction Guidebook.

Program	Level of Effort	General Description
Maritime Non-Containerized Cargo (MNCC)	Starts in FY17	The MNCC Program is a pre-ADE 2a program. The objective is to provide a solution that will allow the efficient and effective scanning of cargo entering the United States as MNCC for rad/nuc material. Currently, MNCC is scanned with hand held RIIDs when it is identified as high risk through the cargo screening process.
Aerial Detection Program	Ongoing	The Aerial Program is a pre-ADE 2a program. The objective is to provide capability via an aircraft-borne detection system to detect and intercept at much greater distances from major population centers and critical infrastructure, and with faster response times than interdictions made via boats and cutters during intelligence-driven operations.
Small Vessel Standoff Detection (SVSD) Program	Ongoing	The SVSD Program is a pre-ADE 2a program. The objective is to develop and field a more capable solution than the currently fielded solution to provide rad/nuc detection systems in U.S. port areas and maritime regions, and to address the need of Federal, state, and local maritime officers to conduct rad/nuc screening missions against the small vessel threat without the need to board each encountered vessel.

HPRDS HELIUM-3 ALTERNATIVE IMPLEMENTATION PROGRAM

The Human Portable Radiation Detection Systems (HPRDS) ³He Alternative Implementation Program utilizes the results of test and evaluation performed under the ³He Shortage Mitigation Program to work with industry to integrate alternative technologies for neutron detection into detection systems and to evaluate these systems for future deployment. The program will address form, fit, and function of alternative technologies into backpack detectors.

The program will identify and facilitate the deployment of radiation detection backpacks with ³He alternative technology under the HPRDS Program, transitioning DHS Components away from ³He-dependent systems.

Prior Year Key Events

- Completed System Threat Review (STR) scenario planning.
- Completed and validated STR models.
- Completed Environmental Testing Survey.

Current Year Key Events

- Utilized test results from ^3He Shortage Mitigation Program to develop Stage 2a baseline program documentation including the STR, Operational Requirements Document, Functional Requirements Document, and Test Evaluation Master Plan.
- Complete STR and Qualitative Risk Analysis.
- Release RFI for ^3He Alternative Backpacks.

Budget Year Key Events

- Release Request for Proposal (RFP) for ^3He Alternative Backpacks.
- Initiate Performance and Operational Test Planning.

RADIATION PORTAL MONITOR (RPM) REPLACEMENT PROGRAM

RPM systems have been successfully deployed in the field over the last decade. Using market research and analytical studies, this program is developing a strategy for system replacement that is consistent with objectives of the GNDA and *SAFE Port Act of 2006* (P.L. 109-347). The program's objectives are to: 1) identify solutions that positively impact GNDA risks which will result in a full or partial replacement of fixed RPM capabilities; and 2) identify improved technology solutions as replacements for the currently deployed fixed RPMs. An RPM Analysis of Alternatives (AoA) was completed in FY 2015. The AoA results will be reviewed and assessed to help provide a path forward for RPM replacement options in FY 2016. Analysis and program planning associated with Systems Development will complete in FY 2017, at which point RPM replacement systems will be procured (procurement to begin in FY 2018) as an activity within the RPM program.

Prior Year Key Events

- Completed initial acquisition program documentation.
- Completed AoA.
- Conducted Commercial-off-the-Shelf (COTS) systems performance evaluation.
- Conducted COTS systems operational analysis.

Current Year Key Events

- Conduct RPM Replacement Industry Engagement Event with RPM vendors.
- Conduct COTS systems performance evaluation.
- Conduct COTS systems operational analysis.

- Complete acquisition and program documentation for the RPM Replacement Program (targeted replacement of a fraction of the RPM fleet servicing high volume POEs).
- Publish RFP for the RPM Replacement Program.

Budget Year Key Events

- Review RFP responses for replacement RPMs.
- Conduct assessment against requirements for replacement RPM candidate systems.

ON DOCK RAIL (ODR) PROGRAM

The ODR program was launched in FY 2009 to deploy solutions for ship-to-rail scanning to address efficiency concerns with the current mobile RPM-based solution. Work continued through FY 2012 when an Alternatives Analysis (AA) was completed that examined potential solutions for ship-to-rail scanning leveraging modeling, testing, and user surveys. The AA provided results and recommendations customized for each of the ODR POEs considered in the study.

In FY 2015, the program reviewed the AA results and considered COTS options available for alternative solutions, to include the fixed RPM and conveyor solution. In FY 2016, the program will begin the piloting of the Straddle Portal Prototype (SPP) at the Port of Tacoma (PoT) Pierce County Terminal (PCT). In addition, the program will assess the need for solutions for additional ODR POEs in cooperation with CBP and the ports. In FY 2017, the program will conduct performance testing and operational assessment on piloted SPP system at PoT PCT, and gather requirements and develop program documentation for additional ODR POEs, as required.

Prior Year Key Events

- Conducted a market survey to identify alternate solutions not addressed in the FY 2012 AA.
- Initiated a delta AA based on market research results.
- Completed delta AA activities for PoT PCT and selected the SPP as ODR solution.

Current Year Key Events

- Update requirements documentation.
- Complete SPP upgrades and modifications for piloting at PoT PCT.
- Complete SPP modeling and analysis activities to determine final detector configuration for piloting at PoT PCT.

- Assess the need for solutions for additional ODR POEs in cooperation with CBP and the ports.

Budget Year Key Events

- Conduct performance testing and operational assessment on piloted SPP system at PoT PCT.
- Develop requirements-related and program documentation for additional ODR POEs, as required.

INTERNATIONAL RAIL (IRAIL) PROGRAM

The International Rail program objective is to detect and identify nuclear or other radioactive materials out of regulatory control entering the United States via freight rail cargo through the currently active 27 out of the 31 POEs identified in the *Trade Act of 2002* (P.L. 107-210).

The IRAIL program was put on hold in 2012 to fund programs that provide greater risk buy down within the GNDA. Scheduled to be reinitiated in FY 2016, the program will review the results of the AoA completed October 2012 and consider COTS options available for alternative solutions that may not have been available or fully developed during the AoA. Based on the results from these reviews, the AoA will be refined appropriately. An IRAIL pathway decomposition study will also be conducted to assess the GNDA risks associated with freight rail cargo from origination to entrance into the United States. In FY 2017, the program will conduct a System Threat Review. These combined assessment efforts will inform the investment strategy with regard to an integrated solution with CBP's future NII equipment.

Prior Year Key Events

- No funding in FY 2015.

Current Year Key Events

- Review the results of the AoA completed October 2012, and consider COTS options available for alternative solutions that may not have been available or fully developed during the AoA. Conduct IRAIL Pathway Decomposition Study.
- Begin planning for System Threat Review.

Budget Year Key Events

- Conduct System Threat Review.

LONG RANGE RADIATION DETECTION (LRRD) PROGRAM

The Long-Range Radiation Detection (LRRD) program addresses existing gaps in the GNDA and an operational need for enhanced standoff radiological/nuclear detection capability. The goal is to detect, identify, locate, and track radiological/nuclear threats at standoff distances greater than is currently commercially available, enabling more efficient interdiction. LRRD technology has demonstrated enhanced capabilities compared to current assets. LRRD is a continuation of CBRNE Office efforts to assess and enhance the performance of long-range radiation detection technologies developed under multiple transformational research and development projects. The technology base was recently characterized as part of a CBRNE Office ATD.

The LRRD capability would support search, survey/sweep, and monitor missions as part of rad/nuc detection efforts. In FY 2016, DNDO will document a set of common requirements from across the possible user communities and based on recommendations from the ATD, and conduct market research to identify commercial products that meet these requirements. In FY 2017, upon validation of the requirements, should sufficient, suitable commercial off the shelf (COTS) or COTS-based solutions not be available, the CBRNE Office intends to pursue system development activities to produce a solution based on the technologies developed in the ATD with form, fit and function that meets the common set of requirements with the intention to pilot it with the various potential user groups.

Prior Year Key Events

Prepared technology transition strategy.

Current Year Key Events

- Support development of operational requirements.
- Conduct market research on commercial products.
- Conduct planning activities for solution design, development, and piloting.

Budget Year Key Events

- Validate operational requirements.
- Conduct activities for solution design, development, and piloting.

U.S. BORDER PATROL (USBP) CHECKPOINT PROGRAM

The USBP Checkpoint Program's objective is to address rad/nuc scanning in the vicinity of the border between land border POEs for large-scale conveyances. Unlike ports of entry, examinations conducted in the interior of the country are subject to Fourth Amendment restrictions. Currently

fielded technology places undue burden upon the agency due to the need to send every alarm to secondary screening. Large scale, movable rad/nuc scanning technology (e.g., transportable RPMs) would enable adjudication without requiring a vehicle and/or passenger to be examined in a secondary screening. Transportable RPMs were piloted recently by DNDO and rendered a successful proof of concept. The USBP would seek to install such technology at most of its permanent checkpoints along the Southwest Border. In FY 2016, DNDO will perform a System Threat Review, alternatives analysis, and request for information to industry to determine if viable COTS products are available to meet Border Patrol Checkpoint requirements. In FY 2017, the CBRNE Office will publish an RFP and evaluate COTS candidates by conducting performance and operational testing.

Prior Year Key Events

- DHS legal counsel conducted a legal review of CONOPS policy.

Current Year Key Events

- Complete initial acquisition program documentation.
- Perform a System Threat Review if analysis indicates it is needed.
- Conduct AA.
- Publish RFI for evaluating COTS candidates.

Budget Year Key Events

- Publish RFP for COTS candidates.
- Evaluate COTS candidates by conducting Performance and Operational Testing.
- Down-select COTS candidates, anticipating Initial Operational Capability (IOC) by end of fiscal year.

MARITIME NON-CONTAINERIZED CARGO (MNCC)

The MNCC program's objective is to provide a solution that will allow the efficient scanning of cargo entering the United States as MNCC for rad/nuc material beyond the current practice of scanning MNCC identified as high risk through the cargo screening process. MNCC is composed of break bulk and roll-on/roll-off cargo. Break bulk cargo is packaged products that can be consolidated into larger parcels and assembled together, for example, on pallet boards bound by wire, or gathered up in rope cargo slings as a means of lifting on and off a vessel. Roll-on/Roll-off is a method of ocean cargo service using a vessel with ramps which allows wheeled vehicles to be loaded and discharged without cranes. The program will begin in FY 2017 when an analysis will be initiated and requirements developed for the solution in coordination with CBP.

Prior Year Key Events

- No funding in FY 2015.

Current Year Key Events

- No funding in FY 2016.

Budget Year Key Events

- Validate mission needs and capability gaps.
- Initiate analysis and support development of requirements for a solution in coordination with CBP.

AERIAL DETECTION PROGRAM

The ability to detect rad/nuc threats from the air is a critical element for a robust layered defense. The feasibility and effectiveness of aerial detection has been proven technologically by a previous DNDO test. In FY 2017, the CBRNE Office will perform system development activities for aerial detection to determine its operational effectiveness and suitability based on currently available commercial products.

In addition, the ARES ATD is developing and characterizing standoff radiation measurement technology for the detection of radiological and nuclear material from an airborne platform. A technology demonstration and characterization will be completed in FY 2016 to assess technology transition potential. These results will help determine whether aerial detection capability can be applied to other mission needs.

Prior Year Key Events

- No funding in FY 2015.

Current Year Key Events

- Funding reallocated to other high-priority programs pending results of a related Advanced Technology Demonstration at the end of FY 2016.

Budget Year Key Events

- Perform system development activities to determine operational effectiveness and suitability of aerial detection based on currently available commercial products.

SMALL VESSEL STANDOFF DETECTION (SVSD) PROGRAM

The SVSD Program focuses on developing technology to provide capability to DHS operational components to protect major population centers and critical infrastructure from the direct-to-target threat, defined as rad/nuc weapons transported by way of small vessels directly to a target. The program will initially develop a capability for scanning small vessels at a distance from U.S. Coast Guard (USCG) and CBP maritime law enforcement vessels.

Through SVSD Increment 1, the SVSD Program conducted test and evaluation of the USCG's currently deployed backpack detector and determined it was effective and suitable for detection only and was deployed to USCG and CBP Air and Marine Operations (AMO).

In FY 2015-2016, the program is conducting a system threat review to determine more precisely what threats are relevant to the SVSD Boat-to-Boat (B2B) mission. This analysis will guide the evaluation of larger COTS systems to determine if they are more capable of detecting these relevant rad/nuc materials than the USCG's backpack and also will provide identification capability, which would facilitate the users' execution of the mission. .

In FY 2017, if the evaluation of the larger COTS system indicates it is more capable of detecting the relevant rad/nuc materials than the USCG's backpack and can also provide identification capability, then the program will pursue an Increment 2 solution. Activities in FY 2017 in support of Increment 2 will include release of a request for proposal, and conducting test and evaluation.

Prior Year Key Events

- Completed USCG and CBP AMO initial training and achieved IOC.
- Completed system delivery and achieved Full Operational Capability (FOC).
- Completed quarterly data collection and analysis, operational surveys, and updates to appropriate program documentation to support Operational Analysis and Post Implementation Review.

Current Year Key Events

- Complete System Threat Review to help inform project initiation decision.

Budget Year Key Events

- If project initiated, complete RFP, and conduct test and evaluation. If the project is not initiated, explore alternative solutions to provide operators with procedures or equipment to meet the mission.

**Summary Tables of Sub-PPA
Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Detection Capability Assessments**

FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)

Detection Capability Assessments		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	52
	Annualization of 2016 Pay Raise	-	-	13
	DHS Balanced Workforce Strategy	1	1	105
	Detection Capability Assessments	-	-	(150)
	From CBRNE R&D R/NDFPC Detection Capability Assessments to Working Capital Fund	-	-	(423)
	From DNDO M&A to CBRNE Research & Development - R/NDFPC	24	24	4,669
	From DNDO RD&O - Assessments to CBRNE Research & Development -R/NDFPC	-	-	37,130
	From DNDO RD&O - Operations Support to CBRNE Research & Development -R/NDFPC	-	-	3,403
	Working Capital Fund	-	-	(77)
Budget Year	FY 2017 Request	25	25	44,722
	Total Change from FY 2016 to FY 2017	1	1	(480)

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Detection Capability Assessments

Cost Drivers (Pay & Benefits) – Sub-PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	23	23	\$3,960	\$171	24	24	\$4,289	\$178	25	25	\$4,649	\$185	1	1	\$360	\$7
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS Pay Cost Drivers Exhibit may reflect a higher average FTE Cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Detection Capability Assessments
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - Detection Capability Assessments	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Test & Evaluation Program	\$19,709	\$17,749	\$17,765	\$16
Studies & Infrastructure	-	\$10,009	\$9,441	(\$568)
Operational Readiness Assessment	-	\$8,386	\$8,572	\$186
Information Sharing	\$3,384	\$3,359	\$3,494	\$135
Total	\$23,093	\$39,503	\$39,272	(\$231)

* FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

CURRENT SERVICES PROGRAM DESCRIPTIONS: DETECTION CAPABILITY ASSESSMENTS

The Detection Capability Development and Assessment mission sub-program - Assessments (under the Rad/Nuc Detection, Forensics, and Prevention Capability PPA) supports the development and acquisition process for mission-related technologies.. The CBRNE Office continually assesses the GNDA and implemented capabilities through a variety of means, including:

- Test and evaluation campaigns to characterize and collect performance data on commercially available and emerging technologies and systems.
- Execution of pilots with operational agencies to evaluate CONOPS.
- Red team assessments to deepen the understanding of deployed capabilities by presenting overt and covert adversarial-based scenarios to FSLTT stakeholders.
- Program assessments to identify the effectiveness of planned and deployed programs and operations.
- Development of national consensus standards and interagency technical capability standards (TCS) for rad/nuc detection systems.

TEST AND EVALUATION PROGRAM

The CBRNE Office research, development, and acquisition process is anchored by rigorous assessments of mission-related technologies as they are developed, deployed, and implemented. These programs are supported by T&E campaigns to characterize, verify, and validate technical performance and assess the operational effectiveness and suitability of technologies under development, as well as that of commercially available systems prior to deployment (Full Operational Capability). The CBRNE Office utilizes a suite of test instrumentation and automated data collection systems to enable testing teams to rapidly verify and validate data.

T&E Operations Project

R&D, developmental T&E, operational T&E, and directed testing are planned and executed to generate data that is analyzed and reported to support the design and development of rad/nuc detection systems. These activities support rad/nuc detection strategies and mitigate risk in R&D and acquisition programs. Decision-makers are provided with analytical results necessary to make informed judgments.

The T&E Operations project funds the staff resources necessary to independently plan test activities, ensure scientific defensibility and rigor, oversee test execution, and report results. This project also includes funding for the travel necessary to provide oversight and execution support of field activities. It should be noted that funding for actual execution of test activities at test facilities in the field is typically funded under the development programs for each project. Additionally, the project provides the facilities, test instrumentation, SNM and radiological sources, and data collection systems required to support the testing activities.

Operational Analysis and Technical Assessments (OATAs) Project

The OATAs project consolidates and integrates three previous projects within the Assessments program, specifically Test Data Management, Algorithm Testbed, and Test Modeling and Simulation, and provides the SME's that conduct technical assessments. The activities and products produced from this effort will transform data collected during into actionable knowledge of rad/nuc detectors under acquisition consideration or that are being considered for COTS procurement. The operations research activities will utilize existing data stored in archives such as the Archive and Retrieval Management System (ARMS) and Report Analysis Archive System (RAAS), along with newly collected test and/or modeling and simulation data to address operational questions. The OATA project has four main elements: Tools for Test Data Management; Spectral Data and Algorithm Analysis Tools; Test Modeling and Simulation; and Technical Assessment.

Directed Test Project

State and local law enforcement partners have repeatedly stated that in order to develop effective nuclear detection programs, they need reliable and objective information on the technical performance and operational effectiveness of currently available rad/nuc detection equipment. Through the Directed Test Project, the CBRNE Office conducts test campaigns using mature, commercially available rad/nuc detection systems in operational scenarios faced by FSLTT end-users. Such tests provide independent assessments of equipment to confirm vendor performance claims, and can help with development and/or refinement of concepts of CONOPS.

In FY 2015, DNDO identified and developed initial planning for three test events in response to requests for feedback and guidance on rad/nuc detection assets from Federal, State, and local operational partners. In FY 2016, DNDO will plan and execute the COTS Mobile Detection Systems test to assess the state of technology for mobile. DNDO will continue to select additional directed test events in response to requests for feedback and guidance on rad/nuc detection assets from Federal, State, and local operational partners. In FY 2017, the CBRNE Office will plan and execute the COTS Rad/Nuc Detection Command and Control (C2) Systems test. The CBRNE Office will also begin planning a test in FY 2018 to assess if explosives can be used as a signature for detecting smuggled improvised nuclear devices, and if CONOPS can be developed for fusing explosives detection with traditional rad/nuc detection techniques.

Prior Year Key Events

- Planned 14 tests: executed and/or reported on nine developmental or operational test campaigns.
- Initiated a complete upgrade of the RAAS system architecture was initiated in 2015. RAAS became the primary document repository for the Data Mining, Analysis and Modeling Cell (DMAMC) program.
- Continued development of the Central Data Repository (CDR).
- Completed ITRAP+10 joint report with the European Community's Joint Research Center which documents the performance of over 80 models of instrument against standards. The Report is a deliverable to the Nuclear Security Summit of 2016.
- Continued to mature the DMAMC. Responded to 34 major technical and scientific requests for information and analysis from January 2015 through the end of the FY 2015. Developed the compendium which comprises separate searchable catalogs of data, models, analysis tools and reports.
- Continued to develop test normalization procedures to tie separate data collection activities together to allow re-use and ultimately conserve resources.

Current Year Key Events

- Plan, execute, or report on at least 11 developmental or operational test campaigns.
- Complete the design, development, and deployment of an accessible and extensible central repository platform for housing test/evaluation data and related information for the Centralized Data Repository (CDR).
- Complete the upgrade of the RAAS system architecture.
- Complete development of DMAMC to full deployment and sustainment. Respond to 50 major technical and scientific requests for information and analysis. Develop and exercise a crisis response capability within the DMAMC to respond to emergency requests for information. Finalize and standardize normalization procedures to ensure re-usability of data. Deploy and dynamically populate the compendium of data.
- Create domestic and international partnerships to expand the Replicative Assessment of Spectrometric Equipment (RASE) data base and enhance the capability to dynamic systems such as portals.

Budget Year Key Events

- Plan, execute, or report on at least 11 developmental or operational test campaigns.
- CBRNE will plan and execute the COTS rad/nuc Detection Command and Control (C2) Systems test to assess their technical and operational performance.
- Conduct the COTS Vehicle-Mounted Mobile Systems "Honey Badger" Directed Test (Phase II-Operational Assessment) in support of our FSLTT partners.
- The continued development of the CDR in 2017 will illuminate areas that yield opportunities for test and evaluation process improvements and efficiencies.
- Continue RAAS integration with DMAMC data repositories and catalogs.
- Continue domestic and international partnership to further expand the RASE data base and enhance the capability to dynamic systems such as portals. Sustain the compendium of data
- Sustain DMAMC capability and deploy initial crisis response capability. Respond to 75 major technical and scientific requests for information and analysis.

STUDIES AND INFRASTRUCTURE PROGRAM

The Studies and Infrastructure develops and maintains unique technical capability standards for radiation detection and non-intrusive imaging systems, facilitates the development and maintenance of national and international voluntary consensus standards for rad/nuc detection equipment, and facilitates the testing of rad/nuc detection equipment against technical capability standards and voluntary consensus standards to ensure that detection equipment obtained by FSLTT end-users is effective, safe, reliable, and affordable. This work also influences the development of more capable technologies by deriving and validating threshold and objective performance requirements, associated test methods, and testing processes.

Work is also conducted to assess the effectiveness and integration of CBRNE Office methods and programs; and manage the CBRNE Office lessons learned process, including monitoring corrective actions and following up to ensure improvement.

Additionally, the program manages rad/nuc test and evaluation facilities and rad/nuc sources used for tests, and provides classification review services rad/nuc topics.

Standards and Conformity Testing Project

The Rad/Nuc Detection Standards Project includes work on national and international consensus standards, development of technical capability standards, and standards validation. Conformity assessments are a systematic examination of the extent to which a rad/nuc detection system conforms to specified standards. Such conformity assessments require testing facilities that can reliably test equipment against the standards.

In FY 2015, DNDO developed Advanced Radiography and Aerial Radiation Detection Technical Capability Standards for interagency coordination and supported publication of the revision to the voluntary consensus standard ANSI N42.38-2015: Performance Criteria for Spectroscopy Based Portal Monitors Used for Homeland Security. In FY 2016, DNDO plans to complete interagency coordination of Advanced Radiography and Aerial Radiation Detection Technical Capability Standards. The CBRNE Office will also prepare final draft of RPM Energy Windowing Technical Capability Standard for interagency coordination and publish a support a revision to the voluntary consensus standard ANSI N42.35: Evaluation and Performance of Radiation Detection Portal Monitors. In FY 2017, the CBRNE Office will publish Advanced Radiography and Aerial Radiation Detection Technical Capability Standards. The CBRNE Office will also complete interagency coordination of RPM Energy Windowing Technical Capability Standard and develop a draft of the Maritime Radiation Detection Technical Capability Standard for interagency coordination.

In FY 2015, DNDO completed conformity testing campaigns for backpack detectors and handheld radioisotope identifiers against respective Technical Capability Standards. In FY 2016, DNDO plans to conduct a conformity testing campaign for mobile radiation detectors against the Vehicle Mounted Mobile Systems Technical Capability Standard. In FY 2017, the CBRNE Office will conduct a conformity testing campaign against a class of rad/nuc detection equipment against the applicable Technical Capability Standard.

The CBRNE Office also builds models that integrate validated lessons learned from overt and covert operations and assessments, intelligence estimates, expert elicitation, and workshops into probabilistic measures of the effect that implemented capabilities have on adversary decision-making. This allows cost-effective computer modeling of how implementing different GNDA capabilities may change adversary behavior. The resultant analysis can help inform decision-makers on the relative benefit of allocating scarce resources across various development and architecture efforts.

Sources and Infrastructure Project

The Sources and Infrastructure project provides oversight for the Rad/Nuc Countermeasures Test and Evaluation Center (RNCTEC) test venue and special nuclear material (SNM) and radioactive sources to support the Test and Evaluation Program.

In FY 2015, DNDO continued with design and assembly of Weapons Grade Plutonium (WGPu) and Highly Enriched Uranium (HEU) sources, and established new source shipment capabilities at some of the National Labs. In FY 2016, DNDO will complete assembly and characterization of two WGPu sources and five HEU sources; and define requirements for Reactor Grade Plutonium (RGPu) sources. Beginning in FY 2017, the CBRNE Office will begin design and fabrication of RGPu sources, and define requirements for neptunium sources.

In FY 2015, DNDO excessed and consolidated property and equipment into one location, closed out a test track, and began to improve the IT infrastructure (wireless, cameras, etc.) at RNCTEC. In FY 2016 DNDO will complete the IT infrastructure improvement project to support directed test of COTS mobile systems, and dispose of legacy source materials. In FY 2017, the CBRNE Office will establish additional source shipment and handling capacity at RNCTEC, if needed, to support rad/nuc detection equipment testing.

Program Assessments (PA) Project

The PA Project performs objective reviews of the effectiveness of GNDA programs and their associated activities by examining GNDA programs, CONOPS, protocols, policies, procedures, and training. PA conducts assessments that provide insights on what is successfully being accomplished and identifies areas for improvement. These assessments are conducted to provide objective findings and recommendations and establish a documented baseline to provide a historic perspective for future endeavors. One of PA's primary goals is to continue assessing STC activities and providing recommendations for incorporation into future STC activities.

In FY 2015, DNDO completed five internal program assessments: the meta evaluation of internal assessment processes, the assessment of the Office of the Chief Information Officer Information Sharing Program, the Red Team Program assessment, the Operational Detector Metrics Program assessment, and the DNDO Solution Development Process assessment; and initiated the Rad/Nuc Situational Awareness assessment. In 2016, DNDO will complete two program assessments and initiate one. In 2017, the CBRNE Office will complete at least one program assessment and perform other assessments as required by the CBRNE Office Assistant Secretary.

Lessons Learned Project

Lessons learned have been collected across DNDO for the specific purpose of each associated program or project. The Studies and Infrastructure Program Lessons Learned Project will develop and build a lessons learned database for rad/nuc detection issues that will archive lessons learned from all programs and projects. The goal of this database will be to allow access across programs in the Rad/Nuc Detection, Forensics and Prevention Capability PPA and other CBRNE Office programs as desired to improve the effectiveness and integration of CBRNE Office methods and programs by managing the lessons learned process, including monitoring corrective actions and follow up efforts. Concept development and initial planning for this project was initiated in FY 2015. In FY 2016, database requirements will be gathered and design and implementation work will be initiated. In FY 2017, Rad/Nuc Detection, Forensics and Prevention Capability programs will execute full implementation of the database and associated processes and project work for lessons learned collection and management.

Prior Year Key Events

- Prepared final drafts of Advanced Radiography and Aerial Radiation Detection Technical Capability Standards (TCSs) for interagency coordination.
- Supported publication of a revision to the voluntary consensus standard ANSI N42.38-2015: Performance Criteria for Spectroscopy Based Portal Monitors Used for Homeland Security.
- Completed conformity test campaigns for backpack detectors and radionuclide identifiers against respective TCSs.
- Continued efforts to design and assemble WGPu and HEU sources for the DNDO Test and Evaluation Program.
- Established new radioactive source shipment capabilities at national laboratories.

- At the RNC TEC located on the NNSS, DNDO excessed and consolidated property and equipment into one storage location, closed out an excess test track, and began improvements on IT infrastructure for use by the DNDO Test and Evaluation Program.
- Completed five internal program assessments and initiated another.
- Initiated concept development and initial planning for a DNDO Lessons Learned Project.

Current Year Key Events

- Complete interagency coordination of Advanced Radiography and Aerial Radiation Detection TCSs.
- Prepare final draft of RPM Energy Windowing TCS for interagency coordination.
- Support publication of a revision to the voluntary consensus standard ANSI N42.35: Evaluation and Performance of Radiation Detection Portal Monitors Used for Homeland Security.
- Conduct a conformity test campaign for mobile radiation detection systems against the Vehicle Mounted Mobile Systems TCS.
- Conduct at least three objective assessments of DNDO programs and projects, including continued evaluations of existing and follow-on STC regions.
- Complete the assembly and characterization of two WGPu sources and five HEU sources.
- Define requirements for a Reactor Grade Plutonium (RGPu) source for the DNDO Test and Evaluation Program.
- At RNC TEC, complete the IT infrastructure improvement project to support directed test of Commercial-Off-the-Shelf mobile systems.
- Dispose of unneeded legacy radioactive source material at RNC TEC.
- Complete two program assessments and initiate one.
- Gather data base requirements and initiate design and implementation for a lessons learned database.

Budget Year Key Events

- Publish Advanced Radiography and Aerial Radiation Detection TCSs.
- Complete interagency coordination of the RPM Energy Windowing TCS.
- Prepare final draft of Maritime Radiation Detection TCS for interagency coordination.
- Support publication of a revision to the voluntary consensus standard ANSI N42.37: Training Requirements for Homeland Security Purposes Using Radiation Detection Instrumentation for Interdiction and Prevention.
- Conduct a conformity test campaign against a class of rad/nuc detection equipment against the applicable TCS.
- Commence the design and fabrication of RGPu sources.
- Define requirements for neptunium sources for the CBRNE Rad/Nuc Test and Evaluation Program.
- Establish additional radioactive source shipment and handling capability at RNC TEC to support rad/nuc detection equipment testing.
- Complete at least one program assessment and perform other assessments as required for the Rad/Nuc Detection, Forensics and Prevention Capability programs.

- Execute full implementation of a lessons learned data base for Rad/Nuc Detection, Forensics and Prevention Capability PPA programs and other CBRNE programs as desired.

OPERATIONAL READINESS ASSESSMENT PROGRAM

The Operational Readiness Assessment Program is the CBRNE Office's primary means to objectively assess the operational effectiveness and performance of CBRNE Office programs and deployed rad/nuc detection capabilities at the FSLTT levels in support of the GNDA.

Red Team (RT) Project

The RT Project fulfills a mission need to evaluate deployed systems and operations and their associated tactics, techniques and procedures, in as-close-to-realistic-environments as possible. The RT Project presents adversary tactics and radiological signature training devices to FSLTT rad/nuc detection and interdiction operations. These presentations can either be covert or overt in nature.

Covert assessments provide the radiation detection system operators experience with detecting adversary tactics in day-to-day operations without any forewarning. The operators believe they may be experiencing an actual threat situation. These operations provide valuable feedback to front-line operations on the performance of their tactics, techniques, and procedures from detection through reporting and adjudication to response. This feedback enables operators to modify their CONOPS and training requirements. Covert and overt assessments are generally the only opportunity for operators of radiation detection systems to have experience detecting uncommon radiation sources to include actual threat signatures. In addition, the RT conducts adversarial-based assessments without using any "inside" information of current or planned capabilities. These assessments give planners an understanding of what adversaries may know about current and planned capabilities. The RT identifies and shares best practices across the GNDA to help improve it over time. Depending on the complexity of the chosen venues, the RT plans to conduct more than 20 (covert and overt) operations in FY 2017, consistent with the number of operations planned for FY 2015 and FY 2016.

Pilots Project

Pilots are activities planned as operational tests or trials that serve as a tentative model for future development or deployment decisions. In conjunction with various applicable user groups (e.g., DOD, DOE, CBP, SLTT law enforcement, etc.) the pilot program conducts limited deployments of new operating concepts or emerging rad/nuc detection technologies in existing operational environments or, alternately, existing operating concepts or technologies in new operational environments. Each pilot provides an assessment of the processes, equipment, and/or systems to support the rad/nuc detection mission objectives and customer/stakeholder requirements. Pilots offer the opportunity for DHS to identify and leverage lessons learned that reduce the risk of full scale deployments, enhance the impact of limited and competing resources, and expedite deployment of effective systems, thereby increasing the Nation's ability to respond to the rad/nuc threat.

In FY 2015, DNDO planned, executed, and reported on the "Air-Ground" Pilot, finalized the "PVT Technology Refresh" Pilot report, planned the Passive and X-ray Imaging Scanning Systems (PAXIS) Pilot, and planned the Enhanced Radiological Nuclear Inspection and Evaluation (ERNIE)

Pilot. These pilots provided insight into the use of current and new equipment in various operating environments. In FY 2016, DNDO plans to execute the PAXIS Pilot and the ERNIE Pilot. Additionally, DNDO will plan for an “RPM Pilot” and participate with DARPA in planning the SIGMA pilot activities. In FY 2017, the CBRNE Office plans to execute the “RPM Pilot” and participate in DARPA’s SIGMA pilot activities.

Prior Year Key Events

- Conducted 32 overt and covert operations and adversarial-based assessments of the GNDA.
- Conducted the Air-Ground Pilot and completed the final report.

Current Year Key Events

- Conduct at least 20 overt and covert operations and adversarial-based assessments of the GNDA.
- Conduct at least one Pilot program in existing operational environments or new operational environments.

Budget Year Key Events

- Conduct at least 20 overt and covert operations and adversarial-based assessments of the GNDA.
- Conduct at least one Pilot program in existing operational environments or new operational environments.

CURRENT SERVICES PROGRAM DESCRIPTIONS: ENTERPRISE INFORMATION MANAGEMENT

The CBRNE Office Detection Capability Development and Assessment mission sub-program - Enterprise Information Management (under the Rad/Nuc Detection, Forensics, and Prevention Capability PPA) is a broadly-based set of ongoing programs and associated projects seeking to assure planning, preparation, and execution of information sharing support activities. Projects within the program ensure that information technology (IT) infrastructure along with CBRNE Office programs are in alignment and compliance with CBRNE Office and DHS architecture, financial, and information security policies, practices, strategies, and plans.

INFORMATION SHARING SUPPORT PROGRAM

The Information Sharing Support program is responsive to Federal and DHS architecture mandates. The program establishes and maintains the necessary enterprise and data architectures conformant with DHS guidance and direction. The program encourages and facilitates collaboration on the development and implementation of standards, conventions, and agreements to effectively share rad/nuc information to prevent terrorism and enhance national security among FSLTT and commercial partners. The program provides subject matter experts, tools, and technology support to meet increasing needs to aid the evolution of standardized systems for robust rad/nuc information exchange and supports other CBRNE Office programs and projects in collection, documentation, analysis and validation of GNDA-related IT initiatives.

Governance and Compliance Project

The Governance and Compliance project provides support to most aspects of integrated governance, investment management, and accessibility. The project includes *Clinger-Cohen Act* (P.L. 104-106) Capital Planning and Investment Control (CPIC) and IT acquisition reviews and reporting, as well as Section 508 independent reviews and testing. The project provides support for fulfillment of DHS-required enterprise architecture and data architecture governance and includes participation in the DHS Headquarters governance entity meetings. The project supports review and reporting of CBRNE Office program and project artifacts for compliance with DHS and GNDA architectures. The project also assists program and project managers in the review and tailoring of architecture, lifecycle, and investment management artifacts to meet systems engineering life cycle (SELCL) / solution development process (SDP) and other requirements.

Interoperability Support Project

The Interoperability Support project supports creation, evolution, and sustainment of policies, plans, models, standards, and conventions essential to interoperability. The CBRNE Office participates in creating and updating voluntary consensus standards promoting and supporting interoperability and compatibility of data and communications interfaces of radiation detectors for homeland security. Supported standards and conventions include the GNDA-relevant American National Standards Institute (ANSI) N.42 and International Electrotechnical Commission (IEC) standards, the National Information Exchange Model (NIEM) CBRN domain, and the NIEM N.25 messaging protocol. The project provides technical expertise for analysis of CBRNE Office standards and architecture and support of legacy interfaces and, in conjunction with exchanges among existing and emerging GNDA partners, provides support to verification of associated technical deployments and configurations.

Information Sharing Tools and Technology Project

The Information Sharing Tools and Technology project aids the CBRNE Office and GNDA program and project capability development through diverse technical methods and means to identify requirements for and to implement and assess interoperable capabilities. The project develops and maintains applications to improve business and solution development processes. Project support ranges from repository-based business intelligence tools for high-level portfolio and project decision making to low-level tools for design, construction, and verification of standards-based, interoperable information exchanges.

Information Security Support Project

The Information Security Support project supports the creation, update, and periodic review of information sharing and safeguarding agreements consistent with DHS guidance and direction. The project also supports preparation, coordination, deployment, configuration, and verification of systems implemented in support of information sharing. Periodic re-assessment of security controls is included to comport with Federal and DHS information security requirements.

Prior Year Key Events

- Completed functional validation of GNDA Repository.
- Completed governance and early lifecycle technical reviews of next generation mission-essential Joint Analysis Center Collaboration Information Sharing Center (JACCIS) 2.0.
- Established foundation for DNDO's emerging IT Infrastructure consisting of an internal GNDA Analytical Tools Environment (GATE) to include cloud-enabled features.
- Identified and compiled relevant interoperability standards for HPT.

Current Year Key Events

- Complete interoperability standards profiles for handheld and mobile radiation detection instruments.
- Update NIEM Chemical, Biological, Radiological, and Nuclear (CBRN) Domain and associated messaging protocols to comport with NIEM Program Management Office requirements.
- Complete integration and security authorization of key components of the DNDO information technology infrastructure for mission-support applications.
- Complete DNDO policies, plans, and procedures for safeguarding sensitive information in high-risk, non-DHS environments.
- Complete technical assessments and security authorization for JACCIS 2.0.

Budget Year Key Events

- Complete interoperability standards profiles for transportable and fixed radiation detection portal monitors.
- Establish NIEM CBRN Community of Interest to facilitate broader adoption of GNDA Interoperability Standards.
- Implement a comprehensive and secure production GATE that supports CBRNE emerging mission needs.

Schedule III – Other Exhibits

Exhibit E. Justification of Proposed Legislative Language

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development**

For necessary expenses of the Chemical, Biological, Radiological, Nuclear and Explosives Office, \$151,605,000, to remain available until September 30, 2019, for research programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats.

Language Provision	Explanation
<p>For necessary expenses of the Chemical, Biological, Radiological, Nuclear and Explosives Office, \$151,605,000, to remain available until September 30, 2019, for research programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats.</p>	<p>The Department of Homeland Security proposes to consolidate the functions, operations, and budget requirements of the Domestic Nuclear Detection Office, Office of Health Affairs, Office of Bombing Prevention, and elements of the Science and Technology Directorate, Office of Policy, and Office of Operations into a single entity named the Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Office. All activities, responsibilities, and authorities from these organizations are transferred to this new organization.</p>

Exhibit F. Summary of Fee Collections and Carryover

N/A

Exhibit G. Summary of Reimbursable Resources

**Department of Homeland Security
 Chemical, Biological, Radiological, Nuclear and Explosives Office
 Research and Development
 Summary of Reimbursable Resources
 (Dollars in Thousands)**

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Collections by Source:												
Science & Technology	-	-	\$1,457	-	-	-	-	-	-	-	-	-
11. Other Anticipated Reimbursables General	-	-	\$430	-	-	-	-	-	-	-	-	-
Total Budgetary Resources	-	-	\$1,887	-	-	-	-	-	-	-	-	-

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Obligations by Program/Project Activity:												
Domestic Nuclear Detection Office	-	-	\$1,887	-	-	-	-	-	-	-	-	-
Total Obligations	-	-	\$1,887	-	-	-	-	-	-	-	-	-

Exhibit H. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development**
(Dollars in Thousands)

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Nuclear Forensics	\$500	\$465	\$261	(\$204)
Transformational Research and Development	1,045	\$950	\$337	(\$613)
Detection Capability Assessments	1,135	\$1,099	\$671	(\$428)
Detection Capability Development	494	\$486	\$273	(\$213)
Total Working Capital Fund	\$3,174	\$3,000	\$1,542	(\$1,458)

* FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Exhibit I. Capital Investment and Construction Initiative Listing

N/A

Exhibit J. Object Class Breakout by Appropriation

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$6,305	\$6,602	\$7,598	\$996
11.3 Other than Full-Time Permanent	-	-	-	-
11.5 Other Personnel Compensation	-	-	-	-
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	-	-	-	-
12.1 Civilian Personnel Benefits	\$1,864	\$2,458	\$2,304	(\$154)
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	\$8,169	\$9,060	\$9,902	\$842
Other Object Classes				
21.0 Travel and Transportation of Persons	\$895	\$749	\$740	(\$9)
22.0 Transportation of Things	-	-	-	-
23.1 Rental Payments to GSA	-	-	-	-
23.2 Rental Payments to Others	-	-	-	-
23.3 Communications, Utilities, and Misc. Charges	-	-	-	-
24.0 Printing and Reproduction	-	-	-	-
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$27,299	\$29,736	\$33,829	\$4,093
25.2 Other Services from Non-Federal Sources	\$1,043	\$88	\$61	(\$27)
25.3 Other Goods and Services from Federal Sources	\$49,142	\$41,030	\$43,704	\$2,674
25.4 Operation and Maintenance of Facilities	-	-	-	-
25.5 Research and Development Contracts	\$69,998	\$71,313	\$56,095	(\$15,218)
25.6 Medical Care	-	-	-	-
25.7 Operation and Maintenance of Equipment	-	-	-	-
25.8 Subsistence & Support of Persons	-	-	-	-
26.0 Supplies and Materials	-	-	-	-
31.0 Equipment	-	-	-	-
32.0 Land and Structures	-	-	-	-
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	\$2,232	\$4,923	\$7,274	\$2,351
42.0 Insurance Claims and Indemnities	-	-	-	-
43.1 Interest and Dividends	-	-	-	-
43.2 Immigration Fees	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
44.0 Refunds	-	-	-	-
91.0 Unvouchered	-	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$150,609	\$147,839	\$141,703	(\$6,136)
Total, Direct Obligations	\$158,778	\$156,899	\$151,605	(\$5,294)
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$158,778	\$156,899	\$151,605	(\$5,294)

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

Exhibit K. Object Class Breakout by PPA

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
R/N Detection, Forensics, and Prevention Capability
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$6,305	\$6,602	\$7,598	\$996
12.1 Civilian Personnel Benefits	\$1,864	\$2,458	\$2,304	(\$154)
Total, Personnel and Compensation Benefits	\$8,169	\$9,060	\$9,902	\$842
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$895	\$749	\$740	(\$9)
25.1 Advisory and Assistance Services	\$27,299	\$29,736	\$33,829	\$4,093
25.2 Other Services from Non-Federal Sources	\$1,043	\$88	\$61	(\$27)
25.3 Other Goods and Services from Federal Sources	\$49,142	\$41,030	\$43,704	\$2,674
25.5 Research and Development Contracts	\$69,998	\$71,313	\$56,095	(\$15,218)
41.0 Grants, Subsidies, and Contributions	\$2,232	\$4,923	\$7,274	\$2,351
Total, Other Object Classes	\$150,609	\$147,839	\$141,703	(\$6,136)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$158,778	\$156,899	\$151,605	(\$5,294)
Full Time Equivalents	50	53	56	3

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

Exhibit L. Permanent Positions by Grade

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development
 Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES	3	3	3	-
GS-15	28	28	28	-
GS-14	9	13	13	-
GS-13	8	4	6	2
GS-12	1	4	5	1
GS-11	1	-	-	-
GS-9	-	1	1	-
Total Permanent Positions	50	53	56	3
Unfilled Positions EOY	-	-	-	-
Total Permanent Employment EOY	50	53	56	3
Headquarters	50	53	56	3
Total, Research and Development:	50	53	56	3
Full Time Equivalents	50	53	56	3
Average ES Salary	170,000	172,000	175,525	3,525
Average GS Salary	129,000	127,000	133,399	6,399
Average Grade	15	15	15	-

Exhibit M. Changes in Full Time Employment

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Research and Development**

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
Increases			
From DNDO M&A to CBRNE Research & Development - R/NDPFC	-	-	53
DHS Balanced Workforce Strategy	-	-	3
Decreases			
Year End Actuals/Estimated FTEs:	50	53	56

Department of Homeland Security

Chemical, Biological, Radiological, Nuclear and Explosives Office

Federal Assistance



Fiscal Year 2017

Congressional Justification

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Schedule I – Executive Summary of Appropriation Exhibits

Summary of Budget Estimates by Program Project Activity- Appropriation Level

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance**

Summary of FY 2017 Budget Estimates by Program Project Activity

**FY 2017 Request
(Dollars in Thousands)**

Program Project Activity	Revised Enacted			Enacted			Request			Total Changes		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
R/N Detection, Forensics, and Prevention Capability	19	19	\$49,144	19	19	\$52,308	24	24	\$51,684	5	5	(\$624)
Operations Support	19	19	\$49,144	19	19	\$52,308	24	24	\$51,684	5	5	(\$624)
Bombing Prevention	-	-	-	-	-	-	23	19	\$14,263	23	19	\$14,263
Total, Federal Assistance	19	19	\$49,144	19	19	\$52,308	47	43	\$65,947	28	24	\$13,639
Subtotal, Enacted Appropriations & Budget Estimates	19	19	\$49,144	19	19	\$52,308	47	43	\$65,947	28	24	\$13,639
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	19	19	\$49,144	19	19	\$52,308	47	43	\$65,947	28	24	\$13,639

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only.

Overview

Federal Assistance (FA) funds necessary operations, mission support, and associated costs in support of the following mission programs:

Radiological and Nuclear Detection, Forensics, and Prevention Capability (R/NDFPC): Plays a pivotal role in implementing the domestic component of the Global Nuclear Detection Architecture (GNDA) by ensuring that the training, exercise, and cross-jurisdictional protocols integral to these elements are adopted and sustained. Includes integration and outreach efforts necessary to ensure that GNDA partners know how to access available resources to support the radiological and nuclear (rad/nuc) detection mission. Programs include Securing the Cities (STC), Training, Exercises, Assistance, and Joint Analysis Center. Issues cooperative agreements

under the STC Program, supporting State, local, tribal, and territorial authorities in the development of nuclear detection capabilities for high-threat, high-density urban areas. All deployed technologies for Federal, State, local, tribal, and territorial (FSLTT) partners are accompanied by the appropriate concepts of operations (CONOPS), training, exercises, and alarm response protocols.

Bombing Prevention: Leads and coordinates DHS efforts to protect life and critical infrastructure by building capabilities across the private and public sectors to prevent, protect against, respond to, and mitigate bombing incidents. Bombing Prevention leads the Department's efforts to implement national counter-improvised explosive device (IED) policy and plans. Within this program are the Coordination of National and Intergovernmental Bombing Prevention Efforts and Counter-IED Capability Analysis and Planning Support, Information Sharing and Decision Support (including the *TRIPwire* project), and Training and Awareness missions.

B. FY 2016 to FY 2017 Budget Change - Appropriation Level

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)**

	Pos.	FTE	Amount
Adjustments-to-Base			
Transfers to and from other accounts:			
From CBRNE FA R/NDFFPC to Working Capital Fund	-	-	(\$497)
From DNDO M&A to CBRNE Federal Assistance - R/NDFFPC	19	19	\$4,092
From DNDO RD&O - Operations Support to CBRNE Federal Assistance -R/NDFFPC	-	-	\$26,792
From DNDO Sys Acq - Securing the Cities to CBRNE Federal Assistance -R/NDFFPC	-	-	\$21,424
From OPS Analysis and Operations to CBRNE Federal Assistance -R/NDFFPC	3	3	\$534
From NPPD Infrastructure Analysis and Planning to CBRNE FA - Bombing Prevention	23	19	\$14,235
Total Transfers	45	41	\$66,580
Increases			
2017 Pay Increase	-	-	\$70
Annualization of 2016 Pay Raise	-	-	\$10
DHS Balanced Workforce Strategy	2	2	\$250
Total, Increases	2	2	\$330
Decreases			
Operations Support	-	-	(\$391)
Working Capital Fund	-	-	(\$72)
Total, Decreases	-	-	(\$463)
Total Other Adjustments	2	2	(\$133)
Total Adjustments-to-Base	47	43	\$66,447
FY 2017 Current Services	47	43	\$66,447
Program Changes			
Decreases			
Operations Support: Federal, State, and Local Outreach/Capabilities Integration	-	-	(\$500)
Total, Decreases	-	-	(\$500)
Total Program Changes	-	-	(\$500)
FY 2017 Request	47	43	\$65,947
FY 2016 to FY 2017 Change	47	43	\$65,947

C. FY 2017 Investment Summary - Appropriation Level

N/A

Schedule II – Program, Project, Activity (PPA) Exhibits

Exhibit D. FY 2016 to FY 2017 Budget Change- PPA Level

Summary Tables of Sub-PPA
Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance
R/N Detection, Forensics, and Prevention Capability
Operations Support
 FY 2016 to FY 2017 Budget Change- PPA Level
 (Dollars in Thousands)

R/N Detection, Forensics, and Prevention Capability		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	42
	Annualization of 2016 Pay Raise	-	-	10
	DHS Balanced Workforce Strategy	2	2	250
	From CBRNE FA R/NDFPC to Working Capital Fund	-	-	(497)
	From DNDO M&A to CBRNE Federal Assistance - R/NDFPC	19	19	4,092
	From DNDO RD&O-Operations Support to CBRNE Federal Assistance -R/NDFPC	-	-	26,792
	From DNDO Sys Acq-Securing the Cities to CBRNE Federal Assistance-R/NDFPC	-	-	21,424
	From OPS Analysis and Operations to CBRNE Federal Assistance-R/NDFPC	3	3	534
	Operations Support	-	-	(391)
	Working Capital Fund	-	-	(72)
Program Changes	Operations Support: Federal, State, and Local Outreach/Capabilities Integration	-	-	(500)
Budget Year	FY 2017 Request	24	24	51,684
	Total Change from FY 2016 to FY 2017	24	24	51,684

PPA Description:

CBRNE requests \$51.684 million and 24 FTE within R/NDFPC for FY 2017.

Adjustments-to-base include:

- Transfer in of \$4.092 million and 19 FTP/19 FTE from DNDO M&A
- Transfer in of \$26.792 million from DNDO RD&O Operations Support
- Transfer in of \$21.424 million from DNDO Systems Acquisition Securing the Cities
- Transfer in of \$0.534 million and 3 FTP/3 FTE from OPS Analysis and Operations
- Transfer out of \$.497 million from CBRNE PC&I R/NDFPC to Working Capital Fund
- Increase of \$0.250 million and 2 FTP/2 FTE for the DHS Balanced Workforce Strategy
- Increase of \$0.042 million for 2017 pay increase
- Increase of \$0.010 million to annualize the 2016 pay increase
- Decrease of \$0.391 million for Operations Support
- Decrease of \$0.072 million for Working Capital Fund Adjustment

Program Changes Include:

- Decrease of \$0.500 million for Operations Support: FSLO/CI

SUB-PPA DESCRIPTION: OPERATIONS SUPPORT

Operations Support provides advisory and assistance services to FSLTT stakeholders who are developing or enhancing rad/nuc detection capabilities. This support includes assistance in developing and integrating local or regional programs into the GNDA, guiding the development of concepts of operations (CONOPS) and standard operating procedures, and developing training and exercise products to ingrain those procedures into day-to-day activities.

Operations Support plays a pivotal role in implementing the domestic component of the GNDA by ensuring that the training, exercise, and cross-jurisdictional protocols integral to these elements are adopted and sustained. In addition, Operations Support includes integration and outreach efforts necessary to ensure that GNDA partners know how to access available resources to support the rad/nuc detection mission.

Operations Support – Program Overview

Program	Project	Level of Effort	General Description
Securing the Cities (STC)	National Capital Region (NCR)	Annual, ongoing	The STC Program seeks to reduce the risk of a successful deployment of a rad/nuc terrorist weapon against major metropolitan regions in the United States by establishing sustainable capability within the GNDA partner agencies to detect, analyze, and report nuclear and other radioactive materials out of regulatory control within their jurisdictions.
	Implementation Site #4 - Houston	Annual, ongoing	
	Implementation Site #5 - Chicago	Annual, ongoing	
Joint Analysis Center (JAC)	JAC Operations	Ongoing	The JAC serves as an interagency coordination mechanism for the implemented GNDA, maintaining situational awareness of GNDA programs, activities, and capabilities, to include status of rad/nuc detection operations, visibility into the status of rad/nuc alarms, and awareness of rad/nuc-related incidents and events.
Joint Analysis Center Collaborative Information System (JACCIS)	JACCIS	Ongoing	JACCIS is a web-based system that provides FSLTT stakeholders alarm adjudication connectivity, a detector database, and situational awareness regarding the events and activities relating to rad/nuc detection and the GNDA.
Federal, State, and Local Outreach	State and Local Stakeholder Working Groups	Semi-Annual, ongoing	State and Local Stakeholder Working Groups are CBRNE Office-sponsored strategic engagements intended to promote capability development and sustainment, and foster strong relationships with and among our State, local, and tribal agency mission stakeholders.
	Executive Steering Council	Semi-Annual, ongoing	Executive Steering Council meetings provide an opportunity for policy coordination, discussion, and implementation among CBRNE Office and senior-level State and local leaders regarding rad/nuc detection programs.
	Capabilities Integration	Annual, ongoing	Capabilities Integration ensures that systems, organizations, and/or procedural changes introduced to the GNDA are properly coordinated with interagency partners and address the full range of operational and technical challenges and opportunities that accompany them.
Training	Training	Ongoing	The Training Program supports FSLTT GNDA stakeholders. Training establishes qualification standards for rad/nuc detection operations, builds curricula to support the standards, enables agencies and their instructors to teach the material, and captures feedback used for process and product improvement.

Program	Project	Level of Effort	General Description
Exercises	Exercises	Ongoing	The Exercises Program supports FSLTT GNDA stakeholders. The Exercises Program supports the development, validation, and dissemination of rad/nuc detection-specific exercise templates, guidance, and standards; validates that rad/nuc detection equipment is properly employed and alarm adjudication processes are operated per FSLTT protocols; and ensures notifications are escalated to appropriate government agencies.
Assistance	Assistance	Ongoing	The Assistance Program provides standardized processes and products to assist GNDA stakeholders with how to plan, develop, manage, evaluate, and sustain a rad/nuc detection program. Assistance efforts support multi-jurisdictional, multi-disciplinary policy makers, program managers, and operational administrators to work together to design and implement land-based and maritime rad/nuc detection programs that will build and enhance detection capabilities in support of the GNDA.
	Mobile Detection Deployment Units (MDDU)	Ongoing	MDDUs are national rad/nuc detection “surge” assets that supplement first responders’ existing detection and reporting capabilities in support of national and other special security events. MDDUs contain radiation detection equipment packages housed in mobile trailers that are located throughout the United States and maintained in coordination with the Department of Energy’s Radiological Assistance Program (RAP).

Securing the Cities (STC) Program

The STC Program seeks to reduce the risk of a successful deployment of a rad/nuc terrorist weapon against major metropolitan regions in the United States by establishing sustainable capability within the GNDA partner agencies to detect, analyze, and report nuclear and other radioactive materials out of regulatory control within their jurisdictions.

STC is a multi-year rad/nuc detection capability development project. The three-phase strategy enables the CBRNE Office to provide financial assistance to multiple regions simultaneously while expanding capabilities to further implement the domestic component of the GNDA. CBRNE Office Federal Assistance funds are disbursed under the STC program through competitively awarded cooperative agreements to a lead agency that then uses local procurement procedures to acquire equipment and services supporting STC goals and objectives. The lead agency establishes a

regional governance structure among the major law enforcement, first response, emergency management, and public health agencies to implement a regional rad/nuc detection program. The three phases of the program are:

Phase I – Initial Operating Capability

STC provides a mechanism for cities to develop an initial operating capability (IOC) to detect and report the presence of nuclear and other radioactive materials that are out of regulatory control. This capability utilizes detection equipment, protocols, and personnel and is integrated into and supports the GNDA. During Phase I, efforts focus on satisfying the immediate needs of State and local agencies in developing detection and reporting capabilities. The CBRNE Office provides financial resources and expertise allowing partners an increased understanding and awareness of the nuclear threat, enhanced regional capabilities to detect and interdict nuclear threats, and increased cooperation and coordination among regional jurisdictions and agencies. Initial capabilities include development of operations plans including alarm adjudication protocols, deployment of equipment, training and exercise support, and technical program assistance. Phase I concludes when the region establishes a nuclear detection program encompassing coordinated operations, self-delivered nuclear detection training and exercise capabilities, and a plan is in place to sustain the program over time in support of the GNDA. This phase of the implementation is expected to take between two and three years to complete.

Phase II – Integration

The STC program provides additional financial resources to allow development of enhanced detection, analysis, communication, and coordination functionality, and builds on the integration of State and local capabilities with U.S. Government (USG) activities and the GNDA that previously existed or were established during Phase I. In this phase, the USG leverages capabilities established locally in Phase I to partner with State and local jurisdictions to ensure a national coordinated response in support of the GNDA. In addition, STC works with the partners to define end states for direct support to State and local activities. Phase II concludes when a region successfully demonstrates its ability to integrate into a national nuclear detection framework in support of the GNDA. This phase of the implementation is expected to take about two years of the engagement.

Phase III – Sustainment

During Phase III, the STC partner executes the rad/nuc detection mission according to the sustainment plan developed during Phase I. The STC Program provides indirect, non-financial support to sustain the program. STC maintains connectivity with the established local architecture through alarm adjudication and subject matter expertise to provide advice on training, exercises, and other program support. This support includes:

- Systems engineering and evaluation programs to provide detection equipment testing to aid partners in making equipment decisions.
- Product acquisition and deployment support provides guidance to help interpret equipment specifications so operators clearly understand equipment capabilities.
- Transformational and applied research offerings explore up-and-coming radiation detection technology and partner with Phase III STC implementations to be test-beds for technology demonstrations.
- Red Team operates in overt or covert modes to assist stakeholders to understand potential vulnerabilities.
- Training and exercise programs provide training materials and exercise assistance.

- State and local participants will maintain and continue to improve their developed capabilities to support the GNDA using local funds or other Federal Government grant funds.

In FY 2017, Los Angeles/Long Beach area will enter the Sustainment Phase, and the CBRNE Office will continue to provide indirect non-financial assistance as described in Phase III activities above.

In FY 2017, the NCR will enter Phase II and is projected to receive up to \$5 million.

In FY 2017, Houston, the fourth locale, will be in the third year of Phase I and will receive up to \$9 million.

In FY 2017, Chicago, the fifth locale, will be in its second year of Phase I and will receive up to \$8 million.

Joint Analysis Center (JAC) Program

The JAC provides a timely information sharing and analysis capability that monitors the status of and facilitates the analysis and distribution of information from both overseas and domestic components of the GNDA. The JAC serves as an interagency coordination mechanism for the GNDA, maintaining situational awareness of GNDA capabilities, to include status of rad/nuc detection operations, visibility into the status of rad/nuc alarms, and awareness of rad/nuc-related incidents and events. The JAC participates in adjudication of nuclear detection events and drafts technical requests for information; analyzes intelligence and sensor information; provides technical support to State, local, and tribal authorities; and assists in the USG technical response to rad/nuc detection incidents.

The JAC maintains a common operating picture for stakeholders throughout the GNDA and provides technical assistance, data mining relating to the current status and disposition of GNDA resources and vulnerability and threat trend analyses to GNDA decision makers. JAC activities are aligned around two key functions: information sharing and information analysis.

JAC Information Sharing

The information sharing function of the JAC supports collaboration among GNDA partners and provides timely data and analyses regarding the current status and disposition of GNDA resources, vulnerabilities, and threat trends, which enable sound and timely leadership decisions. The primary activities under this project include:

- Information product development and deployment, which generates packaged information on both a routine and on-demand basis and delivers products directly to stakeholders or publishes information on appropriate Community of Interest (COI) sites. These products include Situational Awareness Reports and Weekly Open Source Reports.
- Operational planning, which provides information to CBRNE Office Federal Assistance projects and stakeholders to support and promote the planning and execution of rad/nuc detection operations.
- Cross-jurisdictional collaboration, which facilitates the timely delivery of operational information to appropriate stakeholders to enhance

situational awareness of ongoing operations.

JAC Information Analysis

The information analysis function of the JAC consists of adjudication support and data fusion and trend analysis in coordination with DOE's National Nuclear Security Administration. Data fusion and trend analysis ensures that stakeholders are provided with complete and relevant information to include spectral analysis support to ensure timely adjudication of detection events. Data fusion and trend analysis integrates broader knowledge of the operational situation with data derived from a detection event to help set adjudication and post-adjudication action priorities.

- The JAC provides 24/7 capability to facilitate the adjudication of radiation detection alarms and share GNDA information with stakeholders to plan an appropriate response.
- To accomplish data fusion and trend analysis, the JAC maintains a qualified and trained expert workforce, ensures that the reach back community has access and training on the best analytic tools, conducts data fusion of multiple data sources to provide a complete view of the operational environment, and develops awareness within the nuclear detection community to enable alarm resolution at the lowest level possible.

In FY 2015, the JAC instituted 24/7 Watch Operations Support, obtained Resource Equipment and Capability Exchange data, and formalized information sharing with Defense Intelligence Agency (DIA) and the National Counterterrorism Center (NCTC). In FY 2016, the JAC will continue to provide weekly presentation of GNDA related intelligence information for CBRNE Office leadership and stakeholders, provide Situational Awareness Reports as required, and Weekly Open Source Reports to FSLTT stakeholders. In FY 2016 and FY 2017, the JAC will continue its mapping of the international portion of the GNDA, initiated in FY 2015, drawing upon a new data sharing arrangement that provided the secure infrastructure to do so. Fused with data currently being provided by the States and with anticipated additional data streams from interagency partners, the documented constituents of the GNDA, both domestically and internationally, are expected to increase approximately three-fold over the next two fiscal years.

Joint Analysis Center Collaborative Information System (JACCIS) Program

To support its information sharing and information analysis roles, the JAC developed its information technology system, the Joint Analysis Center Collaborative Information System. JACCIS receives, manages, analyzes, transfers, and reports on data relevant to the GNDA. JACCIS provides infrastructure to integrate the JAC operational construct and its processes by means of a focused fusion of raw data from multiple sources (alarm adjudication, intelligence sources, etc.). This system also facilitates the sharing of radiation detection data among FSLTT users and empowers the lowest level of authority to evaluate detection events as either threat or non-threat, rapidly determining the appropriate response while reducing the impact on commerce and personal movement. This system is also the backbone for resolving detection alarms by moving technical data from operators in the field to the Nation's technical experts. Prior to JACCIS achieving IOC in 2011, the JAC relied on resource intensive phone and e-mail communication to integrate data.

In FY 2015, JACCIS supported the Assistance and Training programs for additional FSLTT outreach, awarded the JACCIS 2.0 O&M contract (tech refresh), and added a non-password adjudication capability for FSLTT partners to speed access for law enforcement officers during time-sensitive field operations. In FY 2016 and FY 2017, JACCIS will continue to integrate into the DHS National Operations Center Common Operating Picture (DHS NOC COP), build upon FSLTT relationships via coordination with the Assistance and Training Programs, and establish technology refresh efforts incorporating a more cost efficient cloud environment. More specifically, JACCIS 2.0 is commencing the DHS information security review to operate in a Federal Risk and Authorization Management Program (FedRAMP)-certified cloud environment, with approval expected in FY 2016. The cloud environment will provide a faster, more scalable, more fault-tolerant, and lower cost hosting solution. Additionally, JACCIS 2.0 will have a live connection to the DHS NOC COP so that rad/nuc detector alarm information will be immediately visible to DHS leadership and will be integrated with all-hazards information. Finally, the JACCIS program will build upon the foundation laid in FY 2015 as it adds additional detector data sets for a growing number of states and major urban areas.

Federal, State, and Local Outreach Program

Central to the success of an integrated, layered national defense against the rad/nuc threat is a strong partnership with FSLTT agencies responsible for the detection mission within their areas of responsibility. The Federal, State, and Local Outreach Program maintains engagement with key mission partners and increases awareness of CBRNE threats and risk by executing broad outreach efforts that include:

- Conducting stakeholder events.
- Establishing communication mechanisms that will facilitate interactions with and among State and local stakeholders.

A significant key to developing, maintaining, and expanding rad/nuc detection programs and capabilities across the Nation is affording FSLTT stakeholders the opportunity to engage one another and share best practices and challenges. The major elements of this program include the State and Local Stakeholder Working Group (SLSWG), Executive Steering Council (ESC), and Capabilities Integration projects. These activities support the development of a sustainable partnership between the CBRNE Office and the State and local community to strengthen rad/nuc detection capabilities across the Nation, in support of the GNDA.

The State and Local Stakeholder Working Group (SLSWG)

As required in the Security and Accountability For Every (SAFE) Port Act (P.L. 109-347), the CBRNE Office will be responsible for coordinating with State and local jurisdictions across the Nation, with the SLSWG events being one of the primary mechanisms for coordination with this mission community. Annual SLSWG meetings provide a forum for stakeholders to exchange best practices, obtain feedback on the CBRNE Office's initiatives, and interact with subject matter experts (SMEs).

At SLSWG meetings, participants present and discuss current activities and initiatives, lessons learned, available tools and reports. The office is currently engaged with all 50 states and major urban areas.

Executive Steering Council (ESC)

The ESC provides policy coordination and implementation between the CBRNE Office and senior-level State and local leaders regarding rad/nuc detection programs. The ESC is comprised of Homeland Security Advisors and other executive-level stakeholders and meets biannually. Like the SLSWG, the ESC is a mechanism to solicit input from stakeholders on their successes, evolving requirements, and challenges. Unlike the SLSWG, the focus of this group is less on operations and is more on coordination of capabilities, understanding gaps in the GNDA, and providing insight into how State and local policies integrate with the GNDA. Meeting topics include classified rad/nuc threat updates, mission challenges, and Federal efforts to improve FSLTT coordination. The ESC meeting ensures that executive leadership is apprised of ongoing efforts in support of their jurisdictions and promotes the senior-level mission advocacy needed to sustain State and local programs and capabilities. Attendance at the ESC meetings has grown over the years, with 14 attendees representing 9 states in FY 2012 and 25 attendees representing 21 states in FY 2015. For FY 2016, 42 attendees representing 38 states have been invited, reflecting the growth in rad/nuc detection mission interest and participation around the country.

Capabilities Integration

The Capabilities Integration Project (CIP) serves to ensure that GNDA-related plans and policy are informed by operators' experience and that operators understand how to implement those plans and policies. CIP functions include representing CBRNE Office equities in national-level policy development and identifying coordination needs. One example of internal coordination is the CIP's current role in co-leading the development of a DHS radiological/nuclear threat concept of operations to ensure unity of effort in support of a larger USG response. An example of the external coordination by the CIP is its interface, collaboration, and coordination with partners at the FBI. The two work together with stakeholders across the Federal Government and the country to integrate, align, and utilize all rad/nuc detection resources in a given locale and to improve the relationships with other homeland security partners with counterterrorism missions.

Training Program

The Training Program supports FSLTT stakeholders in developing or enhancing their rad/nuc detection training. Training evaluates GNDA stakeholder rad/nuc detection capability and provides data used to assess rad/nuc detection operational effectiveness.

- The Training Program is responsible for the development, oversight, and administration of the design, delivery, evaluation, and continual improvement of rad/nuc detection training. The Training Program's primary objective is to improve operational capabilities at the FSLTT levels through the development of training standards and curricula.
- The Training Program is developing curricula in basic radiation safety, equipment operations, and tactical deployment; maritime and aerial detection, spectroscopy analysis, and special event planning.

The Training Program is developing effective Training Standards and Qualifications for radiological and nuclear detection, which will allow State and local agencies to develop uniform training qualification standards. To achieve a national-level standardized PRND capability, the Training Program has submitted the definitions for the roles and responsibilities of Preventive Rad/Nuc Detection (PRND) Primary and Secondary Screeners, Team Operators, Team Leaders, and prerequisite training standards to FEMA's National Integration Center (NIC) for review. These National Incident Management System (NIMS) resource type positions and National Training Standards and Qualifications will be part of a NIMS resource typing specific to the PRND mission. NIMS typing provides guidance on required training and establishes desired PRND capabilities levels while also helping to institutionalize the rad/nuc detection training curriculum across the Nation. This will result in responders having more standard PRND capabilities particularly when working missions across multiple jurisdictions.

In FY 2015, the Training Program provided 68 comprehensive rad/nuc detection courses and 25 rad/nuc detection Train-the-Trainer courses to FSLTT, resulting in more than 2,244 participants being trained. In FY 2016, the program plans to conduct 110 courses and train 2,640 participants through direct and indirect training activities. In FY 2017, the program plans to conduct 120 rad/nuc detection courses and train 2,880 participants. This training will result in RN detection capability within a variety of agencies in various communities throughout the United States.

Exercise Program

The Exercise Program validates and enhances emerging and existing rad/nuc detection capabilities by exercising those capabilities in accordance with the Homeland Security Exercise and Evaluation Program (HSEEP) methodology.

The Exercise Program supports FSLTT stakeholders by developing, validating, and disseminating rad/nuc detection-specific exercise templates, guidance, and standards. The level of exercise support provided in the planning, design, execution, and evaluation of exercises is dependent upon the stakeholders' level of knowledge and experience in conducting the rad/nuc detection mission.

In FY 2015, the Exercise Program designed, conducted, and reported on 16 DNDO-sponsored exercises domestically. In FY 2016, the program anticipates support for 10-15 DNDO-sponsored exercises and continued support of the Global Initiative to Combat Nuclear Terrorism Exercise Planning Group. In FY 2017, the program anticipates supporting an additional 10-15 exercises. These exercises validate new capabilities; sustain and enhance existing capabilities; identify weaknesses in operations, training, and resource issues; and provide improvement plans for the stakeholders. This service improves collaboration and mission buy-in from FSLTT stakeholders over time.

Assistance Program

The Assistance Program is designed to help multi-jurisdictional, multi-disciplinary, policy-makers, program managers, and operational administrators work together to develop and implement land-based and maritime rad/nuc detection programs to build out the interior layer and enhance detection capabilities in support of the GNDA. Since January 2014, the Assistance Program has implemented an aggressive outreach strategy to raise

awareness of the R/N detection mission and to improve the Nation's interior R/N detection capabilities by assisting States, major Urban Area Security Initiative (UASI) cities, and USCG Sector Area Maritime Security Committees (AMSC) develop, implement, and sustain R/N detection programs. A focused activity within the Assistance Program is maritime capability development, which works with USCG Sector AMSCs to develop maritime based rad/nuc detection programs that support the region's Area Maritime Security Plans and assist the USCG Captains of the Port in assessing vulnerabilities, mitigating risks, and sharing information to address the small vessel threat.

These assistance efforts are accomplished using a system of standardized processes and products that guide GNDA stakeholders through a series of development phases. This phased approach includes providing comprehensive guidance for the Planning, Organizing, Equipping, Training, and Exercising (POETE) process through the entire rad/nuc detection program lifecycle, thus creating a sustainable framework for the administration of a domestic preventive rad/nuc detection program at the senior policymaking, middle management, and operational levels. The Assistance Program met its FY 2015 goal to have at least made positive contact with all 50 states, consisting of introductory awareness-raising meetings with senior State officials. As of the end of FY 2015, the program was engaged with 31 states to develop and implement their programs, a further stage initiated when states commit to develop a program consisting of concepts of operations or policy, agency, and special event operating procedures and training and exercise plans. With 15 states having existing programs, the Assistance Program plans to engage in FY 2016 with the remaining four states not yet engaged or without an existing program. Also in FY 2016, the program anticipates ongoing program development engagements with 31 States, 5 major UASI regions and 33 USCG AMSCs. By the end of FY 2018, DNDO's goal is for all 50 states, all 11 major UASIs, and all 43 USCG Sector AMSCs to have active, viable, and sustainable rad/nuc detection programs.

Mobile Detection Deployment Units (MDDU)

The MDDU Project provides detection equipment packages for FSLTT authorities to augment their rad/nuc detection capability and support special events and enhanced steady state operations. The MDDU project includes six units pre-staged at DOE Radiological Assistance Program (RAP) team locations around the United States and outfitted with rad/nuc detection equipment. Requests to deploy an MDDU by FSLTT agencies are evaluated based on an assessment of the event's risk and on the readiness of the region to incorporate the MDDU into their operations.

As a result of the engagement via the Assistance Program, there were 83 MDDU deployments in FY 2015, an increase of 18 percent increase over the 70 deployments in FY 2014 and a 51 percent increase over the 55 deployments in FY2013. In FY 2016, the program anticipates an increase of 10 percent in MDDU deployments. In FY 2017, the program requested an increase of three MDDUs from six to nine units to support the increased demand for deployments owing to the success of the assistance outreach strategy. In addition, there is insufficient geographic coverage; deployments to some U.S. regions are more time consuming and costly than others due to their distance from the current MDDU locations. Presently, it could take up to three days for an MDDU to reach some major urban areas via ground transportation, potentially impacting coverage for special events as well as no-notice responses. Nine units would shrink this timeframe to deployments within 24 hours or less within the continental United States.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance
R/N Detection, Forensics, and Prevention Capability
Justification of Program Changes
(Dollars in Thousands)

Program Decrease : Federal State and Local Outreach/Capabilities Integration

PPA: R/N Detection, Forensics, and Prevention Capability Program Decrease: 24 FTP, 24 FTE, \$51,684

Funding Profile

	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request		
	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)	FTP	FTE	Dollars (\$000)
Current Services: Operations Support: FSLO/CI - Operations Support							24	24	\$52,184
Subtotal, Current Services							24	24	\$52,184
Program Decrease: Operations Support: FSLO/CI - Operations Support							-	-	(\$500)
Subtotal, Program Decreases							-	-	(\$500)
Total Request							24	24	\$51,684

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only .

DESCRIPTION OF ITEM:

Federal, State, and Local Outreach/Capabilities Integration

The CBRNE Office’s Federal, state, and local outreach programs support the implementation of the domestic component of the GNDA by assisting FSLTT law enforcement and public safety agencies to efficiently develop and maintain nuclear detection capabilities that conform to and support national policy.

The Capabilities Integration Project (CIP) serves to ensure that GNDA-related plans and policy are informed by operators’ experience and that operators understand how to implement those plans and policies. CIP functions include representing CBRNE Office equities in national-level policy development and identifying coordination needs.

Justification:

The program has matured by establishing capabilities integration ensuring that systems, organizations, and/or procedural changes introduced to the GNDA are properly coordinated with interagency partners and address the full range of operational and technical challenges and opportunities that accompany them. The focus will be shifted to sustaining the capabilities achieved, thereby reducing the required level of support.

Impact on Performance:

Operational Impacts:

Processes and procedures that ensure coordination with interagency partners have matured and the process is now sufficiently optimized to allow for a reduced need for contractors.

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance**

R/N Detection, Forensics, and Prevention Capability

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	19	19	\$3,105	\$163	19	19	\$3,248	\$171	24	24	\$4,042	\$168	5	5	\$794	(\$3)
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS Pay Cost Drivers Exhibit may reflect a higher average FTE Cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

FTE Change FY 2016-2017

The FY 2017 budget request reflects changes to our FTE counts from two sets of position conversions. In FY 2014 DNDO completed the conversion of eight positions from contractors to Federal employees. These conversions focused on staffing to address the most critical vulnerabilities in business areas where “Nearly Inherent Government Functions” are performed by Federal employees. These conversions ensure that financial operations are handled by Federal employees. In FY 2015, DNDO converted an additional 10 positions to achieve an expected savings of \$377K in the FY 2016 budget. The 2017 budget request also includes the anticipated changes in accounts and FTE from the conversion of nine additional positions to be completed in FY 2016.

Personnel Compensation and Benefits Change FY 2016-2017

The change reflects two position conversions, the transfer in of three FTE from Analysis and Operations as part of the Department’s Unity of Effort initiative, and pay inflation.

Average Cost Change FY 2016-2017

The average cost change decreased due to the transfer in of three FTE from Analysis and Operations.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance
R/N Detection, Forensics, and Prevention Capability
Operations Support
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - R/N Detection, Forensics, and Prevention Capability	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Securing the Cities	\$18,145	\$21,113	\$21,135	\$22
Assistance	\$8,709	\$8,648	\$8,788	\$140
Joint Analysis Center	\$6,936	\$6,915	\$6,246	(\$669)
Training	\$3,834	\$3,843	\$3,867	\$24
JACCIS	\$3,569	\$3,557	\$3,580	\$23
Total	\$41,193	\$44,076	\$43,616	(\$460)

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Summary Tables of Sub-PPA
Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance
Bombing Prevention
FY 2016 to FY 2017 Budget Change- PPA Level
(Dollars in Thousands)

Bombing Prevention		Positions	FTE	Amount
Current Services	2017 Pay Increase	-	-	28
	From NPPD Infrastructure Analysis and Planning to CBRNE FA - Bombing Prevention	23	19	14,235
Budget Year	FY 2017 Request	23	19	14,263
	Total Change from FY 2016 to FY 2017	23	19	14,263

PPA Description:

CBRNE requests \$14.263 million and 19 FTE within Bombing Prevention for FY 2017.

Adjustments-to-base include:

- Transfer in of \$14.235 million and 23 FTP/19 FTE from NPPD Infrastructure Analysis and Planning – Explosives
- Increase of \$0.028 million for 2017 pay increase

The Bombing Prevention program leads and coordinates DHS efforts to protect life and critical infrastructure by building capabilities across the private and public sectors to prevent, protect against, respond to, and mitigate bombing incidents. Bombing Prevention leads the Department’s efforts to implement national counter-improvised explosive device (IED) policy and plans.

Sub-PPA: Bombing Prevention (BP)

Bombing Prevention accomplishes its mission through four focus areas:

Coordination of National and Intergovernmental Bombing Prevention Efforts

Bombing Prevention aligns DHS and national efforts through centralized and effective coordination of programs based on understanding of global IED threats. Coordination and integration of national bombing prevention capabilities and programs is critical to effectively and efficiently prevent, protect against, respond to, and mitigate explosive attacks to the Nation's citizens and critical infrastructure. Bombing Prevention has a leading role in national counter-IED policy implementation, serving as the Deputy Administrator for the interagency Joint Program Office (JPO) for Countering IEDs. The JPO coordinates and tracks Federal Government progress in building the C-IED capabilities. At the Department level, Bombing Prevention chairs the DHS IED Working Group to lead DHS implementation of the national counter-IED policy and to optimize the complementary counter-IED equities across DHS Components.

Counter-IED Capabilities Analysis and Planning Support

Bombing Prevention systematically identifies and assesses the Nation's capabilities to C-IED threats and drives capability improvement through enhanced strategy, investment, and planning-based resource optimization.

- The Multi-Jurisdiction IED Security Planning Program (MJIEDSP) is a systematic process that fuses counter-IED capability analysis, training, and planning to enhance urban IED prevention, protection, mitigation, and response capabilities. Bombing Prevention works closely with stakeholders to provide planning and operational expertise that results in jurisdiction-specific guidance and a roadmap to enhance multi-agency, multi-jurisdiction IED prevention, protection, and response capabilities. Bombing Prevention plans to execute ten MJIEDSP events in FY 2017.
- The National Counter-IED Capabilities Analysis Database (NCCAD) is a program that uses a consistent and repeatable analytical methodology to assess and analyze the capabilities of bomb squads, SWAT teams, explosives detection canine units, and public safety dive teams. NCCAD information supports national-level preparedness policy and grant guidance, as well as state and local planning and resourcing efforts. In addition, NCCAD supports crisis action decision support at multiple levels, including at the local, state, regional, and national levels. In FY 2017, Bombing Prevention plans to execute up to 340 NCCAD Assessments.

Counter-IED Information Sharing and Decision Support

Bombing Prevention increases stakeholder knowledge of IED threats, incidents, and their implications, along with counter-IED principles, policies, and programs that increase capability and capacity to conduct critical functions of the counter-IED strategy.

- *TRIPwire* is DHS's secure and unclassified online counter-IED information sharing platform for FSLTT, and private sector officials, such as bomb technicians, first responders, military personnel, intelligence analysts, and security professionals. The information provided through *TRIPwire* increases awareness of evolving IED tactics, techniques, and procedures, as well as incident lessons learned and counter-IED preparedness information. *TRIPwire* combines expert analyses and reports with relevant documents, images, and videos gathered directly from terrorist source materials to help users understand risks to their communities and to prepare for and prevent IED incidents.

- Bombing Prevention serves as a key partner in the National Explosives Task Force, a Federal Bureau of Investigation (FBI)-led interagency entity that fuses technical IED and explosives expertise from multiple Federal agencies to assist in effective management of IED-related incidents and provide focused preparedness and protective security measure guidance and products.

C-IED Training and Awareness

Bombing Prevention develops and delivers a diverse curriculum of training to reduce the risk to the Nation's critical infrastructure by building nationwide counter-IED core capabilities and enhancing awareness of terrorist threats. Bombing Prevention's counter-IED training and awareness courses and products educate FSLTT participants such as municipal officials and emergency managers, State and local law enforcement and other emergency services, critical infrastructure owners and operators, and security staff on strategies to prevent, protect against, respond to, and mitigate bombing incidents.

- Specialized, subject matter expert-led courses such as Surveillance Detection, Protective Measures, Bomb Threat Management, IED Search Procedures, IED Counterterrorism, and Vehicle-borne IED Detection enhance participants' knowledge and skills to effectively reduce the risks of explosive attacks to the Nation's citizens and critical infrastructure. Bombing Prevention plans to execute 275 Counter-IED Risk Mitigation Training courses in FY 2017.
- The Bomb-making Materials Awareness Program (BMAP) is a collaborative effort between Bombing Prevention and the FBI to increase public and private sector awareness of homemade explosives by promoting private sector point-of-sale awareness and suspicious activity reporting to prevent diversion and misuse of explosive precursor chemicals and components commonly used in IEDs. The course provides guidance and materials to help first responders conduct outreach to industries and businesses within their jurisdiction in order to increase prevention opportunities by building a network of vigilant and informed private sector partners who serve as the Nation's counter-IED "eyes-and-ears." Bombing Prevention plans to execute 24 BMAP events in FY 2017.

**Department of Homeland Security
Federal Assistance
Bombing Prevention**

Cost Drivers (Pay & Benefits) - PPA Level (Excludes Reimbursables) (\$000s)

	FY 2015 Revised Enacted				FY 2016 Enacted				FY 2017 Request				Delta FY 2016 - 2017			
	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost	FTP	FTE	Amount	Avg. Cost
Civilian Total	20	20	\$3,0812,826	\$154141	20	19	\$2,611	\$137	23	19	\$3,235	\$170	3	-	\$624	\$33
Military Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. The use of FY 2015 Actuals and FY2015 Revised Enacted Budgetary Resources in the CAS Pay Cost Drivers Exhibit may reflect a higher average FTE Cost than represented in the FY 2016 Enacted or FY 2017 Request average cost columns.

FTE Change FY 2016-2017

The FY 2017 budget request reflects the transfer in of Bombing Prevention.

Personnel Compensation and Benefits Change FY 2016-2017

The FY 2017 budget request reflects the transfer in of Bombing Prevention.

Average Cost Change FY 2016-2017

The FY 2017 budget request reflects the transfer in of Bombing Prevention.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance
Bombing Prevention
Cost Drivers (Non-Pay) – Sub-PPA Level (\$000s)

Appropriation - Bombing Prevention	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
FY 2017 Non- Pay Cost Drivers (greatest-least)				
Counter-IED Information Sharing & Decision Support	-	-	\$5,555	\$5,555
Counter-IED Capability Analysis & Planning Support	-	-	\$2,452	\$2,452
Counter-IED Training & Awareness	-	-	\$1,401	\$1,401
Coordination of National & Intergovernmental Bombing Prevention Efforts	-	-	\$935	\$935
Total	-	-	\$10,343	\$10,343

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Schedule III – Other Exhibits

Exhibit E. Justification of Proposed Legislative Language

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance**

For necessary expenses of the Chemical, Biological, Radiological, Nuclear and Explosives Office, \$65,947,000, of which \$51,684,000, to remain available until September 30, 2019, is for programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats; and of which \$14,263,000 is for programs and operations to prevent, protect against, respond to, and mitigate bombing incidents.

Language Provision	Explanation
For necessary expenses of the Chemical, Biological, Radiological, Nuclear and Explosives Office, \$65,947,000, of which \$51,684,000 to remain available until September 30, 2019, is for programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats; and of which \$14,263,000 is for programs and operations to prevent, protect against, respond to, and mitigate bombing incidents.	The Department of Homeland Security proposes to consolidate the functions, operations, and budget requirements of the Domestic Nuclear Detection Office, Office of Health Affairs, Office of Bombing Prevention, and elements of the Science and Technology Directorate, Office of Policy, and Office of Operations into a single entity named the Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Office. All activities, responsibilities, and authorities from these organizations are transferred to this new organization.

Exhibit F. Summary of Fee Collections and Carryover

N/A

Exhibit G. Summary of Reimbursable Resources

N/A

Exhibit H. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

Department of Homeland Security
 Chemical, Biological, Radiological, Nuclear and Explosives Office
 Federal Assistance
 (Dollars in Thousands)

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Operations Support	\$1,236	\$1,217	\$720	(\$497)
Total Working Capital Fund	\$1,236	\$1,217	\$720	(\$497)

*FY 2015 and FY 2016 funding levels reflect the CAS structure and are for comparison purposes only.

Exhibit I. Capital Investment and Construction Initiative Listing

N/A

Exhibit J. Object Class Breakout by Appropriation

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$2,397	\$2,367	\$5,587	\$3,220
11.3 Other than Full-Time Permanent	-	-	-	-
11.5 Other Personnel Compensation	-	-	-	-
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	-	-	-	-
12.1 Civilian Personnel Benefits	\$708	\$881	\$1,690	\$809
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	\$3,105	\$3,248	\$7,277	\$4,029
Other Object Classes				
21.0 Travel and Transportation of Persons	\$408	\$403	\$455	\$52
22.0 Transportation of Things	-	-	-	-
23.1 Rental Payments to GSA	-	-	\$172	\$172
23.2 Rental Payments to Others	-	-	\$47	\$47
23.3 Communications, Utilities, and Misc. Charges	-	-	-	-
24.0 Printing and Reproduction	-	-	\$100	\$100
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$10,117	\$13,990	\$16,927	\$2,937
25.2 Other Services from Non-Federal Sources	\$401	\$407	\$890	\$483
25.3 Other Goods and Services from Federal Sources	\$18,078	\$16,210	\$23,309	\$6,099
25.4 Operation and Maintenance of Facilities	-	-	-	-
25.5 Research and Development Contracts	-	-	-	-
25.6 Medical Care	-	-	-	-
25.7 Operation and Maintenance of Equipment	-	-	\$66	\$66
25.8 Subsistence & Support of Persons	-	-	-	-
26.0 Supplies and Materials	-	-	\$20	\$20
31.0 Equipment	-	-	\$61	\$61
32.0 Land and Structures	-	-	-	-
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	\$17,035	\$18,050	\$17,623	(\$427)
42.0 Insurance Claims and Indemnities	-	-	-	-
43.1 Interest and Dividends	-	-	-	-
43.2 Immigration Fees	-	-	-	-
44.0 Refunds	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
91.0 Unvouchered	-	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$46,039	\$49,060	\$58,670	\$9,610
Total, Direct Obligations	\$49,144	\$52,308	\$65,947	\$13,639
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$49,144	\$52,308	\$65,947	\$13,639

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only. The Office of Bombing Prevention is included in NPPD for FY 2015 and FY 2016. The 2017 President's Budget proposes moving it to the CBRNE Office.

Exhibit K. Object Class Breakout by PPA

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance
R/N Detection, Forensics, and Prevention Capability
 Summary of Requirements by Object Class
 (Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$2,397	\$2,367	\$3,102	\$735
12.1 Civilian Personnel Benefits	\$708	\$881	\$940	\$59
Total, Personnel and Compensation Benefits	\$3,105	\$3,248	\$4,042	\$794
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$408	\$403	\$225	(\$178)
25.1 Advisory and Assistance Services	\$10,117	\$13,990	\$7,613	(\$6,377)
25.2 Other Services from Non-Federal Sources	\$401	\$407	\$550	\$143
25.3 Other Goods and Services from Federal Sources	\$18,078	\$16,210	\$21,631	\$5,421
41.0 Grants, Subsidies, and Contributions	\$17,035	\$18,050	\$17,623	(\$427)
Total, Other Object Classes	\$46,039	\$49,060	\$47,642	(\$1,418)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$49,144	\$52,308	\$51,684	(\$624)
Full Time Equivalents	19	19	24	5

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only. The Office of Bombing Prevention is included in NPPD for FY 2015 and FY 2016. The 2017 President's Budget proposes moving it to the CBRNE Office.

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance
Bombing Prevention
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	-	-	\$2,485	\$2,485
12.1 Civilian Personnel Benefits	-	-	\$750	\$750
Total, Personnel and Compensation Benefits	-	-	\$3,235	\$3,235
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	-	-	\$230	\$230
23.1 Rental Payments to GSA	-	-	\$172	\$172
23.2 Rental Payments to Others	-	-	\$47	\$47
24.0 Printing and Reproduction	-	-	\$100	\$100
25.1 Advisory and Assistance Services	-	-	\$9,314	\$9,314
25.2 Other Services from Non-Federal Sources	-	-	\$340	\$340
25.3 Other Goods and Services from Federal Sources	-	-	\$678	\$678
25.7 Operation and Maintenance of Equipment	-	-	\$66	\$66
26.0 Supplies and Materials	-	-	\$20	\$20
31.0 Equipment	-	-	\$61	\$61
Total, Other Object Classes	-	-	\$11,028	\$11,028
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	-	-	\$14,263	\$14,263
Full Time Equivalents	-	-	19	19

*FY 2015 and FY 2016 funding levels reflect the CAS Structure and are for comparison purposes only. The Office of Bombing Prevention is included in NPPD for FY 2015 and FY 2016. The 2017 President's Budget proposes moving it to the CBRNE Office.

Exhibit L. Permanent Positions by Grade

Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance
 Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES	1	1	1	-
GS-15	7	7	14	7
GS-14	3	4	17	13
GS-13	7	7	14	7
GS-12	1	-	1	1
Total Permanent Positions	19	19	47	28
Unfilled Positions EOY	-	-	4	4
Total Permanent Employment EOY	19	19	43	24
Headquarters	19	19	47	28
Total, Federal Assistance:	19	19	47	28
Full Time Equivalents	19	19	43	24
Average ES Salary	183,000	186,000	188,564	2,564
Average GS Salary	120,000	121,000	126,378	5,378
Average Grade	14	14	14	-

Exhibit M. Changes in Full Time Employment

**Department of Homeland Security
Chemical, Biological, Radiological, Nuclear and Explosives Office
Federal Assistance**

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
Increases			
From DNDOM&A to CBRNE Federal Assistance - R/NDFFPC	-	-	19
From OPS Analysis and Operations to CBRNE Federal Assistance - R/NDFFPC	-	-	3
From NPPD Infrastructure Analysis and Planning to CBRNE FA - Bombing Prevention	-	-	19
DHS Balanced Workforce Strategy	-	-	2
Decreases			
Year End Actuals/Estimated FTEs:	19	19	43

Note: The Office of Bombing Prevention is included in NPPD for FY 2015 and FY 2016. The 2017 President's Budget proposes moving it to the CBRNE Office.

Department of Homeland Security

Office of Health Affairs



Fiscal Year 2017
Congressional Justification

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II. Summary of FY 2017 Budget Estimates by Program/Project Activity (PPA)

Department of Homeland Security Office of Health Affairs

Summary of FY 2017 Budget Estimates by Program Project Activity

FY 2017 Request (Dollars in Thousands)

Program Project Activity	FY 2015 ¹			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017								
	Revised Enacted			Enacted			Request			Total Changes			Program Changes			Adjustments-to-Base		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Salaries and Expenses	106	99	\$26,148	103	96	\$27,010	-	-	-	-	-	-	-	-	-	-	-	(\$27,010)
Planning and Coordination	-	-	\$4,995	-	-	\$4,957	-	-	-	-	-	-	-	-	-	-	-	(\$4,957)
Chemical Defense Program	-	-	\$824	-	-	\$824	-	-	-	-	-	-	-	-	-	-	-	(\$824)
National Biosurveillance Integration Center	-	-	\$10,500	-	-	\$10,500	-	-	-	-	-	-	-	-	-	-	-	(\$10,500)
BioWatch	-	-	\$86,891	-	-	\$82,078	-	-	-	-	-	-	-	-	-	-	-	(\$82,078)
Total, Office of Health Affairs	106	99	\$129,358	103	96	\$125,369	-	-	-	-	-	-	-	-	-	-	-	(\$125,369)
Subtotal, Enacted Appropriations & Budget Estimates	106	99	\$129,358	103	96	\$125,369	-	-	-	-	-	-	-	-	-	-	-	(\$125,369)
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-4	-	-	(37)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-113	-	-	-	-	-	(21)	-	-	-	-	-	-	-	-	-	-	-	21
Less: Rescissions of Prior Year Balances	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	106	99	\$129,321	103	96	\$125,348	-	-	-	-	-	-	-	-	-	-	-	(\$125,348)

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

III. Current Services Program Description by PPA

Department of Homeland Security
Office of Health Affairs
BioWatch
Program Performance Justification
(Dollars in Thousands)

PPA: BioWatch

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	-	-	\$86,891
FY 2016 Enacted	-	-	\$82,078
2017 Adjustments-to-Base	-	-	(\$82,078)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$82,078)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

BioWatch		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	86,891
Base	FY 2016 Enacted	-	-	82,078
Current Services	From OHA BioWatch to CBRNE Operations & Support - Chemical, Biological, and Infectious Emerging Diseases Capability	-	-	(82,078)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(82,078)

**Department of Homeland Security
Office of Health Affairs
National Biosurveillance Integration Center
Program Performance Justification**
(Dollars in Thousands)

PPA: National Biosurveillance Integration Center

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	-	-	\$10,500
FY 2016 Enacted	-	-	\$10,500
2017 Adjustments-to-Base	-	-	(\$10,500)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$10,500)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

National Biosurveillance Integration Center		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	10,500
Base	FY 2016 Enacted	-	-	10,500
Current Services	From OHA NBIC to CBRNE Operations & Support - Chemical, Biological, and Infectious Emerging Diseases Capability	-	-	(10,500)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(10,500)

**Department of Homeland Security
Office of Health Affairs
Chemical Defense Program
Program Performance Justification**
(Dollars in Thousands)

PPA: Chemical Defense Program

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	-	-	\$824
FY 2016 Enacted	-	-	\$824
2017 Adjustments-to-Base	-	-	(\$824)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$824)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Chemical Defense Program		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	824
Base	FY 2016 Enacted	-	-	824
Current Services	From OHA CDP to CBRNE Operations & Support - Chemical, Biological, and Infectious Emerging Diseases Capability	-	-	(824)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(824)

**Department of Homeland Security
Office of Health Affairs
Planning and Coordination
Program Performance Justification**
(Dollars in Thousands)

PPA: Planning and Coordination

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	-	-	\$4,995
FY 2016 Enacted	-	-	\$4,957
2017 Adjustments-to-Base	-	-	(\$4,957)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$4,957)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Planning and Coordination		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	4,995
Base	FY 2016 Enacted	-	-	4,957
Current Services	From OHA P&C to CBRNE Operations & Support - Chemical, Biological, and Infectious Emerging Diseases Capability	-	-	(4,957)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(4,957)

**Department of Homeland Security
Office of Health Affairs
Salaries and Expenses
Program Performance Justification**
(Dollars in Thousands)

PPA: Salaries and Expenses

	Perm. Pos.	FTE	Amount
FY 2015 Revised Enacted	106	99	\$26,148
FY 2016 Enacted	103	96	\$27,010
2017 Adjustments-to-Base	(103)	(96)	(\$27,010)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	(103)	(96)	(\$27,010)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Salaries and Expenses		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	106	99	26,148
Base	FY 2016 Enacted	103	96	27,010
Current Services	From OHA S&E to CBRNE Operations & Support - Chemical, Biological, and Infectious Emerging Diseases Capability	(60)	(60)	(13,500)
	From OHA S&E to CBRNE Operations & Support - M&A	(43)	(36)	(13,510)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	(103)	(96)	(27,010)

V. Exhibits and Other Supporting Material
B. FY 2016 to FY 2017 Budget Change

Department of Homeland Security
Office of Health Affairs
Office of Health Affairs
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)

	Pos.	FTE	Amount
FY 2015 Revised Enacted	106	99	\$129,358
FY 2016 Enacted	103	96	\$125,369
Adjustments-to-Base			
Transfers to and from other accounts:			
From OHA S&E to CBRNE Operations & Support - Chemical, Biological, and Infectious Emerging Diseases Capability	(60)	(60)	(\$13,500)
From OHA S&E to CBRNE Operations & Support - M&A	(43)	(36)	(\$13,510)
From OHA P&C to CBRNE Operations & Support - Chemical, Biological, and Infectious Emerging Diseases Capability	-	-	(\$4,957)
From OHA CDP to CBRNE Operations & Support - Chemical, Biological, and Infectious Emerging Diseases Capability	-	-	(\$824)
From OHA NBIC to CBRNE Operations & Support - Chemical, Biological, and Infectious Emerging Diseases Capability	-	-	(\$10,500)
From OHA BioWatch to CBRNE Operations & Support - Chemical, Biological, and Infectious Emerging Diseases Capability	-	-	(\$82,078)
Total Transfers	(103)	(96)	(\$125,369)
Total Adjustments-to-Base	(103)	(96)	(\$125,369)
FY 2017 Current Services	(103)	(96)	(\$125,369)
FY 2017 Request	-	(96)	(\$125,369)
FY 2016 to FY 2017 Change	(103)	(192)	(\$250,738)

D. Summary of Reimbursable Resources

Department of Homeland Security
Office of Health Affairs
Office of Health Affairs
 Summary of Reimbursable Resources
 (Dollars in Thousands)

Collections by Source:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
Department of Homeland Security, OPO	-	-	\$177	-	-	-	-	-	-	-	-	-
DHS - Transportation and Security Administration	-	-	-	-	-	\$650	-	-	-	-	-	(\$650)
Department of Defense	-	-	\$3,000	-	-	\$1,500	-	-	-	-	-	(\$1,500)
Immigration and Customs Enforcement	-	-	\$41,000	-	-	\$41,175	-	-	-	-	-	(\$41,175)
Customs and Border Protection	-	-	\$150	-	-	\$500	-	-	-	-	-	(\$500)
Federal Emergency Management Agency	-	-	\$1,500	-	-	\$1,625	-	-	-	-	-	(\$1,625)
DHS Science & Technology	-	-	\$374	-	-	\$350	-	-	-	-	-	(\$350)
VARIOUS	-	-	\$3	-	-	\$3	-	-	-	-	-	(\$3)
Total Budgetary Resources	-	-	\$46,204	-	-	\$45,803	-	-	-	-	-	(\$45,803)

Obligations by Program/Project Activity:	FY 2015 Revised Enacted			FY 2016 Enacted			FY 2017 Request			Increase/Decrease		
	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount	Pos	FTE	Amount
BioWatch	-	-	\$3,000	-	-	\$1,500	-	-	-	-	-	(\$1,500)
Salaries and Expenses	-	-	\$43,204	-	-	\$44,303	-	-	-	-	-	(\$44,303)
Total Obligations	-	-	\$46,204	-	-	\$45,803	-	-	-	-	-	(\$45,803)

E. Summary of Requirements by Object Class

Department of Homeland Security
Office of Health Affairs
Office of Health Affairs
 Summary of Requirements by Object Class
 (Dollars in Thousands)

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$11,713	\$11,745	-	(\$11,745)
11.3 Other than Full-Time Permanent	-	-	-	-
11.5 Other Personnel Compensation	-	-	-	-
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	\$5,581	\$5,469	-	(\$5,469)
12.1 Civilian Personnel Benefits	\$3,304	\$3,498	-	(\$3,498)
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	\$20,598	\$20,712	-	(\$20,712)
Other Object Classes				
21.0 Travel and Transportation of Persons	\$497	\$501	-	(\$501)
22.0 Transportation of Things	-	-	-	-
23.1 Rental Payments to GSA	\$3,243	\$3,726	-	(\$3,726)
23.2 Rental Payments to Others	-	-	-	-
23.3 Communications, Utilities, and Misc. Charges	\$77	\$20	-	(\$20)
24.0 Printing and Reproduction	\$25	\$29	-	(\$29)
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$40,360	\$36,811	-	(\$36,811)
25.2 Other Services from Non-Federal Sources	\$130	\$127	-	(\$127)
25.3 Other Goods and Services from Federal Sources	\$16,925	\$14,673	-	(\$14,673)
25.4 Operation and Maintenance of Facilities	-	-	-	-
25.5 Research and Development Contracts	-	-	-	-
25.6 Medical Care	-	-	-	-
25.7 Operation and Maintenance of Equipment	\$20	-	-	-
25.8 Subsistence & Support of Persons	-	-	-	-
26.0 Supplies and Materials	\$13,908	\$14,561	-	(\$14,561)
31.0 Equipment	-	\$2,200	-	(\$2,200)
32.0 Land and Structures	-	-	-	-
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	\$33,575	\$32,009	-	(\$32,009)
42.0 Insurance Claims and Indemnities	-	-	-	-
43.1 Interest and Dividends	-	-	-	-
43.2 Immigration Fees	-	-	-	-
44.0 Refunds	-	-	-	-
91.0 Unvouchered	-	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$108,760	\$104,657	-	(\$104,657)
Total, Direct Obligations	\$129,358	\$125,369	-	(\$125,369)
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$129,358	\$125,369	-	(\$125,369)

F. Permanent Positions by Grade

Department of Homeland Security
Office of Health Affairs
Office of Health Affairs
 Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES	4	5	-	(5)
Total, EX	1	1	-	(1)
GS-15	28	26	-	(26)
GS-14	33	33	-	(33)
GS-13	12	12	-	(12)
GS-12	9	9	-	(9)
GS-11	9	8	-	(8)
GS-9	2	2	-	(2)
Other Graded Positions	8	7	-	(7)
Total Permanent Positions	106	103	-	(103)
Unfilled Positions EOY	-	-	-	-
Total Permanent Employment EOY	-	-	-	-
Headquarters	106	103	-	(103)
Total, Office of Health Affairs:	106	103	-	(103)
Full Time Equivalents	99	96	-	(96)
Average ES Salary	172,949	174,696	-	(174,696)
Average GS Salary	115,679	113,701	-	(113,701)
Average Grade	14	14	-	(14)

H. PPA Budget Justifications

Department of Homeland Security
Office of Health Affairs
Salaries and Expenses
 Summary of Requirements by Object Class
 (Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$11,713	\$11,745	-	(\$11,745)
11.8 Special Personal Services Payments	\$1,090	\$1,090	-	(\$1,090)
12.1 Civilian Personnel Benefits	\$3,304	\$3,498	-	(\$3,498)
Total, Personnel and Compensation Benefits	\$16,107	\$16,333	-	(\$16,333)
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$104	\$104	-	(\$104)
23.1 Rental Payments to GSA	\$3,243	\$3,726	-	(\$3,726)
24.0 Printing and Reproduction	\$25	\$25	-	(\$25)
25.1 Advisory and Assistance Services	\$300	\$300	-	(\$300)
25.2 Other Services from Non-Federal Sources	\$120	\$120	-	(\$120)
25.3 Other Goods and Services from Federal Sources	\$6,127	\$6,280	-	(\$6,280)
26.0 Supplies and Materials	\$122	\$122	-	(\$122)
Total, Other Object Classes	\$10,041	\$10,677	-	(\$10,677)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$26,148	\$27,010	-	(\$27,010)
Full Time Equivalents	99	96	-	(96)

Department of Homeland Security
Office of Health Affairs
Planning and Coordination
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.8 Special Personal Services Payments	\$1,499	\$1,499	-	(\$1,499)
Total, Personnel and Compensation Benefits	\$1,499	\$1,499	-	(\$1,499)
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$125	\$125	-	(\$125)
25.1 Advisory and Assistance Services	\$1,150	\$1,112	-	(\$1,112)
25.3 Other Goods and Services from Federal Sources	\$1,723	\$1,723	-	(\$1,723)
26.0 Supplies and Materials	\$498	\$498	-	(\$498)
Total, Other Object Classes	\$3,496	\$3,458	-	(\$3,458)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$4,995	\$4,957	-	(\$4,957)
Full Time Equivalents	-	-	-	-

Department of Homeland Security
Office of Health Affairs
Chemical Defense Program
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.8 Special Personal Services Payments	\$187	\$187	-	(\$187)
Total, Personnel and Compensation Benefits	\$187	\$187	-	(\$187)
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$33	\$33	-	(\$33)
25.1 Advisory and Assistance Services	\$604	\$604	-	(\$604)
Total, Other Object Classes	\$637	\$637	-	(\$637)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$824	\$824	-	(\$824)
Full Time Equivalents	-	-	-	-

Department of Homeland Security
Office of Health Affairs
National Biosurveillance Integration Center
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.8 Special Personal Services Payments	\$1,154	\$1,154	-	(\$1,154)
Total, Personnel and Compensation Benefits	\$1,154	\$1,154	-	(\$1,154)
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$35	\$35	-	(\$35)
25.1 Advisory and Assistance Services	\$5,251	\$5,251	-	(\$5,251)
25.3 Other Goods and Services from Federal Sources	\$560	\$560	-	(\$560)
41.0 Grants, Subsidies, and Contributions	\$3,500	\$3,500	-	(\$3,500)
Total, Other Object Classes	\$9,346	\$9,346	-	(\$9,346)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$10,500	\$10,500	-	(\$10,500)
Full Time Equivalents	-	-	-	-

Department of Homeland Security
Office of Health Affairs
BioWatch
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.8 Special Personal Services Payments	\$1,651	\$1,539	-	(\$1,539)
Total, Personnel and Compensation Benefits	\$1,651	\$1,539	-	(\$1,539)
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$200	\$204	-	(\$204)
23.3 Communications, Utilities, and Misc. Charges	\$77	\$20	-	(\$20)
24.0 Printing and Reproduction	-	\$4	-	(\$4)
25.1 Advisory and Assistance Services	\$33,055	\$29,544	-	(\$29,544)
25.2 Other Services from Non-Federal Sources	\$10	\$7	-	(\$7)
25.3 Other Goods and Services from Federal Sources	\$8,515	\$6,110	-	(\$6,110)
25.7 Operation and Maintenance of Equipment	\$20	-	-	-
26.0 Supplies and Materials	\$13,288	\$13,941	-	(\$13,941)
31.0 Equipment	-	\$2,200	-	(\$2,200)
41.0 Grants, Subsidies, and Contributions	\$30,075	\$28,509	-	(\$28,509)
Total, Other Object Classes	\$85,240	\$80,539	-	(\$80,539)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$86,891	\$82,078	-	(\$82,078)
Full Time Equivalents	-	-	-	-

I. Changes in Full Time Employment

**Department of Homeland Security
Office of Health Affairs
Office of Health Affairs**

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
BASE: Year End Actual from Prior Year	99	99	96
Increases			
Decreases			
S&E	-	(3)	(96)
Subtotal, Decreases	-	(3)	(96)
Year End Actuals/Estimated FTEs:	99	96	-
Net Change from prior year base to Budget Year Estimate:	-	(3)	(96)

J. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

Department of Homeland Security
Office of Health Affairs
Office of Health Affairs
(Dollars in Thousands)

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Salaries and Expenses	\$9,799	\$9,587	-	(\$9,587)
Total Working Capital Fund	\$9,799	\$9,587	-	(\$9,587)

Department of Homeland Security

Domestic Nuclear Detection Office Management and Administration



Fiscal Year 2017
Congressional Justification

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II. Summary of FY 2017 Budget Estimates by Program/Project Activity (PPA)

Department of Homeland Security Domestic Nuclear Detection Office Management and Administration

Summary of FY 2017 Budget Estimates by Program Project Activity

FY 2017 Request (Dollars in Thousands)

Program Project Activity	FY 2015:			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017										
	Revised Enacted		Amount	Enacted		Amount	Request			Total Changes			Program Changes			Adjustments-to-Base				
	POS	FTE		POS	FTE		POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount		
Management and Administration	127	127	\$38,601	137	137	\$38,109	-	-	-	-	-	-	-	-	-	-	-	(137)	(137)	(\$38,109)
Total, Management and Administration	127	127	\$38,601	137	137	\$38,109	-	-	-	-	-	-	-	-	-	-	-	(137)	(137)	(\$38,109)
Subtotal, Enacted Appropriations & Budget Estimates	127	127	\$38,601	137	137	\$38,109	-	-	-	-	-	-	-	-	-	-	-	(137)	(137)	(\$38,109)
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-4	-	-	(69)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-113	-	-	-	-	-	(84)	-	-	-	-	-	-	-	-	-	-	-	-	-	84
Less: Rescissions of Prior Year Balances	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	127	127	\$38,532	137	137	\$38,025	-	-	-	-	-	-	-	-	-	-	-	(137)	(137)	(\$38,025)

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

III. Current Services Program Description by PPA

**Department of Homeland Security
Domestic Nuclear Detection Office
Management and Administration
Program Performance Justification**
(Dollars in Thousands)

PPA: Management and Administration

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	127	127	\$38,601
FY 2016 Enacted	137	137	\$38,109
2017 Adjustments-to-Base	(137)	(137)	(\$38,109)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	(137)	(137)	(\$38,109)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Management and Administration		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	127	127	38,601
Base	FY 2016 Enacted	137	137	38,109
Current Services	From DNDO M&A-M&A to CBRNE Federal Assistance - R/NDFPC	(19)	(19)	(4,092)
	From DNDO M&A-M&A to CBRNE Operations & Support - M&A	(34)	(34)	(18,580)
	From DNDO M&A-M&A to CBRNE Operations & Support - R/NDFPC	(24)	(24)	(5,091)
	From DNDO M&A-M&A to CBRNE PC&I - R/NDFPC	(7)	(7)	(1,573)
	From DNDO M&A-M&A to CBRNE Research & Development - R/NDFPC	(53)	(53)	(8,773)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	(137)	(137)	(38,109)

V. Exhibits and Other Supporting Material

B. FY 2016 to FY 2017 Budget Change

**Department of Homeland Security
Domestic Nuclear Detection Office
Management and Administration**
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)

	Pos.	FTE	Amount
FY 2015 Revised Enacted	127	127	\$38,601
FY 2016 Enacted	137	137	\$38,109
Adjustments-to-Base			
Transfers to and from other accounts:			
From DNDO M&A-M&A to CBRNE Federal Assistance - R/NDFPC	(19)	(19)	(\$4,092)
From DNDO M&A-M&A to CBRNE Operations & Support - M&A	(34)	(34)	(\$18,580)
From DNDO M&A-M&A to CBRNE Operations & Support - R/NDFPC	(24)	(24)	(\$5,091)
From DNDO M&A-M&A to CBRNE PC&I - R/NDFPC	(7)	(7)	(\$1,573)
From DNDO M&A-M&A to CBRNE Research & Development - R/NDFPC	(53)	(53)	(\$8,773)
Total Transfers	(137)	(137)	(\$38,109)
Total Adjustments-to-Base	(137)	(137)	(\$38,109)
FY 2017 Current Services	-	-	-
FY 2017 Request	-	-	-
FY 2016 to FY 2017 Change	(137)	(137)	(\$38,109)

D. Summary of Reimbursable Resources

N/A

E. Summary of Requirements by Object Class

**Department of Homeland Security
Domestic Nuclear Detection Office
Management and Administration**
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	\$16,019	\$17,067	-	(\$17,067)
11.3 Other than Full-Time Permanent	-	-	-	-
11.5 Other Personnel Compensation	\$236	\$200	-	(\$200)
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	-	-	-	-
12.1 Civilian Personnel Benefits	\$4,733	\$6,354	-	(\$6,354)
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	\$20,988	\$23,621	-	(\$23,621)
Other Object Classes				
21.0 Travel and Transportation of Persons	\$100	\$75	-	(\$75)
22.0 Transportation of Things	-	-	-	-
23.1 Rental Payments to GSA	\$5,298	\$5,227	-	(\$5,227)
23.2 Rental Payments to Others	-	-	-	-
23.3 Communications, Utilities, and Misc. Charges	-	-	-	-
24.0 Printing and Reproduction	\$20	\$22	-	(\$22)
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$1,046	\$515	-	(\$515)
25.2 Other Services from Non-Federal Sources	\$174	\$115	-	(\$115)
25.3 Other Goods and Services from Federal Sources	\$10,245	\$7,950	-	(\$7,950)
25.4 Operation and Maintenance of Facilities	-	-	-	-
25.5 Research and Development Contracts	-	-	-	-
25.6 Medical Care	-	-	-	-
25.7 Operation and Maintenance of Equipment	\$385	\$289	-	(\$289)
25.8 Subsistence & Support of Persons	-	-	-	-
26.0 Supplies and Materials	\$146	\$146	-	(\$146)
31.0 Equipment	\$199	\$149	-	(\$149)
32.0 Land and Structures	-	-	-	-
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	-	-	-	-
42.0 Insurance Claims and Indemnities	-	-	-	-
43.1 Interest and Dividends	-	-	-	-
43.2 Immigration Fees	-	-	-	-
44.0 Refunds	-	-	-	-
91.0 Unvouchered	-	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$17,613	\$14,488	-	(\$14,488)
Total, Direct Obligations	\$38,601	\$38,109	-	(\$38,109)
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$38,601	\$38,109	-	(\$38,109)

F. Permanent Positions by Grade

Department of Homeland Security Domestic Nuclear Detection Office Management and Administration

Permanent Positions by Grade

Grades and Salary Range	FY 2015	FY 2016	FY 2017	FY 2016 to
	Revised Enacted	Enacted	Request	FY 2017 Change
	Pos.	Pos.	Pos.	Total
Total, SES	8	8	-	(8)
Total, EX	1	1	-	(1)
GS-15	61	61	-	(61)
GS-14	23	33	-	(33)
GS-13	26	21	-	(21)
GS-12	4	7	-	(7)
GS-11	1	3	-	(3)
GS-9	2	2	-	(2)
GS-3	1	1	-	(1)
Total Permanent Positions	127	137	-	(137)
Unfilled Positions EOY	-	-	-	-
Total Permanent Employment EOY	127	137	-	(137)
Headquarters	127	137	-	(137)
Total, Management and Administration:	127	137	-	(137)
Full Time Equivalents	127	137	-	(137)
Average ES Salary	175,000	177,000	-	(177,000)
Average GS Salary	127,000	124,000	-	(124,000)
Average Grade	15	15	-	(15)

H. PPA Budget Justifications

**Department of Homeland Security
Domestic Nuclear Detection Office
Management and Administration**
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
11.1 Full-time Permanent	\$16,019	\$17,067	-	(\$17,067)
11.5 Other Personnel Compensation	\$236	\$200	-	(\$200)
12.1 Civilian Personnel Benefits	\$4,733	\$6,354	-	(\$6,354)
Total, Personnel and Compensation Benefits	\$20,988	\$23,621	-	(\$23,621)
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$100	\$75	-	(\$75)
23.1 Rental Payments to GSA	\$5,298	\$5,227	-	(\$5,227)
24.0 Printing and Reproduction	\$20	\$22	-	(\$22)
25.1 Advisory and Assistance Services	\$1,046	\$515	-	(\$515)
25.2 Other Services from Non-Federal Sources	\$174	\$115	-	(\$115)
25.3 Other Goods and Services from Federal Sources	\$10,245	\$7,950	-	(\$7,950)
25.7 Operation and Maintenance of Equipment	\$385	\$289	-	(\$289)
26.0 Supplies and Materials	\$146	\$146	-	(\$146)
31.0 Equipment	\$199	\$149	-	(\$149)
Total, Other Object Classes	\$17,613	\$14,488	-	(\$14,488)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$38,601	\$38,109	-	(\$38,109)
Full Time Equivalents	127	137	-	(137)

I. Changes in Full Time Employment

	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request
BASE: Year End Actual from Prior Year	124	127	137
Increases			
Hiring to fill vacant positions	3	-	-
Contractor Insourcing	-	10	-
Subtotal, Increases	3	10	-
Decreases			
Transfer for Common Appropriation Structure	-	-	(137)
Subtotal, Decreases	-	-	(137)
Year End Actuals/Estimated FTEs:	127	137	-
Net Change from prior year base to Budget Year Estimate:	3	10	(137)

J. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

Department of Homeland Security
 Domestic Nuclear Detection Office
 Management and Administration
 (Dollars in Thousands)

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Management and Administration	\$12,639	\$11,092	-	(\$11,092)
Total Working Capital Fund	\$12,639	\$11,092	-	(\$11,092)

Department of Homeland Security

Domestic Nuclear Detection Office
Research, Development, and Operations



Fiscal Year 2017
Congressional Justification

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II. Summary of FY 2017 Budget Estimates by Program/Project Activity (PPA)

Department of Homeland Security

Domestic Nuclear Detection Office

Research, Development, and Operations

Summary of FY 2017 Budget Estimates by Program Project Activity

FY 2017 Request

(Dollars in Thousands)

Program Project Activity	FY 2015 ¹			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017								
	Revised Enacted			Enacted			Request			Total Changes			Program Changes			Adjustments-to-Base		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Systems Architecture	-	-	\$16,858	-	-	\$17,000	-	-	-	-	-	-	-	-	-	-	-	(\$17,000)
Systems Development	-	-	\$21,302	-	-	\$22,000	-	-	-	-	-	-	-	-	-	-	-	(\$22,000)
Transformational Research and Development	-	-	\$69,286	-	-	\$68,000	-	-	-	-	-	-	-	-	-	-	-	(\$68,000)
Assessments	-	-	\$37,642	-	-	\$38,000	-	-	-	-	-	-	-	-	-	-	-	(\$38,000)
Operations Support	-	-	\$30,759	-	-	\$31,000	-	-	-	-	-	-	-	-	-	-	-	(\$31,000)
Nuclear Forensics	-	-	\$21,079	-	-	\$20,000	-	-	-	-	-	-	-	-	-	-	-	(\$20,000)
Total, Research, Development, and Operations	-	-	\$196,638	-	-	\$196,000	-	-	-	-	-	-	-	-	-	-	-	(\$196,000)
Subtotal, Enacted Appropriations & Budget Estimates	-	-	\$196,638	-	-	\$196,000	-	-	-	-	-	-	-	-	-	-	-	(\$196,000)
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: 505 Rescissions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	-	-	\$196,638	-	-	\$196,000	-	-	-	-	-	-	-	-	-	-	-	(\$196,000)

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

III. Current Services Program Description by PPA

Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Systems Architecture
Program Performance Justification
(Dollars in Thousands)

PPA: Systems Architecture

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	-	-	\$16,858
FY 2016 Enacted	-	-	\$17,000
2017 Adjustments-to-Base	-	-	(\$17,000)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$17,000)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Systems Architecture		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	16,858
Base	FY 2016 Enacted	-	-	17,000
Current Services	From DNDO RD&O-Systems Architecture to CBRNE Operations & Support - R/NDFPC	-	-	(16,200)
	From DNDO RD&O-Systems Architecture to CBRNE Operations & Support - M&A	-	-	(800)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(17,000)

**Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Systems Development
Program Performance Justification
(Dollars in Thousands)**

PPA: Systems Development

	Perm. Pos.	FTE	Amount
FY 2015 Revised Enacted	-	-	\$21,302
FY 2016 Enacted	-	-	\$22,000
2017 Adjustments-to-Base	-	-	(\$22,000)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$22,000)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Systems Development		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	21,302
Base	FY 2016 Enacted	-	-	22,000
Current Services	From DNDO RD&O-Systems Development to CBRNE Operations & Support - M&A	-	-	(402)
	From DNDO RD&O-Systems Development to CBRNE Research & Development-R/NDFPC	-	-	(21,598)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(22,000)

**Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Transformational Research and Development
Program Performance Justification**
(Dollars in Thousands)

PPA: Transformational Research and Development

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	-	-	\$69,286
FY 2016 Enacted	-	-	\$68,000
2017 Adjustments-to-Base	-	-	(\$68,000)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$68,000)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Transformational Research and Development		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	69,286
Base	FY 2016 Enacted	-	-	68,000
Current Services	From DNDO RD&O-Transformational R&D to CBRNE Operations & Support - M&A	-	-	(1,554)
	From DNDO RD&O-Transformational R&D to CBRNE Research & Development-R/NDFPC	-	-	(66,446)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(68,000)

**Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Assessments
Program Performance Justification
(Dollars in Thousands)**

PPA: Assessments

	Perm. Pos.	FTE	Amount
FY 2015 Revised Enacted	-	-	\$37,642
FY 2016 Enacted	-	-	\$38,000
2017 Adjustments-to-Base	-	-	(\$38,000)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$38,000)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Assessments		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	37,642
Base	FY 2016 Enacted	-	-	38,000
Current Services	From DNDO RD&O-Assessments to CBRNE Operations & Support - M&A	-	-	(870)
	From DNDO RD&O-Assessments to CBRNE Research & Development-R/NDFPC	-	-	(37,130)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(38,000)

**Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Operations Support
Program Performance Justification
(Dollars in Thousands)**

PPA: Operations Support

	<u>Perm. Pos.</u>	<u>FTE</u>	<u>Amount</u>
FY 2015 Revised Enacted	-	-	\$30,759
FY 2016 Enacted	-	-	\$31,000
2017 Adjustments-to-Base	-	-	(\$31,000)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$31,000)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Operations Support		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	30759
Base	FY 2016 Enacted	-	-	31,000
Current Services	From DNDO RD&O-Operations Support to CBRNE Federal Assistance- R/NDFPC	-	-	(26,792)
	From DNDO RD&O-Operations Support to CBRNE Operations & Support - M&A	-	-	(805)
	From DNDO RD&O-Operations Support to CBRNE Research & Development - R/NDFPC	-	-	(3,403)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(31,000)

**Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Nuclear Forensics
Program Performance Justification
(Dollars in Thousands)**

PPA: Nuclear Forensics

	Perm. Pos.	FTE	Amount
FY 2015 Revised Enacted	-	-	\$20,791
FY 2016 Enacted	-	-	\$20,000
2017 Adjustments-to-Base	-	-	(\$20,000)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$20,000)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Nuclear Forensics		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	20791
Base	FY 2016 Enacted	-	-	20,000
Current Services	From DNDO RD&O-Nuclear Forensics to CBRNE Operations & Support - M&A	-	-	(451)
	From DNDO RD&O-Nuclear Forensics to CBRNE Research & Development - R/NDFPC	-	-	(19,549)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(20,000)

V. Exhibits and Other Supporting Material

B. FY 2016 to FY 2017 Budget Change

**Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations**
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)

	Pos.	FTE	Amount
FY 2015 Revised Enacted	-	-	\$196,638
FY 2016 Enacted	-	-	\$196,000
Adjustments-to-Base			
Transfers to and from other accounts:			
From DNDO RD&O-Systems Architecture to CBRNE Operations & Support - R/NDFFPC	-	-	(\$16,200)
From DNDO RD&O-Systems Architecture to CBRNE Operations & Support - M&A	-	-	(\$800)
From DNDO RD&O-Systems Development to CBRNE Operations & Support - M&A	-	-	(\$402)
From DNDO RD&O-Systems Development to CBRNE Research & Development-R/NDFFPC	-	-	(\$21,598)
From DNDO RD&O-Transformational R&D to CBRNE Operations & Support - M&A	-	-	(\$1,554)
From DNDO RD&O-Transformational R&D to CBRNE Research & Development-R/NDFFPC	-	-	(\$66,446)
From DNDO RD&O-Assessments to CBRNE Operations & Support - M&A	-	-	(\$870)
From DNDO RD&O-Assessments to CBRNE Research & Development-R/NDFFPC	-	-	(\$37,130)
From DNDO RD&O-Operations Support to CBRNE Federal Assistance- R/NDFFPC	-	-	(\$26,792)
From DNDO RD&O-Operations Support to CBRNE Operations & Support - M&A	-	-	(\$805)
From DNDO RD&O-Operations Support to CBRNE Research & Development - R/NDFFPC	-	-	(\$3,403)
From DNDO RD&O-Nuclear Forensics to CBRNE Operations & Support - M&A	-	-	(\$451)
From DNDO RD&O-Nuclear Forensics to CBRNE Research & Development - R/NDFFPC	-	-	(\$19,549)
Total Transfers	-	-	(\$196,000)
Total Adjustments-to-Base	-	-	(\$196,000)
FY 2017 Current Services	-	-	-
FY 2017 Request	-	-	-
FY 2016 to FY 2017 Change	-	-	(\$196,000)

D. Summary of Reimbursable Resources

N/A

E. Summary of Requirements By Object Class

**Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	-	-	-	-
11.3 Other than Full-Time Permanent	-	-	-	-
11.5 Other Personnel Compensation	-	-	-	-
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	-	-	-	-
12.1 Civilian Personnel Benefits	-	-	-	-
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	-	-	-	-
Other Object Classes				
21.0 Travel and Transportation of Persons	\$1,726	\$1,577	-	(\$1,577)
22.0 Transportation of Things	-	-	-	-
23.1 Rental Payments to GSA	-	-	-	-
23.2 Rental Payments to Others	-	-	-	-
23.3 Communications, Utilities, and Misc. Charges	-	-	-	-
24.0 Printing and Reproduction	\$8	-	-	-
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$46,636	\$56,240	-	(\$56,240)
25.2 Other Services from Non-Federal Sources	\$2,688	\$1,142	-	(\$1,142)
25.3 Other Goods and Services from Federal Sources	\$73,350	\$60,794	-	(\$60,794)
25.4 Operation and Maintenance of Facilities	-	-	-	-
25.5 Research and Development Contracts	\$69,998	\$71,313	-	(\$71,313)
25.6 Medical Care	-	-	-	-
25.7 Operation and Maintenance of Equipment	-	-	-	-
25.8 Subsistence & Support of Persons	-	-	-	-
26.0 Supplies and Materials	-	\$11	-	(\$11)
31.0 Equipment	-	-	-	-
32.0 Land and Structures	-	-	-	-
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	\$2,232	\$4,923	-	(\$4,923)
42.0 Insurance Claims and Indemnities	-	-	-	-
43.1 Interest and Dividends	-	-	-	-
43.2 Immigration Fees	-	-	-	-
44.0 Refunds	-	-	-	-
91.0 Unvouchered	-	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$196,638	\$196,000	-	(\$196,000)
Total, Direct Obligations	\$196,638	\$196,000	-	(\$196,000)
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$196,638	\$196,000	-	(\$196,000)

F. Permanent Positions by Grade

N/A

H. PPA Budget Justifications

**Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Systems Architecture
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$330	\$301	-	(\$301)
24.0 Printing and Reproduction	\$8	-	-	-
25.1 Advisory and Assistance Services	\$7,839	\$10,839	-	(\$10,839)
25.2 Other Services from Non-Federal Sources	\$1,277	\$687	-	(\$687)
25.3 Other Goods and Services from Federal Sources	\$7,404	\$5,162	-	(\$5,162)
26.0 Supplies and Materials	-	\$11	-	(\$11)
Total, Other Object Classes	\$16,858	\$17,000	-	(\$17,000)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$16858	\$17,000	-	(\$17,000)
Full Time Equivalents	-	-	-	-

Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Systems Development
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$125	\$65	-	(\$65)
25.1 Advisory and Assistance Services	\$10,966	\$12,350	-	(\$12,350)
25.2 Other Services from Non-Federal Sources	\$700	\$65	-	(\$65)
25.3 Other Goods and Services from Federal Sources	\$6,699	\$3,084	-	(\$3,084)
25.5 Research and Development Contracts	\$2,812	\$6,436	-	(\$6,436)
Total, Other Object Classes	\$21,302	\$22,000	-	(\$22,000)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$21,302	\$22,000	-	(\$22,000)
Full Time Equivalents	-	-	-	-

**Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Transformational Research and Development
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$180	\$179	-	(\$179)
25.1 Advisory and Assistance Services	\$3,268	\$2,394	-	(\$2,394)
25.3 Other Goods and Services from Federal Sources	\$1,691	\$108	-	(\$108)
25.5 Research and Development Contracts	\$64,141	\$62,712	-	(\$62,712)
41.0 Grants, Subsidies, and Contributions	\$6	\$2,607	-	(\$2,607)
Total, Other Object Classes	\$69,286	\$68,000	-	(\$68,000)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$69,286	\$68,000	-	(\$68,000)
Full Time Equivalent	-	-	-	-

**Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Assessments**

**Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$553	\$518	-	(\$518)
25.1 Advisory and Assistance Services	\$11,315	\$14,230	-	(\$14,230)
25.2 Other Services from Non-Federal Sources	\$324	-	-	-
25.3 Other Goods and Services from Federal Sources	\$25,450	\$23,252	-	(\$23,252)
Total, Other Object Classes	\$37,642	\$38,000	-	(\$38,000)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$37,642	\$38,000	-	(\$38,000)
Full Time Equivalents	-	-	-	-

Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Operations Support
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$412	\$393	-	(\$393)
25.1 Advisory and Assistance Services	\$9,845	\$13,200	-	(\$13,200)
25.2 Other Services from Non-Federal Sources	\$387	\$390	-	(\$390)
25.3 Other Goods and Services from Federal Sources	\$20,115	\$17,017	-	(\$17,017)
Total, Other Object Classes	\$30,759	\$31,000	-	(\$31,000)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$30,759	\$31,000	-	(\$31,000)
Full Time Equivalents	-	-	-	-

**Department of Homeland Security
Domestic Nuclear Detection Office
Research, Development, and Operations
Nuclear Forensics
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$126	\$121	-	(\$121)
25.1 Advisory and Assistance Services	\$3,403	\$3,227	-	(\$3,227)
25.3 Other Goods and Services from Federal Sources	\$11,991	\$12,171	-	(\$12,171)
25.5 Research and Development Contracts	\$3,045	\$2,165	-	(\$2,165)
41.0 Grants, Subsidies, and Contributions	\$2,226	\$2,316	-	(\$2,316)
Total, Other Object Classes	\$20,791	\$20,000	-	(\$20,000)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$20,791	\$20,000	-	(\$20,000)
Full Time Equivalent	-	-	-	-

I. Changes In Full Time Employment

N/A

J. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

Department of Homeland Security
 Domestic Nuclear Detection Office
 Research, Development, and Operations
 (Dollars in Thousands)

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Systems Architecture	\$164	\$169	-	(\$169)
Systems Development	201	\$219	-	(\$219)
Transformational Research and Development	636	\$677	-	(\$677)
Assessments	349	\$378	-	(\$378)
Operations Support	289	\$309	-	(\$309)
Nuclear Forensics	183	\$199	-	(\$199)
Total Working Capital Fund	\$1,822	\$1,951	-	(\$1,951)

Department of Homeland Security

Domestic Nuclear Detection Office Systems Acquisition



Fiscal Year 2017
Congressional Justification

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II. Summary of FY 2017 Budget Estimates by Program/Project Activity (PPA)

Department of Homeland Security Domestic Nuclear Detection Office Systems Acquisition:

Summary of FY 2017 Budget Estimates by Program Project Activity

FY 2017 Request (Dollars in Thousands)

Program Project Activity	FY 2015:			FY 2016			FY 2017			Increase(+) or Decrease(-) for FY 2017								
	Revised Enacted			Enacted			Request			Total Changes			Program Changes			Adjustments-to-Base		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Radiological and Nuclear Detection Equipment (RDE) Acquisition	-	-	\$53,603	-	-	\$91,011	-	-	-	-	-	(\$91,011)	-	-	-	-	-	(\$91,011)
Radiation Portal Monitor Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Securing the Cities	-	-	\$19,000	-	-	\$22,000	-	-	-	-	-	(\$22,000)	-	-	-	-	-	(\$22,000)
Human Portable Radiation Detection Systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total, Systems Acquisition:	-	-	\$72,603	-	-	\$113,011	-	-	-	-	-	(\$113,011)	-	-	-	-	-	(\$113,011)
Subtotal, Enacted Appropriations & Budget Estimates	-	-	\$72,603	-	-	\$113,011	-	-	-	-	-	(\$113,011)	-	-	-	-	-	(\$113,011)
Less: Adjustments for Other Funding Sources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescission of prior year unobligated balances pursuant to P.L. 114-113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Rescissions of Prior Year Balances	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net, Enacted Appropriations and Budget Estimates:	-	-	\$72,603	-	-	\$113,011	-	-	-	-	-	(\$113,011)	-	-	-	-	-	(\$113,011)

¹Reflects reprogrammings/transfers, as applicable, and actual FTE. This footnote applies to all FY 2015 Revised Enacted tables throughout the CJ Submission.

III. Current Services Program Description by PPA

Department of Homeland Security
Domestic Nuclear Detection Office
Systems Acquisition
Securing the Cities
Program Performance Justification
 (Dollars in Thousands)

PPA: Securing the Cities

	Perm. Pos.	FTE	Amount
FY 2015 Revised Enacted	-	-	\$19,000
FY 2016 Enacted	-	-	\$22,000
2017 Adjustments-to-Base	-	-	(\$22,000)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$22,000)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Securing the Cities		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	19,000
Base	FY 2016 Enacted	-	-	22,000
Current Services	From DNDO Sys Acq-Securing the Cities to CBRNE Federal Assistance - R/NDFPC	-	-	(21,424)
	From DNDO Sys Acq-Securing the Cities to CBRNE Operations & Support - M&A	-	-	(576)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(22,000)

**Department of Homeland Security
Domestic Nuclear Detection Office
Systems Acquisition
Radiological and Nuclear Detection Equipment (RDE) Acquisition
Program Performance Justification
(Dollars in Thousands)**

PPA: Radiological and Nuclear Detection Equipment (RDE) Acquisition

	Perm. Pos.	FTE	Amount
FY 2015 Revised Enacted	-	-	\$53,603
FY 2016 Enacted	-	-	\$91,011
2017 Adjustments-to-Base	-	-	(\$91,011)
FY 2017 Current Services	-	-	-
FY 2017 Program Change	-	-	-
FY 2017 Total Request	-	-	-
Total Change 2016 to 2017	-	-	(\$91,011)

CURRENT SERVICES PROGRAM DESCRIPTION:

As a result of the Common Appropriation Structure, FY 2016 base funds will be transferred out to:

Radiological and Nuclear Detection Equipment (RDE) Acquisition		Positions	FTE	Amount
Prior Year	FY 2015 Revised Enacted	-	-	53,603
Base	FY 2016 Enacted	-	-	91,011
Current Services	From DNDO Sys Acq-RDE Acquisition to CBRNE Operations & Support - M&A	-	-	(1,718)
	From DNDO Sys Acq-RDE Acquisition to CBRNE PC&I - R/NDFPC	-	-	(89,293)
Budget Year	FY 2017 Request	-	-	-
	Total Change from FY 2016 to FY 2017	-	-	(91,011)

V. Exhibits and Other Supporting Material

B. FY 2016 to FY 2017 Budget Change

**Department of Homeland Security
Domestic Nuclear Detection Office
Systems Acquisition:
FY 2016 to FY 2017 Budget Change
(Dollars in Thousands)**

	Pos.	FTE	Amount
FY 2015 Revised Enacted	-	-	\$72,603
FY 2016 Enacted	-	-	\$113,011
Adjustments-to-Base			
Transfers to and from other accounts:			
From DNDO Sys Acq-RDE Acquisition to CBRNE Operations & Support - M&A	-	-	(\$1,718)
From DNDO Sys Acq-RDE Acquisition to CBRNE PC&I - R/NDFPC	-	-	(\$89,293)
From DNDO Sys Acq-Securing the Cities to CBRNE Federal Assistance - R/NDFPC	-	-	(\$21,424)
From DNDO Sys Acq-Securing the Cities to CBRNE Operations & Support - M&A	-	-	(\$576)
Total Transfers	-	-	(\$113,011)
Total Adjustments-to-Base	-	-	(\$113,011)
FY 2017 Current Services	-	-	-
FY 2017 Request	-	-	-
FY 2016 to FY 2017 Change	-	-	(\$113,011)

D. Summary of Reimbursable Resources

N/A

E. Summary of Requirements by Object Class

**Department of Homeland Security
Domestic Nuclear Detection Office
Systems Acquisition:
Summary of Requirements by Object Class
(Dollars in Thousands)**

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Personnel and Other Compensation Benefits				
11.1 Full-time Permanent	-	-	-	-
11.3 Other than Full-Time Permanent	-	-	-	-
11.5 Other Personnel Compensation	-	-	-	-
11.6 Military Personnel-Basic Allowance for Housing	-	-	-	-
11.7 Military Personnel	-	-	-	-
11.8 Special Personal Services Payments	-	-	-	-
12.1 Civilian Personnel Benefits	-	-	-	-
12.2 Military Personnel Benefits	-	-	-	-
13.0 Benefits for Former Personnel	-	-	-	-
Total, Personnel and Other Compensation Benefits	-	-	-	-
Other Object Classes				
21.0 Travel and Transportation of Persons	\$15	\$27	-	(\$27)
22.0 Transportation of Things	-	-	-	-
23.1 Rental Payments to GSA	-	-	-	-
23.2 Rental Payments to Others	-	-	-	-
23.3 Communications, Utilities, and Misc. Charges	-	-	-	-
24.0 Printing and Reproduction	-	-	-	-
25.0 Other Contractual Services	-	-	-	-
25.1 Advisory and Assistance Services	\$1,990	\$2,694	-	(\$2,694)
25.2 Other Services from Non-Federal Sources	-	-	-	-
25.3 Other Goods and Services from Federal Sources	\$5,763	\$3,652	-	(\$3,652)
25.4 Operation and Maintenance of Facilities	-	-	-	-
25.5 Research and Development Contracts	-	-	-	-
25.6 Medical Care	-	-	-	-
25.7 Operation and Maintenance of Equipment	-	-	-	-
25.8 Subsistence & Support of Persons	-	-	-	-
26.0 Supplies and Materials	-	-	-	-
31.0 Equipment	\$47,800	\$88,588	-	(\$88,588)
32.0 Land and Structures	-	-	-	-
33.0 Investments and loans	-	-	-	-
41.0 Grants, Subsidies, and Contributions	\$17,035	\$18,050	-	(\$18,050)
42.0 Insurance Claims and Indemnities	-	-	-	-
43.1 Interest and Dividends	-	-	-	-
43.2 Immigration Fees	-	-	-	-
44.0 Refunds	-	-	-	-
91.0 Unvouchered	-	-	-	-
93.1 Limitation on expenses	-	-	-	-
99.0 Subtotal, Obligations	-	-	-	-
99.5 Below Reporting Threshold	-	-	-	-
Total, Other Object Classes	\$72,603	\$113,011	-	(\$113,011)
Total, Direct Obligations	\$72,603	\$113,011	-	(\$113,011)
Adjustments				
Net Offsetting Collections	-	-	-	-
Unobligated Balance, start of year	-	-	-	-

Object Classes	2015 Revised Enacted	2016 Enacted	2017 Request	FY 2016 to FY 2017 Change
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Offsetting Collections	-	-	-	-
Total Requirements	\$72,603	\$113,011	-	(\$113,011)

F. Permanent Positions by Grade

N/A

H. PPA Budget Justifications

Department of Homeland Security
Domestic Nuclear Detection Office
Systems Acquisition:
Radiological and Nuclear Detection Equipment (RDE) Acquisition
 Summary of Requirements by Object Class
 (Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
25.1 Advisory and Assistance Services	\$1,339	\$1,571	-	(\$1,571)
25.3 Other Goods and Services from Federal Sources	\$4,464	\$852	-	(\$852)
31.0 Equipment	\$47,800	\$88,588	-	(\$88,588)
Total, Other Object Classes	\$53,603	\$91,011	-	(\$91,011)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$53,603	\$91,011	-	(\$91,011)
Full Time Equivalents	-	-	-	-

**Department of Homeland Security
Domestic Nuclear Detection Office
Systems Acquisition:
Securing the Cities**
Summary of Requirements by Object Class
(Dollars in Thousands)

Object Classes	FY 2015 Revised Enacted	FY 2016 Enacted	FY 2017 Request	FY 2016 to FY 2017 Change
Personnel and Compensation Benefits	-	-	-	-
Other Object Classes	-	-	-	-
21.0 Travel and Transportation of Persons	\$15	\$27	-	(\$27)
25.1 Advisory and Assistance Services	\$651	\$1,123	-	(\$1,123)
25.3 Other Goods and Services from Federal Sources	\$1,299	\$2,800	-	(\$2,800)
41.0 Grants, Subsidies, and Contributions	\$17,035	\$18,050	-	(\$18,050)
Total, Other Object Classes	\$19,000	\$22,000	-	(\$22,000)
Adjustments	-	-	-	-
Unobligated Balance, start of year	-	-	-	-
Unobligated Balance, end of year	-	-	-	-
Recoveries of Prior Year Obligations	-	-	-	-
Total Requirements	\$19,000	\$22,000	-	(\$22,000)
Full Time Equivalents	-	-	-	-

I. Changes in Full Time Employment

N/A

J. FY 2017 Schedule of Working Capital Fund by Program/Project Activity

**Department of Homeland Security
Domestic Nuclear Detection Office
Systems Acquisition:
(Dollars in Thousands)**

Program/Project/Activity	FY 2015 Revised Enacted Amount	FY 2016 Enacted Amount	FY 2017 Request Amount	Increase/Decrease for FY 2017 Amount
Radiological and Nuclear Detection Equipment (RDE) Acquisition	\$511	\$1,005	-	(\$1,005)
Securing the Cities	110	\$219	-	(\$219)
Total Working Capital Fund	\$621	\$1,224	-	(\$1,224)

Department of Homeland Security

Chemical, Biological, Radiological, Nuclear, and
Explosives Office



Fiscal Year 2017
Strategic Context
Congressional Submission

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A. Component Overview

The Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Office is comprised of the following mission-oriented programs that support achievement of the DHS strategic missions, goals, and objectives.

Radiological Nuclear Detection, Forensics, and Prevention Capability: The Radiological Nuclear (Rad/Nuc) Detection, Forensics, and Prevention Capability program leads the U.S. Government (USG) with development of the Global Nuclear Detection Architecture and its domestic implementation, as well as coordination and stewardship of USG technical nuclear forensics efforts. Functions include integrating interagency efforts to develop nuclear detection technologies, evaluating detector performance, ensuring effective response to detection alarms, integrating and ensuring readiness of U.S. nuclear forensics capabilities, and conducting transformational research and development for rad/nuc detection and forensics technologies.

Chemical, Biological, and Emerging Infectious Disease Capability: Chemical, Biological, and Emerging Infectious Disease Capability (CBEIDC) coordinates DHS efforts dedicated to national resilience against health incidents and supports DHS programs related to bio/chem defense. CBEIDC manages BioWatch, an early warning system to rapidly detect dangerous pathogens in the air, and the National Biosurveillance Integration Center, which enables the early warning and shared situational awareness of biological events so that critical decisions directing response and recovery efforts are well-informed and ultimately save lives. CBEIDC provides health and medical expertise related to chemical preparedness, detection, and response; and provides expertise to federal planning and policy development. CBEIDC also coordinates DHS programs related to the security of our nation's food, agriculture, and animal health; and provides technical assistance to help state and local communities bolster efforts to prepare for and respond to catastrophic health threats.

Bombing Prevention: The Bombing Prevention program leads and coordinates DHS efforts to protect life and critical infrastructure by building capabilities across the private and public sectors to prevent, protect against, respond to, and mitigate bombing incidents. Bombing Prevention leads the Department's efforts to implement national counter-improvised explosive device (IED) policy and plans. Bombing Prevention accomplishes its mission through coordination of national and intergovernmental bombing prevention efforts, counter-IED capability analysis and planning support, counter-IED information sharing and decision support, and counter-IED training and awareness.

Management and Administration: This program captures activities that provide enterprise leadership, management, and/or business administration services and describes the capabilities and activities that support the day-to-day management and back office functions enabling the Department to operate efficiently and effectively. Key capabilities include conducting agency planning and performance management, managing finances, managing agency workforce, providing physical and personnel security, acquiring goods and services, managing information

technology, managing agency property and assets, managing agency communications, managing legal affairs, and providing general management and administration.

FY 2017 Budget Request

The table below shows CBRNE FY 2017 Budget request by its mission-oriented programs.

Program	FY 2017 Request	
	FTE	Dollars (in thousands)
Rad/Nuc Detection Forensics and Prevention Capability	113	327,701
Bombing Prevention	19	14,263
Chemical, Biological, Emerging Infectious Disease Capability	68	117,920
Management and Administration	76	41,561
Total Budget Request	276	501,445

B. Component Contributions to Achieving Departmental Missions

The table below shows the alignment of the CBRNE programs to the DHS Missions and Mature and Strengthen Homeland Security.

Programs	DHS Missions					Mature and Strengthen Homeland Security
	Prevent Terrorism and Enhance Security	Secure and Manage Our Borders	Enforce and Administer Our Immigration Laws	Safeguard and Secure Cyberspace	Strengthen National Preparedness and Resilience	
Rad/Nuc Detection Forensics and Prevention Capability	100%					
Bombing Prevention	100%					

Programs	DHS Missions					Mature and Strengthen Homeland Security
	Prevent Terrorism and Enhance Security	Secure and Manage Our Borders	Enforce and Administer Our Immigration Laws	Safeguard and Secure Cyberspace	Strengthen National Preparedness and Resilience	
Chemical, Biological, Emerging Infectious Disease Capability	75%				4%	21%
Management Administration						100%

Mission 1: Prevent Terrorism and Enhance Security

Resources Requested

CBRNE resources supporting *Prevent Terrorism and Enhance Security* are provided in the table below.

\$ in thousands

Program	FY 2015*		FY 2016*		FY 2017	
	\$	FTE	\$	FTE	\$	FTE
Rad/Nuc Detection Forensics and Prevention Capability					327,701	113
Bombing Prevention					14,263	19
Chemical, Biological, Emerging Infectious Disease Capability					87,857	6
Total					429,821	138

*All programs were previously reported by three separate Components: Domestic Nuclear Detection Office, Office of Health Affairs, and National Planning Protection Directorate.

Performance Measures

For *Prevent Terrorism and Enhance Security*, two types of performance measures are presented. Strategic Measures represent CBRNE measures that gauge achievement for this mission area, and are considered to be our Government Performance and Results Act Modernization Act (GPRAMA) performance measures. Additional Management Measures are displayed, as appropriate, to provide a more thorough context of expected performance results.

NOTE: The creation of the CBRNE Office subsumes the Domestic Nuclear Detection Office (DNDO) but for the purposes of consistency of performance reporting DNDO retains its name in this portion of the Strategic Context.

Strategic Measures

Measure: Number of people covered by Securing the Cities program preventive radiological and nuclear (rad/nuc) detection capabilities (in millions)						
Description: The Securing The Cities (STC) program provides financial assistance to state, local, and tribal organizations to develop a robust regional radiological/nuclear detection program. For the STC program to count the population as covered by a robust radiological/nuclear detection capability, the region must demonstrate that 10% or more of its standing law enforcement are trained and equipped to conduct primary screening and patrolling as part of their daily routine duties and there are equipped and trained personnel to conduct secondary screening and alarm adjudication. In addition, the region must conduct at least one multi-jurisdictional exercise a year, allow the exchange of information among regional partners and with federal agencies, and mutually assist each other in performing the radiological/nuclear detection mission. If the measure is met, the entire population from the statistical area is counted as covered.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	N/A	N/A	23.0	23.0	37.0	37.0
Result:	N/A	N/A	23.0	23.0	N/A	N/A

Measure: Percent of cargo conveyances that pass through radiation portal monitors upon entering the nation via land border and international rail ports of entry						
Description: This measure gauges the proportion of cargo scanned by radiation detection equipment deployed to the Nation's land border crossing ports of entry and international rail ports of entry. It is expressed in terms of the percent of cargo conveyances scanned by radiation portal monitors (RPM), which enter the Nation through land ports of entry and by international rail. The Domestic Nuclear Detection Office (DNDO) procures and/or installs RPMs at ports of entry, and the U.S. Customs and Border Protection (CBP) conducts the cargo scanning using RPMs to detect nuclear and other radioactive materials that are out of regulatory control.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	FOUO	FOUO	FOUO	FOUO	FOUO	FOUO
Result:	FOUO	FOUO	FOUO	FOUO	N/A	N/A

Measure: Percent of containerized cargo conveyances that pass through radiation portal monitors at sea ports of entry						
Description: This measure gauges the amount of containerized cargo scanned by the radiation detection equipment deployed to the Nation's sea ports of entry. It is expressed in terms of the						

percent of containerized cargo conveyances that are scanned by radiation portal monitors (RPM) entering the nation through sea ports of entry. The Domestic Nuclear Detection Office (DNDO) procures and/or installs RPMs at sea ports of entry and the U.S. Customs and Border Protection (CBP) conducts the cargo scanning using the RPMs to detect nuclear and other radioactive materials that are out of regulatory control.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	FOUO	FOUO	FOUO	FOUO	FOUO	FOUO
Result:	FOUO	FOUO	FOUO	FOUO	N/A	N/A

Management Measures

Measure: Number of comprehensive evaluations and demonstrations of new and improved technologies to protect against nuclear terrorism

Description: This measure includes several technology development activities: feasibility evaluations completed of proposed radiological and nuclear (rad/nuc) detection and forensics technologies through the Academic Research Initiative and the Exploratory Research Program; proof-of-concept demonstrations completed of emerging rad/nuc detection and forensics technologies through the Exploratory Research Program; technology demonstrations and characterizations completed of promising rad/nuc detection and forensics technologies in an operationally relevant environment through the Advanced Technology Demonstration program; and test campaigns planned and executed for systems development testing and commercial systems evaluation testing. Development and acquisition programs are supported by a rigorous and objective test and evaluation program to characterize technologies and systems to understand technical performance, operational effectiveness, and system limitations.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	N/A	23	65	65	45	45
Result:	N/A	42	48	48*	N/A	N/A

*Delays in awarding contracts led to not achieving the FY2015 Target.

Measure: Number of exercises, assessments, and deployments to enhance federal, state, local, and tribal agencies' readiness to combat nuclear terrorism

Description: Number of operational support exercises, assessments, and deployments conducted by DNDO that enhance the Global Nuclear Detection Architecture (GNDA) by assisting federal, state, local, and tribal partners to improve their rad/nuc detection tactics, techniques, and procedures. This measure also includes the number of interagency nuclear forensics exercises in which DNDO serves as the Lead Planner. In leading these nuclear forensics exercises, DNDO ensures a consistent and comprehensive approach to assessing the government's operational capability to perform the nuclear forensics mission.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	N/A	61	110	144	164	164

Result:	N/A	106	161	248	N/A	N/A
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Measure: Percent of international air cargo, including special express commercial services cargo and mail, that passes through radiation detection systems upon entering the nation at air ports of entry

Description: This measure gauges the proportion of international air cargo and international air mail scanned by radiation detection equipment deployed to the Nation's international cargo aviation airports (U.S. air ports of entry). It is expressed in terms of the percent of the total amount of air cargo, including mail and cargo at express consignment courier facilities (ECCF), entering the Nation through the aviation pathway that is scanned using fixed and non-fixed radiation detection equipment. The Domestic Nuclear Detection Office (DNDO) procures and deploys radiation detection equipment and the U.S. Customs and Border Protection (CBP) conducts the cargo scanning using the radiation portal monitors (RPM) to detect nuclear and other radioactive materials.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	FOUO	FOUO	FOUO	FOUO	FOUO	FOUO
Result:	FOUO	FOUO	FOUO	FOUO	N/A	N/A

Measure: Percent of planned nuclear and radiation detection equipment acquired to combat nuclear terrorism

Description: This measure gauges Domestic Nuclear Detection Office's (DNDO) ability to execute its procurement plans by assessing the ratio of fixed, mobile, and portable nuclear and radiation detection equipment that DNDO acquires for federal operators to protect against radiological and nuclear threats to the baseline set out in the spend plan for a particular year. The spend plan is updated as requirements are identified by the federal operators and funding is appropriated. All equipment will be acquired in accordance with the DHS Acquisition Directive 102-01 and will meet codified performance and operational requirements.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	N/A	95%	95%	95%	95%	95%
Result:	N/A	63%	79%	36%*	N/A	N/A

* Changes in a major acquisition program plan led to not achieving the FY2015 Target.

Measure: Number of undergraduate, graduate, and post-doctorate fellowships and internships, university and junior faculty awards, and academic research awards in nuclear forensics and radiation detection-related specialties

Description: This measure gauges the total number of undergraduate, graduate, and post-doctorate fellowships in nuclear forensics- and radiation detection-related sciences, research internships in nuclear forensics, and education awards and junior faculty awards per fiscal year to support nuclear-related academic programs. Recipients of the various Nuclear Forensics

Fellowships and Faculty Award programs are selected from a competitive, merit-based application process. The Academic Research Initiative is a collaborative program with the National Science Foundation. These programs seek to advance fundamental knowledge for nuclear and radiological threat detection and related sciences with emphasis on fundamental research to develop human capital for the nuclear science and engineering professions.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	56	63	65	51	51	51
Result:	58	71	72	76	N/A	N/A

Measure: National Biosurveillance Integration System operational response time to incoming queries relative to biosurveillance (in hours)

Description: This measure is the elapsed time from NBIC receiving a request for relevant information to distributing information to interagency partners through appropriate means. This time includes search requirements within applicable systems and getting permission to release the information.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	<48.00	<24.00	<20.00	<20.00	<20.00	<20.00
Result:	15.42	17.42	4.06	6.15	N/A	N/A

Measure: Estimated time between an indoor monitoring unit exposure to a biological agent and the declaration of a confirmed positive sample result (in hours)

Description: This performance measure calculates the time between an indoor monitoring unit exposure to a biological agent and the declaration of a confirmed positive sample result by the local laboratory official. The indoor detection goal for BioWatch is a maximum time to confirmed positive result (BioWatch Actionable Result declaration) of <33 hours. This time is based on an average of the daily 24-hour aerosol collection cycle at some locations and shorter aerosol collection cycles at other locations (three pickups per day) followed by up to a 12-hour transport and laboratory analysis period.

Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	<33	<33	<33	<33	<33	<33
Result:	30	32	32	32	N/A	N/A

Measure: Estimated time between an outdoor monitoring unit exposure to a biological agent and the declaration of a confirmed positive sample result (in hours)						
Description: This performance measure calculates the time between an outdoor monitoring unit exposure to a biological agent and the declaration of a confirmed positive sample result by the local laboratory official. The outdoor detection goal for BioWatch is a maximum time to confirmed positive result (BioWatch Actionable Result declaration) of < 36 hours. This time is based on the daily 24-hour aerosol collection cycle and up to a 12-hour transport and laboratory analysis period.						
Fiscal Year:	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Target:	<36	<36	<36	<36	<36	<36
Result:	36	36	36	36	N/A	N/A

Mission 5: Strengthen National Preparedness and Resilience

Resources Requested

CBRNE resources supporting *Strengthen National Preparedness and Resilience* are provided in the table below.

\$ in thousands

Program	FY 2015*		FY 2016*		FY 2017	
	\$	FTE	\$	FTE	\$	FTE
Chemical, Biological, and Emerging Infectious Disease Capability					5,102	14
Total					5,102	14

*All programs were previously reported by three separate Components: Domestic Nuclear Detection Office, Office of Health Affairs, and National Planning Protection Directorate. .

Performance Measures

CBRNE contributes to this mission, but does not have performance measures in this area.

Mature and Strengthen Homeland Security

Resources Requested

CBRNE resources supporting *Mature and Strengthen Homeland Security* are provided in the table below.

\$ in thousands

Program	FY 2015*		FY 2016*		FY 2017	
	\$	FTE	\$	FTE	\$	FTE
Chemical, Biological, and Emerging Infectious Disease Capability					24,961	48
Management and Administration					41,561	76
Total					66,522	124

*All programs were previously reported by three separate Components: Domestic Nuclear Detection Office, Office of Health Affairs, and National Planning Protection Directorate.

Performance Measures

CBRNE contributes to this mission, but does not have performance measures in this area.